

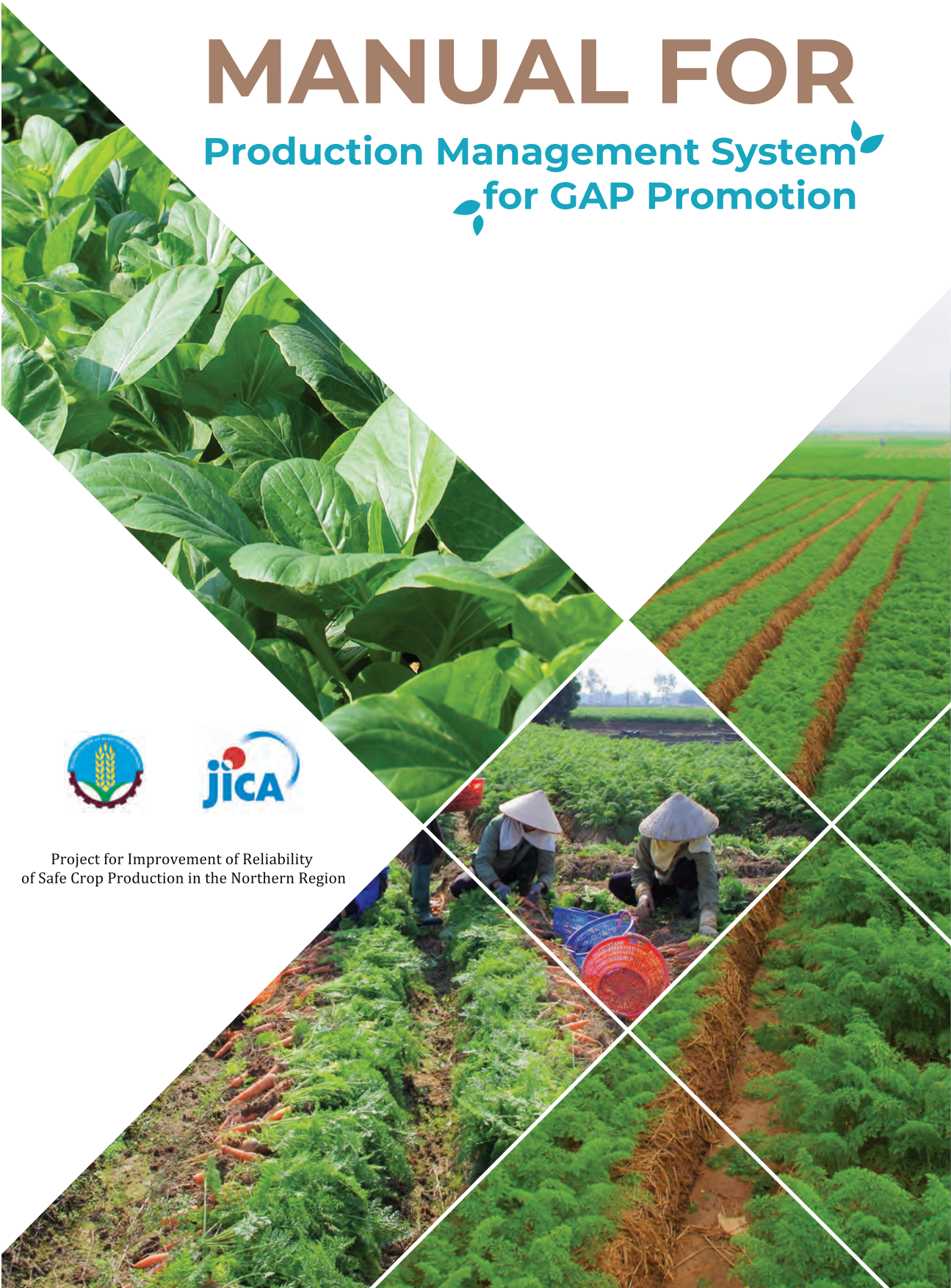
別添13 GAP促進のための生産管理システムマニュアル

MANUAL FOR

Production Management System for GAP Promotion



Project for Improvement of Reliability
of Safe Crop Production in the Northern Region



MANUAL FOR PRODUCTION MANAGEMENT SYSTEM FOR GAP PROMOTION

Project for Improvement of Reliability of Safe
Crop Production in the Northern Region

Japan International Cooperation Agency (JICA)

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Published in 2021.
Printed in Vietnam.

ISBN: 978-604-328-546-8

Manual for Production Management
System for GAP Promotion

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ABBREVIATIONS

ADB	- Asian Development Bank
DARD	- Department of Agriculture and Rural Development
DCP	- Department of Crop Production
GAP	- Good Agricultural Practices
ICM	- Integrated Crop Management
IPM	- Integrated Pest Management
ISO	- International Organization for Standardization
JICA	- Japan International Cooperation Agency
MARD	- Ministry of Agriculture and Rural Development
MRL	- Maximum Residue Level
NAFIQAD	- National Agro-Forestry-Fisheries Quality Assurance Department
NGO	- Non-Governmental Organization
PGS	- Participatory Guarantee System
QCVN	- National Technical Regulations
R/D	- Record of Discussion
TCVN	- Vietnamese National Standards
TOF	- Training of farmers
TOT	- Training of trainers
VietGap	- Vietnamese Good Agricultural Practices

FOREWORD

The Project for “Improvement of Reliability of Safe Crop Production in the Northern Region” is a Technical Cooperation Project (ODA Grant) of the Government of Japan to support Vietnam. Department of Crop Production (DCP), Ministry of Agriculture and Rural Development is the implementation agency of the Project. The Project has been implemented for 5 years (2016-2021) in 13 provinces/ cities in the Northern Region. There are four (4) pilot provinces/cities namely Hanoi, Hung Yen, Hai Duong and Ha Nam; three (3) semi-pilot provinces including Thai Binh, Vinh Phuc and Phu Tho and six (6) knowledge sharing provinces are Bac Ninh, Hai Phong, Quang Ninh, Hoa Binh, Nam Dinh and Ninh Binh.

The Project has been implemented with the overall goal: Agricultural products of the Northern Region are improved in term of safety and reliability, contributing to the development of the crop production sector and related economic industries.

Through implementation of activities, the Project has achieved specific results including: Establishing a model of safe crop production in the supply chain (production management linked with market); Expanding safe crop production areas (safe vegetables) following GAP (Basic GAP, VietGAP) in the Northern provinces; Strengthening the capacity to organize and manage safe crop production of the DCP and Department of Agriculture and Rural Development (DARD) of the Project provinces; Raising awareness of agricultural extension workers, technical officials and farmers in the Project area in terms of safe crop production; Raising awareness about food safety - in consumers through communication activities (school education program in Hanoi).

With advanced technologies, approaches and experiences shared from JICA experts, the direction and supervision of implementation from the DCP

and close coordination in the implementation of Project activities of the DARD in the target provinces, the Project has achieved remarkable results.

To promote production of safe crops, expand the model of crop production applying GAP in the supply chain, disseminate market knowledge, make a linkage of production and consumption and raise awareness on food safety and hygiene, Project results need to be further replicated and developed.

Based on the achieved Project results and ideas contributed from DARD of the target provinces, the Project has compiled **"Manual for Production Management System for GAP Promotion"** and **"Manual for Supply Chain Development"**, with a hope of providing useful information and experiences in order to expand and develop the Model of safe crop production in the supply chain, as well as contribute to the development of safe crop production in particular and the agricultural sector in general.

I sincerely introduce these two manuals to you!

DIRECTOR OF DEPARTMENT OF CROP PRODUCTION

PROJECT DIRECTOR

Nguyen Nhu Cuong

PURPOSE OF THE MANUAL

The purpose of the manual is to provide useful information and guidance to the officials of the Department of Agriculture and Rural Development (DARD) in the provinces which intend to introduce the production management system to support target groups for producing safe vegetables in accordance with Good Agricultural Practices (GAPs: basic GAP/ VietGAP) and distributing in the form of joint sales according to market demand. It is based on the practical experiences through the trial activities implemented for 20 target groups in pilot provinces (Hai Duong province, Ha Nam province and Hung Yen province) and in semi-pilot provinces (Phu Tho province, Thai Binh province and Vinh Phuc province) under the Project for Improvement of Reliability of Safe Crop Production in the Northern Region (hereinafter referred to as “the Project”).

This manual is comprehensive in that it includes the series of activities to be conducted by the officials of DARD: selection of target group, confirmation of safety of production area, trainings for Basic GAP, formulation of safe crop production group, production planning based on market demand, field instructions applying Basic GAP, upgrading conditions to ensure food hygiene and safety, joint sales management, and external inspection and auditing.

The following benefits are expected in using this manual for both officials of DARD and farmers of target groups:

For officials of DARD

- Roles and responsibilities of officials of DARD are clear and feasible to apply.
- Procedures and methodologies to support production and sales of safe vegetables by target groups are described in detail.

- Capacity of officials of instruction, monitoring and inspection for safe vegetable production and sales will be developed.

- Safe vegetable production and sales will be disseminated in the province.

For farmers of target group

- Safe vegetable production and post-harvest practices¹ will be improved in accordance with Basic GAP protocol and government food safety regulations.

- Production plan can be prepared based on market demand.

- Traceability and accountability of safe vegetable production will be improved.

- Safe vegetables will be sold jointly by joint sales mechanism.

- Safe vegetables production and sales will be expanded as the market expands.

- Economic returns of target groups will be increased.

¹Hanoi City, Hai Phong City, Hung Yen Province, Hai Duong Province, Ha Nam Province, Thai Binh Province, Phu Tho Province, Vinh Phuc Province, Quang Ninh Province, Hoa Binh Province, Bac Ninh Province, Nam Dinh Province and Ninh Binh Province.

CHAPTER 1

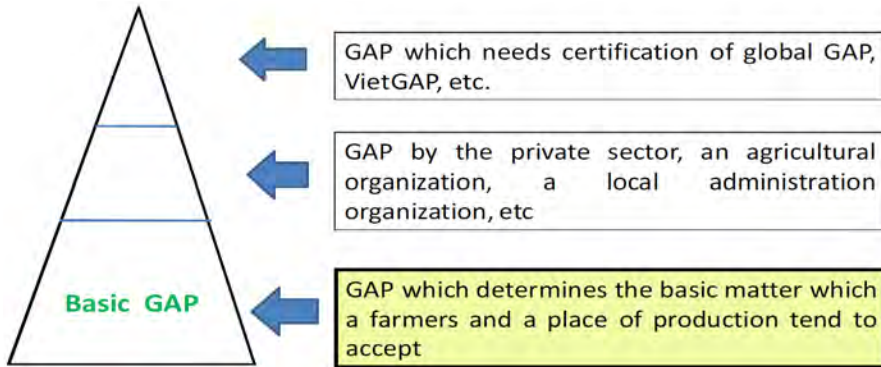
INTRODUCTION

1.1 WHY BASIC GAP?

The Economy of Vietnam has grown even after becoming a Middle-Income Country. The Agriculture sector has been steadily developed, with amount of agriculture production has increased, and export of major crops such as rice, vegetables and fruits increased. As the agriculture production has increased in Vietnam, usages of pesticide and chemicals has increased. This leads to decrease of food safety by presence of residual pesticides and bacteria, etc. The Vietnamese Government has recognized the importance of food safety; however, sufficient countermeasures have not been taken because it requires improvements not only in production technology but also processing and transportation systems/technology and the establishment of testing system of soil, water and agriculture products, etc.

In 2008, MARD has established technical guidance called VietGAP (Good Agriculture Practice) which has 65 criteria for ensuring safe crop cultivation. The criteria involve not only food safety but also indirect items such as environmental protection. VietGAP has been introduced into many vegetable and fruit producers in Vietnam and has contributed to improving the food safety.

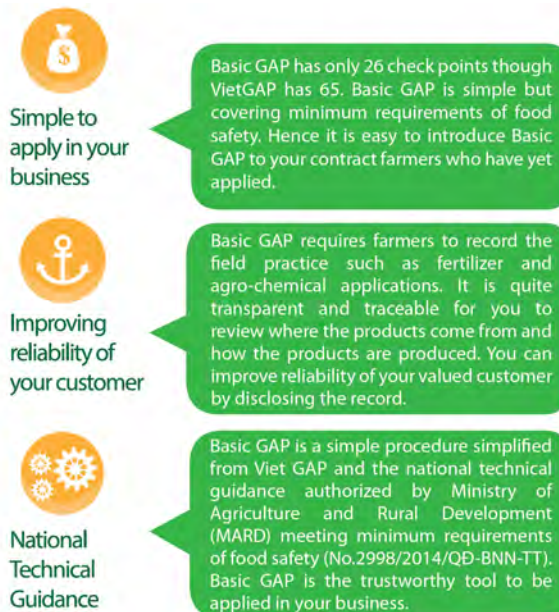
However, VietGAP costs around 2,000 USD per year to acquire certification and requires the meeting of many difficult criteria. Therefore, it is generally difficult for small cooperatives and individual producers to apply VietGAP. Based on the above circumstances, MARD with support of JICA implemented “Strengthen the Capacities for the Field of Management of Vietnam’s Crop Production Sector for Improving the Productivity and Quality of Crop’s Products in Vietnam” (So called “Safe Crop Project”) during 2010-2013. This aimed at raising awareness and improvement of cultivation technology. Through the practical activities, the Safe Crop Project eventually developed “Basic GAP” which extracted only 26 important criteria relating to food safety out of the 65 criteria of VietGAP.



Source: JICA Project team

Figure 1-1 Position of Basic GAP

As the result, producers supported by the Safe Crop Project became aware of appropriate usage of agriculture inputs such as pesticides and chemicals by recording, which led to cost reduction of inputs. In accordance with the result of the Safe Crop Project, MARD officially approved Basic GAP as a technical procedure in July 2014. Basic GAP has three major advantages as shown below.



Source: JICA Project team

Figure 1-2 Advantages of Basic GAP

(1) Simple to apply

Basic GAP has only 26 check points though VietGAP has 65. Basic GAP is simple but covers minimum requirements of food safety. Hence it is easy to introduce Basic GAP to the farmers who haven't yet applied it.

(2) Improving reliability

Basic GAP requires farmers to record the field practice such as fertilizer and agro-chemical applications. It is quite transparent and traceable to review where the products come from and how the products are produced. You can improve reliability of customer by disclosing the record.

(3) National technical guidance

Basic GAP is a simple procedure simplified from VietGap and the national technical guidance authorized by the Ministry of Agriculture and Rural Development (MARD) meeting minimum requirements of food safety (No.2998/2014/Q-BNN-TT). Basic GAP is the trustworthy tool to be applied.

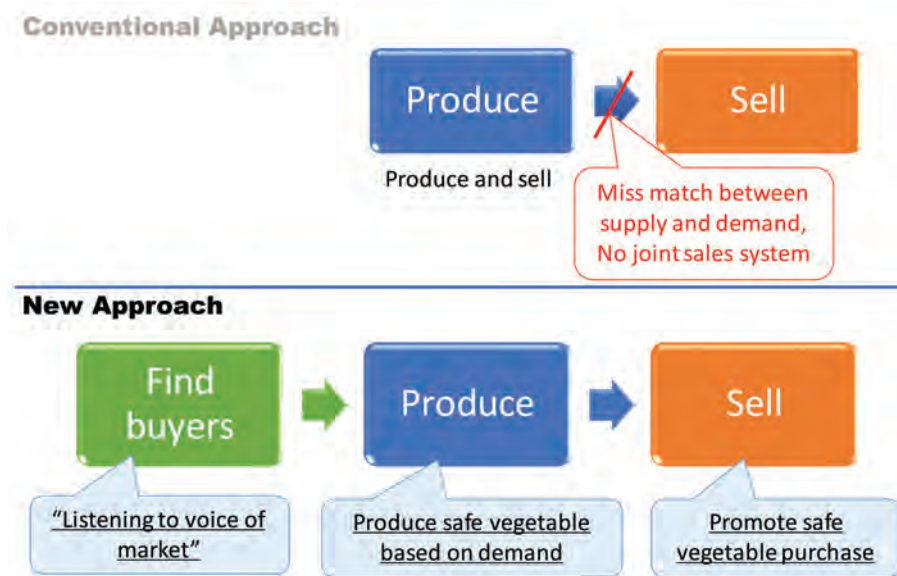
Besides these three advantages, Basic GAP is free to apply. Since VietGAP requires a certification fee, Basic GAP is an easily applicable alternative for agriculture cooperatives and farmer groups in Northern Vietnam. It is also remarkable that under Basic GAP, the safety conditions of the production process shall be confirmed between two parties (producer and buyer) though it is certified by a third party under VietGAP.

1.2 PRODUCE WHAT THE MARKET WANTS

On the supply chain side of agricultural products, reliability of consumers in the safety of vegetables was extremely low due to insufficient management not only in production but also in distribution, processing and selling; such as "mixed loading" during distribution. Price difference between vegetables and *safe* vegetables was also not usually disclosed. This affected in reducing willingness of producers for safe vegetable production. Therefore, Basic GAP has not been disseminated enough even after its approval as a technical procedure. It

is a big challenge to develop a supply chain of safe vegetables that links with production management and can earn the trust of consumers by improving on the processing and distribution process.

In addition, all the stakeholders of production, distribution and sales, as well as consumers lack the correct knowledge and information on vegetable safety. Despite the various awareness activities related to the promotion of safe crop production that have been carried out by the government and donors, the safety crop production area has not been expanded. Recognizing vegetable safety and sharing information among all stakeholders from production, sales and consumption are the subjects through effective awareness activities.



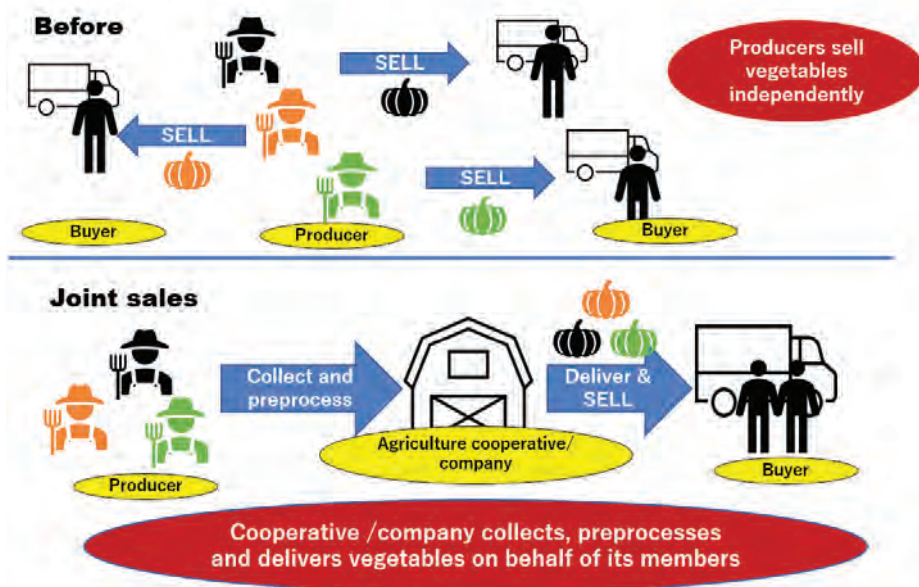
Source: JICA Project team

Figure 1-3 Produce what the market wants

1.3 JOINT SALES

Joint sales means that a producer group (such as a cooperative or company) collects, pre-processes, and sells products as a group in order to increase its bargaining power to buyers by bigger volume as well as better quality of products than those by an individual producer. Although

most producers in Northern Vietnam belong to the cooperatives, they sold their products not cooperatively but individually. This is because although most of the cooperatives have marketing function, they do not have experience in doing so.



Source: JICA Project Team

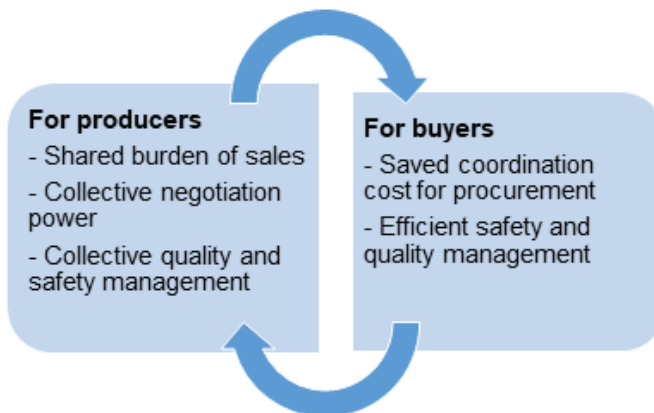
Figure 1-4 Joint sales

However, this practice does have a negative impact on profitability of producers. Since the volume of vegetables small producers can grow is quite limited, their bargaining power with buyers is also limited. This keeps their income level low. If the producers collect and sell vegetables together, they can more effectively negotiate with buyers for price and other trading conditions.

In joint sales, an agricultural cooperative or a company collects, preprocesses, and delivers the vegetables on behalf of producers. Each producer does not need to bring their product to buyers nor find buyers. The agricultural cooperative/company negotiates trading conditions such as price and makes contracts with buyers. Joint sales increases the power of negotiation with buyers. Cooperative management

can negotiate with buyers using volume and quality of product for favorable terms, which is not possible for individual small producers. Lastly, producers can improve their technical skills for safe vegetable production, post-harvest and delivery through collective quality and safety management which satisfy the customer requirement. In this way, joint sales enable producers to adjust their production methods to market demand.

Joint sales is beneficial to buyers too. Institutional buyers such as supermarkets have had difficulty in finding reliable suppliers who can provide safe vegetables of a required amount with required quality at required timing. It is time-consuming as well as costly for them to deal with individual producers. Aggregation through joint sales is an effective way for the cooperatives to supply products to these institutional buyers.



Source: JICA Project team

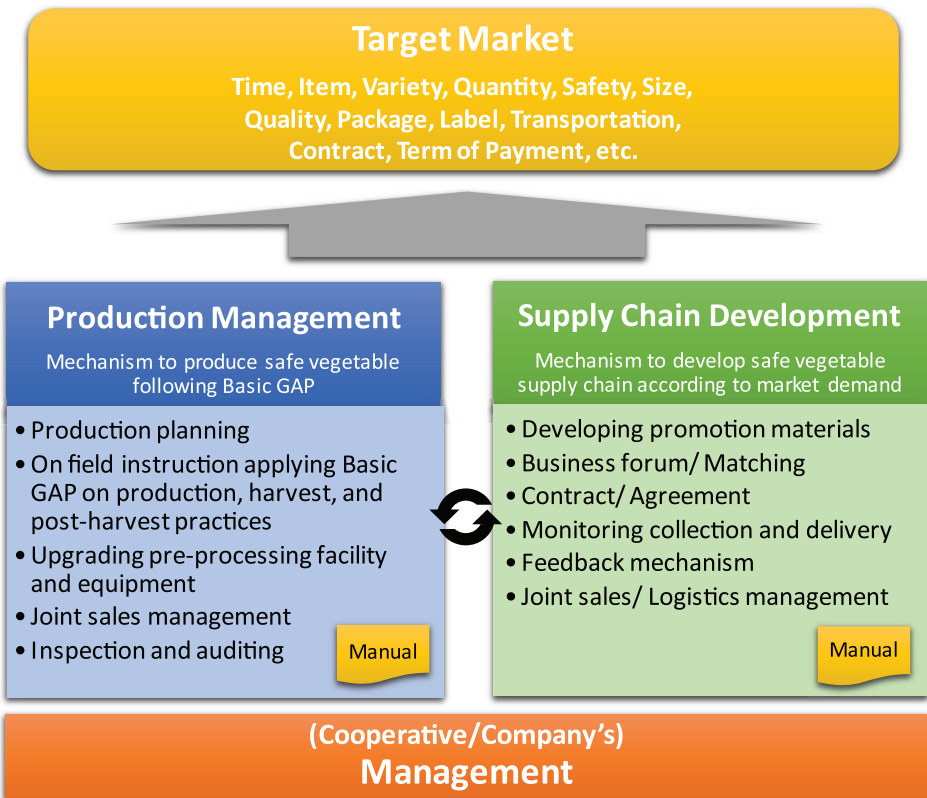
Figure 1-5 Advantage of joint sales

As the number of modern retailers such as supermarkets steadily increases not only in big cities but also provincial cities, capturing this market is the most promising way for safe vegetable producers to be successful. Aggregation through joint sales is, in fact, the only way for small producers to join this market.

1.4 STRUCTURE OF SAFE VEGETABLE PROMOTION PLAN

The safe vegetable promotion plan consists of production management and supply chain development. Production management system and supply chain development is defined as below and the conceptual structure of safe vegetable promotion plan is shown in the following figure:

- ✧ **Production management system** is a mechanism to control safe vegetable production and post-harvest activities following Basic GAP.
- ✧ **Supply chain development** is a process to establish safe vegetable supply chain based on the market demand.



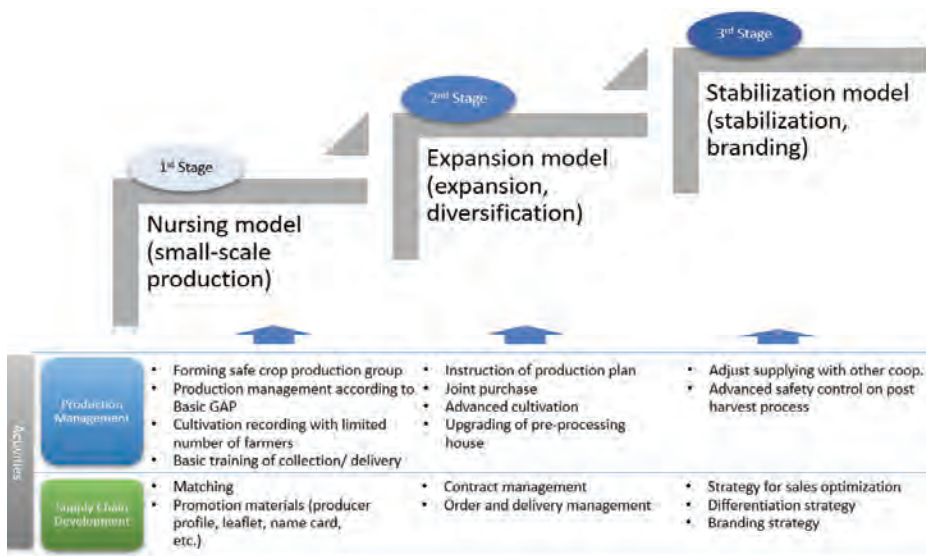
Source: JICA Project team

Figure 1-6 Approaching model for management

Production management is a mechanism to control safe vegetable production and post-harvest activities following GAPs. Supply chain development is a process to establish a safe vegetable supply chain based on the market demand. Both components closely link each other. For example, market demand captured in the supply chain development component is reflected to production planning in production management. On the other hand, the recorded field diaries and the inspection results of pesticide residue implemented in production management systems are good communication tools in explaining the safety of products to the buyers in supply chain development. Target market or buyer's demands, such as time, item, variety, quantity, safety, size, etc. will be achieved by these two components.

1.5 STAGE-WISE APPROACH

Farmers' group (e.g. agriculture cooperative, agriculture company and/or production group) is developed step by step according to the capacity of the group as shown in the following figure.



Source: JICA Project team

Figure 1-7 Stage-wise Approach

If a group has no experience of corrective actions on production and joint sales, the group should start from the 1st stage: small-scale production and sales, then gradually expand the production scale. If a group has experience of corrective actions on production and joint sales, the group should start from the 2nd Stage to expand the production and/or diversify the varieties of vegetables to meet the market demand. If a group has enough production volume and cultivation techniques for different varieties of vegetables, the group should start from the 3rd Stage to stabilize and add values on products by improving traceability and/or packaging. The detailed procedures of operation are explained from Chapter 2.

CHAPTER 2

SELECTION OF TARGET GROUP

Target group candidates should be widely nominated among existing vegetable production groups but selected carefully with both quantitative and qualitative information. Target group selection shall be conducted by the following three procedures from 2.1 to 2.3. The supporting measures for the group not selected as target groups is explained in 2.4.

2.1 NOMINATION OF TARGET GROUP CANDIDATES

Target group candidates should be nominated from an existing list of potential agriculture cooperatives/companies and producer groups cultivating vegetables. If there is no such list, DARD should prepare the one based on pre-existing agricultural cooperatives/ companies and producers who possess sub-departments of rural development, crop production and/ or plant protection. The groups which have the following characteristics should be excluded from the list:

- Potential risk is already identified as chemical industry is located nearby the vegetable production area.
- Contamination of heavy metals and other harmful materials is already confirmed by scientific analysis.
- Vegetables are not produced in a specialized vegetable production area/zone designated by province/district.

Target group candidates shall be listed with basic information including: group name, type of group, number of member farmers, vegetable production area and certified safe vegetable production area as shown in the table below.

Table 2-1 Format of Target Group Candidate List

No.	Group Name	Type	Member ship	Vegetable produc- tion area (ha)	Certified Safe area (ha)

2.2 IMPLEMENTATION OF FIELD SURVEY OF THE TARGET GROUP CANDIDATES

DARD implements the field survey of the target group candidates. Field survey consists of interview with key informants, data collection and field observation to gather necessary information for target group selection. The following table shows the assessment sheet of target group candidates.

Table 2-2 Assessment sheet of target group candidate

Content	Sub content	Answer	Remarks
General Info	Group Name		
	Year Established		
	Registration No.		Attach a business license
1. Target area			
Land	Agriculture Land (ha)	ha	Total agricultural production area including rice, fruit, vegetable, etc.
	Vegetable Land (ha)	ha	Total vegetable production area
Products (production volume)	Winter vegetable (Sep.-Mar.)		List of the major vegetables and production volume
	Summer vegetable (Apr.-Aug.)		List of the major vegetables and production volume
2. Location and environment			
Location	Location (no chemical industry nearby)		Verify through field observation
Suitability of land condition	Infrastructure (road, irrigation, drainage), low risk of flooding		Verify through field observation
Certificate of safe production condition	Certificate of Safe Production Condition		Attach the copy

Content	Sub content	Answer	Remarks
3. Knowledge and techniques			
Farming practice	Knowledge/practice in safe crop production		Verify through field observation (e.g. record keeping, input usage, using waste box, washing facility, etc.)
	Years of farming experience		Count the years of cultivation experiences of target group members ² .
	Technologies applied		Verify through field observation (e.g. knowledge and skills of Integrated Pest Management (IPM) ³ , Integrated Crop Management (ICM) ⁴ , composting, seedling, agri. materials)
4. Number of farmer group and production volume			
Membership	No. of total membership		
	No. of board members		
	No. of members for safe vegetable production		
5. Willingness and eagerness			

2. For example if a member has 3 years' experience of farming like a technical intern training program in Japan, it is counted as 3 years.

3. IPM uses environmentally sound ways to keep pests from invading and damaging plants by prevention, cultural control, physical or mechanical control, and/or biological control.

4. ICM is a whole farm approach including crop rotations, appropriate cultivation techniques, careful choice of seed varieties, minimum reliance on artificial inputs such as fertilizers, pesticides and fossil fuels, maintenance of the landscape, and enhancement of wildlife habitats.

Content	Sub content	Answer	Remarks
Leadership and independency	(Narrative answer)		Verify through interview with group leaders and field observation
6. Group type			
Group Type and business sector	Group registration		Attach the business license (Agriculture company/ Cooperative))
	Business sector on business license		List of the business sectors on business license ⁵
7. Vegetable production and marketing			
Experience in safe crop production	Basic GAP		Verify the training experience
	VietGAP		Verify the training experience/ Attach the copy
	Other (PGS etc.)		Verify the training experience/ Attach the copy
Experience in market channel development	Experience in joint Sales		Yes/No
	Percentage of joint sales out of total sales (%)		0-100%
	Current buyers name and percentage of sales (%)		e.g. 1. Buyer A: 50% 2. Buyer B: 30% 3. Wet market: 20%

⁵ Business sectors on a business license are coded following prime minister's decision No. 27/2018/QĐ-TTg dated on July 06, 2018 Promulgating Vietnam Standard Industrial Classification.

Content	Sub content	Answer	Remarks
8. Other key questions			
Pre-processing, Packaging, Transportation	Existing Facility and infrastructure with current condition/usage		e.g. pre-processing house, irrigation, greenhouse, etc.
	Labelling/ packaging		e.g. logo, business card, packaging tools, QR code, etc.
	Storing/ Cool storage		e.g. cool storage
	Means of transportation		e.g. own/hire a truck for product transport
Product pricing	Selling Price compared with market price (Narrative answer)		e.g. Buyer A pays 10% higher Buyer B pays same as normal vegetable.
Sales Promotion	Experience in sales promotion		e.g. Trade fair/ Catalogue/ Advertise on Facebook/ in-store promotion
External Support	Past and current support by donor/ NGO/ Government		e.g. received/ receives support from ADB for construction of pre-processing house
	Condition of supported items		e.g. fully utilized, partly utilized, not utilized with reasons.
Remarks			(if any)
Overall Assessment			

Content	Sub content	Answer	Remarks
Recommendation	Overall assessment of target group candidate		Write recommendation in regard to land availability, management capacity for joint sales, and willingness of the leader.

Box: Check points of willingness and eagerness

It is emphasized that the target group should hold strong willingness and eagerness in considering a model with sustainability. To check the willingness and eagerness, it is recommended to interview group leaders with focus on the following check points.

- ✧ Express of willingness and eagerness in the involvement of safe vegetable production and joint sales
- ✧ Vision of safe vegetable production
- ✧ Leadership experience (mobilizing people for corrective action)
- ✧ Communication skill (good responses to questions)
- ✧ Independency (no dependency on gov./donor's support)

Box: Business sector on business license

Business sectors on a business license are coded following prime minister's decision No. 27/2018/QĐ-TTg dated on July 06, 2018 Promulgating Vietnam Standard Industrial Classification. All the target groups should be registered under the Code 0118 "Growing vegetables, beans and flowers" as the minimum requirement for vegetable production and sales.

UBND HUYỆN THANH LIÊM CỘNG HÒA XÃ HỘI CHỦ NGHĨA VIỆT NAM
PHÒNG TÀI CHÍNH - KẾ HOẠCH Độc lập - Tự do - Hạnh phúc

GIẤY CHỨNG NHẬN ĐĂNG KÝ HỢP TÁC XÃ
Số: 0700833744
Đăng ký lần đầu, ngày 3 tháng 12 năm 2019

1. Tên hợp tác xã
Tên hợp tác xã viết bằng tiếng Việt: **HỢP TÁC XÃ RAU AN TOÀN XÃ THANH TÂN**
Tên hợp tác xã viết bằng tiếng nước ngoài:
Tên hợp tác xã viết tắt: HTX RAT XÃ THANH TÂN

2. Địa chỉ trụ sở chính: Thôn Bạc, Xã Thanh Tân, Huyện Thanh Liêm, Tỉnh Hà Nam, Việt Nam
Điện thoại: 0376-442998 Fax:
Email: Website:

3. Ngành, nghề kinh doanh

STT	Tên ngành	Mã ngành
1	Trồng rau, đậu các loại và trồng hoa <i>Xuất khẩu rau, củ quả các loại /</i>	0118 (chính)

4. **Vốn đã lệ: 150.000.000 (Một trăm năm mươi triệu đồng)**

5. **Người đại diện theo pháp luật của hợp tác xã**
Họ và tên: **LÊ VĂN ĐỨC** Giới tính: Nam
Chức danh: Chủ tịch Hội đồng quản trị kiêm Giám đốc
Sinh ngày: 10/05/1960 Dân tộc: Kinh Quốc tịch: Việt Nam
Loại giấy tờ chứng thực cá nhân: Thẻ căn cước công dân
Số giấy chứng thực cá nhân: 035060001506
Ngày cấp: 14/09/2017 Nơi cấp: Cục Cảnh sát đăng ký, quản lý cư trú và dữ liệu quốc gia về dân cư
Nơi đăng ký hộ khẩu thường trú: Thôn Bạc, Xã Thanh Tân, Huyện Thanh Liêm, Hà Nam, Việt Nam
Chỗ ở hiện tại: Thôn Bạc, Xã Thanh Tân, Huyện Thanh Liêm, Hà Nam, Việt Nam

TRƯỞNG PHÒNG
PHÒNG TÀI CHÍNH - KẾ HOẠCH
HUYỆN THANH LIÊM

TRƯỞNG PHÒNG

All the key questions should be collected and documented. All the evidences, such as Certificate of Safe Production Condition, VietGAP and business registration should be attached properly as reference. For better reference, it is also recommended to take pictures of certificates, production Area, pre-processing house, package/label, and interviewee. (see Attachment 2.1 Assessment Sheet for Target Group Candidates)

2.3 CONFIRMATION OF TARGET GROUPS

Based on the field survey results, target group candidates are assessed according to the selection criteria. The selection criteria of target groups are developed according to the experiences of trial activities in the Project based on Record of Discussions agreed upon between MARD and JICA on 29th February, 2016 as below.

Table 2-3 Selection Criteria for Target Group

Target Priority	Evaluation Criteria	Indicator	Compulsory	Recommended
1. Target area/zone	Prefer specialized vegetable production area/zone	• Specialized area/zone	●	
		• Land area is more than 1ha.	●	
2. Location and environment	Preferable location whether the areas are suitable for safe vegetable: Favorable natural environment (soil, water, air), Economic and social environment	• Suitability of land condition (infrastructure, low risk of flooding)	●	
		• No chemical industry nearby	●	
		• Certified as safe production area	●	
3. Knowledge and techniques	Accumulated knowledge/techniques on safe crop production	• Years of experience of farming practice is more than 3 years ⁶ .	●	
4. Number of farmers in the group	Certain number of farmers in the group	• No. of farmers are more than 7 members ⁷ .	●	
5. Willingness and eagerness	Willingness and eagerness of producers	• Leadership and independency (recommended)		■

6. Years of experience does not just count the years from establishment of cooperative/company to date, but count the years of cultivation experiences of the target group members. For example, it can be included as the year of experience if the member has an experience of farming in Japan working as a technical intern training program.

7. Number of membership of agriculture cooperative must be more than 7 members under the cooperative law. For farmers group and agriculture company must have more than 7 members including both management members and workers.

6. Group type	Business sector on business license	<ul style="list-style-type: none"> Business sector on business license includes “Growing vegetables, beans and flowers” (code 0118) as the minimum requirement for vegetable production and sales. (recommended) 		■
7. Vegetable production and marketing	Safe vegetable production and distribution	<ul style="list-style-type: none"> Basic GAP and/or VietGap is applied. (recommended) 		■
		<ul style="list-style-type: none"> Experience of market channel development and joint sales (recommended) 		■

Source: Record of Discussions (R/D) agreed upon between MARD and JICA on 29th February, 2016.

Remark: JICA Project team modifies the evaluation criteria and indicators for clarification according to the experiences of trial activities in the Project based on R/D.

Among 7 target priorities, 4 priorities (1. Target area/zone, 2. Location and environment, 3. Knowledge and techniques, and 4. Number of farmers in the group) are compulsory to meet the evaluation criteria, and other 3 priorities (5. Willingness and eagerness, 6. Group type, and 7. Vegetable production and marketing) are recommended to meet.

Sample evaluation sheet of target group candidates is shown in the table 2.4. As shown in the table, all candidate groups are listed, and the collected information should be filled in the cells according to the set criteria. After filling all information, details shall be assessed carefully whether they meet the requirement of each indicator. For example, it is

assessed as ineligible if a group does not have any specialized vegetable area and/o

Table 2-4 Sample Evaluation Sheet of Target Group Candidates

No.	Group name	1. Target area/zone		2. Location and environment		
		Specialized vegetable area	Land area is more than 1ha.	Suitability of land condition	No chemical industry nearby	Certified as safe production area
HD-1	Gia Gia food joint stock Company	Yes	5.3	Good infrastructure, small production area but sufficient	No	Certified
HD-2	Green farm vegetables production group	Yes	7	Sufficient production area with good infrastructure investment	No	Certified
HD-3	Lua farmers group	Yes	27.54	Good infrastructure, small land area but sufficient	No	Certified
HD-4	V-Phuc Green agriculture Cooperative	No	10	Poor infrastructure	No	No
HD-5	Viet A Chau Cooperative	No	13	Good infrastructure, have processing facility (dry shallot)	No	No

Note: Highlighted cells indicate the ineligible indicators not meeting the criteria.

or does not have a certificate of safe production condition.

3. Knowledge and techniques	4. Number of farmers in the group	5. Willingness and eagerness	6. Group type	7. Vegetable production and marketing		Evaluation
Farming practice more than 3 years	No. of farmers is more than 7 members	Leadership and independence	Business license includes growing vegetables	BasicGAP and/or VietGAP is applied.	Experience of market channel development and joint sale	
●	●					
3	10	High leadership	Yes	BasicGAP VietGAP	Newly starting joint sale	Target group
3	10	High leadership and good capacity in capital mobilization	Yes	Safe production, organic	Good marketing, having own safe vegetable shop	Target group
10	147	High leadership	Yes	BasicGAP VietGAP	Joint sale	Target group
-	14	Low leadership	No	No	Joint sale (acts as collector)	-
-	28	Low leadership	No	ISO 22000	Not involved in farming, Collection for processing	-

Box: Selection of target groups, a case in Hai Duong province

In Hai Duong province, JICA project team and Hai Duong DARD discussed and agreed to expand the number of target groups. Hai Duong DARD nominated 5 candidate groups, JICA project team and Hai Duong DARD jointly conducted the field survey of those 5 groups.

As the result of field survey, it was identified that three groups had high potential of safe crop production and sales because they had certificates of safe production condition, good knowledge of GAP, and high motivation to be a safe production model. However, other two groups were not eligible for selection as target groups because they did not have high motivation to produce safe vegetables. One of the groups was registered as a cooperative but it had no vegetable production land and just contracted with individual farmers to procure the vegetable as a collector. It is very important to conduct a field survey and check the actual conditions for each item, otherwise ineligible groups may be selected unintentionally. According to the assessment based on the field survey results, three groups were recommended as the target groups by Hai Duong DARD.

Selection results shall be summarized in the form (Attachment 2.2 Selection result of target groups), attached with assessment sheet of target group candidates. DARD holds a selection meeting to confirm the selection procedures and results and approves the selection. DARD also prepares a producer profile for selected target group (Attachment 2.3 Producer profile).

2.4 SUPPORT FOR BEING SELECTED AS TARGET GROUP

Among the nominated candidate groups, some of groups may not be selected as target groups due to not meeting the selection criteria. For being selected as a target group, it is required to provide supports to meet the criteria. Recommended counter measures for each criterion are shown as below.

Table 2-5 Counter measures to meet each criterion

Target Priority	Evaluation Criteria	Counter measure
1. Target area/zone	Prefer specialized vegetable production area/zone	✓ Support finding a specialized vegetable production area more than 1ha
2. Location and environment	Preferable location whether the areas are suitable for safe vegetable: Favorable natural environment (soil, water, air), Economic and social environment	✓ Support upgrading of infrastructure, such as irrigation and drainage
		✓ Support finding a suitable land for safe vegetable production, keeping distance from chemical industry, low risk of flooding
		✓ Support issuing a certificate of safe production area
3. Knowledge and techniques	Accumulated knowledge/ techniques on safe crop production	✓ Let farmers practice farming more than 3 years with technical support of cultivation skills including IPM and ICM
4. Number of farmers in the group	Certain number of farmers in the group	✓ Support formulating a safe vegetable production group which has more than 7 members.
5. Willingness and eagerness	Willingness and eagerness of producers	✓ Support changing to a new leader who has strong willingness and independence
		✓ Provide leadership/ communication skill trainings (if available)
6. Group type	Business sector on business license	✓ Support acquiring business license indicating the business sector "Growing vegetables, beans and flowers" (code 0118) as the minimum requirement for vegetable production and sales.

7. Vegetable production and marketing	Safe vegetable production and distribution	✓ This criterion is not compulsory, but it is recommended to provide a Basic GAP training and support keeping field diary record.
		✓ This criterion is not compulsory, but it is recommended to confirm the eagerness of joint sales.

(1) Target area/zone: If a candidate group does not have a specialized vegetable production area/zone, DARD should support finding a suitable land more than 1ha.

(2) Location and environment: If the land location is not suitable for safe vegetable production in terms of natural environment and economic and social environment, DARD should:

- Support finding suitable land for safe vegetable production, keeping distance from chemical industry, low risk of flooding
- Support upgrading of infrastructure, such as irrigation and drainage
- Support issuing a certificate of safe production area when the location is suitable for safe vegetable production and the result of soil and water sampling test passes the conditions specified in 3.2

(3) Knowledge and techniques: If the target group farmers have limited experience of farming practice (less than 3 years), it is recommended to:

- Let farmers practice farming more than 3 years as the minimum experience
- Provide technical support for IPM and ICM as the basic cultivation skills for safe vegetable production

(4) Number of farmers in the group: If the members of farmer groups are less than 7 members, which is judged not sufficient to implement the safe vegetable production and joint sales as a group. DARD should support gathering the farmers who are willing to produce safe vegetables jointly.

(5) Willingness and eagerness: If the willingness and eagerness of the leader for safe vegetable production and sales are assessed as low, it is very difficult to sustain the safe vegetable production group. It affects the effectiveness and sustainability of the program. DARD should avoid selecting such groups. However, if the group has potential to meet the criteria other than willingness and eagerness and DARD expects the group to become a model of the province, DARD should support changing to a new leader who has strong willingness and independency and/or provide training to learn leadership or communication skills.

(6) Group type: It is highly recommended the target group has a business license. Business sectors on a business license are coded following prime minister's decision No. 27/2018/QĐ-TTg dated on July 06, 2018 Promulgating Vietnam Standard Industrial Classification. The target group should be registered indicating the business sector as the Code 0118 "Growing vegetables, beans and flowers" as the minimum requirement for vegetable production and sales.

(7) Vegetable production and marketing: If the experience of safe vegetable production and sales is limited, it is not compulsory but recommended to:

- Provide a training of Basic GAP for raising awareness among farmers about the importance of safe vegetable production, especially for traceability by record keeping
- Raise awareness of joint sales and confirm the eagerness to organize.

CHAPTER 3

CONFIRMATION OF SAFETY OF PRODUCTION AREA

3.1 REVIEW OF THE SAFETY OF PRODUCTION AREA

Confirmation of safety of production area is the basis of safe vegetable production. Production area might be changed due to expansion of cultivation area or certificate of safe production area might be expired. It is mandatory for DARD to review the safety of production area of each target group annually.

DARD should arrange a field visit to the target groups and check the status of:

- Certificate of safe production area: Request the group to show the original certificate and verify the validity.
- VietGap certificate: Request the group to show the original certificate and the verify the validity.
- Expansion/Change of production area: Ask the group the plan of expansion or change of production area.

Production area of a target group is confirmed as safe if one of the certificates of safe production area or VietGap is valid and there is no change/expansion of production area. However, it is required to conduct soil and water sampling tests and issue a new certificate of safe production area in the cases below:

- Both certificates of safe production area and VietGap are expired or to be expired in the season.
- The group expands/changes the production area.
- There are potential safety risks evaluated of - the production area due to changing of irrigation water sources and pollution of soil.
- An inspection report by DARD and/or any relevant institution shows a heavy metal residue from the sample products produced in the site.

DARD should also utilize the results of DCP/MARD's program for testing soil and water in safe vegetable area when DCP/MARD's program

for testing soil and water covers the target group area. However, the results of DCP/MARD's program for testing soil and water in safe vegetable area where the samples were taken represents a very large area: a whole district or a commune. DARD can skip soil and water sampling tests when there is a clear result in the land of a target group. In the case that the report result is not clear or does not cover the land of target groups, DARD should conduct soil and irrigation water sampling tests for confirmation of safety of production area. The safe condition of production area shall be summarized as shown in the table below.

Table 3-1 Assessment of safety of production area before starting the project

(Checked on: 1/Aug/2018)

Group Name	Certification of safe production area			VietGap certificate			Expansion/ Change of production area		Re- marks	Recom- mendation
	Copy of certifi- cation	Valid until date	Sta- tus	Copy of certifi- cation	Valid un- til date	Sta- tus	Orig- inal area	Current area		
Target group A	Yes	12/11/2018	To be ex- pired	No			30ha	30ha	-	Required for soil and water test and issue certificate
Target group B	Yes	19/8/2019	Valid	Yes	22/3/2020	Valid	27ha	27ha	-	Meet re- quirement
Target group C	Yes	15/5/2019	Valid	No	-		5ha	10ha (+5ha)	-	Required for soil and water test and issue certificate for new area

3.2 SOIL AND WATER SAMPLING AND TESTING

Soil and water tests shall be exercised according to the following procedures.

(1) DARD appoints an inspector of soil and water samples. It is recommended the inspector shall be nominated from the authorized unit like Sub NAFIQAD.

(2) The inspector shall collect samples and send them to a qualified laboratory for testing of heavy metals (As, Cu, Pb, Cd, Zn) in soil and heavy metals (Hg, As, Cd, Pb,) and E. coli in irrigation water.

Table 3-2 Maximum acceptable level (MRL) of selected heavy metals in soil

No.	Substances	Unit	Maximum acceptable level	Testing method
1	Arsenic (As)	mg/l	15	TCVN 6649:2000 (ISO11466:1995)
2	Cadmium (Cd)	mg/l	1.5	
3	Lead (Pb)	mg/l	70	
4	Bronze (Cu)	mg/l	100	TCVN 6496:1999 (ISO11047:1995)
5	Zinc (Zn)	mg/l	200	
6	Chromium (Cr)	mg/l	150	

Table 3-3 Maximum acceptable level (MRL) of selected heavy metals and microbiological substances in irrigation water

No.	Testing indicator ⁽¹⁾	Unit	Maximum acceptable level	Remark
1	Mercury (Hg)	mg/l	0.001	
2	Cadmium (Cd)	mg/l	0.01	
3	Arsenic (As)	mg/l	0.05	
4	Lead (Pb)	mg/l	0.05	
5	Fecal. Coliform	No. of bacteria /100ml	200	Apply for fresh form vegetables

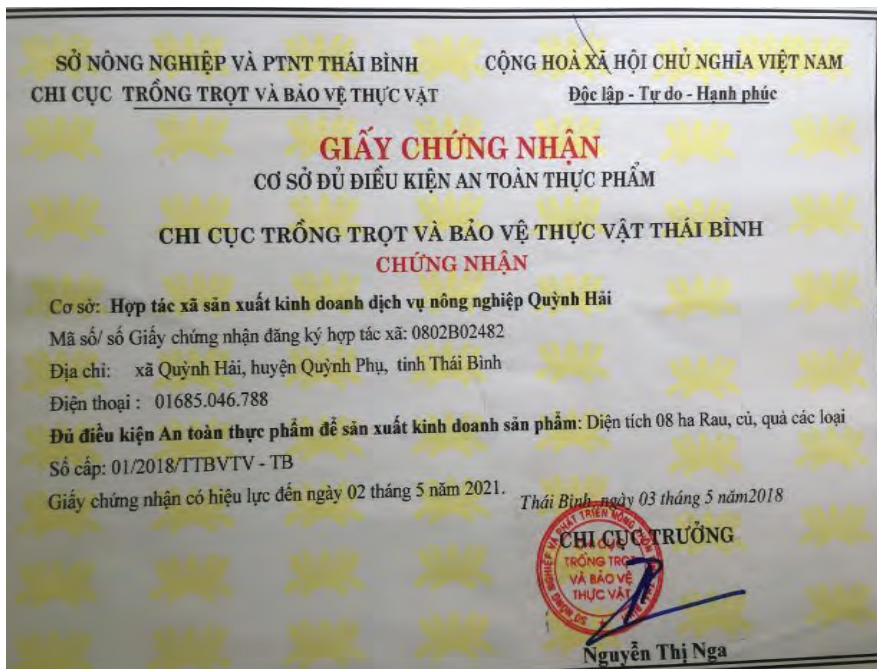
Note (1): Base on QCVN 39:2011/BTNMT National technical regulation for irrigation water.

(3) The inspector shall prepare sampling equipment correctly and follow the procedure according to the guidance from MARD to ensure sampling errors are minimized.

The detailed soil and irrigation water sampling and testing plan are described in Attachment 3.1.

3.3 ISSUE OF CERTIFICATE OF SAFE PRODUCTION AREA

After confirmation of safety conditions by soil and water sampling tests, DARD is required to issue the certificate of safe production area for the target group. This certificate is essential even for marketing activities since buyers request producers to submit it as evidence of proper safety conditions. DARD should update the producer profile by attaching the copy of certificate.



Sample certificate of safe production area

CHAPTER 4

TRAININGS FOR BASIC GAP

4.1 TRAINING CONCEPT

Training of Trainers (TOT) and Training of Farmers (TOF) for Basic GAP will be conducted for officials of DARD and target groups to understand and smoothly carry out production activities according to Basic GAP.

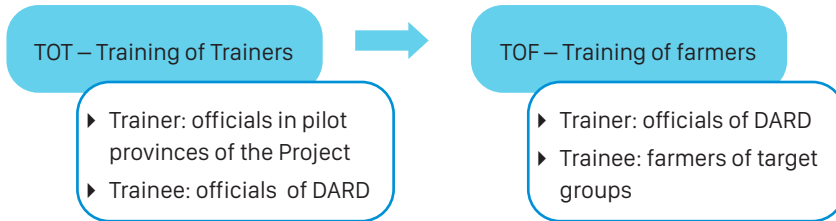


Figure 4-1 Training concept of TOT and TOF

It is recommended that the trainers for TOT are the officials in pilot provinces (Hai Duong province, Ha Nam province and Hung Yen province) of the Project. As it is common to request a training and a study tour between DARDs among provinces/cities, it will be possible to dispatch a trainer if an official request letter is issued to the pilot province.

4.2 TOT FOR BASIC GAP

TOT training for basic GAP, other GAP and TCVN 11892- 1:2017 shall be organized and conducted by DARD. The expected participants are technical staff of DARD (e.g. Provincial and District extension officers) and group leader and technical inspectors of target groups. Training outline is below and sample training materials are shown in Attachment 4.1 TOT training course for basic GAP.

(1) Objective

To provide necessary knowledge, skills, tools and expertise of Basic GAP in order for participants to be capable of planning and delivering TOF training.

(2) Target participants

The expected participants are the technical staff of DARD (e.g.

Provincial and District extension officers) and the group leader and technical inspectors (internal auditors) of the target groups.

Expected number of participants is 15- 20 persons/class.

(3) Training schedules

Training shall be conducted at the beginning of the winter season (August-September). One training course is 2 days and includes a lecture of Basic GAP knowledge as well as a field visit.

(4) Trainers

DARD mobilizes trainers. The main trainer should be an official in pilot provinces (Hai Duong province, Ha Nam province and Hung Yen province) of the Project who has received TOT training for Basic GAP in the Project. Trainers can be arranged per topic.

Table 4-1 Proposed Agenda of TOT for Basic GAP

Day 1

Time	Content	Conducted by
08.00 - 08.15	Registration of trainees	Organizer
08.15 - 08.30	Opening: Introduction of TOT training objective and agenda	Organizer
08.30 - 10.00	Introduction of Basic GAP and safe vegetable production	Trainer
10.00 - 10.15	Tea break	
10.15 - 10.45	Introduction of Basic GAP and safe vegetable production (continued)	Trainer
10.45 - 11.45	Experiences shared by JICA project on implementing pilot project model of safe vegetables production applying GAP	Trainer
11.45 - 12.00	Discussion	Organizer
12.00 - 13.30	Lunch	

13.30 - 14.30	Field visit to a model site ⁸	Site arrangement by Organizer
14.30 - 15.30	Discussion of vegetable production applying GAP and joint sales; Experience sharing on monitoring pesticides and fertilizers application, and recording of field diary	Organizer
15.30 - 16.30	Site visit to production field and pre-processing house	Organizer
16.30 - 17.30	Travel back from the site	

Day 2

Time	Content	Conducted by
8.00 - 9.00	Guidance on Chemical, Pesticides application	Trainer
9.00 - 9.30	Discussion	Organizer
9.30 - 10.00	Harvesting, packing, handling and storing fresh vegetables at farm level	Trainer
10.00 - 10.15	Tea break	
10.15 - 10.45	Experiences sharing of model project on safe vegetables production applying GAP and joint sales	Trainer
11.00 - 11.45	Introduction of cultivation methods and new production input materials contributing to safe vegetable production	Trainer

⁸. It is recommended to arrange a field visit to a model site, where is applying GAP and joint sales and can share the experience among participants. If there is no suitable site in the province, the organizer can skip the visit. It is advised to organize a study tour to advanced area in the other province instead, with an official request letter (see chapter 4.7).

11.45 - 13.30	Lunch	
13.30 - 15.00	Guidance and practice using Quick test to analyze pesticide residue of vegetable products	Trainer
15.00 - 15.30	Introduction of TOF training	Organizer
15.30 – 16.00	Discussion and evaluation of overall training	Organizer

4.3 TOF FOR BASIC GAP

TOF training on basic GAP, other GAP and TCVN 11892- 1:2017 shall be organized and conducted by a DARD officer based on the material and knowledge from TOT training. Training outline is below and sample training materials are shown in Attachment 4.2 TOF Training course for basic GAP.

(1) Objective

To enable participants to be aware of the necessity of corrective action for safety and reliability of vegetable production according to basic GAP.

To enable participants to understand and implement the procedures of production, harvest and post-harvest (collecting, washing, cutting, sorting, packing, storing and delivering) according to the requirements of basic GAP.

(2) Target participants

Expected participants are the members of target groups; consisting of each group leader, technical inspector(s) and farmers participating in production, harvest and post harvesting of vegetables.

Expected number of participants are 20 – 25 persons/class.

(3) Training schedules

Training shall be conducted after implementation of TOT for Basic GAP. One training course is a half-day.

(4) Trainers

DARD technical staff who participated in TOT for Basic GAP

TOF training modules shall be designed by DARD. The contents include: maintenance of checklist indicated in Basic GAP manual, internal audit procedures, quality assurance, nomination of quality control staff, etc. This course includes discussion among participants for better understanding of Basic GAP concepts and procedures. DARD shall apply Basic GAP as the technical procedure with utilization of the “Basic GAP manual”.

Table 4-2 Proposed Agenda of TOF for Basic GAP

Time	Content	Key topics
7.30 - 8.00	Registration and Opening remarks of TOF training	
8.00 - 8.15	Necessity of vegetable production under GAP	<ol style="list-style-type: none">1. Concern among consumers/ serious concern for society on current situation of food safety and hygiene in vegetable production:<ul style="list-style-type: none">- Existing issues during vegetable production and harvest process which causes food unsafety.- Negative impacts of residues of chemical, heavy metal and microorganisms in vegetable production affecting people’s health.2. The necessity to apply GAP in order to:<ul style="list-style-type: none">- Prevent, eliminate risks to food safety in product cultivation, harvesting and delivery;- Create products ensuring food safety, satisfying consumer’s requirements;- Build reputation on quality, food safety, improve economic benefit for producers.

8.15 - 8.30	Requirement of safe production area; soil and water used for production	<ul style="list-style-type: none"> - Recognize, analyze, determine the hazards (chemical, biological, physical) causing food unsafety from soil, irrigation water in safe vegetable production. - Evaluate production area and water source - Check and analyze the water source and soil ensuring the determination of safe production area. - Treatment measures to eliminate hazards affecting safe production area.
8.30 - 9.00	Good practices in fertilizer application	<ul style="list-style-type: none"> - Guide standard practice procedure on fertilizers and supplemental fertilizers including: <ul style="list-style-type: none"> + Recognize, analyze hazards to food safety from fertilizers (in-organic, organic) + Select and use fertilizers in a safe and effective manner + Measures of using fertilizers in safe vegetable production
9.00 - 9.15	Tea break	

9.15 - 10.00	Good practices in use of pesticides and chemicals for safe vegetable production	<ul style="list-style-type: none"> - Guide the implementation of standard practice procedure on pesticides and chemicals. In which, the following points are emphasized: <ul style="list-style-type: none"> + Analyze, recognize hazards causing food un-safety in products from the use of pesticides and chemical. + Producer's existing issues of pesticide utilization, hazards causing food un-safety. + Address to buy chemicals; + Select chemical types for use; + Safe and effective use of pesticides (dosage, treatment time; spraying technique; labor protective clothes, etc.) + Pre-harvest interval for harvesting products; + Warehouse to keep and preserve unused pesticides and chemicals; + Treat the packs of pesticides and chemical after use; - Evaluate the contamination hazards from the use of pesticides, chemicals and treatment measures
10.00 - 10.30	Good practices in harvesting and post harvesting of safe vegetables	<ul style="list-style-type: none"> - Analyze, determine the hazards to food safety and quality losses during harvesting. - Guide the implementation of standard procedure during the harvesting of fresh vegetables including pre-harvest interval; harvesting time; storage devices/ containers; labor hygiene; packaging in the field; water source, collection, and delivery.

10.30 - 11.00	Guide the recording of field diary	- Training on recording for producers - Training on inspection and monitoring of recording for manager/ unit chief.
11.00 - 11.15	Discussion - Summary	

4.4 POST-HARVEST TRAINING

Post-harvest practice is defined as a series of operations after harvest including collecting, washing, cutting, sorting, packing, storing and delivering to a buyer. Post-harvest training shall be organized and conducted by a DARD officer based on the material extracted from TOT training. Training outline is below and sample training materials are shown in Attachment 4.3 Training program on good practices on post-harvest handling.

(1) Objective

To enable participants to understand and implement post-harvest handling properly to ensure food safety.

(2) Target participants

Expected participants are the group leader, logistics manager who operates pre-processing house and workers involved in post-harvest handling.

Expected number of participants are 20 - 25 persons/class.

(3) Training schedules

Training shall be conducted before start of harvest. One training course is a half- day.

(4) Trainers

DARD technical staff who participated in TOT for Basic GAP

The training contents focus on crucial steps in post-harvest handling such as water used for washing vegetables and hygiene conditions in

the pre-processing house. The sample training agenda is shown below, but the training contents shall be modified by DARD technical staff according to the requirements of target groups.

Table 4-3 Proposed Agenda of Post-Harvest Training

Time	Content	Key topics
8.00 - 8.15	Participant registration	
8.15 - 8.30	Opening remarks	
8.30 - 9.00	Good practices on Harvesting at Farm Level	- Good practices on Harvesting, Packing, Handling Fresh Vegetables at Farm Level
9.00 - 9.45	Required infrastructures, equipment, facility of packing house	<ul style="list-style-type: none"> - Required infrastructures, handling equipment, facility of packing house for safe fresh vegetable pre- process and packaging according to the National technical regulation QCVN 01-09:2009/BNNPTNT - Set-up of a fresh vegetable handling house (Location, design, set-up of handling house; and installation of handling equipment; Water drainage system, waste disposal; Lighting system; Facilities and worker's hygiene area)
9.45 - 10.00	Tea break	

10.00 - 10.45	Requirement from buyers for vegetable handling practice	<ul style="list-style-type: none"> - Requirement from buyers for application of good handling practice in safe vegetable production. + Requirements for post-harvest handling by different buyers based on the contract + Explanation about buyers' requirements in terms of volume, appearance, freshness, insect damage, color, size, form of delivery; wash, cut, pack, volume per pack, traceability; logo, label, record based on the buyer's specification + Presenting Good cases and bad cases
10.45 - 11.30	Good practices on packing and transportation	<ul style="list-style-type: none"> - Guidance on good practices in vegetable packing house and transportation + Sorting, cutting, washing and drying; Packing and labeling; Storage before shipping; Transportation
11.30 - 12.00	Guidance on recording, documentation, and traceability	<ul style="list-style-type: none"> - Guidance on recording, documentation, and traceability + Explanation, good practices and lessons of using the recording formats
12.00 - 13.30	Lunch	
13.30 - 15.00	Site visit to a model site	<ul style="list-style-type: none"> - Site visit and check the condition and practices in pre-processing house

15.00 - 16.00	Group discus- sion	<ul style="list-style-type: none"> - Assessment of equipment and material shortcomings - Assessment of upgrading facilities and conditions to ensure food hygiene and safety in harvest and pre-processing handling
16.00 - 16.15	Evaluation and closing	

4.5 TECHNICAL ASSESSMENT FOR SAFETY CONDITIONS IN PRODUCTION, HARVEST AND POST-HARVEST PROCEDURES

At the beginning of the harvest and post-harvest practices, the whole process should be checked by the target group and DARD with the following objectives.

(1) Objective

To ensure the whole procedure from production until post harvesting to satisfy the safety conditions.

(2) Target participants

Expected participants are the technical staff of DARD (e.g. Provincial and District extension officers) and the group leader and technical inspectors (internal auditor) of the target groups.

(3) Schedules

This activity shall be carried out in conjunction with the initial check on “monitoring of collection and delivery” (Refer to Supply chain development manual). Assessment shall be conducted at the beginning of harvest (October-November). This assessment will be organized one time for each target group each year. One assessment is 1 day.

(4) Trainers

DARD technical staff who participated in TOT for Basic GAP

(5) Check points

The monitoring activity will be conducted in the following points. At each check point, participants shall check the control points by using the standard check list (Attachment 4.4).

- i) Harvest (with pre-processing at site)
- ii) Transportation
- iii) Collection
- iv) Preprocessing and packing
- v) Storing
- vi) Loading
- vii) Unloading (in buyers' premises)
- vii) Storing (in buyers' premises)

4.6 TOT FOLLOW-UP TRAINING

In order to share the results and issues among officials of DARD and target groups, TOT Follow-up training shall be organized and conducted by DARD as below. Sample training contents and materials are shown in Attachment 4.5 TOT follow-up training.

(1) Objective

To share the results and issues of the activities including safe vegetable production, record keeping, chemical application, and post harvest handling.

(2) Target participants

Expected participants are the technical staff of DARD (e.g. Provincial and District extension officers) and the group leader and technical inspectors (internal auditors) of the target groups.

Expected number of participants is 20 persons/class in each province.

(3) Training schedules

Training shall be conducted after the end of the winter season (April-June). This training will be organized in each province each year. One training course is 1 day.

(4) Trainers

DARD technical staff who participated in TOT for Basic GAP

4.7 STUDY TOUR OF ADVANCED MODEL

This study tour of an advanced model is optional according to the program design and budget, but it is recommended as an effective approach especially when DARD introduces a new method or a new technology to the target group.

(1) Objective

To provide necessary understanding of good and advanced model related to the production activities (e.g. GAP, post harvesting, cultivation method) and marketing activities

(2) Target participants

The expected participants are the technical staff of DARD (e.g. Provincial and District extension officers) and the group leaders of the target groups.

(3) Schedules

Study tour shall be conducted before start winter season (July-October). It is recommended to organize early timing after start of support for target groups.

(4) Trainers

DARD mobilizes resource persons in the advanced model area. If there is no suitable site in the province, it is advised to organize a tour in another province instead with an official request letter.

Box: Study tour in Da Lat

In order to transfer knowledge and experience of advanced farmers in Vietnam, JICA project teams organized a technical study tour from 3 to 6 of July 2017 to visit Da Lat, Lam Dong province with 13 farmers and 7 DARD officers from pilot provinces: Hai Duong, Ha Nam and Hung Yen. The participants visited advanced farms in Lam Dong province such as Phong Thuy farm and Thien Sinh farm, and learned their technical practices of safe vegetable production according to GAP, good post-harvest handling and packing, and good cultivation technologies such as soil management by using compost and seedling method, etc. Generally farmers hesitate to adopt new technologies, but the participating farmers actively adopted the learned new technologies in their farming.



Demonstration of soil management by using composting method at Thien Sinh farm



Good practice of pre-processing and packing at Phong Thuy farm

4.8 EXPOSURE VISIT TO TARGET GROUPS

Exposure visit is an opportunity for a target group to visit other groups to share the experiences and knowledge with each other. It is also recommended DARD arranges a field trip for target groups to visit the groups supported by JICA project so that the group can learn effectively about safe vegetable production procedure according to Basic GAP and establishment of joint sales management system.

(1) Objective

To share the lessons learnt through the production and marketing activities among target groups and DARD officers.

(2) Target participants

The expected participants are the technical staff of DARD (e.g. Provincial and District extension officers) and the group leaders of the target groups.

(3) Training schedules

Trainings shall be conducted during the winter season. One training course is 1 day.

(4) Trainers

Representatives from farmers' group and DARD staff

CHAPTER 5

FORMULATION OF SAFE CROP PRODUCTION GROUP

5.1 NOMINATION OF MANAGEMENT BOARD MEMBERS

DARD assists in establishment of the implementation structure in each target group. The basic structure is shown in the table below.

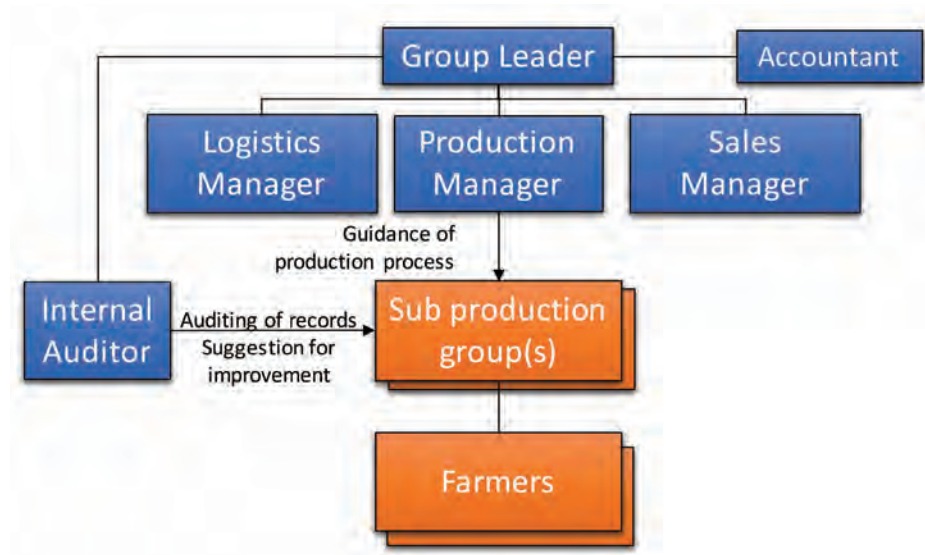


Figure 5-1 Management Structure of Target Group

The positions for a management body are as follows;

- 1) Group Leader/ Head of Cooperative
- 2) Production Manager
- 3) Internal Auditor
- 4) Sales Manager
- 5) Logistics Manager
- 6) Accountant

In some cases, the target group can assign a person for two positions according to the size of the group and capacity of the person. (e.g. one person in charge for both sales manager as well as logistics manager). Roles and responsibilities of each management member are described as below.

1) Group leader/ Head of Cooperative

- To be responsible generally for production and trading of products and internal auditing
- To organize, operate, maintain and develop the quality management system following Basic GAP
- To assign staff to record information based on the logbook forms which are applied for cooperative management
- To represent the cooperative to sign contracts with buyers and basic agreement with the cooperative members
- To represent the cooperative receiving support with materials, finances, technologies from outside organizations and individuals
- To lead and supervise production manager, internal auditor to implement tasks assigned
- To issue the decision of penalty to any member who violates and/or does not comply with quality control in accordance with Basic GAP.
- To resolve complaints, denouncements that may occur during production, collection and delivery of products.

2) Production Manager(s)

The production manager shall be nominated as one person per subdivided production group. The production group subdivision (subgroup) is the minimum management unit for production planning, monitoring of record keeping, chemical application and provision of cultivation techniques. In order to monitor and instruct the farmers properly, the sub group shall be formed every as 20 farmers respectively, especially when there is no experience of record keeping. The subgroup can be expanded according to the experience of record keeping, the capacity of the production manager, and varieties of crops. (e.g. if a sub group cultivates single crop or few varieties of crops, production manager can supervise more than 20 farmers.)

- To be supervised and directed directly by Group leader
- To organize and provide technical assistances to farmers
- To organize group meeting with members when required
- To directly supervise, remind members to comply with Basic GAP requirements
- To recommend technical improvements in cultivation and quality system suitable with Basic GAP requirements
- To monitor and instruct farmers/ members to correct non-conformity points as required in production activities
- To participate in internal audit.

3) Internal Auditor(s)

- To be supervised and directed by Group leader
- To develop audit plan and report to Group leader
- To supervise all activities in the group throughout purchase of agricultural inputs, cultivation, harvesting, collection and delivery in accordance with Basic GAP
- To supervise the corrective actions taken by farmers/ members
- To audit the appropriateness of Basic GAP throughout the above process with check list
- To prepare an audit report and report the result to the Group leader and production manager
- To make recommendations for improvement.

4) Sales Manager

- To be supervised and directed by Group leader
- To develop and implement a marketing plan
- To approach buyers pro-actively to promote the sales

- To draft the sales contracts and negotiate with buyers.
- To participate in stakeholder meetings, which consists of representatives from the farmers' group, buyer(s) and DARD
- To receive and solve claims on products from buyers and/or consumers
- To maintain a reliable and sustainable relation with buyers
- To manage sales of products.

5) Logistics Manager

- To be supervised and directed by Group leader
- To assist in design of production plan developed by production manager
- To design a delivery plan for joint sales through discussion with production manager and sales manager based on the orders from buyers
- To collect the products from farmers to meet the requirement of buyers in terms of quantity and quality
- To manage product in-coming and out-going at pre-processing house/ vegetable storage
- To keep the pre-processing house/ vegetable storage safe and clean to meet the requirements of good post-harvest handling and hygiene conditions
- To hire and supervise the workers at the pre-processing house/ vegetable storage.

6) Accountant

- To be supervised and directed by Group leader
- To maintain daily money transactions (cash and bank)

- To maintain the account book, bank account
- To prepare annual account report.

5.2 CONFIRMATION OF AGREEMENT AMONG GROUP MEMBERS

It is recommended that the target group formulates an internal rule among member farmers. The internal rule consists of mandatory conditions and recommendations. Sample internal rules are shown but not limited to as follows:

- GAP: All member farmers shall follow Basic GAP protocol.
- Joint sales: Member farmers shall deliver the product to the group at least 20% of their products only from area registered as safe production.
- Pesticide usage: The member farmers shall use the pesticide listed on the recommended pesticide lists developed by DARD.

5.3 FORMULATION OF SAFE CROP PRODUCTION GROUP

The target group shall setup a safe vegetable production group with assistance of DARD. One unit of the safe vegetable production group shall be around 20 households, in order to realize effective group management. If the target group holds a greater number of households, another safe vegetable production groups shall be formed.

DARD shall assist the target group to make lists of board members and member farmers. The format of the list is shown in Attachment 5.1. After the confirmation of members, the basic agreement shall be signed by them. The basic agreement aims to protect the safety of agricultural products and to pursue a production method without environmental burden. It is expected that both management board members and member farmers sign the agreement. The sample agreement is shown in Attachment 5.2. DARD shall monitor and encourage the target group to follow the rules.

CHAPTER 6

PRODUCTION PLANNING BASED ON MARKET DEMAND

6.1 PREPARATION OF PRODUCTION PLAN

The target group shall prepare the production plan with assistance from DARD. The objective of the production plan is to estimate production volume, processing and shipment time as a group. The production plan is the accumulated information of production volume per crop per season. The production plan consists of farmer's name, name of vegetable, production area, transplanting date, expected harvest date, estimated production volume, and expected harvest volume per month and accumulate harvest volume of every farmers per month. The format of the production plan is shown below and attached as Attachment 6.1.

		Time	Dec-17	Jan-18	Feb-18	Mar-18	Total
Cabbage			0	15,300	0	8,400	23,700
Kolrabi			0	4,600	20,040	7,800	32,440

No.	Farmer's name	Land code	Vegetables	Area (m2)	Transplanting date	Harvesting date	Estimated total volume (Kg)	Expected harvesting volume for month			
								Dec-17	Jan-18	Feb-18	Mar-18
1			Cabbage	360	5/1/18	31/3/18	1,800				1,800
			Kolrabi	520	26/11/17	25/1/18	1,300		1,300		
2			Kolrabi	1,080	25/12/17	23/2/18	2,700				2,700
			Kolrabi	720	25/12/17	23/2/18	1,800				1,800
3			Kolrabi	1,680	10/1/18	11/3/18	4,200				4,200
4			Kolrabi	1,080	3/1/18	4/3/18	2,700				2,700
5			Kolrabi	1,368	30/12/17	28/2/18	3,420				3,420
6			Kolrabi	600	30/12/17	28/2/18	1,500				1,500
7			Kolrabi	540	20/12/17	18/2/18	1,350				1,350
8			Cabbage	1,080	22/10/17	15/1/18	5,400		5,400		
			Cabbage	720	20/12/17	15/3/18	3,600				3,600
9			Cabbage	360	22/10/17	15/1/18	1,800		1,800		
			Kolrabi	720	13/11/17	12/1/18	1,800		1,800		
			Kolrabi	600	13/11/17	12/1/18	1,500		1,500		
10			Kolrabi	480	25/12/17	13/2/18	1,200				1,200
			Cabbage	600	30/12/17	25/3/18	3,000				3,000
11			Kolrabi	720	15/12/17	13/2/18	1,800				1,800
			Kolrabi	528	10/12/17	8/2/18	1,320				1,320
12			Cabbage	540	22/10/17	15/1/18	2,700		2,700		
			Kolrabi	900	25/12/17	23/2/18	2,250				2,250
13			Kolrabi	1,080	8/12/17	6/2/18	2,700				2,700
14			Kolrabi	360	20/1/18	21/3/18	900				900
15			Cabbage	1,080	18/10/17	8/1/18	5,400		5,400		

Người lập bảng

ngày tháng năm 2018
Ban lãnh đạo HTX

Figure 6-1 Format of production plan

The production plan is the basis of scheduling of safe vegetable production and joint sales. The target group can utilize the production plan as a valuable communication tool with buyers about the expected sales volume and timing per vegetable based on the production plan. The production plan shall be newly prepared per season. In the Project, the production plan was prepared twice a year. To prepare the production plan, there are two different strategies based on the current situation of target groups:

- (1) when a target group does not have any buyer yet
- (2) when a target group already has buyer/buyers

The detailed instructions for each strategy are written below.

(1) When a target group does not have any buyer yet

It is generally difficult for target groups to set a particular vegetable name and volume with a particular buyer if there is no experience of joint sales. From the view of the buyer, it is also difficult to make an agreement with such a target group because there is no reliable information about experience. The procedures to develop a production plan when the target group does not have any buyers yet are below:

- 1) Target group develops production plan based on experience

When a target group does not have any buyer before sowing, the group should prepare the production plan simply based on past experience. The production manager asks member farmers the vegetable name, production area and sowing timing.

- 2) Target group calculates total volume for each product

Farmers will choose the vegetable considering the price and marketability of its previous season. The group will accumulate the farmers information and estimate the total production volume per vegetable per month. DARD shall assist the group in preparing the production plan by using the correct format.

If the target group wants to change the cropping pattern to satisfy market demand or to find new buyers, DARD will facilitate the group in selecting vegetables in reference to the cropping pattern of main vegetables as shown below.

Vegetables	January				February				March				April				May				June				July				August				September				October				November				December			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Cabbage	Early season																																															
	Mid season																																															
	Late season																																															
kohlrabi	Early season																																															
	Mid season																																															
	Late season																																															
broccoli	Early season																																															
	Mid season																																															
	Late season																																															
tomato	Early season																																															
	Mid season																																															
	Late season																																															
gailum	Early season																																															
	Mid season																																															
	Late season																																															
Green mustard	Main crop																																															
Bok Choy	Main crop																																															
lettuce	Early season																																															
	Mid season																																															
	Late season																																															
cucumber	Spring crop																																															
	Summer crop																																															
	Winter crop																																															
	Spring- Summer crop																																															
Water melon	Summer crop																																															
	Winter crop																																															
	Spring - Summer crop																																															
string bean	Summer - Autumn crop																																															
	Late season																																															
Carrot	Early season																																															
	Mid season																																															
	Late season																																															

Note: ■ Sowing time
■ Planting time
■ Harvesting time
■ Growing season (Sowing, planting and harvesting) of short growing duration vegetables

Figure 6-2 Cropping pattern of main vegetables in Northern Vietnam

One key point for this methodology is to ensure a longer harvesting period as most buyers prefer continuous supply for longer periods. There is also a risk of causing price decline if the production is concentrated in a particularly short period. It is recommended to discuss with member farmers adjusting sowing timing into longer periods.

(2) When target group already has buyer/buyers

1) Target group collects information about requirements of buyers

The target group shall collect information from buyers about the requirement about each vegetable, expected volume and timing of delivery. If there is no particular request given from buyers at the time of production planning, the target groups should review the sales dates from the previous year and estimate the volume and timing per vegetable.

2) Target group calculates the total area and sowing time to ensure sufficient supply to buyers.

The target group shall prepare the production plan based on the buyer's demand including vegetable name, production volume and harvesting schedule. Based on past experiences, the group leader roughly estimates the necessary cultivation area and sowing timing to satisfy the buyer's requested volume and shipping schedule.

One key point for this methodology is to make a conservative plan to deliver required volume. Modern markets like supermarkets and convenience stores require stability of producer supply with set volume and quality. Therefore, the producer should reserve the correct amount of products. Otherwise, the producer might not supply stably due to outbreak of diseases or bad weather. It is generally recommended to make a production plan with bigger harvesting volume than buyer's demand, such as 1.5 times bigger than demand.

3) Target group divides sowing area regarding each farmer.

The target group divides the cultivation area for each vegetable in the production on a plan per farmer basis. After drafting the production plan, the group leader checks the expected harvesting volume per crop per month and adjusts the plan by changing the vegetable or adjusting the sowing schedule, etc.

Box: Production planning with target groups based on buyers' demand

Yen Phu cooperative prepared a production plan with 32 farmers of 6.95ha to produce 245 tons of vegetables in summer 2020. Yen Phu cooperative had buyers like Co-op Mart Ha Noi; Co-op Food; VinEco; Hanoi Union Cooperative; Safefood24h; and other small buyers, and plans to produce leafy vegetables, egg-plant, bitter gourd, sponge gourd, lettuce, cucumber, spinach, etc. based on demand. Then the cooperative prepared a detailed production plan per farmer per plot in consideration with the harvesting schedule. According to the cooperative, the production plan must be modified and updated flexibly. For example, Co-op Food sends the vegetable order sheet to the cooperative one month before shipping date, mainly for leafy vegetables. The cooperative checks the order sheet and modify the production schedule to meet the demand.

Especially due to COVID-19 in spring 2020, there was a shortage of leafy vegetables in stores, Yen Phu cooperative reviewed the production plan to supply a greater volume of vegetables by increasing the rotations of vegetable production.

6.2 PROCUREMENT OF MATERIALS (JOINT PURCHASE)

In regard to safety, appropriate agrochemicals and fertilizers should be selected. To ensure the use of appropriate agrochemicals and fertilizers by farmers, it is recommended for the target group to implement joint purchase of such materials and distribute them to member farmers. To control safety through joint purchase, DARD should implement the following activities:

- To verify that the candidate agrochemical and fertilizer is on the list of legal agrochemicals and fertilizers.
- To provide the registered material supplier when the target group requests the information. DARD shall be in charge.

- To recommend target groups establish the following material distribution system: provide material to farmers before sowing and receive cost after harvesting. Since this system is attractive for farmers, they will purchase materials from the cooperative, therefore, the cooperative will be able to control input to farmers.
- To instruct appropriate usage of agrochemicals by workers in cooperative shops.

CHAPTER 7

**ON-FIELD INSTRUCTIONS
APPLYING BASIC GAP,
OTHER GAP AND
TCVN 11892-1:2017**

7.1 FIELD INSTRUCTIONS FOR FARMERS APPLYING BASIC GAP

The key points to disseminate Basic GAP are 1) to ensure the safety of products, 2) to clarify profitability, then 3) to ensure sustainability. In-field instruction shall be provided in consideration with the following points.

(1) Ensure the safety of products

DARD will establish a mechanism to secure the safety by applying Basic GAP. The internal auditor(s) together with production manager(s) shall instruct farmers how to practice farming with application of Basic GAP in steps of cultivation, harvest and post harvest based on the checklist (26 control points). To ensure safety, DARD will especially focus on the most essential practice of the 26 control points as below:

- To select the appropriate agrochemicals and fertilizers. DARD will make the list of appropriate agrochemicals and fertilizers based on the legal list, and distribute it to each target group.
- The list of agrochemicals shall include the following information: Name of legal agrochemical for each crop, commercial name, active ingredient, target diseases and insects, dosage, and isolation days before harvesting (Pre-harvest interval). Also, the list of fertilizers shall include the following contents: Name of legal fertilizer and manufacturing company name.
- To apply agrochemicals with correct volume, dosage, and Pre-Harvest Interval (PHI: Required days to ensure safety after final application of agrochemical until harvest). DARD will provide the information to farmers, board members and cooperative agrochemical shop workers.
- To record field diary. DARD will instruct farmers and board members about record keeping methods. The production manager(s) will assist farmers for self-check and evaluation

of their own practices and provide guidance with the implementation of correction actions. A sample format to monitor the record keeping of each farmer is shown in the Attachment 7.1.

- To keep hygiene of tools, equipment, containers for harvesting and post harvesting activities to eliminate contamination hazards.

In addition to applying Basic GAP, some additional mechanisms are effective in improving the safety. It is recommended for DARD to assist target groups to install the following mechanisms.

- To strengthen the internal rules of the target group. The target group is recommended to make internal rules between member farmers, including punishment and bonus systems to control farmers.
- To establish the joint purchase system to avoid using illegal agrochemicals or fertilizers (Refer 6.2).
- To strengthen DARD's roles related to field instruction of Basic GAP. DARD is required to implement field instruction, regular monitoring and incident response. Thus, DARD technical inspectors shall visit each target group once a week to check the record keeping and guide the field practice in accordance with Basic GAP, and provide technical advice to internal auditor(s) and production manager(s) in case of any detection or error in practice.

(2) Clarify profitability

Clarification of benefit and profit from Basic GAP application is necessary in order to motivate farmers. DARD will evaluate tangible/countable benefit. The candidate items to be evaluated are as follows:

- Farm economy of farmer who applies Basic GAP and who does not apply Basic GAP.

- Profit margin from joint sales of safe vegetables.

The evaluation results will be shared through trainings/ seminars to motivate farmers to apply Basic GAP.

(3) Ensure sustainability

DARD will establish the mechanism to secure sustainability of Basic GAP practice.

- To assign DARD officials continuously. DARD shall continue to monitor and supervise the activities of target groups according to Basic GAP.
- To find respective buyers conducting inspection. DARD will support target groups to find and make contracts with respective buyers who check safety condition of producers.
- To commit safety to the public. Several target groups commit safety of their products to the public, thus, buyers buy preferentially from these groups. DARD will support other target groups in committing safety.
- To educate responsible farmers. Several farmers in target groups have strong responsibilities to produce safe crops, thus, buyers buy preferentially from these groups. This would be one factor to secure sustainability of Basic GAP application. DARD will introduce this example to other target groups.

7.2 INTERNAL MEETING

Internal monitoring meeting should be regularly executed once every three months with participation of production manager, internal auditor, DARD technical inspector and farmers to share experiences and give guidance to farmers application of Basic GAP.

In the internal meeting, important points should be discussed; such as sharing common mistakes in application of fertilizer and agrochemicals (if any) and reminding/ warning farmers about conditions of recording,

usage of fertilizer and agrochemical and other safety conditions according to the agreed internal rule.

7.3 INTERNAL AUDIT

Internal audit shall be conducted by each Target Group 2 times/ year using Basic GAP checklist (26 items). The internal audit checklist with methods will be prepared by DARD (Refer Attachment 7.2 and Attachment 7.3).

DARD's technical inspector will assist the internal auditor(s) together with production manager(s) of each target group to carry out the auditing and evaluation of Basic GAP application according to the Basic GAP checklist (26 control points).

When farmers have unsuitable conditions for control points, the target group shall take further action as follows: instruct farmers to improve situation, check situation once again after several days, check record book or agrochemical residue more frequently, impose a fine, or expel violated farmer from safe vegetable production group. DARD will support farmers group to implement such actions.

CHAPTER 8

**UPGRADING
CONDITIONS TO
ENSURE FOOD
HYGIENE AND
SAFETY**

8.1 TECHNICAL ASSESSMENT FOR UPGRADING CONDITIONS

DARD shall conduct a technical assessment for upgrading physical conditions of production area and pre-processing area to ensure food hygiene and safety. The objective of this assessment is to check the current condition of necessary tools, equipment and facilities for harvesting and post-harvesting activities and reflect the assessment results to develop a plan for procurement of equipment and upgrading of pre-processing facilities. DARD should implement the assessment through the following procedure.

(1) Mobilize evaluators

DARD should nominate the evaluators who conduct the technical assessments. Expected evaluators are the staff of Sub-NAFIQAD and Sub Department of Crop production and Plant protection who received TOT Basic GAP or VietGAP training. The lead evaluator is recommended as the staff member who has experience in food safety and hygiene condition auditing.

(2) Prepare the assessment sheet

The evaluators should check the contents of the sheet. The assessment sheet is shown in the table below.

Table 8-1 Assessment Sheet

No.	Indicator	Criteria	Assessment result
1	Land for pre-processing area	<ol style="list-style-type: none"> 1) Sufficient land size more than 160m² (pre-processing house 100m², loading yard and others 60m²). 2) Good access from farm to the land 3) There is an access road for truck connecting from pre-processing area to main road. 4) No disaster risk like flooding 5) Polluted area is not located near by. 6) Enough space for waste collection outside of pre-processing house. 	<ol style="list-style-type: none"> 1) 2) 3) 4) 5)
2	Building for pre-processing house	<ol style="list-style-type: none"> 1) Enough space for one-way arrangement according to pre-processing procedures from unloading, washing, sorting, packing to shipping (minimum pre-processing house size 100m²) 2) Select building material is easy to clean and wash, no select material can be cracked or chipped (avoid physical hazards) 3) Walls prevent dust blow 4) Floor is easy to clean, wash and drain water 5) Lighting is installed with sufficient brightness for pre-processing. 	<ol style="list-style-type: none"> 1) 2) 3) 4) 5)

3	Loading and shipping yard	<ol style="list-style-type: none"> 1) Enough space for parking of a truck, and loading and shipping of products 2) Good traffic line from loading yard to inside of pre-processing house 3) Plastic pallets are prepared to place vegetable baskets/containers on. 	<ol style="list-style-type: none"> 1) 2) 3)
4	Water source for washing vegetables	<ol style="list-style-type: none"> 1) There is a tap or well water with a treatment system. 2) Water quality meets requirement of QCVN 02-2009/BYT (National technical regulation on domestic water quality.) 	<ol style="list-style-type: none"> 1) 2)
5	Washing section	<ol style="list-style-type: none"> 1) Clean water is supplied from water tank to washing section. 2) Easy to drain wastewater and clean washing basin. 3) There is a separate basin for washing worker's hands (do not mix with vegetable washing basin). 	<ol style="list-style-type: none"> 1) 2) 3)
6	Sorting and packing section	<ol style="list-style-type: none"> 1) There is a table for cutting and sorting vegetables to ensure food hygiene and safety (preferably table made from materials such as stainless steel). 2) There are sufficient numbers of dedicated baskets/containers for pre-processed vegetables (20kg/basket) 3) Enough space for sorting and packing works to avoid mixing different kinds of vegetables with each other. 	<ol style="list-style-type: none"> 1) 2) 3)

8	Storing section	<ol style="list-style-type: none"> 1) There is a clean area for storing that is separated from the other sections 2) Plastic pallets are prepared to place dedicated baskets/containers for pre-processed vegetables on. 	<ol style="list-style-type: none"> 1) 2)
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Source: JICA Project Team

The assessment sheet was developed through the trial activities in the Project by referring to Decision No.2998/QD-BNN-TT (technical procedure of Basic GAP), Circular No.45/2014/TT-BNNPTNT (inspection of agricultural material production and trading, and inspection and certification of safety conditions for agriculture, forestry and fishery products), and National technical regulations QCVN 01-09/2009/BNNPTNT (National technical regulation on Vegetables & Fruits processing units – The conditions for food safety and hygiene).

(3) Organize a field visit for technical assessment

The evaluators fix a day for a field visit with the target group, to conduct a technical assessment. The assessment should be organized with participation of the target group leaders. The evaluators will check the current conditions of the pre-processing area one by one in accordance with the indicators on the assessment sheet and take note of the assessment results on the sheet. In the evaluation report, photographs should be included for easy monitoring and evaluation.

(4) Reporting of technical assessment

The evaluators prepare a technical assessment report based on the assessment sheet. The report should contain current condition, assessment result, and recommendation for necessary tools and equipment and upgrade of infrastructure in pre-processing area. The sample recommendation is shown in the table below.

Table 8-2 Recommended tools and equipment, and upgrade of infrastructure in pre-processing area

No	Item	Description	Quantity recommended
A. Tools and equipment for harvesting vegetables in the field			
1	Nylon canvas for lining under baskets of vegetables harvested in the field	Size (1.5m x 3m)	10 canvas
2	Plastic baskets for harvesting vegetables in the field	Size (40cm x 30cm x 30cm), Capacity 20kg/basket	50 baskets
B. Tools and equipment in the pre-processing area			
1	Plastic containers, trays to keep vegetables	Size (40cm x 60cm x 40cm), Capacity 20kg	50 Pieces
2	Stainless steel table for cutting and paring	Size (2m x 1.2m x 0.7m)	2 Tables
3	Stainless steel basin for washing vegetables	Size (2m x 0.8m x 0.75m)	2 Shelves
4	Aluminum cabinet for keeping vegetable packages, tools	Size (2m x 1.5m x 0.7m)	1 cabinet
5	Stainless steel shelf for keeping baskets of washed vegetables	Size (2m x 1.5m x 0.4m)	2 shelves
6	Medicine cabinet	Size (40cm x 30cm x 17cm)	1 cabinet
7	Plastic pallet for placing products	Size (1.1m x 1.1m x 0.15m)	10 pallets
8	Waste bin in pre-processing and packing house.	Plastic waste bin	1 bin

9	Pressure pump for washing floor, devices for keeping products	1 motor 11.5 HP + pipe, head	1 pump
10	Filming machine	White filming machine	1 machine
C. Build new pre-processing, packaging house			
1	Build pre-processing house		
2	Window in pre-processing house		
3	Lighting system		
4	Full wash basin (including basin, faucet, etc)		
5	Clean water supply pipe for supplying water to vegetable washing basin and full set of basin		

Source: JICA Project Team

The actual condition of facilities and tools will be assessed through three key indicators related to safety: chemical, biological and physical contaminations. In addition to safety condition, quality and traceability conditions will be also assessed to satisfy the buyer's demand.

8.2 DRAFT A LIST OF NECESSARY EQUIPMENT AND MATERIALS

Based on the above assessment results, the target group will check the list of the recommended equipment and materials and will take quotation. The target group will prepare a proposal list of necessary equipment and materials, as well as an upgrading plan, and send it to DARD.

DARD's technical staff will assess the feasibility of equipment, materials and budget estimation, then, send assessment report to DARD's leaders. DARD's leaders will do a final assessment based on

the assessment report prepared by DARD's technical staff. When DARD's leaders approved the proposal, DARD will support one part of equipment/ materials, and the target group will take responsibility for the other parts and labor cost. The sample list of tools, facilities in safe vegetables production and handling is shown for Attachment 8.1.

8.3 UPGRADING OF FACILITIES AND EQUIPMENT

The target group takes responsibility for the purchase, repair and upgrade of facilities and equipment. DARD supervises the installation and operation in line with the upgrading plan. DARD shall evaluate the usage of the installed facilities and the improvement of conditions compared with the previous conditions in terms of food hygiene and safety (chemical, biological and physical conditions will be evaluated).

If the food hygiene and safety conditions are not satisfied yet even after upgrading, DARD shall provide further instruction, and the target group shall follow the instruction.

CHAPTER 9

JOINT SALES MANAGEMENT

9.1 ESTABLISHMENT OF JOINT SALES SYSTEM

Each target group will organize joint sales to ensure safety of crops and to satisfy the requirements of buyers. The system of joint sales is as follows: the target group collects (buys) vegetables from member farmers and delivers (sells) vegetables to the buyer, then, the buyer pays the target group and the group pays the member farmers. The delivery conditions (including date, volume, quality, etc) is coordinated between the target group and buyer, and member farmers shall follow the delivery conditions.

To establish the joint sales system, the target group shall coordinate the following conditions with assistance from DARD.

(1) Coordination between target group and buyer

1) Delivery conditions to deliver (sell) vegetables from the target group to the buyer. The following items shall be coordinated to deliver the products: date, time, location, quality standard (such as size, color, damage condition and safety) and packaging condition.

2) Receipt conditions to receive payment from buyer to target group. Following items shall be coordinated: unit price, timing, payment method (cash or bank) and tax condition.

Target group is recommended to make a contract with the buyer, and the delivery condition and receipt conditions are recommended to be written in the contract. The detailed instructions about drafting a contract is referred to in the supply chain development manual “Making a contract”.

Box: Means of transport per target Group in the Project

There are relations between means of transportation and stage of target groups (Nursing model, Expansion model, and Stabilization model: see Chapter 1.5 stepwise approach):

- In the 1st stage as a nursing model, target groups use their own motorbike and/or the buyer's arrangement for transportation. In this stage, the main buyers are generally local, therefore, transportation by their own motorbike is easy. Or, the group requests buyers to collect.
- In the 2nd stage as an expansion model, target groups use rental truck(s) and/or the buyer's arrangement.
- In the 3rd stage as a stabilization model, target groups use their own trucks. In this stage, it is feasible for the target group to own the truck as business is expanded.

Province	Target Group	Actual Joint Sales Amount (kg)	Means of transport	Specification
Ha Nam	Thanh Tan coop.	43,538	Own transport (motorbike)/ Buyer's arrangement	Motorbikes
Ha Nam	Cat Lai coop.	52,042	Buyer's arrangement	Truck and motorbikes
Phu Tho	Huong Non coop.	53,986	Buyer's arrangement	Motorbike
Phu Tho	Truong Thinh coop.	71,210	Own transport (motorbike)	Motorbike
Hai Duong	Gia Gia company	110,070	Buyer's arrangement/ Own transport (motorbike)	Truck and Motorbikes
Thai Binh	Thanh Tan coop.	118,150	Buyer's arrangement	Truck (1.5 - 5ton)
Vinh Phuc	Dai Loi coop.	130,245	Buyer's arrangement/ Own transport (motorbike)	Truck and motorbikes
Hai Duong	Lua farmers group	286,660	Buyer's arrangement	Truck (5ton)
Thai Binh	Quyhn Hai coop.	311,214	Rental transport	Truck (1.5ton, 1no)

Ha Nam	Ha Vi coop.	60,400	Buyer's arrangement/ Rental transport	Truck and motorbikes
Ha Nam	Lien Hiep coop.	114,769	Buyer's arrangement/ Own transport (motor-bike)	Truck and motorbikes
Hung Yen	Chien Thang coop.	198,590	Own transport	Cool truck (1.5ton, 1no)
Vinh Phuc	Vinh Phuc coop.	350,740	Rental transport	Truck (1.5ton, 1no)
Hai Duong	Duc Chinh coop.	1,045,450	Buyer's arrangement	Truck (5ton)
Hung Yen	Japan Vietnam company	71,470	Rental transport/ Buyer's arrangement	Truck (1.5ton, 1no), Motor-bikes
Hai Duong	Green Farm company	87,515	Own transport	Cool truck (1.5ton, 1no)
Vinh Phuc	Visa coop.	198,081	Own transport	Cool truck (2.5ton, 1no), and cool truck (5ton, 1no)
Hai Duong	Thanh Ha company	222,194	Own transport	Cool truck (2.5ton, 1no); Truck (5ton, 3nos)
Hung Yen	Yen Phu coop.	411,492	Rental transport	Truck (1.5ton, 1no)
Hai Duong	Tan Minh Duc coop.	852,010	Own transport	Truck (5ton, 2nos)
Total	20 groups	4,789,826		

Remark: The order is sorted by joint sales amount in winter 2019-20.

Nursing Expansion Stabilization

(2) Coordination between member farmers

1) Conditions to collect (buy) vegetables from member farmers to target group. The following items shall be coordinated to collect the products: date, time, location, quality standard (such as size, color, damage condition and safety) and packaging condition.

2) Payment conditions to make payment from target group to member farmers. Following items shall be coordinated: unit price, timing and payment method (cash or bank).

Target group is recommended to make a penalty clause, in the case of farmer violation of the collection condition.

For early stages of organizing joint sales, it is recommended to start from a small number of farmers (usually, with safe vegetable production group), for specific crops in the limited season. For smooth implementation of joint sales, it is also recommended to make condition that the participants of the safe vegetable production group are mandated to follow in the joint sales.

9.2 FIELD INSTRUCTION FOR JOINT SALES

DARD will instruct the target group to manage collection and delivery of vegetables and payments and receipts. The target group is required to prepare the following four formats:

- 1) Daily Demand plan and Harvesting plan: To calculate estimated harvesting volume. Sample is attached in Attachment 9.1.
- 2) Results of Collection: To record collection amount of vegetable from farmers to target group, and payment amount from target group to farmers. Sample is attached in Attachment 9.2.
- 3) Results of Sales: To record delivery amount of vegetables from target group to buyer, and payment amount from buyer to target group. Sample is attached in Attachment 9.3.
- 4) Agreement between farmers group and member farmers: To make clear understanding between both sides, and to ensure suitable implementation of joint sales. (Refer Attachment 5.2).

DARD will check the formats if the crops are collected and delivered based on the coordination with buyer, and provide advice to producers on production, collection and delivery if necessary. Also DARD is required to monitor the number of participants and volume of sold crops.

CHAPTER 10

EXTERNAL INSPECTION AND AUDITING

10.1 GUIDANCE OF SAMPLING TESTING PLAN AND EXTERNAL AUDITING

DARD will design a sampling and testing plan of the products for pesticide residue check. The plan will be prepared at the beginning of harvest (tentatively November in every year). Respective staff who is trained in monitoring and inspection will be appointed by DARD to conduct the assessment.

10.2 PESTICIDE RESIDUE CHECK (QUICK SAMPLING TEST)

Pesticide residue check is essential to monitor safety of the products at the time of harvest and/or delivery to buyers. The Quick sampling test will be conducted by DARD inspector (representatively a staff from sub NAFIQAD) by using a quick tool kit in order to measure the pesticide residue of sample products on farm. The results of the quick tests will be shared among target groups and, DARD for auditing purposes only and will not be disclosed to the public.

When agrochemical residue is detected, the crop shall not be delivered to the buyer. The target group shall identify the producer. The group is recommended to impose punishment to the producer, such as charging fine, stopping collection of crops, elimination from safe vegetable production group. Also, the target group shall identify the reason of agrochemical residue through checking the record book or interviewing the producer, and shall share the reason for other member farmers to avoid repeating similar errors.

For target groups which are connected with high-end buyers (such as super-markets), quick sampling test kits seem profitable for the groups to buy themselves⁹. In fact, several target groups are interested in the

⁹. Target group can receive higher selling price from high-end buyer, thus, they can buy the test kit by using increased income as follows:

Name of test kit: GT PESTICIDES RESIDUAL TEST KIT (Phát hiện nhanh dư lượng thuốc trừ sâu nhóm Organophosphates, Carbamates & Cholinesterase inhibitors)

Cost of test kit / increased income = 8% (150,000VND / 1,800,000VND).

Cost of test kit: approximately 150,000 VND/ 1sample (847,000/box / 6 samples).

Increased Income: In the case of leafy vegetables, several supermarkets pay 3,000-9,000 VND/kg higher price

purchase of the test kit by their own budget. Thus, DARD will implement the following activities to support the group: to ensure cost and benefit, to provide information of test kit supplier, to support making the residue check plan, and to instruct how to use the test kit.

10.3 PESTICIDE RESIDUE CHECK (LABORATORY TEST)

A laboratory test will be arranged by a DARD inspector. The DARD inspector collects samples and sends them to a qualified laboratory for testing heavy metals, pesticide residue and microbiological substances respectively if necessary. The results of the laboratory test will be disclosed to the public and utilized for marketing purpose as the evidence of product safety.

When agrochemical residue is detected, the target group shall identify the producer. Since this result will be disclosed to buyers, the target group shall consider countermeasures and shall receive approval for those countermeasures from existing buyers. The countermeasures are similar as the case of quick sample test: the group is recommended to impose punishment to the producer, the target group shall identify the reason of agrochemical residue and share the reason for other member farmers to learn.

10.4 EXTERNAL AUDIT BY DARD

DARD will implement external audits of each target group to evaluate the current situation of Basic GAP application. DARD is required to evaluate each target group though checking 26 control points of Basic GAP. Implementation frequency is one time per year. However, if DARD participates in the internal audit of each target group, external audit is not necessary to be implemented. An audit report shall be prepared and submitted to DARD after the audit.

to producers than local markets. Thus, increased gross income from 1sao (360m²) will be 1,800,000 VND (600kg/1sao x 3,000 VND/kg).

For leafy vegetables, 1 sample test for 1 sao is appropriate since farmers usually harvest 1 sao on the same day.

CHAPTER 11

IMPLEMENTATION STRUCTURE

11.1 IMPLEMENTATION STRUCTURE

The implementation structure is shown as below:

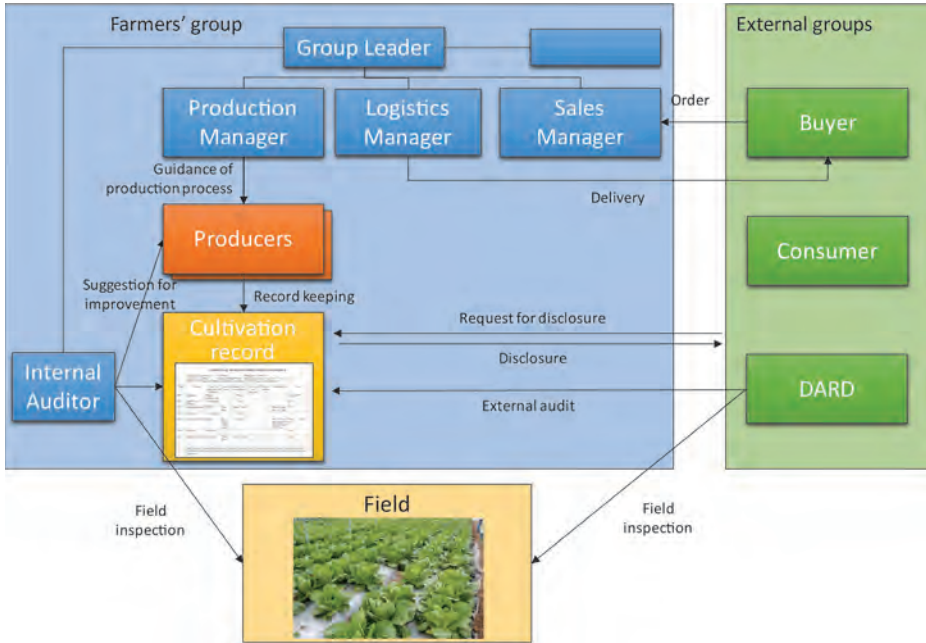


Figure 11-1 Implementation Structure

11.2 ROLES AND RESPONSIBILITIES OF FARMERS' GROUP

Farmers' group (Agriculture Cooperative/ Company) is the main body of safe vegetable production and sales. Each farmers' group shall carry out monitoring and self-auditing activities in compliance with requirements and steps prescribed in the Basic GAP. The group shall also prepare production and delivery plan based on marketing activities and provide support to DARD's technical officers and external experts for monitoring and consultation of the group activities.

Each farmers' group shall establish a management body, which will consist of the following members:

- 1) Group Leader/ Head of Cooperative
- 2) Production Manager

- 3) Internal Auditor
- 4) Sales Manager
- 5) Logistics Manager
- 6) Accountant

Roles and responsibilities of management members are described in 5.1 Nomination of management board members.

11.3 ROLES AND RESPONSIBILITIES OF STAKEHOLDERS

(1) DARD

DARD shall promote the safe vegetable production and sales at the provincial level, including providing technical officers of suitable professions for training of farmers, production, inspection and monitoring of food safety.

DARD should allocate at least one technical staff member for each target group, who will be responsible for implementing field activities such as giving instruction and monitoring activities of the target group. They can be from agriculture extension center, or plant protection station at the district level, or from DARD's Sub-Department/ Division. The role and responsibilities of DARD are below.

- To nominate the technical inspectors and marketing persons in charge.
- To organize, monitor, instruct and inspect the activities of target groups.
- To organize trainings of farmers, such as Basic GAP and marketing trainings.
- To coordinate with local programs to support improvement of infrastructures.
- To disseminate information and knowledge to other farmers groups in the province.

(2) Buyers

- Participate actively in the safe vegetable promotion plan.
- Ensure to have a separate section (effective segregation and traceability) to sell safe vegetables.
- Collaborate with relevant stakeholders to carry out the safe vegetable promotion activities.
- Provide all relevant information on safe vegetables.

CHAPTER 12

IMPLEMENTATION SCHEDULE

The sample implementation schedule is shown in Attachment 12.1. DARD shall make own implementation schedule following the sample.

CHAPTER 13

BUDGET

*The sample cost norm is shown in Attachment 13.1.
DARD shall secure the own budget following the
sample.*



ATTACHMENT

ATTACHMENT 2.1

ASSESSMENT SHEET FOR TARGET GROUP CANDIDATES

Province		Hai Duong	Hai Duong	Hai Duong	Hai Duong	Hai Duong
ID No.		HD-1	HD-2	HD-3	HD-4	HD-5
Group Name		Lua farmers group	V-Phuc cooperative	Viet A Chau cooperative	Thanh Son cooperative	Cat Lai cooperative
Group Type	Agricultural company/ Cooperative/ Farmers group	Agricultural Company (since 2015)	Agricultural Company	Farmers group	Cooperative	Cooperative
	(for Cooperative only) New Style/ Traditional	-	-	-	New style (but it is actually a company)	New style (but it is actually a company)
Land	Agricultural Land (ha)	5.3ha	5.1ha (3.3ha in Trac Chau, 1.8ha in Pho Van)	28.7ha	10ha	13ha (made MOU with 20HH)
	Vegetable Land (ha)	5.3ha	5.1ha	28.7ha	10ha (7ha for lotus, 3ha for asparagus under plan)	13ha
	Safe Production Area (ha)	5.3ha	5.1ha (+ 2ha planned)	27.5ha	0 ha	0 ha
	Location (no chemical industry nearby)	No	No	No	No	No
Membership	Total number	14 members (4 board members, 10 workers)	17 members (2 management/ 1 accountant/ 10 workers + 4 workers)	143 HH (2 board members: Leader and Dty leader, and 3 sub group leaders)	9 members + 5 workers (Board: Director, Co-director, accountant, cashier, auditor, production mgt)	8 members + 20 part-time workers
	Member of safe vegetable production	14 members	17 members	143 HH	No	No

Ha Nam	Ha Nam	Ha Nam	Hung Yen	Hung Yen	Hung Yen
HN-1	HN-2	HN-3	HY-1	HY-2	HY-3
Thanh Tan cooperative	Chien Thang cooperative	Phu Cu cooperative	TTM company		
Cooperative	Cooperative	Cooperative	Cooperative	Cooperative	Agricultural company
New style	New style (but Traditional type)	New style	New style (registered March 2018)	New style	-
180 (116ha paddy, 60ha subsidiary crop)	235ha	35ha	5ha (including associate farmers' land)	5ha	25ha
12ha	47.25ha	12ha	5ha	5ha	5ha
5ha (since Oct.2017), (+ 5ha planned)	4ha	1ha (since 2017 under District Women's Union support)	5ha (including 1.3ha nethouse (est Apr'18))	5ha	25ha (5ha vege, 20 fruits)
No	No	No	No	No	No
1,293HH (6 board members; 3 Directors, 1 Supervisor, 1 Accountant, 1 Cashier)	1,860HH (5 board members; Director, Dty Director, Technical staff, Accountant, Supervisor)	230 members	7 members + 5 workers + 15 associate farmers (7 members from 1 Women Union, 1 Farmer Union, 5 farmers)	5 members (1 Director, 3 stock holders, 1 acting Director), 1 Tech engineer (graduate), 10 permanent workers	6 management + 35 permanent workers
50 HH (for 5ha), (110HH for 10ha)	30 HH (for 4ha) VECO covers 19HH divided in 3groups	6 ladies (under Women's Union support)	27 members	16 members	41 members

"Products (Major products)"	Winter crop	Cabbage, Kohlrabi, Cauliflower, Choysom, Green mustard, Tomato	Cabbage, Kohlrabi, Squash, Leafy vegetable, Pumpkin, Cauliflower	Kohlrabi, Broccoli, Cabbage	-	Onion
	Summer crop	Taro shoot, Muskmelon (in greenhouse)	Melon, Cucumber, Squash, Pumpkin, Malabar nightshade, Jute plant	Watermelon, melon, garlic, kohlrabi	Lotus (main harvesting season: Oct, Mar, May)	Onion
Certificate/ Assurance	Safe Production Condition	Certified	Certified	No (holding VietGAP)	No (even no sampling test)	No (even no sampling test)
	VietGAP	Certified	-	Certified	-	- provided a training to farmers but careless
	Basic GAP	-	Following GAP (but not proper recording)	-	-	-
	Other (PGS etc.)	-	-	-	-	ISO22000 (applying)
Cultivation knowledge and technology	Technologies applied (compost, seedling, agri. materials)	Coir dust for muskmelon,	Soil preparation (sterilizing), Composting, Sprinkler for 3ha, New variety, Sponge tray seedling	Compost, Plastic tunnel	Nothing special	-
Current Market Channel	Name of buyer and percentage of sales (%)	1. Distributer* in district: 50-70% 2. Local collector in and around commune: 30-50% * Distributer sells to canteen	1. Consumer in Hai Duong and Hanoi 50% (3 agents in Hanoi, transport by Greenfarm) 2. Shop/retailer in Hai Duong 30% 3. Surplus to local collectors 20%	1. Phung Viet company: 50% (contract farming for Broccoli and Cabbage) 2. Local collector: 50%	1. Kim Chinh 100%	1. A Chau food company 70% 2. other 4 local companies 30%






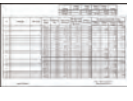








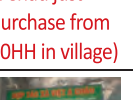














Cabbage, Kohlrabi, Broccoli, Cauliflower, Bok choy, Choysom, Tomato	Cabbage, Kohlrabi, String bean, Tomato	Tomato, Cabbage, Bok choy, Mustard,	Tomato, Cabbage, Kolrabi, Radish, Leafy vegetable, Chrysanthemum, Cucumber	Leafy vege (Mustard), Tomato, Morning glory, Cabbage	Dill, Coriander, Choysum, Chili, Celery, Malabar nightshade
Maize, Leafy vegetable (Malabar nightshade, Mustard), Radish, Sponge gourd, Squash	Leafy vegetable, Shallot	Bitter gourd, Sponge squash, Pumpkin	Leafy vegetable, Spongy gourd, Eggplant, Tomato	Leafy vege (Mustard), Morning glory, Chili, Squash, Sweet potato, Gourd	Jute, vegetable shrinkage, pumpkin, herbs
Under certifying (soil and water tested)	Certified (in 2016)	Under certifying	Under certifying (soil and water tested)	Under certifying (soil and water tested)	Certified
-	-	-	Under certifying	Certified	Certified
-	-	-	-	-	-
PGS (2018~)	PGS (2018~)	PGS (2018~)	-	-	-
"Composting (4 farmers) Grafting (only attended training)"	"Composting Proper agrochemical application"	Composting (JICA method, Traditional method, Biotech are exercised)	Nethouse	Buffalo dung, nursery tray, seedling	Self pesticide residue check by Quick test kit, pesticide check by VinEco, Seedling
1. Local canteen 30% (cement factory, kindergarten, government) 2. Local market 70%	1. Retailer in Phu Ly 2. Local collector	1. Canteen introduced by WU* 20% 2. WU staff** 15% 3. Local market 65% (individual sales) *Canteen is managed by district government. **There are 60 Women's Union staff in district and are clustered in 3-4 groups.	School canteen in Hung Yen 60% School canteen in Hanoi 40%	1. VinEco (since Mar'18) 20% 2. Big C 70% 3. Supermarket, school in Hanoi 10% * VinEco has no interest in trading with Phu Cu since they detected residue in samples.	1. VinEco 100% (Fruits: Vinmart and fruits shop in Hanoi)




























Joint sales	Experience of Joint Sales/ percentage of joint sales out of total sales (%)	100%	100%	90% (for Phung Viet company and local collector) 10% sold individually only for low quality vegetables	100%	100%
Pricing	Selling Price compared with market price	Company in district buys 10% higher, but not satisfied with the pricing. Local collector buys as normal vegetable.	10-15% higher but surplus is sold at normal price	Fixed price VND3,500/ flower is applied for broccoli, 1,500flowers per sao. Production cost is 2,000/ flower.	Lower than market price, since productivity is high.	purchase VND500-1,000/ kg higher than market price
Pre-processing, Packaging, transportation	Existing Facility and infrastructure with current condition/ usage	Yes. utilizing pre-processing house of Pham Kha cooperative since Jan.2017	Yes. There are stainless tables and shelves, washing basin is outside of house (concrete type)	No. Land is available.	Office house in field (cutting and packing by Kim Chinh)	Yes (processing facility for green onion)
	Labelling/ packaging	Yes, has logo. Also promoting a vacuum packaging.	Yes.	No. Company packs for export Broccoli.	Yes	Yes
	Storing/ Cool storage	No. planning to install cool storage.	No.	No	No	Yes
	Means of transportation	No. hiring a transporter or collector comes to buy.	1 truck (7seaters)	No	No (a truck belongs to Kim Chinh)	Yes
Sales Promotion	eg. Trade fair/ Catalogue/ Internet/ Advertise	Facebook/ participate in trade fair/ in-store promotion	Facebook/ participate in matching event	No. (Phung Viet was never a big collector in neighboring village.)	Attended trade fair in Hanoi, China	Not attending any trade fair. Communication is only by face to face and e-mail.

0% collectors come to individual farmers/ individual farmers bring to local market (There is an experience with Hiep for joint sales)	0% Group was formulated but sells individually	35% Husband of a member is the village leader, he collects from 6 ladies and distributes to canteen and WU staff houses.	100%	100%	100%
No difference with normal vegetable	No difference with normal vegetable	50% higher Fixed price for canteen, Flexible price for WU staff based on market price	0% There was no evidence, no facility in last year.	200% (Mustard for VinEco) 0% (Sweet potato for Big C and VinEco)	VinEco pricing
No. Land for pre-processing house is available.	No. Land was allocated, will start construction by cooperative fund in Q3 2018.	No. currently use the village leader's house	Under construction	Yes. Pre-processing house with table and equipment	Pre-processing, storage, etc.
No	No, but receiving a training for Branding by VECCO	No. packing in a simple nylon bag.	Logo was designed. Label to be supported by DARD after receiving a certificate	Yes	Yes
No	No	No	Under construction	Yes (normal temperature)	Cold storage
No	No	Motorbike	Cool truck (for ice cream distribution)	1 truck	1 truck and 1 pickup truck
Not attending/ no advertise	Attended trade fair/ Brings products to retail shop No internet promotion	Attended trade fair supported by Women's Union No label/ No logo	Marketing via Google Ads. Tried website, but not efficient.	Face to face promotion especially with manager/ senior staff of buyers	Only VinEco. Now start promoting to export market, Taiwan.

External Support	Past and current support by donor/ NGO/ Government	DARD supported a greenhouse construction (100,000/m2 x 500m2)	No	DARD supported VietGAP certificate.	DARD will support VietGAP certificate.	No
Willingness	Leadership and intention	Mr.Kai, president came into safe vegetable business after early retirement from military. He is conscious of food safety and enthusiastic about processing and sales promotion.	President is still working as Gov. staff. But he expanded new land 3.3ha last year and challenges new technologies.	Leader is chairman of village PC. Group has a good management structure dividing 3 sub groups for production management.	Director is active.	-
Remarks		All 4 board members are family. Reasons to choose Pham Kha are; 1. not close to chemical industry, 2. fair price of land lease, 3. famous area for vegetable production. One technical staff is hired for production mgt.	Address: Trac Chau village, An Chau commune, Hai Duong city	Responsibility: Leader/Dty leader: Plan, Marketing, Contract, Order, Account Sub group leader: production mgt, monitoring record keeping, collection and payment 90 farmers participate in Contract farming out of 143. Farmers are satisfied with Phung Viet due to quick payment.	V-Phuc is actually a subsidiary of Kim Chinh company, but registering as cooperative for tax matters.	Viet A Chau is actually a processing company of dried green onion chips, and is registering as a cooperative for tax matters. Farmers cultivate using traditional methods and do not care GAP and food safety.

<p>VECO (15-20HH divided into 3 groups), training only Commune PC supported nethouse construction.</p>	<p>DARD supported a greenhouse construction (200,000/m2), but not under safe production group. DARD also supported installation of sprinkler system under new rural development program.</p>	<p>Women's Union supports technical training, seedling and fertilizer. VECO organize a study tour to Tu Xa, Thanh Son and Hiep farm.</p>	<p>No.</p>	<p>No.</p>	<p>No.</p>
<p>Leaders of Thanh Son cooperative have already attended JICA trainings several times, are willing to joint the project.</p>	<p>Interviewee (Dty Director) is the coordinator for VECO project, but is not a vegetable farmer and does not know very much about vegetable.</p>	<p>Only 6 women, but active.</p>	<p>Two leaders have high motivation for management and faming. One leader can engage in farming full time.</p>	<p>Unclear information from Director. Poor management. Director is absent in farm due to side business (construction),</p>	<p>Does not desire any intervention program, no request for new production techniques. Only expects support for export marketing</p>
<p>10ha land belongs to commune, so easy to arrange for pre-processing house or any other purpose. 1 input supply manager looks after chemical application for all products including paddy. Hiep farm jointly produced vegetables with 10 farmers in Thanh Son and sold as joint sales in 2017.</p>	<p>No board member is involved in safe vegetable production. VECO has just started project for 19HH, implemented 4-5 trainings so far. Major challenge is marketing. There is no buyer for safe vegetables.</p>	<p>District Women's Union supports to formulation of safe vegetable production group. Husband of a member receives orders from customers. Small group but has a unique supply chain. Possible to expand membership to 10-12 in 2018. Expansion of Market and production volume is the challenge.</p>	<p>Registration as Cooperative but actually company model like Japan-Vietnam. Two leaders worked in South Korea for 5 years, then started farming in Hung Yen after returning to Vietnam. Farm field was covered by weeds, needs improvement of field preparation.</p>	<p>Registration as Cooperative but actually company model like Japan-Vietnam. No technical staff dispatched (only one fresh graduate is in field). Director does not know details of farming.</p>	<p>Production and pre-processing are standardized manner dedicated for VinEco. Father of director is the vegetable and fruits collector of Long Bien wholesale market. He knows very well about market trends and requirements.</p>

Evaluation by consultant team	Eligibility for target group 1. Management capacity (for joint sales) 2. Land availability for expansion 3. Willingness of leader/s 4. Overall evaluation	1. High 2. High 3. High 4. Eligible	1. High 2. High 3. High 4. Eligible	1. High 2. High 3. High 4. Eligible	Not eligible (special crop: Lotus. And, in fact, a subsidiary of a private company)	Not eligible (In fact, a processing company)
Recommendation by DARD				High priority by Director, PPMU Cooperative model		
Photo	Certificate				no certificate	no certificate
	Production Area					No production area (Viet A Chau just purchase from 20HH in village)
	Production Area					No production area (Viet A Chau just purchase from 20HH in village)
	Pre-processing					
	Pre-processing					
	Package/ Label			no label/ logo		
Interviewee (Management board)						

<p>1. Low, need confirmation of management board 2. High 3. High 4. Not eligible (need strengthening of management structure)</p>	<p>1. Low, needs transferring of authority to sub-group 2. High 3. Low, need transferring of authority to sub-group 4. Not eligible (needs strengthening of management structure)</p>	<p>1. High 2. Relatively low, needs expansion of members and market 3. High 4. Eligible</p>	<p>1. High 2. High 3. High 4. Eligible</p>	<p>1. Low, needs to establish management 2. High 3. High 4. Not eligible (needs restructuring of management structure)</p>	<p>1. High 2. High 3. Low 4. Eligible, but less expectation from project</p>
<p>High priority by Director PPMU Consolidated land</p>	<p>High priority by Director PPMU Specialized vegetable land</p>		<p>High priority by Coordinator, PPMU</p>		<p>High priority by Coordinator, PPMU</p>
<p>no certificate</p>	<p>no certificate</p>	<p>no certificate</p>	<p>no certificate</p>	<p>no certificate</p>	
					
					
<p>no facility</p>	<p>no facility</p>	<p>no facility</p>			
<p>no facility</p>	<p>no facility</p>	<p>no facility</p>			
<p>no label/ logo</p>	<p>no label/ logo</p>	<p>no label/ logo</p>	<p>no label/ logo</p>		
					

ATTACHMENT 2.2

SELECTION OF TARGET GROUPS IN SEMI-PILOT PROVINCES AND ADDITIONAL SELECTION IN PILOT PROVINCES

September, 2018

JICA Project Team

1. CONFIRMATION OF SELECTION CRITERIA FOR TARGET GROUPS

7 Criteria are applied according to Record of Discussion and specific indicators for each criterion are set by Project team as below.

No.	Item	Evaluation Criteria	Indicator
1	Target area/zone	Vegetable production area (ha)	1-1 Specialized vegetable area/zone
			1-2 Land area is more than 1ha.
2	Location and environment	Favorable natural environment	2-1 Land is certified as safe production area
		Economical and social environment	2-2 There is no existence of chemical industry nearby
		Suitable area for safe vegetable	2-3 Suitability of land condition (Field observation)
3	Knowledge and techniques	Knowledge and techniques of Basic GAP and/or other safe crop production	3-1 BasicGAP and/or VietGAP is applied.
			3-2 Farming practice (Field observation)
4	Number of farmer group and production volume	Certain number of farmer groups members	4-1 No. of farmers for safe crop production is more than 5.
5	Willingness and eagerness	Willingness and eagerness of producers	5-1 Leadership and independency (Field observation)
6	New model	Desirable new agriculture cooperative model	6-1 New model group
7	Vegetable production	Safe vegetable production and distribution	7-1 Experience of market channel development

2. NOMINATION OF TARGET GROUP CANDIDATES

No.	Group Name	Type	Member ship	Vegetable area	Certified Safe area
Hai Duong					
HD-N1	Gia Gia food Joint stock Company	Company	14	5.3	5.3
HD-N2	Green farm vegetables production group	Company	17	5.1	5.1
HD-N3	Lua farmers group	Farmer group	143	28.7	27.5
HD-N4	V-Phuc Green agriculture Cooperative	Coop.	14	10	0
HD-N5	Viet A Chau Cooperative	Coop.	28	13	0

3. EVALUATION OF TARGET GROUP CANDIDATES (HAI DUONG)


No.	Group name	1. Target area/zone		2. Location and environment		3. Knowledge and techniques		4. Number of farmer group and production volume	5. Willingness and eagerness	6. New model	7. Vegetable production and marketing	Evaluation	
		Specialized vegetable area	Land area is more than 1ha.	Certified as safe production area	No chemical industry nearby	Suitability of land condition	BasicGAP and/or VietGAP is applied.	Farming practice	No. of farmers is more than 3.	Leadership and independency	New model group		Experience of market channel development
HD-1	Gia Gia Food Joint Stock Company	Yes	5.3	Certified	No	Good infrastructure, small production area but sufficient	BasicGAP VietGAP	Fair good	10	High leadership	Agri. Company	Newly starting joint sale	Target group
HD-2	Green Farm safe vegetable, fruit and root vegetables production group	Yes	7	Certified	No	Sufficient production area with good infrastructure investment	Safe production organic	Fair good	2	High leadership and good capacity in capital mobilization	Agri. company	Good marketing, having own safe vegetable shop	Target group
HD-3	Safe vegetable production group in Lua Village, Doan Thuong commune	Yes	27.54	Certified	No	Good infrastructure, small land area but sufficient	BasicGAP VietGAP	Good	147	Low leadership	Farmer group	Joint sale	Target group
HD-4	V-Phuc Green agriculture Cooperative	No	10	No	No	Poor infrastructure	Normal	Traditional	14	Low leadership	New cooperative	Joint sale (acts as collector)	
HD-5	Viet A Chau Cooperative	No	13	No	No	Good infrastructure, have processing facility (dry shallot)	ISO 22000	Traditional	28	Low leadership	New cooperative	Not involved in farming, Collection for processing	

4. CONFIRMATION OF TARGET GROUPS (PILOT PROVINCES)

Based upon the criteria agreed on in the Record of Discussions of the project, 6 target groups in 3 pilot provinces have been additionally selected.

No.	Group Name	Type	Member ship	Vegetable area	Certified Safe area
Hai Duong					
HD-N1	Gia Gia food joint stock Company	Comp	10	5.3	5.3
HD-N2	Green farm vegetables production group	Comp	17	5.1	5.1
HD-N3	Lua farmers group	FG	143	33	27.5

PRODUCER'S PROFILE

Province: Hải Dương		ID Number: HD-N1												
Name of Unit														
Gia Gia food joint stock Company														
Established year	2015													
Number of members	10													
Form of management	Company													
Total vegetable land/ Safe vegetable area	5.3 ha/5.3 ha													
Estimated annual safe vegetable output	10 tons													
Protocol applied	VietGAP													
Vegetables with strengths														
Vegetable Name	Volume	Harvesting Season												
		1	2	3	4	5	6	7	8	9	10	11	12	
Mesh melon	5 tons						X	X	X					
Taro shoot	5 tons	X	X	X	X	X	X	X	X	X	X	X	X	X
Perspective of Unit														
<ul style="list-style-type: none"> - The president is conscious of food safety and enthusiastic on processing and sales promotion. - Desire to have more customers 														

Province: Hải Dương

ID Number: HD-N2

Name of Unit**Green farm vegetables production group**

Established year	2014
Number of members	17
Form of management	Company
Total vegetable land/ Safe vegetable area	75.1ha/ 5.1 ha
Estimated annual safe vegetable output	80 tons
Protocol applied	Certificate of safe production condition

Vegetables with strengths

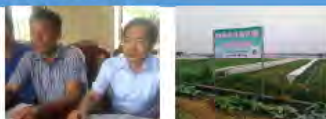
Vegetable Name	Volume	Harvesting Season											
		1	2	3	4	5	6	7	8	9	10	11	12
Cauliflower	20 tons	X	X	X	X	X					X	X	X
Leafy vegetables	15 tons	X	X	X	X	X	X	X	X	X	X	X	X
Cabbage	30 tons	X	X	X	X	X					X	X	X
Melons	15tons						X	X	X	X			

Perspective of Unit

- Cooperate with import-export businesses, supermarkets, trading groups and companies to promote production and marketing.
- Desire to have more customers are purchasing, processing, export facilities.
- Expect to have more customers in supermarket system, hotels, restaurant and canteens

Province: Hải Dương

ID Number: HD-N3

Name of Unit**Lua farmers group**

Established year	2012
Number of members	143
Form of management	Farmer group
Total vegetable land/ Safe vegetable area	33 ha/27.54 ha
Estimated annual safe vegetable output	370 tons
Protocol applied	VietGAP

Vegetables with strengths

Vegetable Name	Volume	Harvesting Season											
		1	2	3	4	5	6	7	8	9	10	11	12
Kohlrabi	200	X	X	X	X	X				X	X	X	X
Pear-shaped melon	20 tons						X	X	X	X			
Cabbage	100 tons	X	X	X	X	X					X	X	X
Water melon	70 tons						X	X	X	X			

Perspective of Unit

- Cooperate with import-export businesses, supermarkets, trading groups and companies to promote production and marketing.
- Desire to have more customers are purchasing, processing, export facilities.
- Target of production households is 100% members in the production group applying vegetable production in accordance with VietGAP.
- Branding development: logo, brand, bar code, collective label for vegetable products of the commune

ATTACHMENT 2.3

PRODUCER PROFILE



PROFILE



YÊN PHÚ

AGRICULTURE SERVICE COOPERATIVE

Address:	Mễ Hạ, Yên Phú, Yên Mỹ, Hưng Yên
Tel:	02213 965 066
Fax:	
Mob:	0976 828 460
Email:	huuhunghtxyp@gmail.com
Website:	

MAY 2019

Producer Profile

I. General information			
Province:	Hưng Yên	ID Number:	HY-N4
Group name:	YÊN PHÚ AGRICULTURE SERVICE COOPERATIVE	Leader Name:	Nguyễn Hữu Hưng
			
Address:		Mễ Hạ, Yên Phú, Yên Mỹ, Hưng Yên	
Tel:	02213 965 066	Fax:	
Cell:	0976 828 460	Email:	huuhunghtxyp@gmail.com
Website:			
Established year:		1997	
Number of members on Management Board/ Number of farmers:		6/150	
Form of management:		Cooperative	
II. Production			
1. Total vegetable cultivation land/ safe vegetable land/ project area (as of April 2019)		20 ha/ 20 ha/ 4.54 ha	
2. Estimated annual vegetable volume in: Total vegetable cultivation land/ safe vegetable land/ project area (as of April 2019)		1,800 tons (for 20ha)/ 1,800 tons (for 20ha)/ 412 ton (for 4.54ha)	
3. Protocol applied:		1. Safe vegetable 2. Basic GAP 3. VietGAP	

4. Vegetables produced in safe vegetable land (20 ha):

Leafy veg	Fruit veg	Root veg	Flower veg
Choysum	Tomato	Kohlrabi	Broccoli
Flowering choysum	Sponge gourd		
Cabbage	Gourd		
Chinese cabbage	Bitter gourd		
Green mustard	Cucumber		
Spring onion	Eggplant		
Green Bok Choy	Snow bean		
Lettuce	Sweet corn		
Coriander			
Dill			
Basil			
Beetroot			
Brussel Sprout			
Morning glory			
Cilantro			

5. Supply time of vegetables in the safe vegetable land (20 ha):

Type	Vegetable					
		4	5	6	7	8
L	Choysum	X	X	X	X	
	Flowering choysum	X	X	X	X	
	Cabbage	X	X			
	Chinese cabbage					
	Green mustard	X	X	X	X	
	Spring onion					
	Green Bok Choy	X	X	X	X	
	Lettuce					
	Coriander	X	X	X	X	X
	Dill	X	X	X	X	X
	Basil	X	X	X	X	X
	Beetroot	X	X	X	X	X
	Brussel Sprout	X	X	X	X	X
	Morning glory	X	X	X	X	X
Cilantro	X	X	X	X		
Fr	Tomato	X	X	X	X	X
	Sponge gourd	X	X	X	X	X
	Gourd	X	X	X	X	X
	Bitter gourd	X	X	X	X	X
	Cucumber	X	X	X	X	
	Eggplant		X	X	X	
	Snow bean		X	X	X	
	Sweet corn					
R	Kohlrabi	X				
Fl	Broccoli	X				

Supply time (month)						
9	10	11	12	1	2	3
	X	X	X	X	X	X
	X	X	X	X	X	X
X	X	X	X	X	X	X
	X	X	X	X	X	
	X	X	X	X	X	X
		X	X	X	X	X
	X	X	X	X	X	X
	X	X	X	X	X	X
X	X	X	X	X	X	X
X	X	X	X	X	X	X
X						
X	X	X	X			
X	X	X	X	X	X	X
	X	X	X	X	X	X
X	X	X	X	X	X	X
X	X	X	X			
X	X	X	X			
X	X	X	X	X	X	X
		X	X	X	X	X
X	X	X	X	X	X	X
X	X	X	X	X	X	X

6. Supply Volume under project area (actual joint sales result in 4.54 ha, 2018-19)

Vegetable	Vol. (Ton)				
		4	5	6	7
Tomato	73.0	11.5	11.2	1.1	
Cabbage	58.3	26.1	0.1		
Kolhrabi	9.1				
Leafy vegetables*	26.6	1.5	2.1	4.2	1.0
Bitter Gourd	15.4		1.9	4.5	3.8
Basil	5.1	0.0	1.2	0.9	0.7
Sponge Gourd	14.2		0.9	1.5	3.0
Gourd	1.6			0.8	
Eggplant	4.4				
Cucumber	3.1				
Chinese cabbage	1.3				
Spring onion	1.0				
Cilantro	1.0				
Total	214.1	39.1	17.4	13.0	8.5

* Leafy vegetables: Choysum, Flowering choysum, Green mustard, and Green

8	9	10	11	12	1	2	3
			5.2	16.6	7.5	3.9	16.0
			4.9	4.8	4.6	2.7	15.1
		1.8		1.1	0.6	1.0	4.6
1.7		4.1	3.8	1.6	3.4	1.9	1.3
3.5		1.0	0.7				
0.1	0.3	0.2	0.3	0.1	0.6	0.4	0.3
3.3		4.2	0.3		0.6	0.4	
		0.2	0.3				0.3
			0.5	0.8	0.8	1.1	1.2
		0.7	0.6		0.5	0.7	0.6
				1.3			
				0.4			0.6
	0.2	0.2	0.2	0.2			0.2
8.6	0.5	12.4	16.8	26.9	18.6	12.1	40.2
Bok Choy							

7. Status of vegetable production and consumption:

The Cooperative has a focused area for vegetable production, which makes it easy for monitoring and management of production. Also, the Cooperative has applied some advanced techniques such as: (1) Applying new fermented compost to recover the soil structure and improve the fertility for the soil. (2) New method of seedling production using foam trays to have healthy seedlings which obtain good disease resistance and are quickly adaptable to outside environment after being transplanted in the field.

III. Collection and consumption of products

The Cooperative has a pre-processing house which ensures food safety and hygiene. Safe vegetables are currently sold to consumption areas such as Ha Noi Union of cooperative; Safefood24h; VinEco; Nhat Minh commercial and food limited company; Co-op Mart Ha Noi; Co-op Food; Mùa Việt food

IV. Monitoring the quality

The Cooperative organizes an internal audit for the whole production area of safe vegetables and VietGap vegetables. Especially, an internal auditor team and VietGap production households organize evaluation twice a year.

V. Perspective of the Unit/ orientation of consumption development

Increase of VietGap production area from 15.5 ha to 20 ha (since 05/ July/2018).

Continue to pilot application of advanced techniques from JICA, for example, non-woven textile.

In addition, the cooperative has net house of around 5,000 m² and sprinkler irrigation system for safe vegetable production. It also has camera for monitoring vegetable production in some areas.

company; An Hòa food chain; Safe meals; Hương Việt Sinh Limited company; TPS Việt commercial and product company; Tan Phat limited company; Nam Bao limited company. Workers have good skills in preprocessing, packaging vegetables to satisfy buyer's requirements on quality and safety.

The Cooperative regularly checks the residue of pesticides by quick test and periodically checks the samples by lab test.

External monitoring is conducted by Sub-NAFIQAD and buyers.

Continue to expand consumption market, toward such customers as safe vegetable shops, supermarkets, canteens, schools, hospitals, etc.

Build/open safe vegetable shops for advertising Yen Phu brand-name.

COOPERATIVE PROFILE

LIST OF ATTACHED DOCUMENTS

1. Business Registration Certificate
2. List of Management Board Members of Yen Phu Cooperative
3. List of households and farming area
4. Certificates, certification
5. Some pictures of Yen Phu Cooperative

1. BUSINESS REGISTRATION CERTIFICATE

UBND HUYỆN YÊN MỸ CỘNG HÒA XÃ HỘI CHỦ NGHĨA VIỆT NAM
PHÒNG TÀI CHÍNH - KẾ HOẠCH Độc lập - Tự do - Hạnh phúc

GIẤY CHỨNG NHẬN ĐĂNG KÝ KINH DOANH HỢP TÁC XÃ
Số: 17
Đăng ký lần đầu: ngày 18 tháng 10 năm 2000
Đăng ký thay đổi lần tư ngày 8 tháng 6 năm 2016

1. Tên hợp tác xã viết bằng tiếng Việt: (ghi bằng chữ in hoa):
HỢP TÁC XÃ DỊCH VỤ NÔNG NGHIỆP TỔNG HỢP XÃ YÊN PHÚ
Tên hợp tác xã viết tắt:

2. Địa chỉ trụ sở chính: Thôn Mê Hạ, xã Yên Phú, huyện Yên Mỹ, tỉnh Hưng Yên
Điện thoại: Fax:
Email: Website:

3. Ngành, nghề kinh doanh: dịch vụ khâu thủy nông, bảo vệ thực vật, con giống, cấy giống, thuốc thú y, dịch vụ bao tiêu, tiêu thụ sản phẩm và thực phẩm.

4. Vốn điều lệ: 209.750.000.đồng (Hai trăm linh chín triệu bảy trăm năm mươi nghìn đồng chẵn)

5. Điều lệ của hợp tác xã đã được Đại hội xã viên thông qua ngày 16 tháng 03 năm 2016


6. Tên, địa chỉ chi nhánh:

7. Tên địa chỉ văn phòng đại diện:

8. Danh sách Ban quản trị hợp tác xã:

STT	Họ và tên (ông/bà)	Ngày sinh	Nơi thường trú	Chức danh
I	Hội đồng quản trị HTX			
1	Nguyễn Hữu Hưng	1978	Thôn Từ Tây, xã Yên Phú, huyện Yên Mỹ, tỉnh Hưng Yên	Chủ tịch HĐQT Giám đốc HTX
2	Lê Quang Chức	1957	Thôn Mê Hạ, xã Yên Phú, huyện Yên Mỹ, tỉnh Hưng Yên	Ủy viên HĐQT - P.Giám đốc
3	Phùng Thị Phương Thanh	1984	Thôn Lại Trách, xã Yên Phú, huyện Yên Mỹ, tỉnh Hưng Yên	Ủy viên HĐQT
II	Ban kiểm soát HTX			
1	Nguyễn Đình Lương	1972	Thôn Bình Phú, xã Yên Phú, huyện Yên Mỹ, tỉnh Hưng Yên	kiểm soát viên HTX

CƠ QUAN ĐĂNG KÝ KINH DOANH
(Người ký, đóng dấu và ghi rõ chức vụ, họ tên)

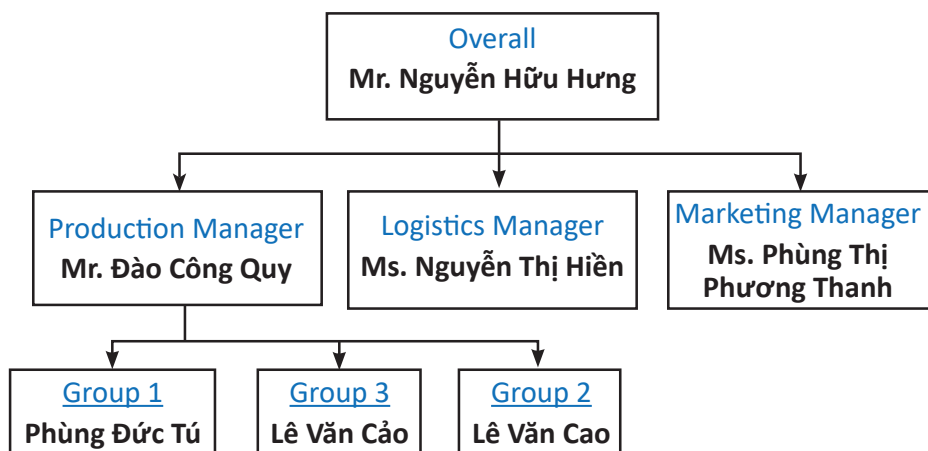

TRƯỞNG PHÒNG
Binh Hồng Huyền

2. LIST OF MANAGEMENT BOARD MEMBERS OF YEN PHU COOPERATIVE

Province	Hưng Yên
District	Yên Mỹ
Commune	Mễ Hạ, Yên Phú
Name of Coop	(YEN PHU AGRICULTURE SERVICE COOPERATIVE)

Position	Name	Gender	Cell phone	Email
Director	Nguyễn Hữu Hưng	Male	0976 828 460	hunuhnghtxyp@gmail.com
Production manager	Đào Công Quy	Male		
Logistics manager	Nguyễn Thị Hiền	Female		
Sales manager	Phùng Thị Phương Thanh	Female		
Accountant	Nguyễn Thị Hiền	Female		
Internal auditor	Nguyễn Hữu Hưng	Male		

PRODUCTION MODEL FOR JOINT SALE



3. LIST OF HOUSEHOLDS AND FARMING AREA

No.	Farmer's name	Gender		Land code	Areas (sào)	Area (m ²)
		Male	Female			
1	Phùng Đức Tú	x		30.1	3	1080
				30.2	3	1080
				30.3	2	720
				30.5	3	1080
				30.6	2	720
				30.7	3	1080
2	Phùng Đức Tuyển	x		30.4	3	1080
3	Lê Văn Cảo Tuyết	x		16	1,7	612
				15	2,5	900
				10	1,2	432
				2	1,2	432
				17	1,5	540

4	Lê Quang Đóa	x		45	1	360
5	Lê Thị Gấm Thắm		x	5	2	720
				5.1	2	720
6	Lê Thị Hương Quốc		x	25	2	720
				8	1,4	504
7	Lê Văn Cao	x		26	1,5	540
				26.1	1,5	540
				26.2	2,5	900
				26.3	2,5	900
8	Lê Văn Hoàn Vân	x		39	1,7	612
				39	2,5	900
				39	1	360
9	Lê Văn Long Quyên	x		17.1	2,5	900
				17.2	2,5	900
				17.3	2	720
10	Lê Văn Quân Nghì	x		5	1,5	540
				52	2	720
11	Lê Văn Trãi	x		24	1	360
				14	1,7	612
13	Lê Văn Luyện Bắc	x		2	1,7	612
14	Lê Văn Nhí	x		50	1,7	612
				18	2	720
				46	3	1080
				18	1	360

15	Đào Công Quy	x		6	2,5	900
				6	1	360
16	Nguyễn Thị Hiền		x	28	2	720
17	Lê Văn Tuyển Hồng	x		40	2,5	900
18	Lê Văn Xuân	x		36	1,2	432
19	Lê Văn Luyện Thơm	x		37	1,2	432
20	Lê Văn Thắng	x		43	1,8	648
21	Nguyễn Văn Phương	x		47		0
22	Lê Thị Lan Bình		x	48	6	2160
				54	2,5	900
23	Lê Văn Dụng Thùy	x		57	1,5	540
24	Lê Văn Sành	x		56	1,5	540
25	Lê Văn Xoài	x		34	1,2	432
				11	2,5	900
26	Lê Văn Khiển Ước	x		33	4	1440
27	Lê Văn Hùng Thủy	x		7	2	720
28	Vũ Văn Hưng Nghiêm	x		9	2,5	900
29	Dương Thị Thái		x	31	2	720

30	Lê Văn Là	x	28.1	2	720
			28.2	2,5	900
			28.3	2,5	900
31	Lê Thị Vân Đặc	x	29	1,5	540
32	Nguyễn Hữu Hưng	x	Neth- ouse-1	2,5	900
			Neth- ouse-2	2,5	900
			Coop. land-02	3,5	1260
Total				126.2	45.432

4. CERTIFICATE, CERTIFICATION

4.1 Testing soil and water samples in 2016

CÔNG QUẢN LÝ CHẤT LƯỢNG NÔNG LÂM SẢN & DỊCH VỤ
 TRUNG TÂM CHẤT LƯỢNG NÔNG LÂM SẢN VÀ DỊCH VỤ
 THE NATIONAL AGRICULTURE FORESTRY QUALITY ASSURANCE REFERENCE BRANCH I

NAFIQAD - BRANCH 1
 BÙI LẠI - QUẬN SÓC TRĂNG
 THÀNH PHỐ HỒ CHÍ MINH - VIỆT NAM
 TEL: 0843.907616 FAX: 0843.907607

PHIẾU KẾT QUẢ THỬ NGHIỆM HOÀ HỌC
CHEMICAL TEST REPORT

Tên hàng hoá/Name of goods: Cà
 Tên khách hàng/Name of client: Công ty TNHH Dịch vụ Nông Lâm Sản và Dịch vụ Hưng Yên
 Địa chỉ khách hàng/Address of client: Số 1 Nguyễn Lương Bằng, phường Bắc Sơn, Quận Hưng Yên
 Địa chỉ sản xuất/Manufacturer: HUY, đường Nguyễn Huệ, phường Đông Sơn, Quận Hưng Yên
 Mã chi BVSN/Address of manufacturer: Thành phố Hồ Chí Minh, Việt Nam, Trụ sở: Trưng Vương
 Mã chi BVSN/Approval number: 11-11-002016 Ngày làm báo cáo phân tích/Date of issuing test: 19/02/2016
 Ngày nhận mẫu/Date of receipt: 19/02/2016 Ngày làm báo cáo phân tích/Date of issuing test: 19/02/2016
 Giấy K & K/Registration No: TH Hưng Yên

KẾT QUẢ/RESULT

STT No.	Tên mẫu Name of Sample	Ngày sản xuất Date of Production	Số mẫu Batch Number	KẾT QUẢ/RESULTS				
				Ascorbic acid	Chlorophyll	Carotenoids	Protein	Starch
1	Mẫu số 02		0010	96,0	28,7	11,4	100	21,3

PHƯƠNG PHÁP/METHODS
 1-9/02/2016
 Trưởng phòng Kỹ thuật Nghiệm Hóa học
 Head of Laboratory
 Vũ Thị Thanh
 TRƯỞNG PHÒNG
 BÙI THỊ NHÂN

CÔNG QUẢN LÝ CHẤT LƯỢNG NÔNG LÂM SẢN & DỊCH VỤ
 TRUNG TÂM CHẤT LƯỢNG NÔNG LÂM SẢN VÀ DỊCH VỤ
 THE NATIONAL AGRICULTURE FORESTRY QUALITY ASSURANCE REFERENCE BRANCH I

NAFIQAD - BRANCH 1
 BÙI LẠI - QUẬN SÓC TRĂNG
 THÀNH PHỐ HỒ CHÍ MINH - VIỆT NAM
 TEL: 0843.907616 FAX: 0843.907607

PHIẾU KẾT QUẢ THỬ NGHIỆM HOÀ HỌC
CHEMICAL TEST REPORT

Tên hàng hoá/Name of goods: Cà
 Tên khách hàng/Name of client: Công ty TNHH Dịch vụ Nông Lâm Sản và Dịch vụ Hưng Yên
 Địa chỉ khách hàng/Address of client: Số 1 Nguyễn Lương Bằng, phường Bắc Sơn, Quận Hưng Yên
 Địa chỉ sản xuất/Manufacturer: HUY, đường Nguyễn Huệ, phường Đông Sơn, Quận Hưng Yên
 Mã chi BVSN/Address of manufacturer: Thành phố Hồ Chí Minh, Việt Nam, Trụ sở: Trưng Vương
 Mã chi BVSN/Approval number: 11-11-002016 Ngày làm báo cáo phân tích/Date of issuing test: 19/02/2016
 Ngày nhận mẫu/Date of receipt: 19/02/2016 Ngày làm báo cáo phân tích/Date of issuing test: 19/02/2016
 Giấy K & K/Registration No: TH Hưng Yên

KẾT QUẢ/RESULT

STT No.	Tên mẫu Name of Sample	Ngày sản xuất Date of Production	Số mẫu Batch Number	KẾT QUẢ/RESULTS				
				Ascorbic acid	Chlorophyll	Carotenoids	Protein	Starch
1	Mẫu số 02		0010	96,0	28,7	11,4	100	21,3

PHƯƠNG PHÁP/METHODS
 1-9/02/2016
 Trưởng phòng Kỹ thuật Nghiệm Hóa học
 Head of Laboratory
 Vũ Thị Thanh
 TRƯỞNG PHÒNG
 BÙI THỊ NHÂN

4.2 Testing soil and water samples in 2017

116/TN LAS-NN79 TNĐM-BCT.10.16

TESTING REPORTI BẢO CÁO KẾT QUẢ PHÂN TÍCH

1/ Số phiếu yêu cầu phân tích: 4696/17 Report dated ngày: 28-08-2017
 Doc code: MĐ số 16/ ngày: PR22-FM02 Page: Trang 1/1

Applicant (vi khách hàng số yêu cầu): CHI CỤC QUẢN LÝ CHẤT LƯỢNG NÔNG LÂM SẢN VÀ THỰC PHẨM HƯNG YÊN
 Address (địa chỉ): Số 01, Nguyễn Lương Bằng, phường Hòa Hải, Nam Thành phố, Hưng Yên
 Information provided by applicant (Thông tin được khách hàng cung cấp): Mẫu được chia trong 03 nylon
 Sample description (Mô tả mẫu): Đầu tiên phong của Chi cục Quản lý Chất lượng Nông Lâm sản và Thực phẩm Hưng Yên của cơ quan người gửi
 Seal No (số niêm): Khách hàng gửi mẫu
 Source of sample (Nguồn mẫu): Mẫu được chia trong 03 nylon
 Sample received on (Ngày nhận mẫu): Đầu tiên phong của Chi cục Quản lý Chất lượng Nông Lâm sản và Thực phẩm Hưng Yên của cơ quan người gửi
 Sample tested on (Ngày phân tích): 23-08-2017

Code/ Mã mẫu	Name/ Tên mẫu	Test Parameter/ Chỉ số phân tích	Test Method/ Phương pháp	Unit/ Đơn vị	LOD/ Giới hạn	Result/ Kết quả
4600/17	Mẫu đất 02 YP Nơi sản xuất, cơ sở HTX DVNN làng Hạp xã Yên Phú, huyện Yên Mỹ, tỉnh Hưng Yên	Asen (As)	ISO 20320:2007	mg/kg	1,30	13,62
		Chì (Pb)	ISO 11447:1998	mg/kg	0,60	26,36
		Đồng (Cu)	ISO 11447:1998	mg/kg	1,60	35,30
		Kẽm (Zn)	ISO 11447:1998	mg/kg	2,00	83,40
		Cadmium (Cd)	ISO 11447:1998	mg/kg	1,20	ND

Authorized Technical Representative: Nguyễn Thị Hằng Hương

116/TN LAS-NN79 TNĐM-BCT.10.16

TESTING REPORTI BẢO CÁO KẾT QUẢ PHÂN TÍCH

1/ Số phiếu yêu cầu phân tích: 4696/17 Report dated ngày: 28-08-2017
 Doc code: MĐ số 16/ ngày: PR22-FM02 Page: Trang 1/1

Applicant (vi khách hàng số yêu cầu): CHI CỤC QUẢN LÝ CHẤT LƯỢNG NÔNG LÂM SẢN VÀ THỰC PHẨM HƯNG YÊN
 Address (địa chỉ): Số 01, Nguyễn Lương Bằng, phường Hòa Hải, Nam Thành phố, Hưng Yên
 Information provided by applicant (Thông tin được khách hàng cung cấp): Mẫu được chia trong 03 nylon
 Sample description (Mô tả mẫu): Đầu tiên phong của Chi cục Quản lý Chất lượng Nông Lâm sản và Thực phẩm Hưng Yên của cơ quan người gửi
 Seal No (số niêm): Khách hàng gửi mẫu
 Source of sample (Nguồn mẫu): Mẫu được chia trong 03 nylon
 Sample received on (Ngày nhận mẫu): Đầu tiên phong của Chi cục Quản lý Chất lượng Nông Lâm sản và Thực phẩm Hưng Yên của cơ quan người gửi
 Sample tested on (Ngày phân tích): 23-08-2017

Name/ Tên mẫu	Test Parameter/ Chỉ số phân tích	Test Method/ Phương pháp	Unit/ Đơn vị	LOD/ Giới hạn	Result/ Kết quả
Mẫu đất 02 YP Nơi sản xuất, cơ sở HTX DVNN làng Hạp xã Yên Phú, huyện Yên Mỹ, tỉnh Hưng Yên	Asen (As)	ISO 20320:2007	mg/kg	1,30	20,11
	Chì (Pb)	ISO 11447:1998	mg/kg	0,60	16,22
	Đồng (Cu)	ISO 11447:1998	mg/kg	1,60	40,15
	Kẽm (Zn)	ISO 11447:1998	mg/kg	2,00	68,17
	Cadmium (Cd)	ISO 11447:1998	mg/kg	0,20	ND

Authorized Technical Representative: Nguyễn Thị Hằng Hương

116/TN LAS-NN79 TNĐM-BCT.10.16

TESTING REPORTI BẢO CÁO KẾT QUẢ PHÂN TÍCH

1/ Số phiếu yêu cầu phân tích: 4696/17 Report dated ngày: 28-08-2017
 Doc code: MĐ số 16/ ngày: PR22-FM02 Page: Trang 1/1

Applicant (vi khách hàng số yêu cầu): CHI CỤC QUẢN LÝ CHẤT LƯỢNG NÔNG LÂM SẢN VÀ THỰC PHẨM HƯNG YÊN
 Address (địa chỉ): Số 01, Nguyễn Lương Bằng, phường Hòa Hải, Nam Thành phố, Hưng Yên
 Information provided by applicant (Thông tin được khách hàng cung cấp): Mẫu được chia trong 03 nylon
 Sample description (Mô tả mẫu): Đầu tiên phong của Chi cục Quản lý Chất lượng Nông Lâm sản và Thực phẩm Hưng Yên của cơ quan người gửi
 Seal No (số niêm): Khách hàng gửi mẫu
 Source of sample (Nguồn mẫu): Mẫu được chia trong 03 nylon
 Sample received on (Ngày nhận mẫu): Đầu tiên phong của Chi cục Quản lý Chất lượng Nông Lâm sản và Thực phẩm Hưng Yên của cơ quan người gửi
 Sample tested on (Ngày phân tích): 23-08-2017

Code/ Mã mẫu	Name/ Tên mẫu	Test Parameter/ Chỉ số phân tích	Test Method/ Phương pháp	Unit/ Đơn vị	LOD/ Giới hạn	Result/ Kết quả
4600/17	Mẫu nước NT 02 YP Nơi sản xuất, cơ sở HTX DVNN làng Hạp xã Yên Phú, huyện Yên Mỹ, tỉnh Hưng Yên	Asen (As)	SMEWW 3103 E, 3114B	mg/L	0,002	0,004
		Chì (Pb)	SMEWW 3030 E, 3113B	mg/L	0,003	0,008
		Thủy ngân (Hg)	SMEWW 3030 E, 3112B	mg/L	0,0005	ND
		Cadmium (Cd)	SMEWW 3030 E, 3113B	mg/L	0,0005	0,0022
	Fecal coliform (TC)	TCVN 6187-2:1996	MPN/100ml		1,1x10 ⁷	

Authorized Technical Representative: Nguyễn Thị Hằng Hương

116/TN LAS-NN79 TNĐM-BCT.10.16

TESTING REPORTI BẢO CÁO KẾT QUẢ PHÂN TÍCH

1/ Số phiếu yêu cầu phân tích: 4696/17 Report dated ngày: 28-08-2017
 Doc code: MĐ số 16/ ngày: PR22-FM02 Page: Trang 1/1

Applicant (vi khách hàng số yêu cầu): CHI CỤC QUẢN LÝ CHẤT LƯỢNG NÔNG LÂM SẢN VÀ THỰC PHẨM HƯNG YÊN
 Address (địa chỉ): Số 01, Nguyễn Lương Bằng, phường Hòa Hải, Nam Thành phố, Hưng Yên
 Information provided by applicant (Thông tin được khách hàng cung cấp): Mẫu được chia trong 03 nylon
 Sample description (Mô tả mẫu): Đầu tiên phong của Chi cục Quản lý Chất lượng Nông Lâm sản và Thực phẩm Hưng Yên của cơ quan người gửi
 Seal No (số niêm): Khách hàng gửi mẫu
 Source of sample (Nguồn mẫu): Mẫu được chia trong 03 nylon
 Sample received on (Ngày nhận mẫu): Đầu tiên phong của Chi cục Quản lý Chất lượng Nông Lâm sản và Thực phẩm Hưng Yên của cơ quan người gửi
 Sample tested on (Ngày phân tích): 23-08-2017

Code/ Mã mẫu	Name/ Tên mẫu	Test Parameter/ Chỉ số phân tích	Test Method/ Phương pháp	Unit/ Đơn vị	LOD/ Giới hạn	Result/ Kết quả
4600/17	Mẫu nước NT 02 YP Nơi sản xuất, cơ sở HTX DVNN làng Hạp xã Yên Phú, huyện Yên Mỹ, tỉnh Hưng Yên	Asen (As)	SMEWW 3103 E, 3114B	mg/L	0,002	ND
		Chì (Pb)	SMEWW 3030 E, 3113B	mg/L	0,003	0,004
		Thủy ngân (Hg)	SMEWW 3030 E, 3112B	mg/L	0,0005	ND
		Cadmium (Cd)	SMEWW 3030 E, 3113B	mg/L	0,0005	ND
	Fecal coliform (TC)	TCVN 6187-2:1996	MPN/100ml		1,1x10 ⁷	

Authorized Technical Representative: Nguyễn Thị Hằng Hương

CERTIFICATE OF VIETGAP



CERTIFICATE OF COMPLIANCE WITH FOOD SAFETY REGULATIONS



5. SOME PICTURES OF YEN PHU COOPERATIVE





ATTACHMENT 3.1

SOIL AND IRRIGATION WATER SAMPLING AND TESTING PLAN FOR PILOT PROJECT

I. OBJECTIVES AND REQUIREMENTS

1. Objectives

- To confirm the safety of pilot project sites through the soil and irrigation water sampling tests in compliance with safe vegetable production standards in Vietnam.

2. Requirements

- Sampling procedures based on an internal fresh vegetable production Sampling Procedures Manual/ or TCVN (Vietnam Standard TCVN 5297-1995 Soil quality - Sampling - General requirements and TCVN 4046 - 85 - Cultivated land - Sampling method)
- Samples are collected by the sample inspectors, who are appointed by PPMU. Samples are sent to a qualified laboratory for testing heavy metals (As, Cu, Pb, Cd, Zn) on soil; testing heavy metals (Hg, As, Cd, Pb,) and E. coli on irrigation water.

II. IMPLEMENTATION PROCEDURES

1. Identification of potential pilot sites for soil and water testing

In the cases below, JICA Project team shall consider carrying out soil and water tests to confirm the safety of the pilot project sites:

- The certificate of safe production area has expired or will be expired during the project period.
- The production area is not certified yet as a safe production area.

- The production area is extended as the new pilot project site.
- Change in irrigation water sources and any polluted contamination risk are observed.
- An inspection report by DARD and/or any relevant institution shows a heavy metal residue from the sample products produced in the pilot project site.

2. Assessment of current situation of pilot project site

Prior to the sampling, current land area of selected target groups as pilot project sites shall be assessed with the following items:

- Total safe vegetable production land area
- Average land area of different locations of land
- Number of farmers participating in pilot projects per commune

Assessment shall be done by JICA Project team with support of PPMU. PPMU provides necessary data and information for the assessment and dispatches a staff member to accompany the JICA Project team to conduct field assessment.

3. Execution of sampling and testing of soil and irrigation water

Soil and water sampling and testing shall be exercised according to the following procedures.

- PPMU appoints collector of soil and water samples. It is recommended the sample collector is required to be trained in sampling and have a training certificate.
- The inspector shall prepare sampling equipment correctly and follow the procedure according to the guidance in TCVN 5297-1995 to ensure minimization of sampling errors..
- The inspector shall collect samples according to the III. Contents of Sampling Plan, and send the samples to a qualified laboratory (see Annex 3).

- The inspector shall receive results from the laboratory and submit to PPMU.

4. Issuing a certificate of safe crop production area

PPMU shall issue the certificate when the safety of the sampling area is confirmed.

III. CONTENTS OF SAMPLING PLAN

1. Soil

a. Sampling equipment: According to TCVN 4046-85 and TCVN 5297-1995.

b. Frequency and sampling time

- Frequency: once in the period of pilot project implementation
- Time: before starting pilot project.

c. Sampling method

- Sampling method: TCVN 4046-85 Cultivation soil - Analysis method and TCVN 5297-1995 Soil quality - Sampling - General requirements. (Refer TCVN 7538 - 2: 200).
- Size of land where soil sample is collected and number of samples are used to identify the various chemical content in soil:
 - + Homogeneous land area (from 1 to 5 ha) and non-homogeneous land area (from 0.5 - 1 ha), 12 subsamples mixed to form a composite sample in the cultivated land layer (Depth: 20cm)
 - + Sampling probes must be washed before sampling and covered with aluminum paper to avoid subsequent contamination
 - + Sampling location and pattern: Randomly in a “W” pattern as shown in Figure 1 in the cultivated part of the field and at a depth of 20 cm.

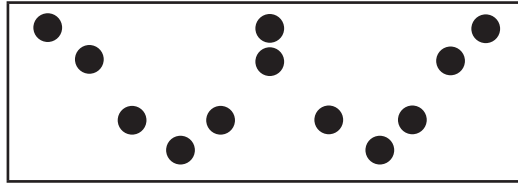


Figure 1 Sampling Location and Patterns

- d. **Shipping and Storage:** Sample must be intact, not broken, label is intact, avoid confusion, and be preserved according to the requirements of laboratories in accordance with TCVN 4046-85 and TCVN 5297-1995
- e. **Performance indicator and testing organization**

The maximum acceptable levels of selected heavy metals in soil are indicated in Table 1. (Accompanied issued with the Circular 49/2013/TT-BNNPTNT on 19th November 2013 and National technical regulation QCVN 03-MT/2015/ BTNMT.d)

Table 1 Maximum acceptable level of selected heavy metals in soil

No.	Substances	Unit	Maximum acceptable level	Testing method
1	Arsen (As)	mg/l	15	TCVN 6649:2000 (ISO11466:1995) TCVN 6496:1999 (ISO11047:1995)
2	Cadimi (Cd)	mg/l	1.5	
3	Lead (Pb)	mg/l	70	
4	Bronze (Cu)	mg/l	100	
5	Zinc (Zn)	mg/l	200	
6	Crom (Cr)	mg/l	150	

2. Agricultural Irrigation Water

a. Frequency and sampling time

- Frequency: once in the period of pilot project implementation
- Time: before starting pilot project.

b. Sampling method

- Sampling method: TCVN 6663-1-: 2011 (ISO 5667-1:2011)
- Water quality - Sampling - Part 1 - guidelines for sampling

schedule and sampling techniques

- The sampling characteristics are:
 - Frequency: at the beginning of the pilot project
 - Number of subsamples: three subsamples (75ml each) mixed to form a composite sample
 - Sampling location at the delivery end:
 - For overhead irrigation: at least three sprinklers' heads.
 - For drip irrigation: at least three locations.
 - Surface irrigation: where the pipe or canal is entering the field or at the end of the hose.
 - Sampling procedures:
 - Let the water flow or drip for five minutes before beginning sampling.
 - For drip irrigation: the tape must be sterilized with alcohol
 - For surface irrigation: take three subsamples at five minute intervals.
 - Sampling procedures when results are positive or over the limit:
 - Three subsamples (75 ml) mixed to form a composite sample.
 - Surface water: three subsamples taken at different depths and locations.
 - Ground water: at the well head, three subsamples taken at five minute intervals and let the water drip for five minutes before beginning sampling.

c. Shipping and Storage:

Immediately after sampling, samples must be placed in a cooler containing icepacks and kept between 1 to 5°C from sampling to analysis. For microbiological analysis, the maximal delay between sampling and analysis is 48 hours. Also, samples must not be frozen before microbiological analysis.

d. Performance indicator and testing organization

The maximum acceptable levels of selected heavy metals in soil are indicated in Table 1, Based on Circular 49/2013/TT-BNNPTNT on 19th November 2013; National technical regulation QCVN 08-MT:2015/ BTNMT; QCVN 39:2011/BTNMT National technical regulation for irrigation water

Table 2 Maximum acceptable level of selected heavy metals and microbiological substances in irrigation water

No.	Testing indicator ⁽¹⁾	Unit	Maximum acceptable level	Remark
1	Thủy ngân (Hg)	mg/l	0.001	
2	Cadimi (Cd)	mg/l	0.01	
3	Arsen (As)	mg/l	0.05	
4	Chì (Pb)	mg/l	0.05	
5	Fecal. Coliform	No. of bacteria /100ml	200	Apply for fresh form vegetables

Note (1): Base on QCVN 39:2011/BTNMT National technical regulation for irrigation water.

3. Number of samples of soil and irrigation water

Estimated number of samples of soil and irrigation water in pilot provinces are shown in Table 3.

Table 3 Estimated number of samples of soil and irrigation water in pilot provinces

No.	Topography of the sampling area	Number of homogeneous lands	Number of sample	
			Soil	Water
Ha Nam				
Pilot project 1	Homogeneous land area (from 1 to 5 ha)	1	1	1
	Homogeneous land area (from 0.5 - 1 ha)	2	2	2
	Non-homogeneous land area (from 0.5 - 1 ha)	2	2	2
Pilot project 2	Homogeneous land area (from 1 to 5 ha)	1	1	1
	Homogeneous land area (from 0.5 - 1 ha)	2	2	2
	Non-homogeneous land area (from 0.5 - 1 ha)	2	2	2
Hai Duong				
Pilot project 1	Homogeneous land area (from 1 to 5 ha)	1	1	1
	Homogeneous land area (from 0.5 - 1 ha)	2	2	2
	Non-homogeneous land area (from 0.5 - 1 ha)	2	2	2
Pilot project 2	Homogeneous land area (from 1 to 5 ha)	1	1	1
	Homogeneous land area (from 0.5 - 1 ha)	2	2	2
	Non-homogeneous land area (from 0.5 - 1 ha)	2	2	2

Pilot project 3	Homogeneous land area (from 1 to 5 ha)	1	1	1
	Homogeneous land area (from 0.5 - 1 ha)	2	2	2
	Non-homogeneous land area (from 0.5 - 1 ha)	2	2	2
Hung Yen				
Pilot project 1	Homogeneous land area (from 1 to 5 ha)	1	1	1
	Homogeneous land area (from 0.5 - 1 ha)	2	2	2
	Non-homogeneous land area (from 0.5 - 1 ha)	2	2	2
Pilot project 2	Homogeneous land area (from 1 to 5 ha)	1	1	1
	Homogeneous land area (from 0.5 - 1 ha)	2	2	2
	Non-homogeneous land area (from 0.5 - 1 ha)	2	2	2
Pilot project 3	Homogeneous land area (from 1 to 5 ha)	1	1	1
	Homogeneous land area (from 0.5 - 1 ha)	2	2	2
	Non-homogeneous land area (from 0.5 - 1 ha)	2	2	2
	Total	40	40	40

IV. SELECTION OF LABORATORY FOR TESTING

The laboratory for testing should be qualified under the following conditions.

- The laboratory shall be accredited by MARD (see Annex3).
- The laboratory shall hold ISO/IEC 17025 for the designated testing parameters.

There are some laboratories that are recommended as follows:

- National Agro-Forestry & Fisheries Quality Assurance Dept.- Region 1 LAS-NN 63 (NAFIQAD 1); Address: Số 51 Lê Lai, Q. Ngô Quyền, Thành phố Hải Phòng.
- Laboratory of Center of Food Hygiene and Safety - National Food Safety testing Institute (NIFC); Address: 13 Phan Huy Chú, Hà Nội – Viet Nam

- Pesticide Formulation and Residue Laboratory - Northern Pesticide Control and Testing Centre, LAS – NN 62 (NPCTC); Address: 149 Ho Duc Di – Ha Noi – Viet Nam.

V. ROLES AND RESPONSIBILITIES OF STAKEHOLDERS

CPMU

- To provide technical and legal advice to JICA Project team for the execution of sampling and testing.

PPMU

- To submit necessary data and information including the certificates of safe crop production area issued for the pilot sites to JICA Project team.
- To appoint and supervise two sample collectors who shall be inspectors of Sub-NAFIQAD and/or Sub-plant protection department, and also one person from each target group as an assistant to sample collectors.
- To issue the certificates of the safe crop production area

JICA Project team

- To identify the potential pilot sites for soil and water testing.
- To assess the current land area of the pilot sites, such as total safe vegetable production land area, average land area of different locations of land, and number of farmers participating in pilot projects per commune.
- To assist in and facilitate the execution of sampling and testing by stakeholders.

VI. BUDGET

Cost estimation and budget allocation are shown in Attachment 6.1.

ANNEX 1

LIST OF LEGAL REQUIREMENTS FOR REFERENCE

- Circular 49/2013 / TT-BNNPTNT dated November 19, 2013 guiding criteria for determining concentrated crop production areas meeting food safety conditions.
- Vietnamese standard TCVN 5297-1995 Soil quality - Sampling - General requirements.
- TCVN 4046 - 85 - Cultivated soil - Sampling method.
- National technical regulation QCVN 03-MT/2015/ BTNMT The maximum allowed level of some heavy metals in soil.
- QCVN 39: 2011 / BTNMT National technical regulation on irrigation water.
- National technical regulation QCVN 08-MT/2015/ BTNMT National technical regulation on surface water quality.
- TCVN 6663-12011 (ISO 5667-12011) - Water quality - Sampling irrigation water.
- QCVN 02: 2009 / BYT National technical regulation on domestic water quality.

ANNEX 2 BIÊN BẢN LẤY MẪU

SỞ NÔNG NGHIỆP VÀ PTNT
HẢI DƯƠNG

BAN QUẢN LÝ DỰ ÁN SẢN XUẤT
RAU AN TOÀN (SCP)

CỘNG HÒA XÃ HỘI CHỦ NGHĨA VIỆT NAM

Độc lập - Tự do - Hạnh phúc

BIÊN BẢN LẤY MẪU ĐƠN MẪU.....

Hôm nay ngày.....tháng.....năm 2016

Chúng tôi gồm:

1. Thành phần tham gia đoàn lấy mẫu

..... Chức vụ:

..... Chức vụ:

..... Chức vụ:

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2. Tên cơ sở sản xuất/ hộ sản xuất:

- Địa chỉ:

- Khu vực lấy mẫu:.....

- Hợp tác xã:.....

3. Qui cách mẫu:

- Mẫu số (Ký hiệu mẫu):.....

- Thời gian lấy mẫu:.....

- Số lượng:

- Khối lượng mẫu:.....

- Tình trạng bao gói, bảo quản mẫu (Nhiệt độ, môi trường, áp suất):.....

Đại diện Đoàn lấy mẫu Đại diện mô hình thí điểm Đại diện cơ sở/hộ
sản xuất

(Ký và ghi rõ họ tên)

(Ký và ghi rõ họ tên)

(Ký và ghi rõ họ tên)

ANNEX 3

LIST OF FOOD SAFETY TESTING LABORATORIES ACCREDITED BY MARD

Laboratory	Accreditation decision	Issued date	Area of testing
Công ty TNHH Giám định Vinacontrol Tp. HCM	584/QĐ-BVTV-KH	31/3/2021	Phân bón, ATTP sản phẩm nông lâm thủy sản, đất, nước
Trung tâm Kỹ Thuật Tiêu chuẩn Đo lường chất lượng 3	588/QĐ-BVTV-KH	31/3/2021	Phân bón, thuốc BVTV, đất, nước
Trung tâm Khảo kiểm nghiệm phân bón Quốc Gia	1599/QĐ-BVTV-KH	18/8/2020	Phân bón
Công ty Cổ phần Chứng nhận và Giám định IQC	599/QĐ-BVTV-KH	31/3/2021	Phân bón, ATTP sản phẩm nông lâm thủy sản, đất, nước
Công ty Cổ phần Chứng nhận và Giám định VinaCert	609/QĐ-BVTV-KH	01/4/2021	Phân bón, ATTP sản phẩm nông lâm thủy sản, đất, nước
Công ty Cổ phần Giám định và Khử trùng FCC	587/QĐ-BVTV-KH	31/3/2021	Phân bón, ATTP sản phẩm nông lâm thủy sản, đất, nước
Trung tâm Kiểm định và Kiểm nghiệm hàng hóa tỉnh Lào Cai	584/QĐ-BVTV-KH	31/3/2021	Phân bón
Chi nhánh Công ty Cổ phần Tập đoàn Vinacontrol Hải Phòng	598/QĐ-BVTV-KH	31/3/2021	Phân bón

Accreditor	Address
Cục Bảo vệ thực vật	số 80 Bà Huyện Thanh Quan, Phường 9, Quận 3, Thành phố Hồ Chí Minh;
Cục Bảo vệ thực vật	Số 2 Nguyễn Văn Thủ, P. Đa Kao, Quận 1, Tp.HCM
Cục Bảo vệ thực vật	Số 65, phố Sa Đới, phường Phú Đô, quận Nam Từ Liêm, Tp. Hà Nội. Điện thoại: 0243.37561025 Fax: 0243.37561025
Cục Bảo vệ thực vật	Ô 6, BT4, Khu đô thị mới cầu Bươu, Thanh Trì, Hà Nội; Điện thoại 02437892397; Fax:02437892397
Cục Bảo vệ thực vật	Tầng 4, Tòa nhà 130 Nguyễn Đức Cảnh, Tương Mai, Hoàng Mai, Hà Nội; Điện thoại 0243-6341933; Fax: 0243.6341137
Cục Bảo vệ thực vật	45 Đinh Tiên Hoàng, Phường Bến Nghé, Quận 1, Tp.Hồ Chí Minh; Điện thoại 028.38297857/ 8223183; Fax: 028.38390202/ 3910370
Cục Bảo vệ thực vật	Km2+300 đại lộ Trần Hưng Đạo, P.Bắc Cường, Tp.Lào Cai, tỉnh Lào Cai; Điện thoại 02143820397; Fax: 02143820352
Cục Bảo vệ thực vật	Số 56, Phạm Minh Đức, Phường Máy Tơ, Quận Ngô Quyền, Hải Phòng; Điện thoại 0225.3.760072; Fax: 0225.3.625776

Công ty Cổ phần Chứng nhận và Giám định Saigoncert	2792/QĐ-BVTV-KH	29/12/2020	Phân bón
Trung tâm Giám định và Chứng nhận Hợp chuẩn hợp quy Vietcert	2791/QĐ-BVTV-KH	29/12/2020	Phân bón, đất, nước
Trung tâm Kiểm định và khảo nghiệm thuốc BVTV phía Nam	2838/QĐ-BVTV-KH	31/12/2020	Thuốc BVTV
Trung tâm Kiểm định và khảo nghiệm thuốc BVTV phía Bắc	2844/QĐ-BVTV-KH	31/12/2020	Thuốc BVTV
Viện Năng suất Chất lượng Deming	263/QĐ-BVTV-KH	05/02/2021	Thuốc BVTV
Trung tâm Dịch vụ Phân tích Thí nghiệm TP. Hồ Chí Minh	368/QĐ-BNN-KHCN	28/01/16	Thực phẩm, thức ăn chăn nuôi, thức ăn thủy sản, thuốc bảo vệ thực vật, phân bón
Phòng thử nghiệm giống cây trồng của Trung tâm Thổ nhưỡng nông hóa Vĩnh Phúc	442/QĐ-TT-QLCL	5/10/2015	Phân bón, đất
Phòng thử nghiệm phân bón thuộc Trung tâm Khảo kiểm nghiệm phân bón vùng Nam bộ	358/QĐ-TT-QLCL	18/8/2015	Phân bón
Phòng thử nghiệm giống cây trồng của Trung tâm Khảo kiểm nghiệm giống, sản phẩm cây trồng Miền Trung	43/QĐ-TT-QLCL	18/02/2016	Chất lượng hạt giống cây trồng

Cục Bảo vệ thực vật	139 Man Thiện, P.Hiệp Phú, Tp. Thủ Đức, Tp Hồ Chí Minh Điện thoại: 0968972331
Cục Bảo vệ thực vật	28 An Xuân, P.An Khê, Q.Thanh Khê, Tp Đà Nẵng; Điện thoại: 0511 6562929 Fax: 0511 3617519
Cục Bảo vệ thực vật	28, Mạc Đĩnh Chi, Quận 1, Tp.HCM; Điện thoại: 028 38231805; Fax: 028.38244187
Cục Bảo vệ thực vật	Số 7A Lê Văn Hiến, phường Đức Thắng; Điện thoại: 02438513590; Fax: 024 35330205
Cục Bảo vệ thực vật	Lô 21-22 B16, KĐC Quang Thành 3B, phường Hòa Khánh Bắc, quận Liên Chiểu, Tp. Đà Nẵng. Điện thoại 0236.6562929 Fax: 029.3881.749
Vụ Khoa học	Số 2 Nguyễn Văn Thủ, P. Đa Kao, Quận 1, Tp.HCM
Cục Trồng trọt	Đường Bà Triệu, Phường Liên Bảo, Thành Phố Vĩnh Yên, Tỉnh Vĩnh Phúc
Cục Trồng trọt	Địa chỉ: Số 12 Nguyễn Chí Thanh, phường 2, Quận 10, tp Hồ Chí Minh
Cục Trồng trọt	Số 291 Hùng Vương, thành phố Quảng Ngãi, tỉnh Quảng Ngãi.

Phòng thử nghiệm Hóa Sinh thuộc Trung tâm Kỹ thuật Tiêu chuẩn Đo lường Chất lượng Bình Thuận	365/QĐ-BNN-KHCN	28/1/2016	Thực phẩm, TĂCN, đất, phân bón, TBVTV
Phòng kiểm tra chất lượng và thử nghiệm của Công ty cổ phần Long Hiệp	1834/QĐ-BVTV-QLT	10/9/2015	Thuốc bảo vệ thực vật
Phòng thử nghiệm Hóa sinh - Trung tâm Kỹ thuật và Ứng dụng Công nghệ Cần Thơ	340/QĐ-CN-TĂCN	8/11/2012	Thức ăn chăn nuôi
Phòng phân tích môi trường, Trung tâm phân tích và chuyển giao công nghệ môi trường- Viện Môi trường nông nghiệp	1613/QĐ-BN-NPTNT	15/7/2013	Thực ăn chăn nuôi, thức ăn thủy sản, chất xử lý cải tạo môi trường, môi trường nuôi trồng thủy sản, Môi trường đất, Phân bón, nông sản
Trung tâm chất lượng nông lâm thủy sản vùng 1	219/QĐ-QLCL	1/7/2013	Thực phẩm, môi trường thủy sản, thức ăn nuôi thủy sản, dư lượng thuốc bảo vệ thực vật, đất, nước
Phòng kiểm nghiệm của Trung tâm phân tích và Chứng nhận chất lượng sản phẩm nông nghiệp – Sở Nông nghiệp và Phát triển nông thôn Hà Nội	24/QĐ-QLCL	06/1/2016	Thức ăn chăn nuôi, thức ăn thủy sản, ATTP sản phẩm nông lâm thủy sản, phân bón, đất, nước.
Phòng thử nghiệm thực phẩm, thử nghiệm vi sinh, thử nghiệm hóa môi trường -Trung tâm kỹ thuật Tiêu chuẩn đo lường chất lượng 1	2820/QĐ-BNN-KHCN	29/10/2013	Thức ăn chăn nuôi, phân bón, ATTP, nước dùng trong nông nghiệp, đất, thuốc trừ sâu

Vụ KHCN&MT	Địa chỉ: Số 04, Nguyễn Hội, Phan Thiết, Bình Thuận;
Cục Bảo vệ thực vật	Tầng 4, Tòa nhà 6 tầng, Lô A2, CN1, Cụm CN vừa và nhỏ Từ Liêm, Minh Khai, Từ Liêm, Hà Nội
Cục Chăn nuôi	45 đường 3/2, phường Xuân Khánh, quận Ninh Kiều, thành phố Cần Thơ
Vụ KHCN và MT	Phường Phú Đô, Quận Nam Từ Liêm, Hà Nội, Việt-nam -
Cục QLCLNLS&TS	Số 51 Lê Lai, Q. Ngô Quyền, Thành phố Hải Phòng
Cục QLCLNLS&TS	44 Mai Dịch, quận Cầu Giấy, Hà Nội.
Vụ KHCNMT	Số 8, nhà E, đường Hoàng Quốc Việt, Quận Cầu Giấy, Hà Nội.

Trung tâm Chất lượng nông lâm thủy sản vùng 5.	527/QĐ-QLCL	31/12/2013	ATTP sản phẩm nông lâm thủy sản, đất, nước
Trung tâm Chất lượng nông lâm thủy sản vùng 6.	528/QĐ-QLCL	31/12/2013	ATTP sản phẩm nông lâm thủy sản, đất, nước
Trung tâm Chất lượng nông lâm thủy sản vùng 3	536/QĐ-QLCL	31/12/2013	ATTP sản phẩm nông lâm thủy sản, đất, nước
Trung tâm Chất lượng nông lâm thủy sản vùng 4	534/QĐ-QLCL	31/12/2013	ATTP sản phẩm nông lâm thủy sản, đất, nước
Trung tâm Chất lượng nông lâm thủy sản vùng 2	695/QĐ-QLCL	20/1/2014	ATTP sản phẩm nông lâm thủy sản, đất, nước
Phòng đảm bảo chất lượng và thử nghiệm của Cty Cổ phần thuốc sát trùng VN	67/QĐ-BVTV-QLT	12/1/2015	Chất lượng thuốc BVTV
Phòng thử nghiệm hợp trí - Cty TNHH hóa nông Hợp Thí	66/QĐ-BVTV-QLT	12/1/2015	Chất lượng thuốc BVTV
Phòng thử nghiệm hóa sinh- Trung tâm chứng nhận phù hợp - Quacert	2360/QĐ-BVTV	26/11/2015	Thuốc bảo vệ thực vật

	Cục QLCL	số 57 Phan Ngọc Hiển, phường 6, tp Cà Mau, tỉnh Cà Mau
	Cục QLCL	Địa chỉ. 386C Cách Mạng Tháng Tám – P. Bùi Hữu Nghĩa, Bình Thủy , Cần Thơ
	Cục QLCL	779 Lê Hồng Phong, tp Nha trang
	Cục QLCL	30 Hàm Nghi, Quận 1, Tp. HCM
	Cục QLCL	31 Ngũ Hành Sơn, quận Ngũ Hành Sơn, Tp. Đà Nẵng
	Cục Bảo vệ Thực vật	127 Lê Lợi, phường 4, quận Gò Vấp, TP HCM
	Cục Bảo vệ Thực vật	Lô B.14, KCN Hiệp Phước, nhà bè Thành phố HCM
		37 Phạm Tuấn Tài, Q.Bắc Từ Liêm, tp. Hà Nội

ATTACHMENT 4.1

TOT TRAINING COURSE ON BASIC GAP

1. OUTLINE OF TOT TRAINING COURSE

TOT training on basic GAP shall be organized and conducted by JICA Project team with assistance of CPMU.

- Objective

To provide PPMU technical staff and pilot project managers necessary knowledge of Basic GAP, skills, tools and expertise in order for them to be capable of planning and delivering TOF training.

- Target participants

The expected participants are the technical staff of PPMU members (e.g. Provincial and District extension officers) and the group leader and technical inspector(s) of the target groups.

- Number of participants

15 – 20 persons/class

- Training schedules

Trainings will be conducted in August - September 2018 tentatively. One training course consists of a 2-day program, including lecture of Basic GAP knowledge as well as a field visit.

In addition, a follow-up course will be held in June 2019.

- Trainers

Vietnamese GAP, technical experts with assistance of JICA Project Team

2. PROPOSED TOT TRAINING PROGRAM ON BASIC GAP

Day 1/ Ngày thứ nhất

Thời gian/ Time	Nội dung /Content	Thực hiện / Conducted by
08.00 08.15	Đăng ký học viên/ <i>Registration of trainees</i>	Ban tổ chức/ <i>Organization Board</i>
08.15 - 08.30	Khai mạc/ <i>Opening</i> - Giới thiệu về Dự án JICA và Kế hoạch thực hiện dự án thí điểm <i>Introduction of JICA project and pilot project implemetation plan</i> - Giới thiệu mục đích, nội dung, chương trình khóa tập huấn <i>Introduction of TOT training objective, program</i>	PPMU Vinh Phúc Nhóm Dự án JICA <i>PPMU, JICA project team</i>
08.30 - 10.00	Introducing and implementing Basic GAP Giới thiệu và triển khai thực hiện GAP cơ bản trong sản xuất cây trồng an toàn <i>Introducing and implementing Basic GAP on safe vegetable production</i>	Dự án JICA, Cục Trồng trọt, Bộ NN&PTNT/ <i>JICA project team, DCP, MARD</i>
10.00 -10.15	Giải lao / <i>Tea break</i>	
10.15 -10.45	Introducing and implementing Basic GAP Giới thiệu và triển khai thực hiện GAP cơ bản trong sản xuất cây trồng an toàn (Tiếp tục) <i>Introducing and implementing Basic GAP on safe vegetable production (continue)</i>	Dự án JICA, Cục Trồng trọt, Bộ NN&PTNT/ <i>JICA project team, DCP, MARD</i>

10.45-11.45	Kinh nghiệm Dự án Jica triển khai mô hình thí điểm sản xuất rau an toàn áp dụng GAP <i>Experiences shared by JICA project on Implementing pilot project model of safe vegetables production applying GAP</i>	Giảng viên Nhóm Dự án JICA /Trainer, JICA project team
11.45 – 12.00	Thảo luận / <i>Discussion</i>	Học viên/Giảng viên Trainee / Trainer
12.00 – 13.30	Nghỉ trưa / <i>Lunch</i>	
13.30 – 14.30	Đi thăm quan thực địa tại vùng dự án thí điểm sản xuất rau an toàn (do PPMU Vĩnh Phúc bố trí địa điểm) <i>Field visit to pilot project site (arranged by PPMU)</i>	Học viên/Giảng viên Trainee / Trainer
14.30 – 15.30	Trao đổi về tổ chức sản xuất rau an toàn, kinh doanh, bán rau thông qua HTX/ công ty; kinh nghiệm giám sát sử dụng thuốc BVTV, phân bón của hộ dân, hướng dẫn, kiểm tra ghi chép nhật ký đồng ruộng <i>Discuss on organisation of vegetable production applying GAP and joint sales; Experience sharing on monitoring pesticides application, fertilizers and record of farmer field diary/ Logbook</i>	Học viên/Giảng viên Trainee / Trainer
15.30 – 16.30	Thăm thực địa đồng ruộng và khu sơ chế rau <i>Site visit to production field and pre-processing house</i>	Học viên/Giảng viên Trainee / Trainer
16.30 – 17.30	Di chuyển từ Địa điểm thăm quan về TP. Vĩnh Yên <i>Travel back from visit site to Vinh Yen city</i>	Học viên/Giảng viên Trainee / Trainer

Ngày thứ hai (Day 2)

Thời gian/ Time	Nội dung/Contents	Thực hiện/ Conducted by
8.00 – 9.00	Hướng dẫn sử dụng Thuốc BVTV và hoá chất <i>Guidance on Chemical, Pesticides application</i>	Giảng viên của Sở NN&PTNT / Trainer from PPMU
9.00– 9.30	Thảo luận / <i>Discussion</i>	Học viên/Giảng viên <i>Trainee / Trainer</i>
9.30 – 10.00	Thu hoạch, Đóng gói, Bốc xếp và Bảo quản rau tươi tại khu vực sản xuất <i>Harvesting, Packing, Handling and Storing Fresh Vegetables at Farm Level</i>	Giảng viên Nhóm Dự án JICA /Trainer, JICA project team
10.00 – 10.15	Giải lao/ <i>Tea break</i>	
10.15 – 10.45	Kinh nghiệm Dự án JICA triển khai mô hình bán rau an toàn áp dụng GAP <i>Experience sharing of JICA project pilot project implementation on safe vegetables production applying GAP and establishment of joint sales system</i>	Giảng viên Nhóm Dự án JICA /Trainer, JICA project team
11.00 – 11.45	Giới thiệu một số biện pháp kỹ thuật canh tác tiên tiến và vật liệu mới áp dụng để nâng cao chất lượng và an toàn sản phẩm rau <i>Introduction and Guidance on applying some cultivation methods and new production input materials for improvement of quality and safety vegetable products</i>	Giảng viên Nhóm Dự án JICA /Trainer, JICA project team
11.45 – 13.30	Nghỉ trưa / <i>Lunch</i>	

13.30 – 15.00	Hướng dẫn sử dụng Bộ kiểm tra nhanh (Quick test) để kiểm tra dư lượng thuốc bảo vệ thực vật trong rau <i>Guidance/ practice using Quick test to analyse pesticide residue in vegetable products</i>	Giảng viên Nhóm Dự án JICA /Trainer, JICA project team
15.00 – 15.30	Thảo luận khung chương trình tập huấn TOF <i>Discussion on program TOF training</i>	Giảng viên Nhóm Dự án JICA /Trainer, JICA project team
15.30 – 16.00	Đánh giá kết quả đào tạo và Bế mạc khóa tập huấn <i>Discussion and evaluation on TOT training results</i>	Học viên/Giảng viên <i>Trainee / Trainer</i>

For the presentation materials, please refer the website as below:

http://khuyennongvn.gov.vn/thu-vien-khuyen-nong/thu-vien-sach-kt_t244c28



Project for Improvement of
Reliability of Safe Crop Production
in the Northern Region

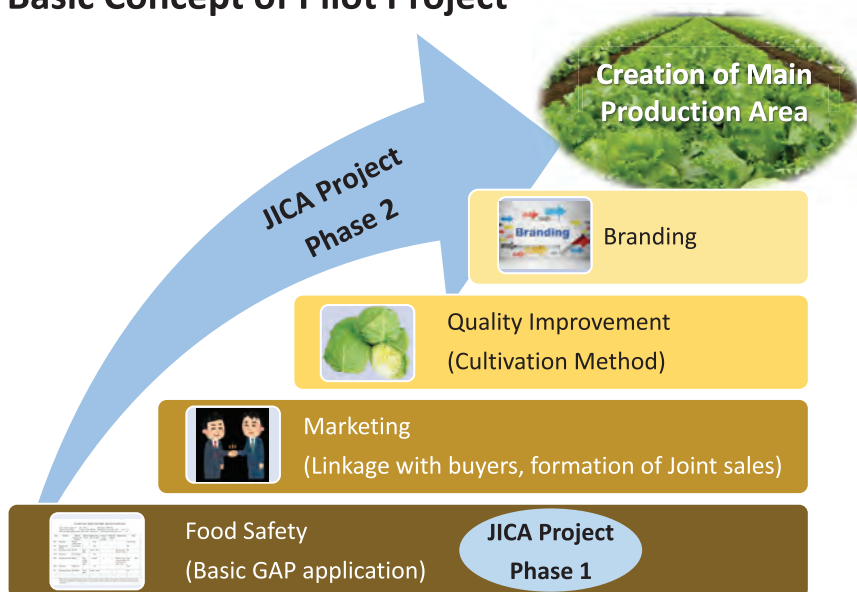
**Introduction of JICA Project and Pilot
Implementation Plan**

April, 2017

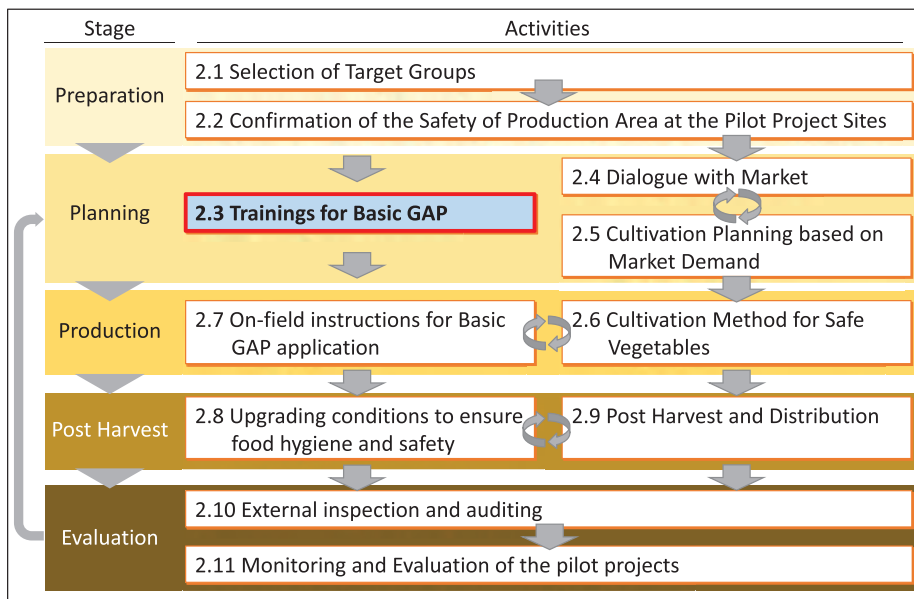
JICA Project Team

BASIC CONCEPT OF PILOT PROJECT

Basic Concept of Pilot Project



PILOT PROJECT IMPLEMENTATION FLOW CHART



2.4 DIALOGUE WITH MARKET

Basic principles for marketing pilot activities

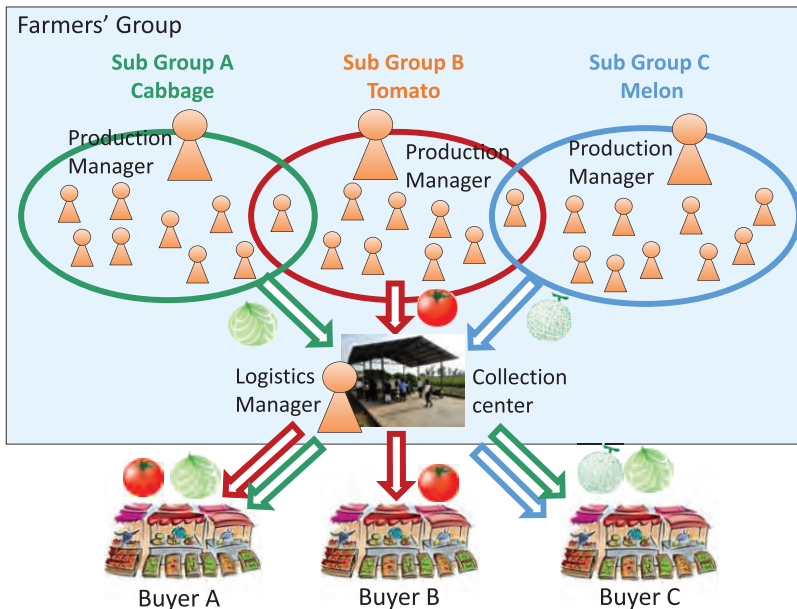
1. Differentiate approaches based on the existing conditions of target groups
2. Continuous matching process
3. Find socially responsible buyers and establish trust



TOT training on marketing

2.5 CULTIVATION PLANNING BASED ON MARKET DEMAND

2.5.1 Formation of safe vegetable production group



2.6 CULTIVATION METHOD FOR SAFE VEGETABLES

2.6.1 Installation of pilot farm

- To select persons in charge of cultivation
- To set-up a pilot farm as target group



2.6.2 Production of safe crops

Actual Problems observed and Expected Key Techniques

Actual Problem	Solution	Expected Key Techniques
Yield of vegetable is low due to condition of farmland being not appropriate for vegetable production	- Improvement of farmland condition	- Application of compost to improve soil condition - Application of appropriate amount of fertilizer to adjust content of nutrients - Improvement of plowing and ridging - Economic evaluation (cost and benefit analysis)
Quality of vegetable is low due to damage by insects and disease	- Improvement of insect and disease control	- Application of appropriate agrichemical to control insects - Improvement of seed sowing, seedling production, transplanting to reduce disease - Economic evaluation (cost and benefit analysis) - Mitigation measures of insect and disease damage
Quality of vegetable is low due to lack of usage of materials	- Installation of agri-materials	- Usage of mulching, tunnel and/or greenhouse to equalize and enhance growth, to control insect and disease - Economic evaluation (cost and benefit analysis) - Control of fertilizer and pesticide approved by the Gov. - Encouraging farmers to use bio-insecticide

2.7 FIELD INSTRUCTIONS APPLYING BASIC GAP

2.7.3 Internal Monitoring

Internal monitoring shall be executed once a month.

Participants are production manager, internal auditor, PPMU technical inspector and farmers to share experience and give guidance to farmers in the application of basic GAP.



2.7.4 Internal Audit

- Internal audit shall be conducted 2 times/ year using basic GAP checklist (26 items)
- PPMU technical inspectors shall attend the internal audit to instruct target group
- **2.8 Upgrading** Conditions to Ensure Food Hygiene and Safety

- With consideration of market requirements, JICA Project team and PPMU conduct a technical assessment to upgrade the conditions to ensure food hygiene and safety in production area, pre-processing place and outlets.
- JICA Project team and PPMU will develop an upgrading plan with a list of necessary equipment and materials.
- JICA Project team and PPMU supervise the installation and operation, and evaluate the usage of the installed facilities and the improvement of the conditions compared with the previous conditions.



2.10 EXTERNAL INSPECTION AND AUDITING

2.10.1 Inspection and assessment of Basic GAP implementation

- PPMU and JICA Project team shall assess the implementation of pilot projects in line with Basic GAP by using the checklist.
- A respective staff will be appointed as external inspectors by PPMU.
- Audit report shall be prepared and submitted to PPMU and JICA Project team.

2.10.2 Pesticide residue check

(1) Quick Sampling Test

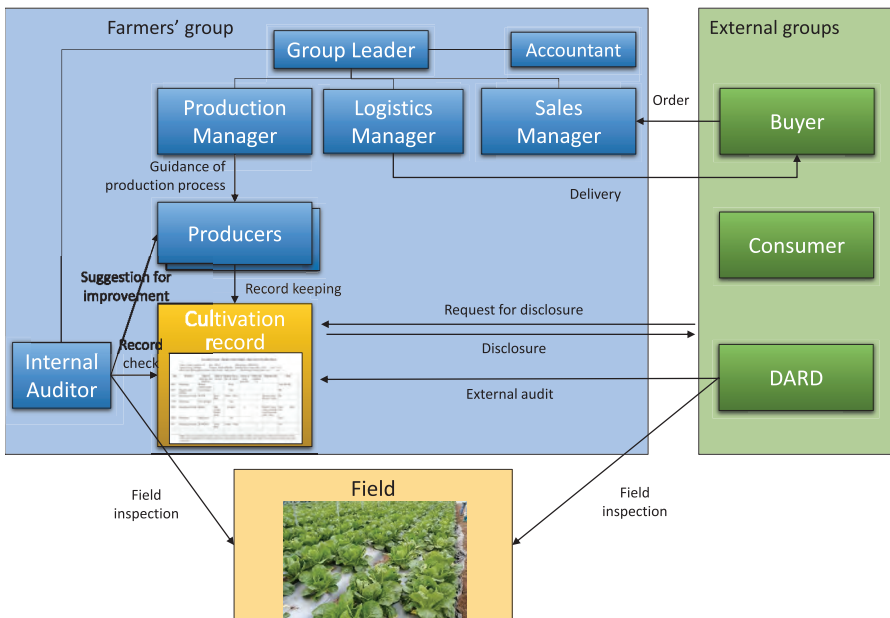
- Quick sampling test will be conducted by PPMU inspector by using a quick tool kit.
- The results will be shared among target groups, PPMU and JICA Project team, but not be disclosed to the public.

(2) Laboratory Test

- Laboratory test will be arranged by PPMU with JICA Project team.
- PPMU inspector collects and send samples to a qualified laboratory.
- The results will be disclosed to the public and utilized for marketing as the evidence of safety of products.



PILOT PROJECT IMPLEMENTATION STRUCTURE



FORMATION OF SAFE VEGETABLE PRODUCTION GROUP

No.	Group Name	Group Size (Total)	Group size for pilot activity	Target crops (tentative)
Ha Nam				
HN-N3	Ha Vi coop.	1.45ha 25 members	(1.1ha) 25 members	Winter: Broccoli (16HH; 5100 m ²) Cabbage (8 HH; 4200 m ²)
HN-N7	Hiep farmers group	2.5ha 13 workers	2.5ha 13 workers	Winter: Tomato (3600 m ²) Summer: Melon (10,000 m ²)
Hai Duong				
HD-N1	Tan Minh Duc coop.	27ha 168 members	(10ha) 60 members	Winter: Cabbage (20 HH; 4 ha) Summer: Melon (10 HH; 2ha), W.Melon (10 HH; 2 ha)
HD-N4	Thanh Ha company	20ha 59 members	4ha 40 members	Winter: Tomato (6 HH; 4000 m ²) Summer: Cucumber (4 HH; 2500 m ²)
HD-N5	Duc Chinh coop.	200ha 1,636 members	7ha 74 members	Winter: Carrot, Summer: Melon, W.Melon
Hung Yen				
HY-N2	Japan-Vietnam coop.	1ha 5 members	1ha 5 members	Winter: Tomato, leaf vegees Summer: Melon, leaf vegees
HY-N4	Yen Phu coop.	15.5ha 197 member	(3,4ha) 32 members	Winter: Tomato (15HH; 2 ha) Cabbage (10 HH; 1 ha) Summer: Cucumber (10 HH; 1 ha) Pearl shape melon (10 HH ; 1 ha)

Note: Numbers of farmers in pilot activity might be changed according to future marketing and planning activities. Target crops described here are tentative and to be decided through discussions in the future.



**Project for Improvement of Reliability of
Safe Crop Production in the Northern Region**



Basic GAP TOT Material Series

No.1

**DEVELOPMENT OF SAFE CROP PRODUCTION WITH GAP
APPLICATION**

**DCP/MARD
JICA Project Team**

1

Explanation of terms

- What is GAP?** GAP is an of “Good Agriculture Practice”
- What is TOT?** TOT is an abbreviation of “Training of Trainer”, training for **trainer**
- Why should “TOT training” be conducted?**
 - New knowledge, difficult to access and update information
 - Cascade training method: The expert trains the technical staff, who trains other farmers who have less knowledge.
- Study to transfer to other people**

Meaning of GAP application

Gap application in safe crop production is an international and inevitable trend, including Vietnam

1. Avoid risk, hazards in production (protect labor)
2. Create safe agricultural products
(for community)
3. Reduce production input – land between land and environment
4. Develop sustainable production (active, effective)
5. Increase more opportunities for international integration opportunities

Classification of GAP

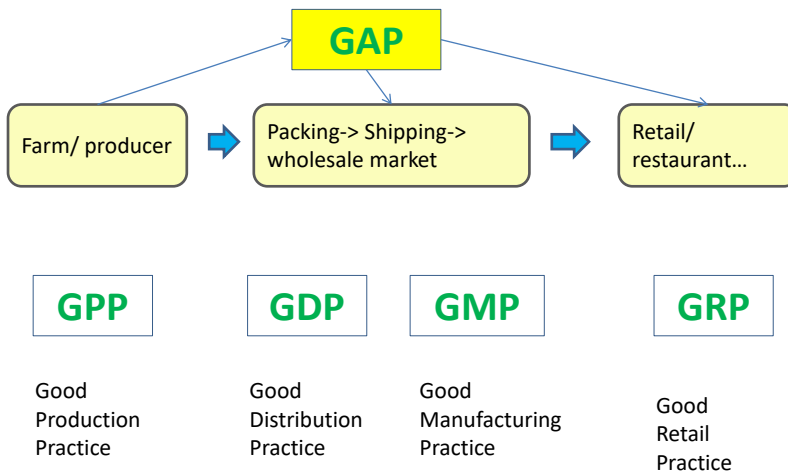
■ National, international GAP procedure

1. Global GAP (started from EuGAP)
 2. Asean GAP (GAP applied in Asean countries)
 3. Country's own GAP
 4. VietGAP
 - VietGAP for fresh vegetables, fruits, issued in 2008
 - VietGAP for fresh tea, rice, coffee issued in 2010
 - VietGAP for rice, issued in 2010
 - Basic GAP for vegetables, issued in July 2014
- (Decision No.2998/QĐ-BNN-TT dated 0/07/2014)*
- In 2017, Cultivation VietGAP standard was issued.

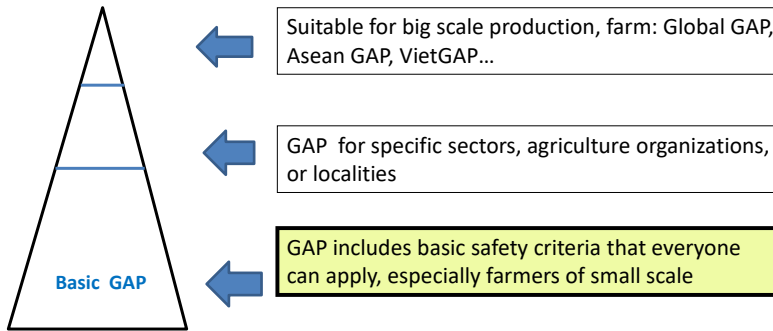
■ Other Gap procedure

Locality, companies, private sector, supermarket, etc.

Sitemap of GAP practice



Selection of appropriate GAP



Perspective approach of Basic GAP

- Simple, easy to access, **active** for practice, **effective** for production.
- Ensure to produce safe products and origin traceability
- Basic GAP is suitable for almost all farmers in Vietnam
- **Basic GAP is equivalent to Cultivation VietGAP standard (regarding safety criteria)**

Why should GAP be applied?

GAP application produces safe products and trace product origin, resulting in benefits for both producers and consumers.

For Producer

- Use information recorded in diary to improve production
- Able to reduce production cost and improve product quality
- Prevent factors causing pollution to production area and environment
- Minimize risk to work safety
- Have evidence to answer customer's question (product origin)
- Develop branding, label for product.
- Develop production on active and effective basis

For Consumer

- Consumers have chance to select safe products
 - Contribute to protect community health.
2. Other GAP process with safe production processes
- Record production diary, manage production and keep dossier.
 - Serve as basis for improving production and product traceability

Actual situations of safe vegetable production

- Total vegetable farming area across the country: more than 800,000 ha/ year
 - Average productivity: 14 – 15 tons / ha;
 - volume: 12 – 13 million tons; Export: around 10 – 12 %
 - 90 % farmers are at small scale
 - Many safe vegetable production procedures have been applied.
 - Many relevant legal documents
 - The ratio of products which satisfy food safety quality is still low
 - Viet GAP has been applied since 2008, but there are many shortcomings
 - Phase 1 JICA project developed Basic GAP procedure
 - Basic GAP procedure applied for vegetables was issued in 7 / 2014.
- However, safe vegetable production applying GAP is still limited



Which measures to develop safe crop production ?

The necessity of Basic GAP application

1. High risk of food un-safety, difficult to avoid
(unable to differentiate safe products in the market)
2. The production routine practice that was based on experience must be changed to be suitable with current requirement
3. Must change awareness, behaviors to protect health, produce safe products and conserve natural resources
4. Production should be suitable with planning, current regulations and development trends.
5. Production must comply with plan, current regulations and be suitable for developments trends
6. It's necessary to form sustainable and effective production.



To achieve target: all products produced should be safe

Effectiveness of GAP application

1. Actively select GAP suitable to production conditions and customer's requirements.
2. Internal monitoring and inspection (serving as basis for the safety level) is a requirement of GAP application overcome the problems together actively detect risks and overcome the problems together
3. Information in the Field diary helps producers clearly see the advantages, disadvantages of un-safe behaviors and therefore actively revise them.
4. GAP helps producers feel more confident and have sufficient basis for taking responsibility for their product's level of safety
5. Reduce input cost, reduce product price, economic effectiveness
6. Improvement in every aspect of production activities when applying GAP.
7. Develop branding and create trading opportunities
8. Protect health, develop sustainable production.

Good Agriculture Practice

1. Define safe production area

- Production area is planned, focused with good environment
- Farming soil, irrigation water and washing water must satisfy safety criteria

2. Production organization

- Establish production group (focused) on volunteer basis
- Make production plan, select suitable GAP
- Assign responsibilities (internal agreement)

3. Manage quality of production input

- Agriculture material shops of Cooperative (ensure quality of production input: fertilizer, approved pesticides from the list, good quality)
- Do not buy pesticides which do not have clear origin

4. GAP in production

- Good Agriculture Practices
- Good harvesting, pre-processing
- Safe transportation

Good Agriculture Practices

5. Record field diary, record keeping

Record field diary (following form): record all production activities, production management in sufficient and regular manner.

6. Internal monitoring, inspection

- Internal monitoring, inspection: 1-2 times/ year, 1 time/ season (following procedure)
- Check field, warehouse of agriculture materials, pre-processing area, check field diary in comparison with control points (Viet GAP, Basic GAP)
- Detect and handle safety risks, adjust production behaviors.

7. Selling products

- Product introduction shops
- Field visit, check field diary → consumption contract
- Consume order-based products
- Organize joint sale

Why should we record a field diary, and continue recording?

- A field diary shows the whole production process and confirms production practice behaviors
 - A field diary keeps information on production cost, quality of agricultural materials
 - Provides information on varieties, technique solutions, types and yields of crops
 - Provides information on customers, price, volume, income, etc.
- > Handle information > Improve production in a safe and effective manner
- A field diary serves as proof for adjusting production behaviors to ensure safety
 - A field diary reflects information which serves as proof to explain about GAP of production activities
 - Basis for product origin traceability



Field diary is the basis, foundation of GAP

PRODUCERS MUST HAVE KNOWLEDGE ON GAP

Audit and monitoring system

- * **Internal audit and monitoring** (stipulated in GAP procedure)
Monitor, check production process internally
- **Monitor together with customers**
Can invite customers to join the monitoring of quality
- **Participatory Guaranty System (PGS):** different parties (Producers + technical staff + auditor + consumer) together check production, products
- **Certification bodies** (3rd party)
Certification bodies directly check production activities; base on information provided by producers and issue Certificate
- **Monitor by functional authorities**
MARD, National Program, provinces have program, plan, activities to monitor the quality and safety of products produced in the agricultural field

Certificate for quality

- **Self confirm the quality**
- Producers confirm product quality by themselves and take responsibility for the product quality (prove the production activities, information transparency, invite customers to visit field, check production diary, etc).
- **Quality confirmed by certification body**
 - **Circular 06/2018/TT-BNN revised, Circular 48/2012/TT-BNN on certification for quality**
 - When will they certify (VietGAP, Basic GAP, etc).
 - + When customers require, make order or accept the higher price
 - + When there is support provided by programs, projects.
- **Participatory Guaranty System (PGS) VECO project**
Confirm and monitor quality internally: group members will monitor each other, monitor different groups (parties: technical staff, producers, consumers) This leads to self propagation of the safety level of products.

Necessary supports

- Planning production area with safe production conditions (including analysis of soil, water samples, tank, rubbish treatment), infrastructure, etc.
- Pre-processing area (simple, clean water source, washing basin, etc).
- Training in safe crop production: organize production, safe process, safe input, advanced techniques, market information
 - Training of trainers: staff, in-charge extension staff
 - Training of farmers: regularly
- Communication to improve awareness on food safety and hygiene, protection of health and environment and relevant legal documents
- Support, encouragement by all levels, sectors

Roles of stakeholders

1. Pilot farmers:

- Apply GAP to produce safe products
- Agree, assign tasks, share benefits
- Comply with procedures, follow guidance
- Have habit of recording field diary and record keeping

2. Technical staff, group leader: directly guide farmers

- Guide farmers to follow GAP
- Organize production, manage quality of production inputs
- Distribute, sell safe agriculture materials to farmers
- Chair the inspection, internal audit
- Directly deliver trainings to farmers
- Evaluate market, develop production plan

3. Local authority (ward, commune): support, connect communication, supporting activities

4. Governmental managements: Make general plan, have encouragement policies, supporting budget, direction, monitoring

Conclusion and Lessons learned

- **GAP application:** reduces input cost, increases economic efficiency; improves production capability, protects health, is responsible for the community
- **Trace product origin:** enhances opportunities to find customers, product consumes. At the same time, increases responsibility of producers regarding product safety.
- **Record field diary and keep production file:** results in practical benefits; therefore, these activities should be routinely practiced
- **Producers are the best source of awareness of product safety:** can confirm by themselves, take responsibility of product quality. Information transparency will build the customer's trust.
- **Joint sale and production will result in higher economic efficiency**
- **The easier it is to practice, the greater the scale of application**
- **Sustainability starts from effectiveness.**

Together do Good Agriculture Practices to protect health and produce safe products



GUIDANCE ON BASIC GAP PRACTICES

Training of Trainer course (TOT)

Introduction of Basic GAP



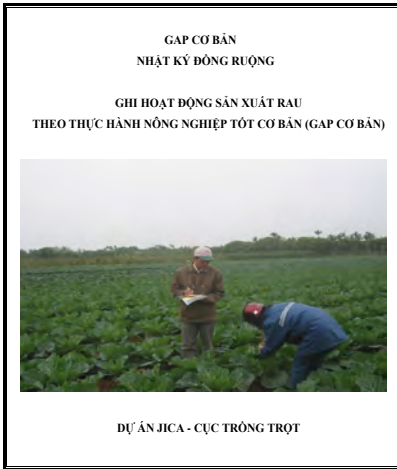
Basic GAP

Procedure of basic good agriculture practices

Basic GAP was issued under Decision No. 2998/QĐ-BNN-TT dated 2/7/2014 of Minister of MARD

- Purpose: Promote and disseminate the production of safe crops
- Target: all producers, suitable for small-scale farmers
- Requirement: safe product production and traceability.
- Contents:
 - + Conditions of safe production area: soil, water, pre-processing area, waste disposal containers, producers provided with training, unpolluted environment
 - + Safe inputs: clear origin, reflected in the List, etc.
 - + Good practices: Proper use of fertilizer, agro-chemicals, quarantine time before harvesting, pre-processing, production management record and record keeping
 - + Record of production diary, record of farm management and other record keeping
 - + Internal audit, evaluation (Farmers, technical staff, head of Co-op, etc)
- Control points: 26 / 65 control points of VietGAP

Basic GAP



STRUCTURE OF BASIC GAP (Field diary and Production management diary)

FIELD DIARY

Farmers record daily production activities.

- Guidance for use
- Overall information for producers
- Table: sample sheet and 3 tables
- + Diary of production practices
- + Diary of buying agricultural supplies
- + Diary of harvesting, selling products
- Attached documents
- + Checklist table, internal audit
- +26 control points (Basic GAP)

PRODUCTION MANAGEMENT DIARY

Technical staff, Co-op, group records seasonal/ yearly production activities in the area

- Guidance for use
- Overall information for producers
- Record table: 5 tables
- + Management of production conditions
- + Production management in the area
- + Manage the quality of production inputs
- + Management of selling and supplying agricultural materials
- + Management of training activities
- Attached documents
- + Checklist table, internal audit
- +26 control points (Basic GAP)

BOOK 1- FIELD DIARY

GUIDANCE FOR USE

1. Target of use: farmers/ producers
2. Reason for recording Field diary: to prove production activities, monitor the outgoing and incoming flow of money, calculate economic turnover, adjust schedule/ plan for next season
3. Guidance for use: record and keep activities including production, buying agricultural materials, harvesting and selling products

How to record: record production activities (following forms in the book)

How to keep records: farmers/ producers should regularly record and keep diary of production practices (hanging on the wall, place seen daily to facilitate convenient use).

Note: Checklist and evaluation table including 26 control points are used to monitor, evaluate internally during the process of production practices (following GAP)

Based on basic principles of this book, producers can split or detail to make it suitable to each specific condition.

Field Diary

SAMPLE PAGE– DIARY OF PRODUCTION PRACTICES

Name of field plot (No.): 01 Area: 0,5 sào Planted date: 5/9/2010
Name of crop: cabbage; Varieties: KAKACROSS; Expected harvest time: 1st time: 24/11 Last time: 5/12; Protective cloth: Yes () No (); Waste disposal is placed in proper place: Yes (), No ()

Date, (Solar year)	Activities	Name of pesticide and fertilizers	Name of disease	Quantity (kg, g, litre, ml, pack)	Follow the guidance	Warning board (x)	Risks detected	Implemented by
2/10	Fertilizing	Composted manure		50 kg			No warning board	Trần Thị Mỹ
7/10	Applying nitrogen with water irrigation	Nitrogen Urea		2 kg				Mỹ
13/10	Spraying pesticide	Regent	Diamond-black moth, flea beetle	0,2		x	Plot No.3 is sprayed 3 times more than usual	Mỹ
20/10	Spraying pesticide	Abamettin	Deep blue	0,2		x		Mỹ

TABLE 1 - DIARY OF PRODUCTION PRACTICES

Name of field plot (No.):Area..... Plated date.....
 Name of crop:..... Varieties..... Expected harvesting time: 1st:.....Last time
 Protective cloth: Yes () No () ; Waste disposal is put in proper place : Yes () No ()

Record from planting to harvesting; One separate table for each kind of crop to facilitate convenient monitoring

Date, (Solar year)	Activities	Name of pesticide and fertilizers	Name of disease	Quantity (kg, g, litre, ml, pack)	Follow the guidance	Warning board (x)	Risks detected	Implemented by

TABLE 2 – DIARY OF BUYING AGRICULTURAL SUPPLIES FOR PRODUCTION

Place to keep pesticides, fertilizer.....

The stores which provide agricultural supplies must have a business license, under the control of legal agencies

Date (Solar year)	Name of pesticides, fertilizer	Quantity (Kg, g, liter, ml, bottle, pack)	Price (đồng/kg, liter, bottle, pack)	Purchased at stores of Cooperative/household owner, mark (x)	Purchased at other stores		Buyer/ User (Full name, sign)
					Name	Address	

TABLE 3. DIARY OF HARVESTING AND SELLING PRODUCTS

Area of pre-processing/preservation:.....Address of retail markets:.....

Note: This table is commonly used for many kinds of vegetable harvested from different field plots; Number of isolation days: from last day of spraying pesticides to harvesting day;

At the column of retail and risk detected.. If have, just mark (x)

Date/ month (solar year)	Harvesting			Selling products					Risk detected/ already addressed the hazard (mark x)	Impleme nted by
	Kind of crop	Name/ code of field plot	Isolation time (day)	Quantity (kg, plant)	Price (₹/kg, plant)	Selling ways/ buyers				
						Retail (mark x)	Wholes ale to whom	Sold under contract to whom		

BOOK 2- PRODUCTION MANAGEMENT DIARY

GUIDANCE FOR USE

- 1. Target of use:** Head of Cooperative/ group leader/ Technical staff
- 2. Reasons for recording a production management Diary and record keeping**
Run production activities; manage quality of inputs, adjust un-safe behaviors; evidence of traceability, improve management responsibility, etc.

3. Guidance for use:

How to record: record production management activities of Cooperative/ production unit/ farmers group (following form)

How to keep record:

Head of Coop/ head of unit/ respective technical staff/ leader of farmers group is responsible for monitoring production process, production management in the area and keeping the record.

Note: Checklist, evaluation table including 26 control points are used for internal auditing and evaluation (1-2 times/ year or 1/ season)

Results of internal auditing (for each household) are stored in Table 5-Production management in the area. In case of being not satisfactory, it requires corrective actions and re-check.

TABLE 4 – PRODUCTION CONDITIONS MANAGEMENT

Production unit.....Commune.....District.....Province.....
 Total area of vegetable cultivation (farming area).....(sào/ ha).....
 Source of irrigation water:.....Environmental conditions: Satisfactory.....Not satisfactory...
 Date of sampling.....Sampling person.....Unit which analyzes sample.....

Actual situation of production conditions			Risks detected and Corrective actions			
Condition	Factors that cause pollution	Current evaluation		Description of risk observed	Corrective actions	Implemented by
		Satisfactory	Not satisfactory			
Soil	Heavy metals					
Irrigation water	Heavy metals					
	Microbiology					
Water for pre-processing, washing products	Heavy metals					
	Pesticides					
	Nitrat					
	Microbiology					

-The limit of heavy metals in soil: National Technical Regulations: NTR No 03: 2008/BTNMT;

-The limit of heavy metals in irrigation water: National Technical Regulations. 39:2001/BTNMT;

- Quality of water used for washing and pre-processing products: Following QCVN số 02: 2009 /BYT of Ministry of Health regarding the quality of water

TABLE 5 – PRODUCTION ACTIVITY MANAGEMENT IN THE AREA

Production unit.....Commune.....District:.....Province.....
 Total cultivation area (vegetable):.....(ha); Number of members:.....; Season/ year.....
 Area of model site:(ha); Number of farmers households participating in the model...
 Technical guidelines, advanced technology (if applied): Type of key products.....
 Note: If the production unit has many members, members are divided into groups, each group/table;
 Results of internal evaluation every season/ year (following form) are stored in this table

No.	Field management			Results of internal evaluation		
	Name of household	Production area (m ²)	Code of field plot	Date/ contents	Results	
					Satisfactory	Not satisfactory
1						
2						
3						
4						
5						
6						
7						

TABLE 6.- MANAGEMENT OF PRODUCTION INPUTS (BUYING PESTICIDES, FERTILIZERS, SEEDS)

Name of shop:..... Address:..... Storage:.....
 Code/ Paper licensed for business:..... Full name of store owner:.....
 Production unit..... Inspector (if have):.....

Date/month/year	Name of pesticides, fertilizer, seeds, etc (correct name on pack)	Quantity (bottles, boxes, packs)	Unit (g, kg, ml, litre)	Producer/distributor

Note: can make a separate record book (Record book of agricultural materials of production unit)

TABLE 7 – MANAGEMENT OF PRODUCTION INPUTS (SELLING/ PROVIDING AGRICULTURE MATERIALS)

Production unit.....
 Inspector (if any):.....

Date/month/year	Name of pesticides, fertilizers, seeds, etc (correct name on package)	Quantity (bottles, boxes, packages)	Unit (g, kg, ml, litre)	Store	Buyers

Note: can make a separate record book (Record book of agricultural materials of production unit)

TABLE 8 – MANAGEMENT OF TRAINING, COMMUNICATION

Production unit.....Commune.....District.....Province.....
 Full name of unit leader..... Technician in charge.....

Date/ month/ year	Training				Communication		
	Number of farmers (list attached)	Contents of training	Duration of training (day)	Certificatio n (mark x)	Communica tion contents	Response to communi cation (mark x)	Opinion/ initiatives (if any)

TABLE 9 – TABLE OF CHECKLIST

No.	Practices	Level	Notes
I	Production conditions		
1	Is the production area in accordance with national and provincial planning on the crop type intended for production?	A	
2	Does the production area meet safety requirements (quality of soil, irrigation water for production) in accordance with regulations?	A	
II	Management of planting soil and field hygiene		
3	Has soil of production area been analyzed and assessed in terms of potential chemical, biological and physical risks?	A	
III	Manage the use of fertilizer and additives		
4	Are only fertilizers which are on the list of those permitted for doing business in Vietnam used?	A	
5	Are only organic fertilizers which have been treated and have sufficient dossier of these organic fertilizers used?	A	
6	Is the dossier of purchase and application of fertilizers, soil additives recorded and kept?	A	
IV	Manage the use of water source for production		
7	Is quality of irrigation water and water which is used for post-harvest handling ensured in accordance with current standards?	A	

No.	Practices	Level	Note
V	Manage the use of pesticides and chemical		
8	Have workers and organizations/ individuals who hire workers been trained on management and safe utilization of agrochemicals?	A	
9	Have measures on Integrated Pest Management (IPM) and Integrated Crop Management (ICM) been applied?	B	
10	Are chemicals, pesticides, biochemical applied in production in the list of permission for use?	A	
11	Are chemicals, pesticides and other agriculture materials purchased from shops which have business license?	B	
12	Are pesticides and chemicals used in accordance with guidance provided by technical staff and instruction on product packs/ labels?	A	
13	Are dairy and records/ documents for monitoring the application of pesticides and chemicals available?	A	
14	Is the destruction of chemicals and packages in accordance with regulations?	A	
15	Is the inspection of production process and chemical residues accumulated in crop products conducted in periodic or unscheduled manner?	A	
VI	Harvesting and post harvest handling		
16	Are products harvested with appropriate application of pre-harvest interval (PHI)?	A	

17	Is the area for pre-processing, packaging and preserving products isolated from warehouse of chemicals and pollutants?	A	
18	Is the clean water source used for washing post-harvest products?	A	
19	Is quality of water applied in post-harvest handling in accordance with regulations?	A	
VII	Management and Waste treatment		
20	Is waste water and garbage collected and treated in accordance with the regulations?	A	
VIII	Training, communication		
21	Are workers fully trained with knowledge on Integrated Pest Management (IPM), Integrated Crop Management (ICM) and Good Agriculture Practices (GAP)?	A	
22	Are warning boards available in the vegetable, fruit production area which has been just applied with pesticides?	B	
IX	Record the production diary, record keeping, traceability		
23	Are the Field Dairy and Production Management Diary fully recorded?	A	
24	Are internal audit, recording and keeping dossier of internal audit results implemented?	A	
25	Is the production address or product label put on products to ease the traceability?	A	
X	Internal audit		
26	Is internal audit and internal evaluation implemented for at least once per year/ season?	A	

Practices of Basic GAP



SAFE PRODUCTION AREA

The production area is eligible for safe conditions

- ✓ The production area should be in the planned area
- ✓ Conditions of soil, irrigation water, environment must be safe in accordance with regulations
- ✓ Have pre-processing area, safe water for washing products. Isolated from chemical stores.



SAFE PRODUCTION AREA

- **Other conditions**
 - ✓ Have area, bins to contain waste, and treat pesticide bags/containers in the field.
 - ✓ Farmers are provided with training, knowledge on IPM, ICM, GAP, crop production process to ensure food safety



PRODUCTION MANAGEMENT

- 1. Manage production conditions.**
 - ✓ Keep the analysis results of soil and water samples or Certificate of safe crop production conditions (*At Table 4 – Production condition management*)
 - ✓ Timely detect and have corrective actions for potential risks of environment and production area contamination.
- 2. Manage production in the area**
 - ✓ Give code for field plots of households participating in production
 - ✓ Keep internal evaluation results (every season/ year)



MANAGE QUALITY OF PRODUCTION INPUTS

3. Manage quality of agriculture materials

- ✓ Cooperative's store must have business license, under the control of legal agencies
- ✓ Pesticides, fertilizers, chemicals in the list approved for use have clear origin (producer, distributors)

4. Provide safe agriculture materials

- Sell/ provide fertilizer, pesticide with correct type, correct quality and clear origin
- Varieties, advanced cultivation techniques, etc.

➤ **Responsibility of Management Board of Cooperative**



MANAGEMENT OF HUMAN RESOURCE

5. Training management

- Provide GAP knowledge (*how to record field diary and record keeping*)
- Knowledge on plant protection
- Production techniques
- Improve awareness
- Share experience
- **Recording diary, record keeping**
- Head of Cooperative, technical staff in charge, group leader record production diary and keep the record



PRODUCTION ORGANIZATION

1. Group discussion

- Volunteer participation
- Meet to reach an agreement on production plan, general regulations
- Select proper GAP, cultivation technique advancement, new varieties, etc.
- Give numbers to field plots to facilitate the management

2. Practices of production

- Buy fertilizers, pesticides, chemicals of clear origin: buy in Cooperative's stores/ approved for business
- Keep/ store fertilizer, pesticides, chemicals in proper places
- Minimize the use of chemicals
- Promote the application of organic fertilizer, biological pesticides



PRODUCTION ORGANIZATION

3. Use of fertilizers and pesticides

- Apply fertilizers, pesticides properly: right time, correct quality, correct dosage, correct method (follow guidance by technical staff or information on the package)
- Warning board in the production area which has been sprayed is displayed
- Share information, experience

(plant protection group)

4. Record field diary and keep the record

Record field diary, production management diary following the forms

Production record is kept to change for the next seasons, and prove evidence on origin traceability



QUALITY AUDIT

- **Internal audit, inspection** (Following GAP process)
 - Establish internal audit team including:
Technical staff + producer + manager
 - Inspect 1-2 times/ year or 1 time/ season
 - Method: Check actual conditions of production, pre-processing conditions (water source, tools, packing, means of product delivery, etc); check Field diary, production management diary in comparison with 26 control points > timely corrective action
 - In case of not satisfactory: must have corrective actions and check again
- **Keep results of internal audit, inspection**
 - Results of internal audit, inspection is kept in Table 5- Production management in the area (Production Management Diary)

HARVESTING, PRE-PROCESSING PRODUCTS

Harvesting and preprocessing the products

- ✓ **Proper isolation time before harvesting**
- ✓ **Clean tools used for harvesting and pre-processing**
- ✓ **Clean water used for washing products**
- ✓ **Clean containers to keep products harvested**
- ✓ **Safe means of transportation used to deliver the products**
- ✓ **Have labels, stamps to facilitate origin traceability**
- ✓ **Introduction of products**



CONSUMPTION OF PRODUCTS

1. Actual conditions of safe product consumption

- **Ways of consumption**
 - Self-consumption (mainly)
 - Joint consumption (small percentage)
 - **Market**
 - Retail selling in local markets (same price with normal products)
 - Sell to collectors (collect at the field, no need for pre-processing)
 - Product introduction stores of Cooperative (limited amount)
 - Sell under contract (restaurant, supermarket, school, canteen, etc)
 - **Concerns of customers**
 - Price is 10–20 % higher (sell under Contract or at the store)
 - Is interested by customers
- ### 2. Orientation of development
- Production bases on market demand, promote joint consumption



Production and joint consumption will achieve better economic efficiency

QUALITY AND SAFETY CERTIFICATION

- **Self certification for quality and safety**

Implement GAP by self-proclaiming the quality, self-certifying the product, which is easy initial for producers
- **Clearly understand production behaviors -> self-confirm > self responsibility, information is shown on product -> customers can trace the product origin**
- **Quality and safety is certified by organization (3rd party Certifier)**

When customers require, make order and accept higher price, producers can invite Quality Certification Organization (3rd party certifier) come to check, monitor the production process and issue Certificate (Viet GAP, Basic GAP, etc)
- **Participatory Guarantee System (PGS)**

Self-check in accordance with principles of ensuring the engagement of stakeholders: producers, production managers, customers

ORIGIN TRACEABILITY

- Attach the stamps, labels on product to facilitate customer's origin traceability.
- Introduce products: invite customers to visit production area, review field diary
- Provide transparent information, build customer's trust/ reliability
- Clearly understand product origin, promote responsibility
- Listen to feedback
- Develop brand-name



CHANGE AWARENESS FOR PRODUCERS

- **Make production plan**
Based on production capacity, market requirements, information of preceding season > make decision of types, quantity, quality, etc.
- **Organize the production**
Production in group: save inputs, easy to manage and revise, many opportunities of product consumption> Better efficiency
- **Record field diary and keep record**
Establish routine practice of recording production activities and keep record serving as evidence and drawing lessons learned for next seasons
- **Take self-responsibility for product quality**
Provide transparent information of production > self-proclaim and self responsible for product quality
- **Clearly understand purpose of internal audit**
 - It is necessary mission to be done
 - Together check quality of input, production conditions, production practices, production process, etc.
 - Revise for improvements
- **Draw lessons learned**
Willing to share information, take responsibility, have mutual benefit
- **Joint consumption**
Share customer's information, quantity, type of products to facilitate best consumption of products

LESSONS LEARNED FOR PRODUCERS

- Self supply: Sell products produced > produce to meet market requirement
- Individual, don't care for others > collective, share information
- Lack knowledge on working safety > protect their health
- Only concern about yield, volume > yield goes together with quality
- Don't know how to find output market for products > build customer's trust
- Overuse of fertilizers, pesticides > reduce quantity of inputs
- Do not care to input quality > input plays important role
- Maximize the exploitation of land potential > renovate, preserve resources of farming land
- Production behaviors are arbitrary, spontaneous > Awareness to protect environment
- Work hard > Improve production methods (apply GAP)
- Lack knowledge on food safety > all products produced must be safe

Production of safe crops is not difficult, no need to invest big amount. It is important to change awareness and behaviors

PRODUCTION ORGANIZATION IN PROJECT MODEL

**“PRODUCE SAFE VEGETABLES FOLLOWING VALUE CHAIN”
(APPLY BASIC GAP AND OTHER GAP)**



Organize production following new Coop model

- **Follow Cooperative Law 2012**
- **Coordinate, supply services for Coop members.**
- **Less join direct production**
- **Organize, manage production: implementing work that Coop members are unable to do or do ineffectively.**
 1. Supply or link to distribute agriculture materials (competitive price, good quality)
 2. Train technical staff, guide practices (new techniques)
 3. Manage production process (agree in Cooperative)
 4. Link to consume agriculture products.

Activities of Cooperative, production team

1. **Study market, evaluate demand of safe products, develop business plan.**
2. **Develop and standardize production process and internal audit system.**
3. **Organize training for Coop members and farmers.**
4. **Supply seedlings, agriculture materials to members (ensure quality, competitive price).**
5. **Monitor the implementation of production plan and production process**
6. **Organize linkage for agriculture product consumption: purchase, pre-process, preserve and consume products for members.**
7. **Draw experience/ orientation for price and develop plan for next year/ season**

Select production process Internal audit system

■ Common production process must:

1. Agree on the selection
2. Application is compulsory for all Coop members
3. Satisfy requirements on product quality requested by Companies/ customers.

■ Internal audit system:

1. Monitor and evaluate member's level of complying with technical process (production and field activities, recording production diary, record keeping)
2. Origin traceability: recording of monitoring/ reporting by groups/ teams/ technical staff/ Coop members and activities of checking practices/ product quality must be kept/stored.

Supply particular agriculture materials, fertilizers, credit to member's production

- Coop should give priority to supplying materials, fertilizers, credit that are not available in the market
- Joint purchase, buy from the reputable manufactories, address will help to reduce price, avoid fake materials and fertilizers, etc.
- Should refer to textbook: "Joint supply" and "Internal credit in Cooperative" issued by Department of Cooperatives and Rural Development (DCRD).
- Can apply models of in-kind credit (supply agriculture materials/ fertilizers in advance to members)

Organize training

- **Coop must make sure that all members fully grasp minimum knowledge on safe production and GAP process**
- **Need to expand training to the whole community and future members of Coop.**
- **Combine theory and practice, focus on hand-on method in training.**
- **Regularly organize training, update and improve knowledge for members.**
- **Organize training of trainer (TOT) and TOF training**

Purchase, pre-process, preserve and consume products

- **It is currently the most important and difficult step**
- **Coop needs to care about developing facilities for pre-processing, processing, sorting products (warehouse, pre-processing house, packaging tools and delivery vehicles, etc)**
- **2 main ways of consumption**
 1. Contract-based consumption with Companies, distributors
 2. Self consumption: directly sell to markets
- **Importance is: product quality, label, brand-name of cooperative.**

Draw experience/ orientation on price and develop plan for next year/ season

- It is regularly organized after each production season and have wide participation by members.
- Contents include:
 1. Evaluate production situation over the past time (good and not good results) both in terms of productivity, yield, price quality, season, etc.
 2. Develop price orientation for next year/ season
 3. Determine works to be done for improving the situation
- Orientation for next year/ season: find solutions for obtaining product price, in the context of always fluctuation of input factors.

IT IS NECESSARY TO BUILD RELATIONSHIP WITH CUSTOMERS

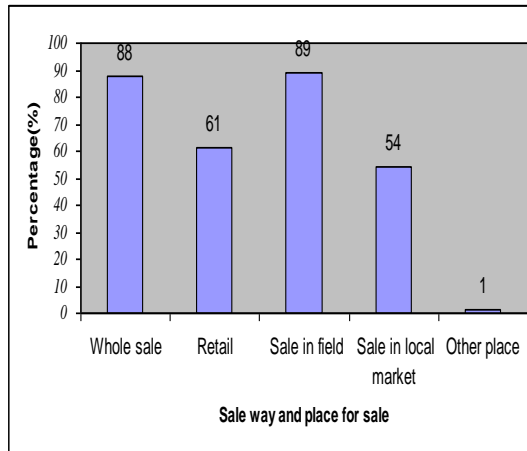


ACTUAL SITUATION OF PRODUCT SALE

Selling plays a very important role for producers. In reality, there are still some limitation:

- Actual situation of product selling:

- Most of products are sold right in the field
- Products are sold in local markets



ACTUAL SITUATION OF PRODUCT SELLING

- **Producers:**

- Do not know whom the products are sold to, how/ where the products are sold

- **Customers:**

- Do not know where and how the products are produced.

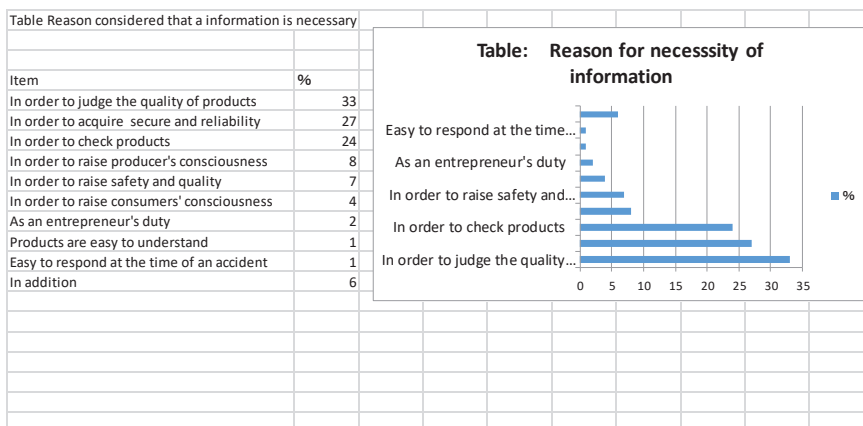


WHAT DO THE PRODUCERS EXPECT?

- Products are fully consumed
- High price
- No negative feedback on the product quality
- Do not have to keep product in warehouse or in the field
- More and more customer's trust



WHAT DO CUSTOMERS EXPECT?



(Food Consumption Monitor: MAFF – Ministry of Agriculture, Forestry and Fishery, Japan)

WHAT DO CUSTOMERS EXPECT?

Customers hope to get “**safety**” and “**trust**”

- “**Safety**” means no residues of pesticides, chemicals, etc.
- “**Trust**” means clearly understanding on information of production, products.



Message to customers: Not only “safety” but also “trust”

SOLUTIONS

For “Safety”

- Crops must be produced in compliance with standards, safe process
- Production diary must be fully recorded and kept.
- Products must have labels for origin traceability

For “Trust”

To build good relationship

- Publicize and transparent information on production process, producers
- Have brand-name, good reputation

WHAT SHOULD PRODUCERS DO?

- Production plan (on basis of market requirement)
- Good production organization, produce safe products
 - Safe production area (soil, water, environment)
 - Quality of production inputs is assured.
 - Information production activities, process are kept (field diary, record keeping)



WHAT SHOULD PRODUCERS DO?

- Sufficient conditions for pre-processing, shipping (washing water, tools, etc)
- Joint sale > maximize customer's requirements (share product kinds, customers, etc)
- Products are traced (stamp, label)
- **Develop relationship with customers**



BUILD RELATIONSHIP

- Invite customers to visit the field
- Go to customer's place to explain about the products
- Open the shops/ stores for product introduction



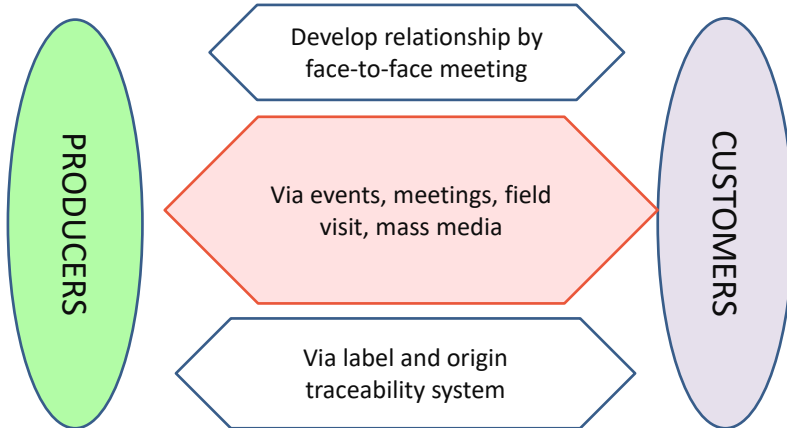
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BUILD RELATIONSHIP

- Have stamps, label on products to ease customer's recognition of product origin
- Join trade fair, exhibition, etc.
- Visit, join workshop, conference (more opportunities to meet and introduce about products, etc)
- Information sent to customers (develop website, leaflet, etc).



BUILD GOOD RELATIONSHIP BETWEEN PRODUCERS AND CUSTOMERS



ISSUES to be concerned

- Do you know when your products are sold?
 - Where the products are sold, in what kind of shops/ markets, who are the customers, and how much is the price?
- Do you have information on producers, production process?
 - Do customers know where, by whom and what method the products are produced?
- What are products which customers expect to buy?
 - Is your product one of customer's choices?
- Do you have opportunities to share customers about your production conditions?
 - Can customers be provided with these information to enhance the trust?

“Safety” and **“trust”** result in effectiveness and sustainable development





**Project for Improvement of Reliability of
Safe Crop Production in the Northern Region**



Basic GAP TOT Material Series

No.2

**PRODUCTION SITE SELECTION
SOIL AND WATER MANAGEMENT**

**DCP/MARD
JICA Project Team**

INTRODUCTION

Basic GAP is issued according to Decision No. 2998 / QD-BNN-TT dated July 2, 2014 of the Minister of Agriculture and Rural Development to promote safe crop production with minimum 26 control points extracted from 65 control points of VietGAP. This material provides guidance and references to meet the requirement of **No.1-3 out of 26 control points** on Basic GAP as below:



- 1 Is the production site appropriate for the State's and local planning?**
- 2 Do the quality of soil, irrigation water meet the standard for safe vegetable production condition?**
- 3 Do the safe vegetable production site be assessed the potential chemical. Physical and microbiological risks?**

CONTROL POINT

No.1 Is the production site appropriate for the State's and local planning?

No	Criteria	Level	Requirement	Method	Reference
1	Is the production site appropriate for the State's and local planning?	A	The production site is appropriate for the State's and local planning. e.g.) Non-compliance case - Location is not separate from industrial zone, polluted river, and other contaminated risks.	- Review of documents (Land use map and/or Certificate of safe production area) - On-site review of farm location	- Law and regulation

No.2 Do the quality of soil, irrigation water meet the standard for safe vegetable production conditions?

No	Criteria	Level	Requirement	Method	Reference
2	Do the quality of soil, irrigation water meet the standard for safe vegetable production conditions?	A	<p>The soil and water sampling and laboratory tests are conducted to check heavy metal and biological residues.</p> <p>The chemical, biological, physical risks in soil, irrigation water and washing water shall not exceed the maximum residual limit (Circular 49/2013/TT-BNNPTNT). e.g.) Non-compliance case</p> <ul style="list-style-type: none"> - There is no record of the results of heavy metal and biological residue checks. - There is no Certificate of safe production area. 	<ul style="list-style-type: none"> - Review the certificate of safe production area and/or laboratory test results. - Review record of heavy metal and biological residue checks and/or laboratory test results 	<ul style="list-style-type: none"> - Certificate of safe production area - National technical regulation QCVN 03-MT/2015/BTNMT - National technical regulation QCVN 08-MT:2015/BTNMT

No.3 Has the safe vegetable production site been assessed for potential chemical, Physical and microbiological risks?

No	Criteria	Level	Requirement	Method	Reference
3	Has the safe vegetable production site been assessed for potential chemical, physical and microbiological risks?	A	<p>There is no chemical, biological, physical risk in the safe vegetable production site. e.g.) Non-compliance case</p> <ul style="list-style-type: none"> - There is no assessment on potential contamination risks - There is no corrective action to enable the avoidance, elimination and reduction of chemical, biological, physical pollution risks in food. 	<ul style="list-style-type: none"> - Review the record of field assessment for potential chemical, physical and microbiological risks. 	<ul style="list-style-type: none"> - Law and regulation


CONTROL POINT NO.1

Actual conditions are surveyed and assessed in line with the government’s stipulations on biological, chemical and physical contamination hazards

- ▶ In the following cases, soil and water will be tested to confirm the safety of pilot project sites
 - Production area hasn’t been confirmed as the one which complies with condition for safe production.
 - Certificate on condition for safe production has expired or will expire in project time.

- Production area expanded is the new pilot project sites.
 - Potential risks are assessed as un-safe for production area due to the change of irrigation water source or soil contamination.
 - Testing results by DARD and/ or any relevant agencies show residues of heavy metal from product samples produced in pilot project sites.
- Soil and water will be tested in accordance with current standards and regulation.

Chemical hazard identification

Hazards	Causes
<p>Pesticides</p> 	<ul style="list-style-type: none"> - Cultivated soil and water are contaminated with pesticides - Soil and water source are contaminated by durable toxic chemicals from equipment/ tools in the production areas or chemicals from nearby industrial zones, hospitals, etc.

Chemical hazard identification

Hazards	Causes
<p>Heavy metal (Lead, Cadmium, Mercury, Arsenic, etc)</p>	<p>High concentration of heavy metals accumulated in soil and water of cultivation sites due to previous existence or application of many fertilizers containing heavy metals for a long time.</p>

Biological hazards

Hazards	Causes
+ Bacteria, fungi + Virus + Parasites	Soil and water in production site are contaminated with microbiological substances from husbandry waste water, domestic, hospital and industrial sewage, etc.

CONTROL POINT NO.2

Assessment of chemical, biological contamination hazards



- ▶ Collect soil, water samples to analyze the chemical and biological contamination levels in accordance with the stipulations:
 - Methods
 - Sample collector
 - Testing laboratory
 - Performance parameters

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Assessing by taking soil and water samples then analyze the residues

- ▶ Taking samples is conducted by correct methodology: Method of sampling cultivation soil in accordance with TCVN 4046-85:
 - Equal land area (from 1 to 5 ha) and un-equal land area (from 0.5 to 1 ha), 12 sub-samples are mixed into one sample at cultivation layer (depth: 20 cm)

- Sampling position and pattern: randomly take samples with “W” pattern reflected in Photo 1 in the cultivation plot and in depth of 20 cm.
- ▶ Guidance on sampling water samples in accordance with TCVN 6000-1995 on quality of water - sampling underground water.
- ▶ Send samples to qualified lab appointed or recognized.
- ▶ It is able to check the appearance of E.coli bacteria to show the level of biological contamination of water source.

Annex 1 MRL of some heavy metals in soil in accordance with National technical regulations QCVN 03-MT:2015/BTNMT

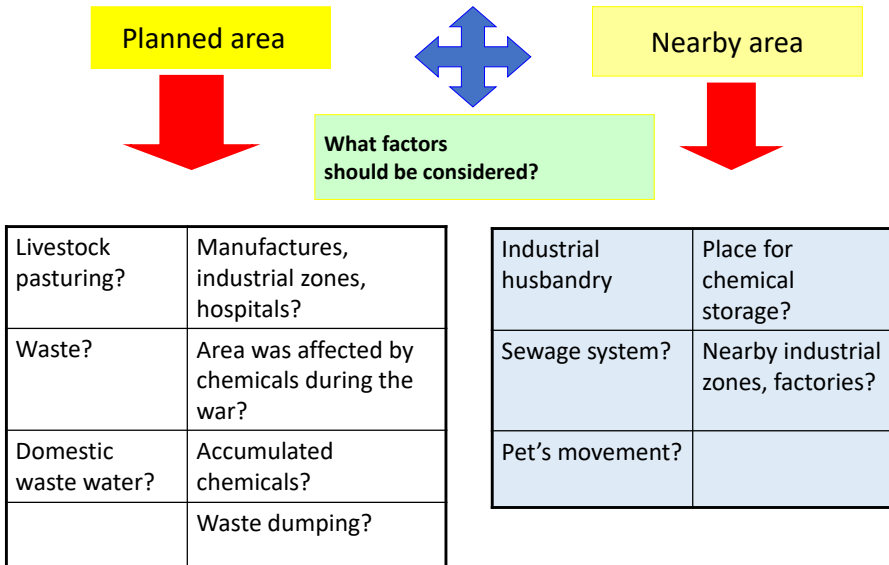
No.	Element	MRL (Mg/kg of dry soil)
1	Arsenic (As)	15
2	Cadmium (Cd)	1.5
3	Lead (Pb)	70
4	Copper (Cu)	100
5	Zinc (Zn)	200
6	Crom (Cr)	150

Annex 2 MRL of some heavy metals in irrigation water (QCVN 08-MT:2015/BTNMT)

No.	Element	MRL (mg/lit)	Trial method
1	Mercury (Hg)	0.001	TCVN 5941:1995
2	Cadmium (Cd)	0.01	TCVN 665:2000
3	Arsenic (As)	0.05	TCVN 665:2000
4	Lead (Pb)	0.05	TCVN 665:2000
5	Fecal E. Coli	200 (quantity of bacteria or CFU/100 ml)	Apply for salad vegetables and fruits

CONTROL POINT NO.3

Evaluating risks of biological and chemical contamination



Evaluating risks of biological and chemical contamination



How can such dirty water be used for watering GAP safe vegetables?



Potential hazards?

Can this garbage dump affect my production field?



Biological hazards



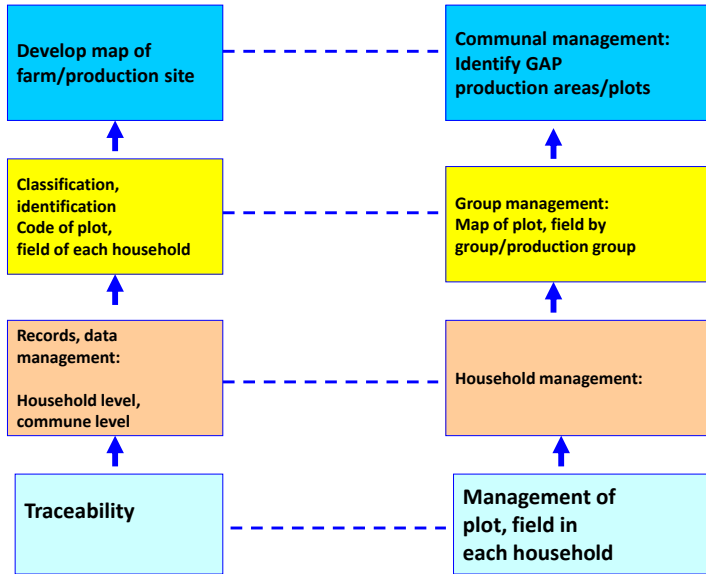
Record form – Site assessment and selection

Đơn vị sản xuất..... Xã..... Huyện..... Tỉnh.....
 Tổng diện tích đất trồng rau (diện tích canh tác)..... (sào/ ha).....
 Nguồn nước tưới:..... Điều kiện môi trường: Đạt..... Không đạt.....
 Ngày lấy mẫu..... Người lấy mẫu..... Đơn vị phân tích mẫu.....

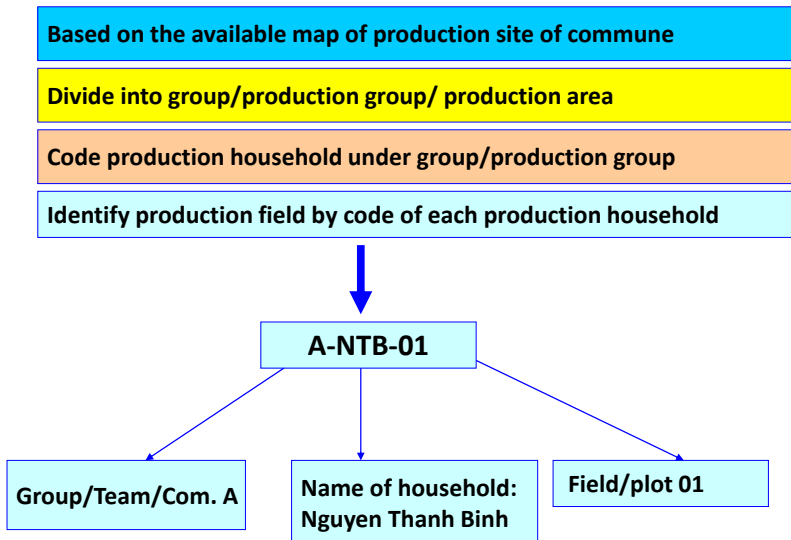
Thực trạng điều kiện sản xuất				Phát hiện và khắc phục		
Cultivation factors	Hazards	Current Assessment results		Describe risks observed	Corrective action	Person in charge
		Pass	Fail			
Soil	Heavy metal					
Irrigation water	Heavy metal					
	Mirobiological					
Post harvest water	Heavy metal					
	Pesticides					
	Nitrat					
	Mirobiological					

- Giới hạn cho phép của kim loại nặng trong đất:: QCKT Quốc gia: QCVN số 03: 2008/BTNMT;
- Giới hạn cho phép của kim loại nặng trong nước tưới: theo QCVN.39:2001/BTNMT ;
- Nước rửa, sơ chế sản phẩm theo QCVN số 02: 2009 /BYT của bộ Y tế về chất lượng nước sinh hoạt

Map of farm/production site



Map of farm/production site



2. Soil and growing media management

Before PRODUCTION	During and after PRODUCTION
Done	Assess potential hazards in the soil and growing media during GAP vegetable production

Why?

Internal potential contamination risks:
fertilizers, pesticides etc

External potential contamination risks arising:
husbandry, waste water, etc.

Such risks may appear throughout the production process

Heavy metal and other chemical hazard identification

Hazards	Causes
Chemical (residues of chemical drugs and other chemicals in the soil)	<ul style="list-style-type: none"> - Misuse of pesticides, chemicals, causing residue in the soil - Improper packaging disposal; accidental spillage or leakage of chemicals, fuels into soil
Heavy metals (As, Pb, Cd, Hg)	<ul style="list-style-type: none"> - Continuous use of fertilizers with high concentration of heavy metals - Discharged from nearby areas

Pathogenic organisms and parasites

Hazards	Causes
Pathogenic organisms (<i>bacteria, viruses and parasites</i>)	- Use of untreated manure - Domestic animal manure in production site and nearby areas
Parasites (<i>Worm, intestinal flat worm, protozoa, etc.,</i>)	- ditto

Measures to assess, eliminate and mitigate the hazards

Annually, potential hazards in the soil and growing media should be analyzed and assessed.

By:

- Analyzing current status
- Collecting representative soil and growing media samples to analyze contamination levels

Appropriate treatment measures:

When hazards exceeding the maximum limit arise, producers should take measures as similar as stated in Chapter 1.

Hazard mitigation:

- Proper use of fertilizers,
- Chemicals
- Isolate grazing animals (fence, canals, ditches, etc.)
- Do not farm, pasture animals in the production, preliminary handling areas
- Take measures to prevent soil erosion and degradation





**Project for Improvement of Reliability of
Safe Crop Production in the Northern Region**



Basic GAP TOT Material Series

No.3

FERTILIZER AND IRRIGATION WATER MANAGEMENT

**DCP/MARD
JICA Project Team**

INTRODUCTION

This material provides guidance and references to meet the requirement of No.4-7 out of 26 control points on Basic GAP as below:



4 Only have fertilizers included in the list of fertilizers approved for trading in Vietnam applied?

5 Are only treated organic fertilizers applied and is a record kept on these organic fertilizers?

6 Has a record been made and kept when fertilizers and soil additives are purchased and used?

7 Has the quality of irrigated water and water used after harvesting for production been ensured in accordance with current standards?

1. Why?
2. What to do (explain for mobilization of required staffing, materials)
3. Method
4. Assessment/ evaluation
5. Lessons/ good practices from project experiences
6. Reference (law and regulations for deep understanding)

CONTROL POINT

No.4 Only have fertilizers included in the list of fertilizers approved for trading in Vietnam applied?

No	Criteria	Level	Requirement	Method	Reference
4	Only have fertilizers included in the list of fertilizers approved for trading in Vietnam applied?	A	Chemical fertilizers on the approved list by Vietnam are used. e.g.) Non-compliance case Chemical fertilizers and soil additives are not approved by Vietnam, nor used.	- Review the production diary to check all chemical fertilizers and soil additives used on farm	- [FARM] Table1 – Production diary – Practices in the Field

No.5 Are only treated organic fertilizers applied and is a record kept on these organic fertilizers?

No	Criteria	Level	Requirement	Method	Reference
5	Are only treated organic fertilizers applied and is a record kept on these organic fertilizers?	A	Only treated organic fertilizers have are applied and a record is kept on these organic fertilizers. e.g.) Non-compliance case - Farmers apply raw manure on farm without fermentation - Farmers apply organic fertilizers which are not adequately composted.	- Review the production diary - On-site review of the production site of organic fertilizers and storage, and conduct interview (if necessary).	- [FARM] Table1 – Production diary – Practices in the Field

No.6 Has a record been made and kept when fertilizers and soil additives are purchased and used?

No	Criteria	Level	Requirement	Method	Reference
6	Has a record been made and kept when fertilizers and soil additives are purchased and used	A	Purchasing and using fertilizers and soil additives are recorded. e.g.) Non-compliance case - There is no record of purchasing and using. - Sufficient information regarding purchasing and using is not recorded.	- Review the production diary - Review the record of buying agricultural supplies - On-site review and conduct interviews (if necessary)	- [FARM] Table1 – Production diary – Practices in the Field - [FARM] Table 2 – Production Diary - Buying Agricultural supplies for production

No.7 Has the quality of irrigated water and water used after harvesting for production been ensured in accordance with current standards?

No	Criteria	Level	Requirement	Method	Reference
7	Has the quality of irrigated water and water used after harvesting for production been ensured in accordance with current standards?	A	The quality of water used for irrigation and for post-harvest handling meets the current standards. e.g.) Non-compliance case - On-farm level: Residual limit level of heavy metals or other quality criteria exceeds the requirements. - Packing level: Microbiological contamination level exceeds the requirements. - Note: In case on having doubts on analytical results, audit team shall take samples of water for analysis. The analytical results are the basis for evaluation of this criterion.	- Review the analytical results of water at farm level and at packing house(if applicable) - On-site review and conduct sampling (if necessary)	- Circular 49/2013/TT-BNNPTNT on 19th November 2013. for irrigation water - QCVN 02/2009/BYT for post-harvest handling [MGT] Table1 – Production condition management - Laboratory test results

Apply Fertilizers In Safe Vegetable Production



CONTROL POINT NO.4

Chemical hazards

Hazards	Source	Contamination mechanisms
High concentration of heavy metals (As, Pb, Cd, Hg, etc.,)	The presence of heavy metals (particularly cadmium) in low grade fertilizers and soil amendments such as gypsum, animal manure, compost, etc.	The presence of heavy metals in fertilizers and soil amendments contributes to high concentration of heavy metals in the soil → absorbed by vegetables



High risks for rooty vegetables

Chemical hazards

Hazards	Origin	Ways of causing pollution
High content of nitorat	+ Soil has nitrogen (normally it is organic nitrogen) + Apply fertilizers which have nitrogen (in-organic) too much or too late	Because of the surplus of NO ₃ , vegetables absorb too much, resulting in the surplus of NO ₃



High risks for leafy, flower and stem vegetables

Biological hazards

Hazards	Origin	Ways of causing pollution
Pathogenic organism	Animal dung and urine which hasn't been treated or has been composted but unsatisfactory quality contain a big amount of pathogenic organism	+ Pollution can occur through direct contact of organic fertilizers with edible parts of vegetables while fertilizing, irrigating or indirectly through contaminated soil. + Leafy, stem vegetables near the ground and root vegetables in the soil have high risk of biological contamination because of this fertilizer.

Select fertilizers and supplemental matter

- ▶ Only buy and use fertilizers in the list allowed for production and business in Vietnam issued by MARD.
- ▶ Only use fertilizers whose expire date is clear
- ▶ Do not use fertilizers which do not have clear origin, do not have label or those are expired.
- ▶ Do not use organic fertilizers which hasn't been treated to apply for vegetables because they contain many pathogenic organisms.

List of fertilizers permitted for production and trade

- ▶ At present, how many fertilizers are listed? Where to find them?

Decision No.17/2009/QĐ-BNN dated 27/3/2009
 Circular No. 29/2011/TT-BNNPTNT dated 15/4/2011
 Circular No. 42/2011/TT-BNNPTNT dated 6/6/2011
 Circular No. 59/2011/TT-BNNPTNT dated 30/8/2011
 Circular No. 86/2011/TT-BNNPTNT dated 16/12/2012
 Circular No. 13/2012/TT-BNNPTNT dated 19/3/2012
 Circular No. 31/2012/TT-BNNPTNT dated 12/7/2012
 Circular No. 45/2012/TT-BNNPTNT dated 12/9/2012

<http://www.cuctrongtrot.gov.vn/ctt/chuyentrang/default.aspx>



<http://www.cuctrongtrot.gov.vn/ctt/chuyentrang/default.aspx>

CỤC TRỒNG TRỌT

Trang phân bón

Trang chủ | Báo cáo | Dự báo | Liên hệ | Trợ giúp

Trang: 1/1

Địch vụ công | Báo cáo | Dự báo | Văn bản | T.C.K.T. quy phạm | DM Số NNP/PTNT | DM Phòng PT | DM Đơn vị SXCC | DM Phân bón | DM người lấy mẫu | Chức năng SP

Loại văn bản: **Danh sách văn bản quy phạm pháp luật: Quyết định**

Loại: Luật, Pháp lệnh, Nghị định, Thông tư, Quyết định, Văn bản khác

Tìm kiếm: Tìm kiếm nâng cao

Văn bản mới

Số/Ký hiệu	Ngày ban hành	Trích yếu
55/2006/QĐ-BNN	7/7/2006	Quyết định số 55/2006/QĐ-BNN, ngày 07 tháng 7 năm 2006 về việc ban hành "Danh mục Bộ sung phân bón được phép sản xuất, kinh doanh và sử dụng ở Việt Nam"
57/68/2003/QĐ-BNN	7/1/2003	Quyết định của Bộ trưởng Bộ Nông nghiệp và Phát triển nông thôn số 68/2003/QĐ-BNN ngày 15/6/2003 về việc ban hành danh mục phân bón phải công bố tiêu chuẩn chất lượng.
57/68/2004/QĐ-BNN	11/24/2004	Quyết định số 68/2004/QĐ-BNN ngày 11/24/2004 về việc ban hành "Danh mục Bộ sung phân bón được phép sản xuất, kinh doanh và sử dụng ở Việt Nam"
57/67/2004/QĐ-BNN	11/24/2004	Quyết định số 67/2004/QĐ-BNN về việc ban hành "Quy chế bình tuyến, công nhân, quản lý và sử dụng cây đầu dòng, vườn cây đầu dòng của cây công nghiệp và cây ăn quả lâu năm"
57/77/2005/QĐ-BNN	ngày 23 tháng 11 năm 2005	Quyết định số 77/2005/QĐ-BNN, ngày 23 tháng 11 năm 2005 của Bộ Nông nghiệp và PTNT

Receipt and storage of fertilizers

Storage: keep fertilizer in proper place to avoid contamination to products and water sources, etc.,



Storehouse for fertilizers, places of mixing and packing fertilizers must be built separately from production and post-harvest treatment areas and well covered. Organic fertilizer must be stored and transported to avoid contamination to products .

Safe utilization of fertilizers for chemical fertilizers

- ▶ Need to apply enough dosage following technical process for each type of vegetable
- ▶ Avoid overuse of nitrogen fertilizers
- ▶ Stop applying nitrogen fertilizers at least 10 days before harvesting
- ▶ Control Point No.5



Treating compost/dung/organic waste

- ▶ Must be treated for at least 2 months
- ▶ Regularly mix to ensure adequate temperature, moisture for organic matters to be decomposed.
- ▶ Fertilizer treatment and storage sites: **be isolated** from production, post-harvest handling sites, and with **full covering**



Check composting after 6 weeks in Duc Chinh Cooperative – Hai Duong

Safe application of fertilizers: Organic fertilizers

- ▶ Organic fertilizers should be applied to the soil directly, early and well covered with soil (otherwise causing contamination to adjacent crops through wind drift or rainfall runoff); do not let fertilizers contact directly to the edible vegetable parts;
- ▶ Only apply well-treated organic fertilizers and stop applying fertilizers at least 60 days before harvest.



Apply organic fertilizers early and cover with soil, use shading materials

Safe use of fertilizers



Apply organic fertilizers early and cover with soil and cover with certain materials

FIELD DIARY (For producers and households)

Include:

- ☞ DIARY OF PRODUCTION PRACTICES
- ☞ DIARY OF BUYING AGRICULTURE MATERIALS
- ☞ DIARY OF HARVESTING AND SELLING PRODUCTS

TABLE 1 - DIARY OF PRODUCTION PRACTICES

Name of field plot (No.): ...08...Area.....360.....
 Name of crop: **Kohlrabi**... Varieties **B40 (Korean)**
 Transplanted date: **02/09/16** Expected harvesting time: 1st: **12/10/16** Last time: **22/10/16**
 Protective cloth: Yes (x) No () ; Waste disposal is put in proper place : Yes (x) No ()

Date, (Solar year)	Activities	Name of pesticide and fertilizers	Name of disease	Quantity (kg, g, lire, ml, pack)	Follow the guidance	Warning board (x)	Risks detected	Doer
01/09/16	Basel application	Urea		2 kg	X			Ng.T.Lan
...						
07/09/16	Additional dressing	Urea		1.5 kg	X			Ng.T.Lan
...								
22/09/16	Spraying	Sokupi 0.5 SL	Diamond black moth	20ml/16/360 m ²	X	X		P.Văn Diệp

TABLE 2 – DIARY OF BUYING AGRICULTURAL MATERIALS

Place to keep pesticides, fertilizer **At hamlet**.....**Commune**.....

Date (Solar year)	Name of pesticides, fertilizer	Quantity (Kg, g, liter, ml, bottle, pack)	Price (đồng/ kg, liter, bottle, pack)	Purchased at stores of Cooperative/ household owner, mark (x)	Purchased at other stores		Buyer/ User (Full name, sign)
					Name	Address	
20/7/16	Tomato seed, Savior	05 packages	100,000/ package		Tran Trong Mac	Cho Hui Thanh Khoi	Lan
25/7/16	Urea nitrogen	50 kg	8,000 dong/ kg	Cooperative			Quang
.....							
10/8/16	Biobus 1.00 WP	02 packages	10,000 d/ package		Nguyen Van Tuyen	Tu Minh – Hai Duong city	Quang

TABLE 3. DIARY OF HARVESTING AND SELLING PRODUCTS

Area of pre-processing/preservation:.....

Address of retail markets:.....

Date/ month (solar year)	Harvesting			Selling products					Risk detected/ already handle the hazard (mark x)	Doer
	Kind of crop	Name/ code of field plot	Isolation time (day)	Quanti ty (kg, plant)	Price (đ/kg, plant)	Selling ways/ buyers				
						Retail (mark x)	Wholes ale to whom	Sold under contract to whom		
25/11/16	Tomato	12/5	15	20 kg	15,000 đ/ kg	X				Nguyen Thi A
27/11/16	Tomato	12/5	17	100 kg	10,000 đ/ kg		Bui Van C			Nguyen Thi A
28/11	Kohlrabi	8/2	15	2,000 kohlrabi	3,000 đ/ kohlrabi			Pham Van H		Nguyen Thi A

CONTROL POINT NO.6

Water source management

Kinds of water	Water sources
<ul style="list-style-type: none"> ☞ Irrigation water ☞ Diluting water: nutrient, leafy fertilizer and pesticide solutions; ☞ Equipment washing water 	<ul style="list-style-type: none"> ☞ Rivers, ☞ lake, big ponds, ☞ drilled-well, ☞ tanks








CONTROL POINT NO.7

Hazards from irrigation water

Hazards	Sources	Contamination mechanism
Chemical	+ Chemicals are dumped, leaked or run-off into water sources from adjacent areas + Surface water from stream, river run through industrial zone and chemical, pesticide residue contaminated areas	☞ Using heavy metal contaminated water for irrigation causes plants to absorb through roots and accumulate edible vegetable parts. ☞ Irrigate contaminated water directly on edible parts near harvest date.
Biological	+ Water from rivers, streams are contaminated with pathogenic microorganisms if flowing through animal farming, grazing, domestic waste storage and residential areas. + Surface water from lakes, ponds may be contaminated with microorganism (carcass and faeces of birds, rats and livestock, etc.,)	

Water for post-harvest handling

Kinds of water	Water sources
<ul style="list-style-type: none">  Product washing water,  Water to make preservative chemical solution,  Product cooling or top icing water 	<ul style="list-style-type: none">  tap water  drilled-well water <p style="text-align: center; color: #0070C0;">meet the standards</p>





Please sympathize, the weather is too drought!!!



Hazards from washing water

Hazards	Sources	Contamination mechanisms
Chemical	<ul style="list-style-type: none"> + Drilled-well water is contaminated with heavy metals such as Arsenic, Mercury, etc + Domestic water does not meet the standards + Washing water is supplied from contaminated domestic water source 	<p style="color: #D9534F;">Directly</p> <p>Wash products with contaminated water</p>
Pathogenic organisms	<ul style="list-style-type: none"> + Drilled-well water is contaminated with microorganism due to running-off from the contaminated areas. + Water is contaminated by untreated waste water 	

Measures to mitigate, eliminate hazards

Do not use the following kinds of water for irrigation		
<ul style="list-style-type: none">☞ Industrial sewage,☞ Waste water discharged from hospitals,☞ Residential area,☞ Husbandry farms,☞ Livestock slaughter houses,☞ Untreated raw fecal liquid, urin		
		

MAINTENENCE IRRIGATION SOURCE AND IRRIGATION SYSTEM

- ☞ Ensure that wells are carefully covered to avoid external contamination.
- ☞ The top of the well is at least 30 cm higher than the ground to avoid flood.
- ☞ Periodically check at least once/ year to monitor well structure status (cover the well to avoid other contamination substances, etc.)
- ☞ Regularly clean water supply system including water tank to avoid accumulation of dirty and maintain water quality. Need to remove and clean dirty layers accumulated at the bottom of the tank. Disinfect the pond if necessary.
- ☞ Record the repair/maintenance and cleaning procedure.


Irrigation water application

- ▶ Should water in very early morning that makes products dry faster.
- ▶ Use qualified water source for rain watering and especially for pre-harvest.
- ▶ If possible, avoid to apply rain watering at least 5 days before harvest.
- ▶ If possible, apply drop watering or bed watering when it is close to harvest to minimize contamination risks and make crop wet.
- ▶ Use PP for bed watering or ditches watering if water quality or source (e.g.: river water) is not controlled or identified.

Problems

- ▶ If water source is contaminated due to abnormal problems (leak of waste water, chemical) -> do not use this water for irrigation, mixing pesticides or fertilizers, etc.
- ▶ If the problems happen in stormy, rainy day, pay attention to use surface water source for irrigation. If there is doubt, take samples for testing or minimize the use until the testing results are positive.
- ▶ If underground water (well water) is polluted due to flood, need to test the water samples and use alternative water source until the testing results are positive.

Treatment of water in case of contamination

- ▶  For chemical contamination, there must be an alternative water source or analyzing quality of fruits to decide the alternative water source.
- ▶ For biological contamination, if it is unable to find alternative water source, overcoming by the use of sterilization method. Refer to advice of professional experts.
- ▶ Use: Chlorine for biological contaminated water and check the effectiveness of chemical.



**Project for Improvement of Reliability of
Safe Crop Production in the Northern Region**



Basic GAP TOT Material Series

No.4

UTILIZATION OF PESTICIDES AND CHEMICALS

**DCP/MARD
JICA Project Team**

INTRODUCTION

This material provides guidance and references to meet the requirement of **No.8-15 and No. 21-23 out of 26 control points** on Basic GAP as below:

- 8. Have farmers been trained on the utilization of pesticides and other chemicals?***
- 9. Are Integrated Pest Management (IPM) and Integrated Crop Management (ICM) measures applied?***
- 10. Are the applied chemicals/plant protection products/biological medicines included in the lists of those approved for use?***
- 11. Are pesticides purchased from licensed suppliers?***
- 12. Are chemicals/plant protection products used strictly in accordance with label directions and guidance of technicians?***

This material provides guidance and references to meet the requirement of **No.8-15 and No. 21-23 out of 26 control points** on Basic GAP as below:

- 13. Have records been set up for monitoring the use and treatment of chemicals/plant protection products?***
- 14. Are chemicals and their packages destroyed strictly in compliance with the State's regulations?***
- 15. Is there any unscheduled and periodic inspection to check the production process and chemical residue of crop products?***
- 21. Have farmers been trained on Integrated Pest Management (IPM) and Integrated Crop Management (ICM)?***
- 22. Have farmers posted warning signs in productions sites just sprayed by pesticides?***
- 23. Are the field and production management diaries fully recorded?***

- 1. Why?**
- 2. What to do (explain for mobilization of required staffing, materials)**

3. Method

4. Assessment/ evaluation

5. Lessons/ good practices from project experience

6. Reference (law and regulations for deep understanding)

CONTROL POINT

No.8 Have farmers been trained on the utilization of pesticides and other chemicals?

No	Criteria	Level	Requirement	Method	Reference
8	Have farmers been trained on the utilization of pesticides and other chemicals?	A	The farmers are trained on the utilization of pesticides and other chemicals. e.g.) Non-compliance case - There is no record to prove that the farmers are trained on safe use of pesticides.	- Review the record of training activity - Conduct interview (if necessary)	- [MGT] Table 5- Management training activity - Certificates of attendance on relevant training courses

No.9 Are Integrated Pest Management (IPM) and Integrated Crop Management (ICM) measures applied?

No	Criteria	Level	Requirement	Method	Reference
9	Are Integrated Pest Management (IPM) and Integrated Crop Management (ICM) measures applied?	A	Integrated Pest Management (IPM) and Integrated Crop Management (ICM) measures applied. e.g.) IPM uses environmentally sound ways to keep pests from invading and damaging plants. Sample ideas for IPM are as below; - Prevent pests from invading or building up their populations in the first place. This might include removing the pests' sources of food, water, and shelter, or blocking their access into buildings or plants. - Cultural practices are things you can do to discourage pest invasion such as good sanitation, removing debris and infested plant material, proper watering and fertilizing, growing competitive plants, or using pest - resistant plants. - Control pests with physical methods or mechanical devices such as knocking pests off of plants with a spray of water, using barriers and traps, cultivating, soil sterilization, or heat treatments. - Biological control is the use of beneficial organisms (called natural enemies) to manage pests. Encourage natural enemies by planting flowering and nectar-producing plants and avoiding the use of broad-spectrum pesticides.	- Review the production diary - On-site review on relevant materials with use of IPM and/or ICM and conduct interviews (if necessary)	- [[FARM] Table1 – Production diary – Practices in the Field

No.10 Are the applied chemicals/plant protection products/ biological medicines included in the lists of those approved for use?

No	Criteria	Level	Requirement	Method	Reference
10	Are the applied chemicals/plant protection products/biological medicines included in the lists of those approved for use?	A	Only the pesticides included in the approved list by MARD are allowed for use. e.g.) Non-compliance case - Non-approved pesticides found in the record and/or on farmers' premises.	- Review the record of applied chemicals/plant protection products comparing with approved list - On-site inspection	- [FARM] Table 1 – Production Diary - Practices in the Field

No.11 Are pesticides purchased from licensed suppliers?

No	Criteria	Level	Requirement	Method	Reference
11	Are pesticides purchased from licensed suppliers?	A	Pesticides are purchased from licensed suppliers. e.g.) Non-compliance case - There is no evidence to prove that pesticides were bought from licensed suppliers. - Evidence shows that pesticides were bought from non-licensed supplier.	Review the record and/or a receipt of buying agricultural supplies	[FARM] Table 2 – Production Diary - Buying Agricultural supplies for production

No.12 Are chemicals/plant protection products used strictly in accordance with label directions and guidance of technicians?

No	Criteria	Level	Requirement	Method	Reference
12	Are chemicals/plant protection products used strictly in accordance with label directions and guidance of technicians?	A	Pesticides are used strictly in accordance with label directions. e.g.) Compliance case - Right pesticide is used for the right crop as stated on the label, - Right dosage is applied as stated on the label, - Pre-harvest interval from the last application is applied as stated on the label, and - Compatibility of pesticides is proved when 2 and more pesticides are mixed. e.g.) Non-compliance case - Pesticides are not used in accordance with label directions.	- Review the record of production diary comparing with label directions - On-site inspection and interview (if necessary)	[FARM] Table1 – Production diary – Practices in the Field Label directions

No.13 Have records been set up for monitoring the use and treatment of chemicals/plant protection products?

No	Criteria	Level	Requirement	Method	Reference
13	Have records been set up for monitoring the use and treatment of chemicals/plant protection products?	A	Farmers have records of pesticide usage. e.g.) Non-compliance case - There is no record of pesticide usage. - There is a record but not filled adequately	Review the record of pesticides	[FARM] Table1 – Production diary – Practices in the Field

No.14 Are chemicals and their packages destroyed strictly in compliance with the State's regulations?

No	Criteria	Level	Requirement	Method	Reference
14	Are chemicals and their packages destroyed strictly in compliance with the State's regulations?	A	Chemicals and their packages are properly taken out from the farm land and chemical waste bin by authorized companies/ persons. e.g.) Non-compliance case The chemicals and their packages are destroyed and/or burned on farm and/or farmers' premises.	On-site inspection to investigate the practices of disposal Conduct interviews (if necessary)	- Law and regulation

No.15 Is there any unscheduled and periodic inspection to check the production process and chemical residue of crop products?

No	Criteria	Level	Requirement	Method	Reference
15	Is there any unscheduled and periodic inspection to check the production process and chemical residue of crop products?	A	There are internal and external inspections to check the production process and chemical residue of crop products. e.g.) Compliance case - Record of internal audit is documented. - Pesticide residue check by quick test is carried out and documented. - Laboratory test of vegetable samples is carried out and documented. - Unscheduled inspection and/or external audit is carried out and documented. e.g.) Non-compliance case - Internal audit has not been carried out in the past year. - Internal audit has been carried out, but not recorded. - Pesticide residue check of vegetable samples has not been carried out by either quick test nor laboratory tests.	- Review the analytical results of water at farm level and at packing house(if applicable) - On-site review and conduct sampling (if necessary)	- Circular 68/2010/TT-BNNPTNT on 02th December 2010 - National technical regulation QCVN 8-3:2012/BYT - Laboratory test results for pesticide residue check

No.21 Have farmers been trained on Integrated Pest Management (IPM) and Integrated Crop Management (ICM)?

No	Criteria	Level	Requirement	Method	Reference
21	Have farmers been trained on Integrated Pest Management (IPM) and Integrated Crop Management (ICM)?	A	The farmers are trained on Integrated Pest Management (IPM) and Integrated Crop Management (ICM). e.g.) Non-compliance case - There is no record to prove that the farmers are trained on Integrated Pest Management (IPM) and Integrated Crop Management (ICM).	- Review the record of training activity - Conduct interview (if necessary)	- [MGT] Table 5- Management training activity - Certificates of attendance on relevant training courses

No.22 Have farmers posted warning signs in productions sites just sprayed by pesticides??

No	Criteria	Level	Requirement	Method	Reference
22	Have farmers posted warning signs in productions sites just sprayed by pesticides??	A	Warning signs are placed at production site just after spraying pesticides. e.g.) Non-compliance case - Farmers do not have any warning sign board. - Warning signs are not placed at production site just after spraying pesticides.	- On-site inspection and conduct interview to investigate the usage of warning signs	- Warning sign board

No.23 Are the field and production management diaries fully recorded?

No	Criteria	Level	Requirement	Method	Reference
23	Are field diary and production management diary fully recorded?	A	The manager and farmers/ workers record production management diary and field diary regularly and properly. e.g.) Non-compliance case - There is no record on Production management diary and Field diary. - There are records, but those are not fully nor properly recorded.	- Review the record of Production management diary and Field diary)	- [MGT] Table1, 2, 3, 4 and 5 - [FARM] Table1, 2 and 3

PESTICIDES AND CHEMICALS

I. MISTAKES ALWAYS OR USUALLY ENCOUNTERED IN APPLYING PESTICIDES

II. MEASURES FOR ELIMINATING AND AVOIDING HAZARDS

III. SOME NECESSARY ACTIONS FOR RESOLVING THE HAZARDS OF PESTICIDES AND CHEMICALS.

CONTROL POINT NO.8

1. Mistakes always encountered in applying pesticides

- ▶ Use of banned pesticides; pesticides not on the list;
- ▶ Use of pesticides unregistered for vegetable crops;
- ▶ Improper use of pesticides against regulation;
- ▶ Not ensuring the pre-harvest interval for pesticides;
- ▶ Pesticides are sprayed near products which have been harvested
- ▶ Pesticides have stuck to product containers and packing materials
- ▶ Pesticide packaging has not been collected into proper areas
- ▶ Unsafe spraying equipment

TABLE 8 – MANAGEMENT OF TRAINING, COMMUNICATION

Production unit.....Commune.....District.....Province.....

Full name of unit leader..... Technician in charge.....

Date/ month/ year	Training				Communication		
	Number of farmers (list attached)	Contents of training	Duration of training (day)	Certification (mark x)	Communicatio n contents	Response to communic ation (mark x)	Opinion/ initiatives (if any)

1. MISTAKES USUALLY ENCOUNTERED IN APPLYING PESTICIDES

☞ Use of banned pesticides, not on the list:



Banned pesticide



Pesticide not in the list of legal pesticides

☞ Use of pesticides not approved for vegetable crops :

For example: Pursuance to Circular No.03/2018/TT-BNN Tricklorogon (90SP, Dip 80SP, Terex 50 EC, Ofatox 400EC, etc) are not allowed to apply in Vietnam for vegetables. However, these pesticides are being used for vegetables



☞ **Improper use of pesticides against regulation:**

- *Pesticides selected are not suitable for diseases*
- *Overdose, many times higher than instructed on the label*
- *Mixture of many kinds, etc.*



Farmers used to mix 7 types of pesticides/ tank to spray onions.

☞ **Not ensuring pre-harvesting interval for pesticides:**



HƯỚNG DẪN
Hoạt chất **Alpha-Cypermethrin**
lên thương mại khác nhau ở 1
thân, cuốn lá, bộ trị hại lúa sâu (1
que), bộ xịt, bộ nhậy hại vài thì
quýt rau màu và cây ăn quả.
FMTOX 25EC đặc trị sâu cuốn
khoang hại lạc, Rệp sáp hại c
điều.
Liều dùng: - Lúa: 0.8 - 1.0 lít/
- Cà phê: 0.2- 0.3
Cách pha phun: Pha một gói/
đều hoặc phun theo nồng độ%
Lượng nước phun: 400 - 600
Có thể hỗn hợp với các loại
khác. **Trà thuốc có tính kiềm.**
Thời gian cách ly: 14 ngày.

☞ Pesticides are sprayed in area where products have been harvested



☞ Pesticide residue is left in/on product containers and packing materials



☞ Pesticide residue accumulated in soil, irrigation water from previous use



2. IDENTIFY HAZARDS CAUSED BY OTHER CHEMICALS

- ▶ Soil, water is contaminated by chemicals from industrial zones, chemical factories nearby.
- ▶ Application of chemicals not on the list approved for use:
- ▶ Inappropriate chemicals or improper use of chemicals for cleaning and washing, leaving residue on equipment, containers, etc.
- ▶ Fuel (oil and gasoline), paints, etc on harvesting equipment, packing and delivery, causing direct contamination to products and packing:

☞ **Soil, water is contaminated by chemicals from industrial zones, chemical factories nearby.**



☞ **Application of chemicals not on the list approved for use**

For example: Waste water is applied for morning glory



☞ **Inappropriate chemicals or improper use of chemicals for cleaning and washing, leaving residue in equipments, containers, etc**

For example: Application of *Natrihidrosulfit* (NaHSO_3 , a chemical used in textile industry, to make radish white and fresh)

Or fruit is soaked in an antibiotic or Carbendazim chemical to avoid rotting.



☞ Fuel (oil and gasoline), paints, etc on harvesting equipment, packing and delivery, causing direct contamination to products and packing



DO NOT USE PROHIBITED SUBSTANCES IN FOOD PERSERVATION



Part II: MEASURES TO AVOID AND MINIMIZE HAZARDS

- ▶ Control the use of pesticides and other chemicals
- ▶ Control farming soil, irrigation water source, etc.

CONTROL POINT NO.9

1. PROMOTE THE APPLICATION OF IPM AND ICM TO MINIMIZE THE USE OF PESTICIDES AND OTHER CHEMICALS

- ▶ Integrated Pest Management (IPM): aims at suppressing pest populations below economic injury level and pesticides are only used when pest populations are at higher level than economic injury level.
- ▶ Integrated Crop Management (ICM): Manage to facilitate the good development of crops to minimize the use of chemicals and fertilizers (3 reductions 3 increases)



2. USE OF CHEMICALS



- Good management of following activities:





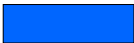


- ☞ Buy, receive and manage pesticides (preservation, store)
- ☞ Use of chemicals (spray chemicals)
- ☞ Manage well the waste (package) of pesticides after use

CONTROL POINT NO.10

Select, buy, receive pesticides

- ▶ Carefully read the instructions to know the expiration date, the suitability of pesticides on crops, etc.
- ▶ Do not buy banned pesticides, or those not on the approved list
- ▶ Only use pesticides on the list approved for use in Vietnam. Priority should be given to less toxic pesticides (blue color) and chemicals of plant origin, biological chemicals, especially at the end of the season
- ▶ Only buy pesticides from suppliers/ shops licensed by competent authorities





Toxic level symbols of pesticides

Toxic group	Symbols			Notes
	Color	Symbols	Notes on the label	
I (extremely toxic)	Red 		Extremely toxic	Banned
II (highly toxic)	Yellow 		Highly toxic	Limited use for vegetable
III (less toxic)	Blue 		Dangerous	
IV (least toxic)	Green 	No symbols	Be careful	Priority should be given to vegetable

Toxic level symbols of pesticides(since 2018)

Theo Thông tư số 21/2015/TT-BNNPTNT ngày 08/6/2015 của Bộ trưởng Bộ Nông nghiệp và PTNT. Độ độc sẽ được ký hiệu như sau:

Độc cấp tính

Yếu tố ghi nhãn	Loại 1	Loại 2	Loại 3	Loại 4	Loại 5
Hình đồ cảnh báo					Không sử dụng Hình đồ cảnh báo
Tên gọi hình đồ	Đầu lâu xương chéo	Đầu lâu xương chéo	Đầu lâu xương chéo	Đầu chằm than	
Từ ký hiệu	Nguy hiểm	Nguy hiểm	Nguy hiểm	Cảnh báo	Cảnh báo
Cảnh báo nguy cơ: Miệng	Chết nếu nuốt phải	Chết nếu nuốt phải	Ngộ độc nếu nuốt phải	Có hại nếu nuốt phải	Có thể có hại nếu nuốt phải
Cảnh báo nguy cơ: Da	Chết khi tiếp xúc với da	Chết khi tiếp xúc với da	Ngộ độc khi tiếp xúc với da	Có hại khi tiếp xúc với da	Có thể có hại khi tiếp xúc với da
Cảnh báo nguy cơ: Hô hấp	Chết nếu hít phải	Chết nếu hít phải	Ngộ độc nếu hít phải	Có hại nếu hít phải	Có thể có hại nếu hít phải
Vạch màu	Đỏ	Đỏ	Vàng	Vàng	Lam

Select, buy, receive pesticides

☞ Only buy pesticides from suppliers/ shops licensed by competent authorities



☞ Carefully read instruction to know information such as: expiration date, **poison** level, target pest, target crop of pesticides, etc.

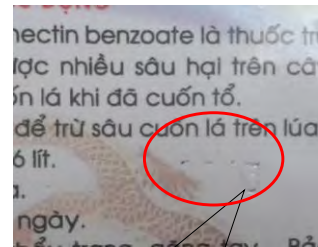


Crops

Target diseases

Production date and expiration date

Show the poison level



Production date is erased, new one is created

☞ Do not buy banned pesticides or those not on the approved list, etc (*usually pesticides with red color bar, no Vietnamese language, no label, etc*)



Banned pesticides (red color bar)



Pesticides not in Vietnamese language

☞ Only use pesticides on the list approved for use on crops in Vietnam (*Circular No.03/2016/TT-BNNPTNT and Circular No.06/2017/TT-BNNPTNT*). Priority should be given to less toxic chemicals (blue and green color) and chemicals of plant origin, biological chemicals, especially at the end of season.



Chemical of plant origin



Microbiological chemicals

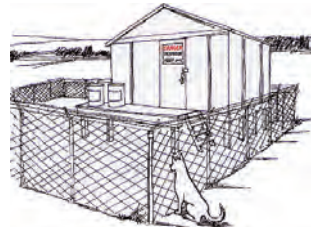
CONTROL POINT NO.10 & NO.11

Preserve and store pesticides

(applies to households and vegetable production farms; not for stores, pesticide trading agencies)

Warehouses (stores to keep chemicals):

- Located in high land area to avoid flood, far away from children's reach
- Does not affect products in production area.
- Should have warning board, lock, etc
- Pesticides are neatly arranged to avoid mixture with other agricultural materials.



CONTROL POINT NO.12

Use of pesticides



Only use pesticides when needed.

Must comply with the following:

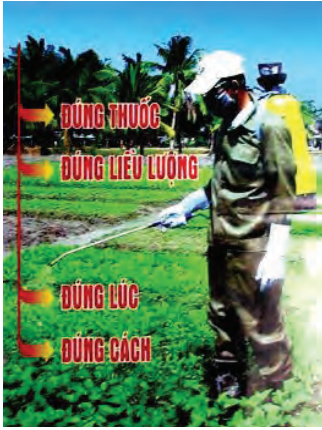
- ☞ *4 Principles of Correction*
- ☞ *Safety principles*
- ☞ *Fully record the process of pesticide utilization.*

Only use pesticides when needed

- ▶ Regularly check and visit the field, combine with analysis of weather and crops
- ▶ Only apply pesticides when the pests and diseases are at economic injury level.



Pesticides must be applied in accordance with principles of 4 rights



- ☞ Right pesticides: suitable for target diseases, pests, etc.
- ☞ Right dosage: Follow the instructions on label (amount of pesticides/ amount of water for one area unit)
- ☞ Right time: apply pesticides for the diseases at early growth stage (newly occurred diseases are easy to be killed)
- ☞ Right application method: Follow the instructions (only spray leaves or root)

Chemical users must carefully read instructions before use

Use pesticides according to the label's instructions

ALWAYS READ THE LABEL CAREFULLY BEFORE USE

<p>USAGE INSTRUCTIONS</p> <p>:: Crops</p> <p>:: Pest</p> <p>:: Dosage</p> <p>:: Mixing method</p> <p>:: Water quantity to be used</p> <p>:: Treatment time</p> <p>:: Number of treatment/crop</p> <p>:: Pre-harvest interval</p> <p>:: Important notes</p>	<p> DANGEROUS KEEP OUT OF CHILDREN'S REACH</p> <p>Kind of pesticide</p> <p>NAME OF PRODUCT® 123 XX</p> <p>Use: abc def ghi jkl mno pqr stu vwxyz abc def ghi</p> <p>Active element: zzz 12.3%</p> <p>Net weight</p> <p>Net volume</p> <p>Reg. No.</p> <p>Quality Reg. No.</p> <p>Production date</p> <p>Expiry date</p>	<p>SAFETY INSTRUCTIONS</p> <p>• Pesticides are toxic and can be harmful to humans. Store in dry place, out of children's reach, away from food and feed.</p> <p>• Wear full-body clothing when handling pesticides. Do not smoke, eat or drink during application. Avoid contact with eyes, nose and mouth.</p> <p>• Do not eat, drink, smoke or use any tobacco products, drink alcohol, or use any other substances while applying pesticides. Wash hands thoroughly after use.</p> <p>• Do not use electrical or heating devices in vicinity.</p> <p>• Clean up spills immediately with water. Do not use any material for disposal of pesticides or their containers. Do not burn.</p>
		<p>FIRST AID</p> <p>• If pesticide sticks to skin: take off clothes. Continuously flush water on the infected skin area. Cleanse skin and hair carefully with soap.</p> <p>• If pesticide sticks to eyes: Quickly wash eyes with clean water. Keep eyes open and wash eyes in the water flow for 15 minutes.</p> <p>• If pesticide is swallowed: take the victims to the nearest clinics, remember to bring pesticide label along.</p>
<p></p>		

Guide to control pest/diseases on mustard crops

Chemical method

- ▶ Use chemicals which are less toxic to humans and the environment
- ▶ Use chemicals that take less time to decompose
- ▶ Chemicals in the low toxic level (group 3, 4)



Common pests on cruciferae crops:

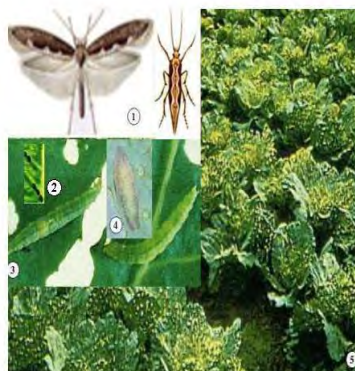
Diamond-back moth (*Plutella xylostella*)

- The pest feeds on leaves of cruciferae crops, short life cycle: 12 – 30 days, high productivity (1 female moth laid more than 100 eggs), high level of pesticide resistance. A life of cruciferae crop faces 2-3 appearances of diamond-back moth. The moth population has a high density at the middle and end of the season, harmful to crops. The most affected period is in November, December, February, and March.



Pesticides to be used

Radiant 60SC
Dupont Prevathon 5SC
Match 050EC
Brightin 1.8EC
Abatin 5.4EC
Proclaim 1.9EC
Tasieu 1.9EC
Pegasus 500SC
Delfin 32WG

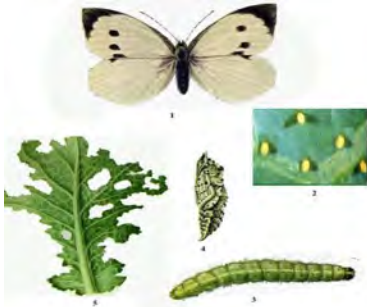


Sâu tơ - *Plutella xylostella* Linnaeus (Tên cũ: *Plutella maculipennis*)
 1. Trưởng thành; 2. Trứng; 3. Sâu non; 4. Nhộng;
 5. Rụng rau bị hại



Deep blue *Pieris rapae*

- Commonly harmful to cruciferae crops, even from its immature stages. The pest feeds on the leaves, making many holes in them. *Pieris rapae* appears throughout the year, mostly March through April and September through November.



Sâu xanh bướm trắng-*Pieris rapae* Linnaeus
1. Trứng thành; 2. Trứng; 3. Sâu non; 4. Nhộng; 5. Bọ phá hoại bị hại

Pesticides to be used

Actimax 50WG

Prevathon 5SC

Match 050EC

Brightin 1.8EC

Radiant 60SC

Delfin 32WG



Aphid

(Brevicoryne brassicae)

Takes nutrition primarily from the underside of leaf surfaces in young plants through plants ready to be harvested. *Brevicoryne brassicae*

stunts plant growth and causes plants to be deformed and yellowish. This pest thrives in dry conditions. If it is not detected early, it is difficult to control later.



Pesticides to be used

Name of pesticides	Name of active substances
Movento 1000D	Spirotetramat
Sokupi 0.5SL	Matrine
Plutel 1.9EC	Abamectin
Reasgant 3.6EC	Abamectin
Radiant 60SC	Spinetoram
Actara 25WG	Thiamethoxam
Tasieu 1.9EC	Emamectin benzoate

Flea beetle (*Phyllotreta striolata*)



- The baby beetle affects the roots, the mature beetle feeds on leaves, creating many holes in the leaves. They develop throughout the year with mature ones surviving 2-3 months, and in some cases the whole year. The optimal temperature for laying eggs is 25-30° C

Pesticides

Dupont Prevathon 5SC

Oshin 20WP

Elsin 10EC

Sokupi 0.5SL



- Vegetable multi-eaters with a life cycle of 30-60 days. Worms from newly hatched eggs live in a focused manner. If not detected early, it is difficult to control. Spodoptera litura damages vegetables of all seasons except during the cold weather of winter.

Pesticides

Reasgant 3.6EC	Abamectin
Delfin 32WG	Bacillus thuringiensis
Tasieu 1.9EC	Emamectin benzoate
Plutel 3.6EC	Abamectin



Black cutworm (*Agrotis ipsilon* Huf.)

Vegetable multi-eaters that are strongly active in the night. *Agrotis ipsilon* eats the body of the plant and can cause serious damage when the seedlings are still young. Difficult to control because this pest lives inside the soil.

Name of pesticides	Active substances
Reasgant 3.6EC	Abamectin
Delfin 32WG	Bacillus thuringiensis
Tasieu 1.9EC	Emamectin benzoate
Plutel 3.6EC	Abamectin



Common diseases harmful to Cruciferae crops

► Method for disease management:

- Clean the field, cut off and destroy the affected leaves..
- Use high beds with good drainage to avoid high humidity in the field.

- Plant at a suitable density. Not planting at a high density will result in serious damage.
- Select good, clean varieties with strong disease resistance.
- Remove all residue of diseased plants after harvesting.
- Treat seeds with specific drugs for each disease before sowing.
- Some pesticides may be used for spraying when the disease is newly occurred and in favorable weather conditions to prevent the occurrence of harmful diseases.:

+ Damping off in seedbed:

This disease affects the seed and seedling, caused by Pythium, Fusarium, Phytophthora, Rhizoctonia fungus, etc in soil. The diseased seedling is easy to die or rot near the ground when they fall and die.

- Pesticides used when necessary:

Name of pesticides	Active substance name
Daconil 75WP	Chlorothalonil
Moren 25WP	Pencycuron
Validacin 5SL	Validamycin A
Score 250EC	Difenoconazole
Kasumin 2SL	Kasugamycin

► Downy mildew:

This disease can affect both seedling and mature plant. The diseased plant has a layer of grey mold under the leaf. The upper side of the leaf has yellow color, after that yellowish or die. Heavily diseased leaves are withered and died. The disease develops seriously in high humidity.

+ Pesticides used:

Name of active substance
Mancozeb+Metalaxyl
Chitosan
Chlorothalonil
Chlorothalonil

+ **Ringspot:** Caused by *Alternaria brassicae* fungus.

The disease damages cruciferae crops and some other crops, causing serious damage even when the plants are mature. The disease appears as a circle shape, with many circles having the same center, linked together. In high humidity there is mold on the leaves.

+ **Pesticides used:**

Daconil 75WP	Chlorothalonil
Score 250EC	Difenoconazole
Nativo 750WG	Tebuconazole + Trifloxystrobin



► **Sclerotinia blight:** Caused by *Sclerotinia sclerotiorum* fungus on cabbage. If the seedlings are rotten in their roots, they will not be able to stand. If the mature plant has this disease, it invades from the stem to the head causing rot from the outside in. A diseased plant can rot and die in the field. Sclerotinia blight develops well in high humidity (November-April).

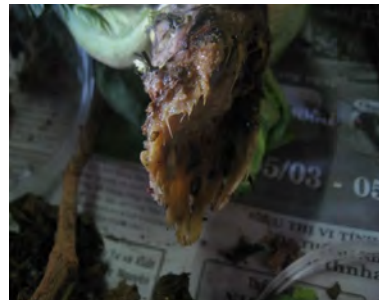


Pesticides used:

Biobus 1.00WP	Trichoderma viride
Moren 25WP	Pencycuron
Alfamil 25WP	Metalaxyl



- ▶ **Soft rot:** Resulted by *Erwinia carotovora fungus on cruciferae crops*. The disease often occurs in mature plants that are infected quickly. The disease can be traced to one starting spot, causing rot and a bad smell. It can be serious at the late stages at the end of the season. It can even develop quickly during product preservation.



How to control diseases caused by bacteria

- For bacteria diseases, prevention is the key method. When disease occurs, it is almost very difficult to control, most products must be destroyed. The bacteria exists in soil, water, seedling, invades through mechanical injuries, etc.

- The dead plant should be moved out of the field and destroyed, use lime for sterilizing soil. To eliminate the spread of disease, apply more P and K, stop applying N.

► **Pesticides:**

Pesticide name	Name of active substance
New Kasuran 16.6WP	Copper Oxychloride + Kasugamycin
DuPont™ Kocide 46.1WG	Copper Hydroxide
Kasumin 2SL	Kasugamycin
Alfamil 25WP	Metalaxyl



CONTROL POINT NO.13**Fully record the process of pesticide utilization****Contents:**

- Name of pesticides
- Target of pesticides
- Dosage
- Sprayed date, etc.
- Quarantine period (PHI)

Note: How to record is guided in the diary of production practices.

CONTROL POINT NO.14**Comply with principles of safety during the pesticide use**

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Comply with principles of safety during the use of pesticides

- Calculate the sufficient amount of chemicals to avoid surplus of chemicals. In the case of chemical surplus, the destruction process

should be suitable (land should be far away from any water source, make a hole, mix surplus chemical with lime, cover the hole with soil).

- Do not pour chemical surplus into water or fish ponds

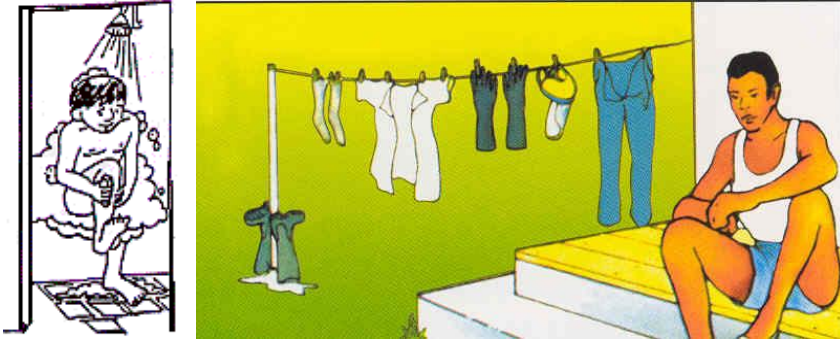



Comply with principles of safety during the use of pesticides

- Packages of chemicals after use should be collected and treated in accordance with the proper process to avoid the contamination of environment and products



- Comply with principles of safety during the use of pesticides



 Bathing and washing clothes, protective equipment after spraying chemicals

CONTROL POINT NO.15

Checking residues of pesticides, heavy metals and micro-organisms in products

- Analyze and quick test the pesticide residues.
- Check, analyze samples in lab to check residue of pesticides, heavy metal and micro-organism.



Testing residues of pesticides by quick test

Province	Target groups	Date	No. of samples	No. of detected safe	No. of detected unsafe
Hai Duong	Tan Minh Duc coop.	20 Nov 2018	7	1	0
	Thanh Ha company				
	Duc Chinh coop.				
	Gia Gia company	3 Dec. 2018	6	1	0
	Green farm company	3 Dec 2018	6	1	0
	Lua farmer group	15 Nov 2018	5	2	0
Ha Nam		19 Nov 2018	2	0	0
	Ha Vi coop	28 Nov 2018	10	7	0
	Hiep farm	16 Nov 2018	10	7	0
	Cat Lai coop.	16 Nov 2018	10	7	0
	Thanh Tan coop.	28 Nov 2018	9	6	0
Hung Yen	Japan Vietnam company	6 Nov 2018	5	3	0
		10 Nov 2018	3	2	0
	Yen Phu coop.	22 Nov 2018	8	5	0
Phu Tho	Chien Thang coop.				
	Huong Non coop				
	Truong Thinh coop				
Vinh Phuc	Visa coop	6 Dec 2018	5	3	0
	Dai Loi coop	6 Dec 2018	5	1	0
	Vinh Phuc coop	22 Nov 2018	5	0	0
	Quynh Hai coop	27 Nov 2018	3	0	0
Thai Binh		3 Jan 2019	3	1	0
	Thanh Tan coop	27 Nov 2018	3	1	0
		3 Jan 2019	2	1	0
Total	20 groups		111	55	0

Sampling fresh vegetables in the field/ production garden (TCVN 9016-2011)

Determine the minimum quantity of pilot samples and sub-samples

- Case 1: Production plot is managed by 1 household or 1 company:
- Production plot has area ≤ 05 ha, take at least 1 pilot sample in each plot
- Production plot has area > 05 ha, divide that big area into small areas of ≤ 05 ha, take at least 1 pilot sample in each plot.

Minimum number of sub- samples/ 1 testing sample depending on kind of crop and lot area, details:

Type of crop	Lot area	Minimum number of pilot sample	Minimum number of sub- samples/ 1 pilot sample
Vegetable is graded as big size (average weight > 250 gr/ unit)	≤ 05 ha	01	05
Vegetable is graded as small and medium size (average weight < 250 gr/ unit)	≤ 0.1 ha	01	05
	0.1 – 1 ha	01	05 - 08
	01 - 05 ha	01	08 - 12
	05 ha	01	12 - 16

Determine the minimum quantity of pilot samples and sub-samples

► **Case 2: production lot is managed by many households (Cooperative, group)**

- Production lot has area ≤ 05 ha: at least 1 pilot sample/ 1 lot.
- Production lot has area > 05 ha: divide this big lot into many lots of ≤ 05 ha, 1 pilot sample/ 1 small lot divided.
- Minimum number of sub- samples/ 1 pilot sample depends on number of production households in that lot (n).
- Minimum number of sub- samples = number of households have minimum samples taken \sqrt{n} , but ≥ 5 samples
- If the lot is managed by many households with different production conditions, take separate sample of each household and that sample just represents that household only.

Results of lab test on residues of pesticides, heavy metals and micro-organisms in products

Province	Target group	Quantity of samples	Heavy metal	E.Coli. Salmonella	Pesticide
Hải Dương	HTX Tân Minh Đức:	3	0	0	0
	Duc Chinh Coop:	5	5(0)	0	4(<u>1</u>)
	Thanh Ha Company:	6	4(0)	0	0
Ha Nam	Hiep farm group:	3	0	0	0
	Ha Vy Cooperative:	2	0	0	0
Hưng Yên	Yen Phu Cooperative	3	3(0)	0	1(0)
	Japan-Vietnam Company:	3	3	0	0
Total		25	15(<u>1</u>)	0	5(<u>1</u>)

*(**): * -- detect, (**)-- detect the exceed of MRL

Samples detected:



Pesticide (*Difenoconazole*) 0.243mg/kg
(MRL 0.2mg/kg)

Carrot

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CONTROL POINT NO.21

Guide to controlling pest/diseases on mustard crops

Integrated Pest Management (IPM) and Integrated Crop Management (ICM)



Integrated pest management (IPM) and integrated crop management (ICM)

I. Cultivation method

- *Clean the field*: Collect and destroy plant residues having disease sources such as soft rot, Scherotinia blight, downy mildew, etc harmful to mustard crops, wild grass where harmful pests live, etc eliminate the spreading sources, etc.
- *Use healthy seedlings with no diseases, use seedlings with good resistance*
 - + Only use healthy seedlings, seeds with high germination rate, no diseases
 - + Should produce seedlings on bedding, ensuring quality of seedlings for production area
- *Caring*:
 - + Fertilizer and applying fertilizer: Apply with right technique, apply enough and balanced amount for each vegetable, each soil type, each season, in correct time to facilitate the growth, increase the resistance to diseases, promote the use of composting.
 - + Watering: Ensure enough humidity for vegetable field, not too much.
 - Season: Select varieties suitable to season for good growth
 - Rotate and intercrop

II. Manual method

- Use light trap, yellow or blue stick catch to kill winged aphids, leafy maggot/fly, flea beetle; removing insect larvae, catching insects, destroying insect pests, treating seeds, etc.

III. Biological method: Exploit and use beneficial organism (natural enemies, enemies of pests), biological products in controlling harmful pests.

- *Protect natural enemies*

- Ladybugs eating aphid, worm
- Bees parasiting on eggs, young worm, papue of harmful insects
- Ants, beetles, spider, etc eating pests
- *Using Pheromone trap:* Attract mature pests into trays and kill them (these pests will become armyworm, white butterfly, diamond-back moth, etc)

CONTROL POINT NO.22

Warning signs in the production site where pesticides were just sprayed

BIỂN CẢNH BÁO THUỐC BẢO VỆ THỰC VẬT



Ngày phun	Tên thuốc	Thời gian cách ly

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FIELD DIARY

(For producers and households)

Include:

- ☞ DIARY OF PRODUCTION PRACTICES
- ☞ DIARY OF BUYING AGRICULTURAL MATERIALS
- ☞ DIARY OF HARVESTING AND SELLING PRODUCTS

TABLE 1 - DIARY OF PRODUCTION PRACTICES

Name of field plot (No.): ...08...Area.....360.....
 Name of crop: Kohlrabi... Varieties B40 (Korean)
 Transplanted date: 02/09/16 Expected harvesting time: 1st: 12/10/16 Last time: 22/10/16
 Protective cloth: Yes (x) No () ; Waste disposal is put in proper place : Yes (x) No ()

Date, (Solar year)	Activities	Name of pesticide and fertilizers	Name of disease	Quantity (kg, g, lire, ml, pack)	Follow the guidance	Warning board (x)	Risks detected	Implemented by
01/09/16	Basel application	Urea		2 kg	X			Ng.T.Lan
...						
07/09/16	Additional dressing	Urea		1.5 kg	X			Ng.T.Lan
...								
22/09/16	Spraying	Sokupi 0.5 SL	Diamond black moth	20ml/16/360 m ²	X	X		P.Văn Diệp

TABLE 2 – DIARY OF BUYING AGRICULTURAL MATERIALS

Place to keep pesticides, fertilizer At hamlet.....Commune.....

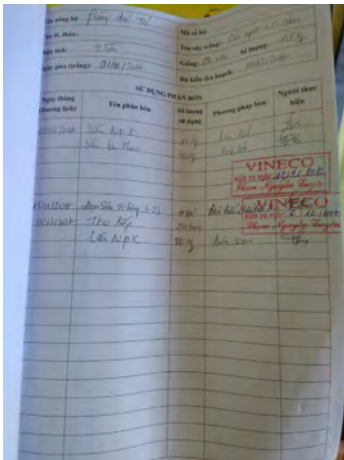
Date (Solar year)	Name of pesticides, fertilizer	Quantity (Kg, g, liter, ml, bottle, pack)	Price (đồng/ kg, liter, bottle, pack)	Purchased at stores of Cooperative/ household owner, mark (x)	Purchased at other stores		Buyer/ User (Full name, sign)
					Name	Address	
20/7/16	Tomato seed, Savior	05 packages	100,000/ package		Tran Trong Mac	Cho Hui Thanh Khoi	Lan
25/7/16	Urea nitrogen	50 kg	8,000 dong/ kg	Cooperative			Quang
.....							
10/8/16	Biobus 1.00 WP	02 packages	10,000 d/ package		Nguyen Van Tuyen	Tu Minh – Hai Duong city	Quang

TABLE 3. DIARY OF HARVESTING AND SELLING PRODUCTS

Area of pre-processing/preservation:.....
 Address of retail markets:.....

Date/ month (solar year)	Harvesting			Selling products					Risk detected/ already ad dressed the hazard (mark x)	Implemented by
	Kind of crop	Name / code of field plot	Isolation time (day)	Quanti ty (kg, plant)	Price (đ/kg, plant)	Selling ways/ buyers				
						Retail (mark x)	Whole sale to whom	Sold under contract to whom		
25/11/16	Tomato	12/5	15	20 kg	15,000 đ/ kg	X				Nguyen Thi A
27/11/16	Tomato	12/5	17	100 kg	10,000 đ/ kg		Bui Van C			Nguyen Thi A
28/11	Kohira bi	8/2	15	2,000 kohlrabi	3,000 đ/ kohlrabi			Pham Van H		Nguyen Thi A

Recording activities in some target groups



THU HOẠCH V		THU HOẠCH		THU HOẠCH		THU HOẠCH	
Ngày thu hoạch	Phân loại	Số lượng	Loại	Ngày tháng	STT	Ngày tháng	Tổng
23/10	đất đỏ	ke sa am	80g / 2 bình				
27/11	Sông mai	Maico Zed 80 WP	300g / 2 bình				
27/11	Sông mai	Mancozel	300g / 2 bình				
	bổ phân	osin	20g / 2 bình				
04/12	Sông mai	Đa Că Nam	60ml (3 bình)				

KIỂM TRA	
Đơn vị kiểm tra	Ngày
Y kiến đánh giá	

Thực hiện	Ngày
cau	
cao	
cau	

VINEGO
 15/11/2011 ngày...
 Phạm Nguyễn Tuấn



**Project for Improvement of Reliability of
Safe Crop Production in the Northern Region**



Basic GAP TOT Material Series

No.5

**GOOD PRODUCTION PRACTICES IN HARVESTING, PACKAGING
SAFE VEGETABLE PRODUCTS**

**DCP/MARD
JICA Project Team**

INTRODUCTION

This material provides guidance and references to meet the requirements of **No.16-20 and No.25 out of 26 control points** on Basic GAP as below:

16. Do farmers harvest products on a date after the Pre-Harvest Interval period (PHI) indicated on pesticide labels?

17. Are processing, packaging, and storage areas isolated from storehouses and containing sites of pesticides, fertilizers and other hazardous chemicals?

18. Is clean water used to wash products after harvesting?

19. Does the quality of clean water used to wash products meet the standard?

20. Is waste water, garbage collected and treated properly in accordance with regulations?

25. Do products have product origin or label to facilitate the traceability?

- 1. Why?**
- 2. What to do (explain for mobilization of required staffing, materials)**
- 3. Method**
- 4. Assessment/ evaluation**
- 5. Lessons/ good practices from project experiences**
- 6. Reference (law and regulations for deep understanding)**

CONTROL POINT

No.16 Do farmers harvest products at the date after Pre- harvest Interval period (PHI) indicated on pesticide labels?

No	Criteria	Level	Requirement	Method	Reference
16	Do farmers harvest products on a date after the Pre-Harvest Interval period (PHI) indicated on pesticide labels?	A	Farmers/ workers harvest products on a date after the Pre-Harvest Interval period (PHI) and have to keep a record of harvesting products. e.g.) Non-compliance case - Farmers harvest on a date before the PHI. - There is no record on harvesting products.	- Review and cross-reference the record of harvesting products and the production diary	- [FARM] Table1 – Production diary – Practices in the Field - [FARM] Table3 - Field diary for harvesting and selling products

No.17 Are processing, packaging, and storage areas isolated from storehouses and containing sites of pesticides, fertilizers and other hazardous chemicals?

No	Criteria	Level	Requirement	Method	Reference
17	Are processing, packaging, and storage areas isolated from storehouses and containing sites of pesticides, fertilizers and other hazardous chemicals?	A	The processing, packaging, and storage areas are isolated from storage of pesticides, fertilizers and other hazardous chemicals. (This criterion is not applicable in the case that the Products are only harvested at the farm level and no further handling or storing) e.g.) Non-compliance case - Design, construction and maintenance of handling, packaging, and storage areas do not meet requirement. - The handling, packaging, and storage areas have potential risk of flooding and/or contamination.	On-site inspection of processing, packaging and storage areas	

No.18 Is clean water used to wash products after harvesting?

No	Criteria	Level	Requirement	Method	Reference
18	Is clean water used to wash products after harvesting?	A	Clean water is used to wash products after harvesting. e.g.) Non-compliance case - Quality of water used for post-harvest and packaging handling does not meet the requirement of QCVN 02/2009/BYT. - There is no test result of water quality.	- Review the record of production condition and laboratory test results - On-site inspection of fresh water supply system	- [MGT] Table1 – Production condition management - QCVN 02/2009/BYT for post-harvest handling - Laboratory test results

No.19 Does quality of clean water used to wash products meet the standard?

No	Criteria	Level	Requirement	Method	Reference
19	Does the quality of clean water used to wash products meet the standard?	A	The post-harvest washing water sampling and laboratory tests are conducted to check heavy metal and biological residues. The chemical, biological, risks in washing water shall not exceed the maximum residual limit (QCVN 02/2009/BYT). e.g.) Non-compliance case - There is no record of the result of heavy metal and biological residue check. - The laboratory test shows chemical, biological residues exceeding the maximum residual limit.	- Review record of heavy metal and biological residue check and/or laboratory test results	- [MGT] Table1 – Production condition management - QCVN 02/2009/BYT for post-harvest handling - Laboratory test results

No.20 Is waste water, garbage collected and treated properly in accordance with regulations?

No	Criteria	Level	Requirement	Method	Reference
20	Is waste water, garbage collected and treated properly in accordance with regulations?	A	Waste water is collected and properly treated and disposed. The garbage and solid waste are collected and put into the waste bin. e.g.) Non-compliance case - There is no waste bin and/or no proper place for disposal.	- On-site inspection to investigate the usage of waste bins and disposal of garbage and waste sources - Conduct interview (if necessary)	

No.25 Are only treated organic fertilizers applied and is a record kept on these organic fertilizers?

No	Criteria	Level	Requirement	Method	Reference
25	Do products have product origin or label to facilitate the traceability?	A	Products are labeled with information of producers name and contact in order to facilitate the traceability. e.g.) Non-compliance case - There is no information of name and contact on package and label of the products.	- On-site check at packing and selling points	- Labels and packing

Objective

- Obtain products of highest quality and suitable cost;
- Reduce chemical, biological and physical hazards for products during harvesting, packaging, delivery;
- Minimize the losses during harvesting.

Losses after harvesting

- Reduction of quality;
- Food safety is not ensured;
- Reduction of volume;
- Reduced nutritional value of products;
- Economic losses: the product value is reduced because quality and volume is reduced.

Changes in product quality after harvesting

- **Chlorophyll decomposition** - reduces perceptual quality of products, especially leafy vegetables.
- **Dehydration due to evaporation** - decreases freshness; causes tissue structure to soften and color to fade..
- **Respiration process continues** - reduces concentration of nutrients in product.

CONTROL POINT NO.16

Harvesting point

Determine the proper point for harvesting products:

- Ensure yield, product quantity;
- Ensure perceptual quality, nutritional quality:
 - Products harvested at pre-mature time do not satisfy expected quality standards.
 - Products harvested after maturity will be old, fibered, of less quality.
 - Ensure food safety:
 - accurate pre-harvest interval

Before harvesting

- To verify the pre-harvest interval (PHI) for pesticides and organic fertilizers, farm manager should check diary of pesticide and fertilizer use to ensure:
 - Interval from application of pesticides and fertilizers to harvest is proper as regulated.
 - Only harvest products with their pre-harvest interval verified as regulated.
 - If the pre-harvest interval is not ensured, harvesting should be delayed until the PHI is verified as regulated.



Green mustard: 30 days after sowing



Green choysum: 30 days after sowing seeds



Morning glory produced by seeds: 25 days after sowing seeds

HARVESTING POINT

Amaranth: 40-45 days after sowing seeds



Kohlrabi: 55-60 days after transplanting

Cabbage: 70-80 days after transplanting



Tomato: 50 days after transplanting

HARVESTING POINT

Broccoli: 65-70 days after transplanting



Harvesting time

- Harvesting time: Coolest time of day - early in the morning or late in afternoon
- Do not harvest products in rainy or highly humid weather - Products are wet, and easy to generate temperature. If products are not preserved in ventilated conditions, they are easy to rot.
- Post-harvest products should be kept in a cool (shaded) area if they are not immediately shipped to pre-processing house or selling point.



Good practices in harvesting vegetables

- Check the field diary, ensuring the PHI for pesticides applied before harvesting
- Harvest vegetables in early morning or late afternoon to deliver to buyers within the day.
- Workers must pay attention during harvesting fresh vegetables to prevent products from directly touching soil.

CỘNG HÒA XÃ HỘI CHỦ NGHĨA VIỆT NAM BAN CHẤP HÀNH VIỆT NAM		CÔNG NGHỆ QUẢN LÝ SẢN XUẤT Hàng rau - Trái cây - Thực phẩm	
Mẫu số: 01/2014		NHẬT KÝ SẢN XUẤT	
Số đăng ký: 01/2014		Ngày ghi: / /	
Ngày tháng năm	Nội dung công việc thực hiện (theo dõi, ghi chép, kiểm tra, đánh giá, báo cáo, lưu trữ hồ sơ)	Người ghi: / /	
20/10/2014	Đánh giá, thu hoạch, vận chuyển, phân phối	/ /	
21/10/2014	Đánh giá, thu hoạch, vận chuyển, phân phối	/ /	
22/10/2014	Đánh giá, thu hoạch, vận chuyển, phân phối	/ /	
23/10/2014	Đánh giá, thu hoạch, vận chuyển, phân phối	/ /	
24/10/2014	Đánh giá, thu hoạch, vận chuyển, phân phối	/ /	
25/10/2014	Đánh giá, thu hoạch, vận chuyển, phân phối	/ /	
26/10/2014	Đánh giá, thu hoạch, vận chuyển, phân phối	/ /	
27/10/2014	Đánh giá, thu hoạch, vận chuyển, phân phối	/ /	
28/10/2014	Đánh giá, thu hoạch, vận chuyển, phân phối	/ /	
29/10/2014	Đánh giá, thu hoạch, vận chuyển, phân phối	/ /	
30/10/2014	Đánh giá, thu hoạch, vận chuyển, phân phối	/ /	
31/10/2014	Đánh giá, thu hoạch, vận chuyển, phân phối	/ /	



Equipment, tools, containers

- Tools: Knife, scissors, etc.

- Product containers: Tray, plastic box, bamboo basket, nylon bags, jute bags, etc.
- Materials for line, containing products: Canvas, nylon, etc.

>>> **Must be clean and ready for use during harvest.**

- *Check, ensure hygiene of tools, equipments, containers before using to eliminate contamination hazards.*
- If it is not possible to clean or remove product contamination hazards from tools or containers, it is better not to use them.

Control Point No.17

Equipment, tools, containers

- Tools, equipment, containers should be maintained regularly to avoid chemical or physical hazards to products.
- Tools, containers must be isolated from areas that keep chemicals, fertilizers or additives.
- Need to have measures for differentiating containers used during harvesting and containers used in pre-processing house: Use containers that have different shape and color.

Good practices in harvesting vegetables

- Must cover vegetables or bring vegetables to pre-processing house immediately to avoid direct sunlight.
- Except for root vegetables, workers must handle carefully to avoid damages and soil on products.
- Remove strange objects, damaged, rotten products and plant residues out of harvested products.



Không để sản phẩm trực tiếp trên đất

Pre-processing and packaging at the harvest location

- Select suitable place for pre-processing and packaging fresh vegetables in order to avoid cross-contamination. Must use canvas lining for harvested products, do not let products directly touch soil.
- Check, ensure hygiene of tools, equipment, containers before using in order to eliminate contamination hazards.
- Pay attention while working in order to avoid damage or cause of biological, physical, chemical contamination to products.



Collecting, delivering vegetables from production area to pre-processing, packing house

- Products must be gathered in a place that will not cause contamination to products.
- Use canvas and baskets to keep vegetables in the field and deliver vegetable to pre-processing house
- Collect a small quantity each time.
- Do not pile heavy or strongly press vegetables.



Good practices of product transport

- Transporting vehicle must be clean while arranging products.
- Protect products and containers to avoid dust, dirty contamination hazard while arranging and transporting.
- Pay attention to avoid contamination on products while using animals (buffalo, cow, horse, etc) for transporting.



Good practices of Pre-processing and packaging in the Pre-processing house

- Only use clean water for washing products - *Water used in agriculture*
- Water for washing products must be regularly replaced. Do not wash products for more than 3 minutes in order to avoid water and micro-organisms from entering into the products.
- Use plastic basket to store products after washing to ensure no cross contamination.
- Fully avoid direct contact between packaged products and un-packaged products.
- After packaging, products must be labeled to facilitate product traceability.

Selecting location of pre-processing house

Handling house must be located far away from the following areas:

- Polluted environment, industrial activities, livestock, etc. causing serious contamination to fresh fruit, vegetables.
- Potential of flood and inundation unless assured flood control is provided.

- Risk to be affected by infestation of pests.
- Existence of solid or liquid waste that can't be disposed of.



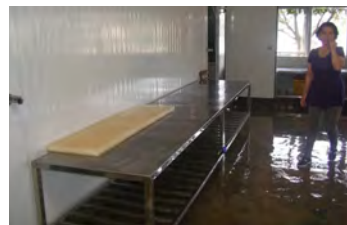
Design and construction

- Design and set up the handling house:
- Design with 1-way principle
- Advantageous for good hygiene practices
- Avoid cross-contamination during the pre-processing and handling process.
- Must be suitable with technology and type of products.



Cleaning, washing

- Product cleaning materials, devices such as wash cloths, brushes should be properly kept in original form to avoid being infected and contaminated by foreign objects.
- There should be suitable equipment to wash products and water supply source of hygienic standards must be available.



Cleaning, washing

- Quality of water used must be suitable with each stage of the pre-processing process and water supply system should meet hygiene standards.
- E.g: Clean water can be used for initial stages while water used for final stages must meet quality standards in Vietnam.



Cleaning, washing (Cont)

- If antiseptic materials in water are used to wash products, antiseptic concentration should be checked and controlled to ensure the effectiveness.
- The utilization of chemicals and equipment maintenance should comply with manufactory's manual.



Good practices in vegetable washing stage

- Gently wash to avoid damage
- Wash the root in some cases only
- Arrange vegetables into the basket, do not put too many
- Put basket onto shelves or using a fan for drying vegetables before packaging



Good practices in cutting, pruning vegetables

- Prune all old leaves and un-mature leaves – easy to be damaged.
- Sort vegetables into uniform size following buyer's standard
- Arrange vegetables gently to avoid damage
- Do not arrange vegetables forcefully onto hard objects, this damages vegetable stems.
- Put vegetable roots into 2% vinegar to avoid contamination by microorganisms (possible, especially in early summer)
- All pre-processing workers must be trained and guided with standard practices of pre-processing, packaging

Good practices in packaging vegetables

- Use nylon bags with holes in the bottom and middle.
- Do not pack vegetables when they are still wet.
- Do not fully seal the bag top
- Vegetables are neatly arranged in the bag
- Consider designing packs suitable with customer's requirements.



Good practices of preserving vegetables

- Products must be preserved in clean, dry area, avoiding contamination hazards. Products should not be preserved together with fertilizers, agricultural chemicals and cleaning or disinfecting agents.
- Except for root vegetables, post-harvested vegetable products should not be directly put on ground or floor in order to avoid chemical, biological and physical contamination.

Good practices of preserving vegetables

- Preserve vegetables in cool, ventilated conditions
- If vegetables are preserved in cool storage, adjust the temperature to not be too low in order to avoid temperature shock.
- Record date of pre-processing, packaging and monitor products to avoid the supply of supermarkets and hotels with vegetables from the previous day



Pre-processing, packaging of vegetables that do not satisfy requirements



Mustard vegetables with rotten roots

Pre-processing, packaging of vegetables that do not satisfy requirements



Rotten roots, many yellow leaves

Pre-processing, packaging of vegetables that do not satisfy requirements




Vegetables are damaged, vegetables are not packed in neat and attractive manner.

Cause and corrective measures

- **Cause:**
 - Pruning, cutting techniques result in bacteria contamination
 - The rainy and hot weather makes vegetables easy to be damaged.
 - Vegetables are stored for a long time.
 - Effects from heat shock during preservation in cool storage
- **Corrective measures:**
 - Need to refer to cutting, pruning techniques for application (need to put the vegetable roots into vinegar liquid for disinfection, etc)
 - Need to tightly control all the stages from caring (amount of water, etc), harvesting, pre-processing, packaging and delivery to customers.
 - Sort the products to deliver to each target customer.

CONTROL POINT NO.18

Water for product handling

Kinds of water	Water sources
<ul style="list-style-type: none">☞ Product washing water,☞ Water to make preservative chemical solution,☞ Product cooling or top icing water	<ul style="list-style-type: none">☞ tap water☞ drilled-well water☞ must meet the standards 



CONTROL POINT NO.18**Hazards from washing water**

Hazards	Sources
Chemical	+ Drilled-well water is contaminated with heavy metals such as Arsenic, Mercury, etc. + Domestic water does not meet the standards + Washing water is supplied from contaminated domestic water source
Pathogenic organisms	+ Drilled-well water is contaminated with microorganism due to running-off from the contaminated areas. + Water is contaminated by untreated waste water

CONTROL POINT NO.19**Product washing water**

When using water to wash or cool products, manager and workers must ensure the following practices:

- Product washing water must be clean water (in compliance with Vietnam's regulations).
- In case of lacking microorganisms requirements, water must be treated to meet clean water requirements (eg. Chlorine treatment or other water treatment methods).
- Water must be contained and transported in clean container or reservoirs with appropriate operation.
- Water retrieved from product drying can be used for the first product wash.

Assessing and testing quality of water source

Assessment criteria	Compared standards
☞ Water used in preliminary handling, post-harvest handling	☞ National technical regulations QCVN 02: 2009/BYT on domestic water quality

CONTROL POINT NO.20

Waste management

Waste in pre-processing, trading areas must be collected daily or after each production shift.



Waste management



Pre-processing house



Wholesale market

Do not let waste accumulate around pre-processing, trading areas

Waste management

- Waste baskets must be covered to avoid contamination
- Packs/ bags of preservation chemicals, fungus control chemicals must be collected and treated in accordance with legal regulations.

- Organic waste must be collected and treated in locations separate from pre-processing area.
- Waste that is hard to decompose (nylon, plastic, glass bag, etc) must be collected and kept in separate area.

CONTROL POINT NO.25

Labelling

- Packs/bags for products must be labelled in compliance with current regulations in Vietnam.
- Re-used packs/bags must be suitable, durable and easy to clean and disinfect.



Labelling (Cont)

- Product label should have such basic information to serve origin traceability as:
 - + Name of product
 - + Name, address of producer
 - + Code of product batch
- E.g: R01-28012009
- R01: Code of production batch





**Project for Improvement of Reliability of
Safe Crop Production in the Northern Region**



Basic GAP TOT Material Series

No.6

**INTERNAL AND EXTERNAL AUDIT ON THE BASIC GAP
APPLICATION BY COOPERATIVE**

**DCP/MARD
JICA Project Team**

INTRODUCTION

This material provides guidance and references to meet the requirement of **No.24 and 26 out of 26 control points** on Basic GAP as below:

24. Has an internal audit been conducted, recorded, and filed?

26. Has an internal audit and evaluation been carried out at least one per crop/ year?



1. Why?
2. What to do (explanation for mobilization of required staffing, materials)
3. Method
4. Assessment/ evaluation
5. Lessons/ good practices from project experience
6. Reference (laws and regulations for deep understanding)

CONTROL POINT

No.24 Has an internal audit been conducted, recorded, and filed?

No	Criteria	Level	Requirement	Method	Reference
24	Has internal audit been conducted, recorded, and filed?	A	Internal audit is conducted more than once a year. The manager records and files the results of internal audit. e.g.) Non-compliance case There is no record on internal audit conducted.	- Review the record of internal audit conducted	- Checklist of internal audit

No.26 Has an internal audit and evaluation been carried out at least once per crop/ year?

No	Criteria	Level	Requirement	Method	Reference
26	Has internal audit and evaluation been carried out at least one per crop/ year?	A	Internal audit is carried out at least once per crop/ a year. It is recommendable that internal audit shall be carried out once per crop season. e.g.) Non-compliance case Internal audit is not carried out last one year. Internal audit is carried out more than once a year, but it does not follow the requirements, and/or the results are not reflected into the practices of farmers/ workers.	- Review the internal audit results	- [MGT] Checklist of internal audit

CONTROL POINT NO.24

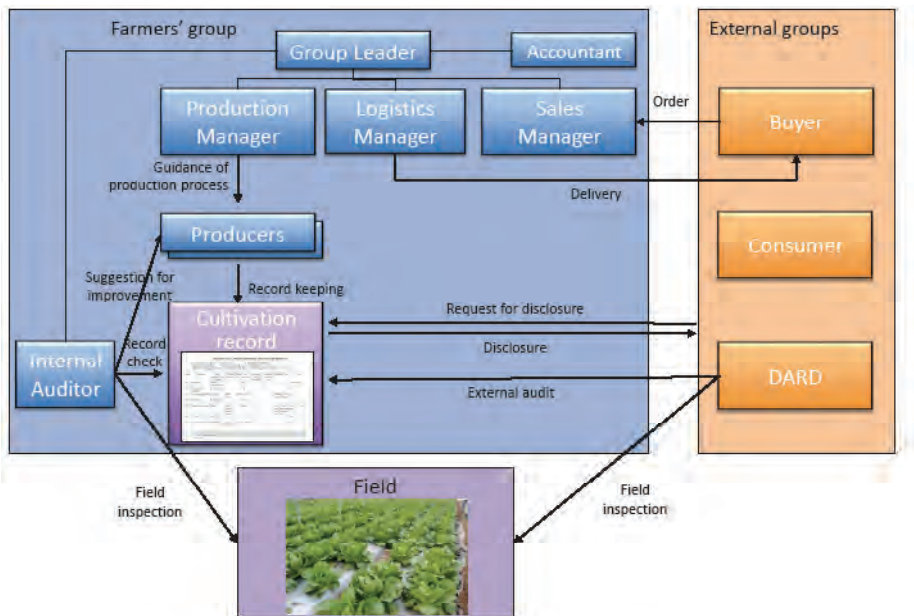
Internal audit definition

- Internal audit is a procedure put into effect by the management board, managers and other members of an organization. It is designed to ensure the relevance during the implementation process aiming at achieving the targets set by the management board:
 - Effectiveness and efficiency of activities.
 - The reliability of product safety level.
 - Compliance and regulations, rules available.
- Internal audit can be done by producers themselves or hired auditor to perform a self audit on good production practices, records and documentation in line with VietGAP requirements.

Internal audit

- Activities of an internal audit are carried out to assess the implementation of production practices in farmer households;
- The assessment results form a basis to confirm whether workers comply with Good Production Practices (Basic GAP, GMP) and records are applied properly and accurately in line with requirements or not.
- Establish quality management system in the Company/ Cooperative
- **Number of members:** 1-2 technique auditors/cooperative.
- **Requirements for technique auditors:**
 - Provided with training on auditing, monitoring, inspection.
 - Join the pilot auditing before officially becoming an internal auditor of Cooperative.

Pilot Project Implementation Structure



Operation of internal audit (Basic GAP)

- *Conduct Internal monitoring of farmers' activities*
- **Frequency:** 1 time/ month in the production cycle
- **Auditing is conducted by:** self-audit by a group (2-3 persons) of technique auditors of cooperative/ company.
- **Scope of internal audit:** 100% farmers;
- **Violation for non-compliance:** provided with guidance and corrective actions.
- **Periodical meeting:** is organized to share experience of Basic GAP application and new cultivation methods.

Operation of internal audit (Basic GAP)

- Conduct internal Audit
 - Frequency: At least 1 time/ production cycle
 - Evaluation is conduct by: Cooperative.
 - Scope of evaluation: 100% farmers; select representative farmers to conduct internal evaluation; refer to Circular No. 48 /2012/TT-BNNPTNT on evaluating VietGAP certification, number of farmers randomly selected = $\sqrt{\text{total number of farmers in cooperative/ company}}$.
 - Evaluation method: Use Basic GAP checklist (26 items) with 2 evaluation levels (satisfactory, not satisfactory)
 - Handling violation: suspension, corrective action.

CONTROL POINT NO.26

How does the internal audit operate?

- **Farmers:** provided with training on safe vegetable production technique agreed upon, cultivation skills (planting, harvesting and post-harvesting) (26 check list items) and auditing; commitment to follow the correct procedure of safe vegetable production
- **Farmer group:** from 5-15 members; group leader will instruct the production, **cross-audit among groups.**

- **Cooperative/ inter-group:** Link production groups in localities, including group leader, distributors, managers, etc. Cooperative conducts periodic auditing at least twice/ year and after each auditing, it has a report on auditing and handling of violation groups
- **Local coordination board:** provide support to internal audit groups.

TABLE 9 – TABLE OF CHECKLIST

No	Practices	Level	Notes
I	Production conditions		
1	Is production site suitable for planning of the Government and localities for produced crop expected?	A	
2	Production area is satisfactory in terms of safety (quality of soil, irrigation water) according to regulations?	A	
II	Management of planting soil and field hygiene		
3	Has analysis and evaluation of potential chemical, biological, physical risks in production soil been conducted?		
III	Manage the use of fertilizers and additives		
4	Are only fertilizers which are on the list of those approved for use in Vietnam used?		
5	Are organic fertilizers which have been treated and had sufficient documents applied only?	A	
6	When the fertilizers and additives are purchased and put into use, are they recorded and stored in the book?	A	
IV	Manage the use of water source for production		
7	Quality of water used for irrigation and post-harvest handling is assured according to current standards or not?	A	
8	Have farmers, organizations and individuals been trained on the management and utilization of agrichemicals?	A	
9	Are measures of Integrated Pest Management (IPM) and Integrated Crop Management (ICM) applied?	B	
10	Are used chemicals/ plant protection products/ biological medicines included in the list of those approved for use?	A	

11	Are chemicals, plant protection products and other agricultural materials purchased from licensed stores?	B	
12	Have plant protection products, chemicals been used in accordance with guidance of technical staff and instruction shown on package and label?	A	
13	Do farmers have a diary and record to monitor the utilization of plant protection products and chemicals?	A	
14	Are chemicals and packaging destroyed strictly in compliance with the State's regulations?	A	
15	Is there unscheduled and periodic inspections to check the production process and chemical residue of crop products?	A	
VI	Harvesting and post-harvest handling		
16	Are the products isolated properly before harvesting?	A	
17	Are areas of pre-processing, packaging and product preservation isolated from storehouses, sites containing chemicals and other materials?	A	
18	Is clean water used to wash harvested products?	A	
19	Is quality of water used in the post-harvest handling process in accordance with the State's regulations?	A	
VII	Management and Waste treatment		
20	Is wastewater, garbage collected and treated properly in accordance with regulations?	A	
VIII	Training, communication		
21	Are farmers provided with training and sufficient knowledge on Integrated Pest Management (IPM), Integrated Crop Management (ICP) and Good Agriculture Practices (GAP)?	A	
22	Is there a warning sign for a production area that has recently been sprayed?	B	
23	Records in the production diary, record keeping, traceability	A	
24	Are Field diary, production management diary fully recorded?	A	

25	Has internal audits, recording, keeping of internal audit record conducted?	A	
X	Internal audit		
26	Has an internal audit and evaluation been carried out at least one per crop/ year?	A	

CONTROL POINT NO.26

Experience for success

1. 100% group members are provided with training, guidance on standards of System.
2. 100% households of groups have registered letter to committee to comply with regulation;
3. Conduct internal audit: subjectively handle the results.
4. Combination of internal audit and external audit of functional units



Development of traceability system

Basic GAP TOT materials

*Project for Improvement of Reliability of Safe Crop
Production in the Northern Region*

INTRODUCTION

This material provides guidance and references to meet the requirement of **No.25 out of 26 control points** on Basic GAP as below:

25. Do products have product origin on label to facilitate the traceability?



Consumers...



Trace...

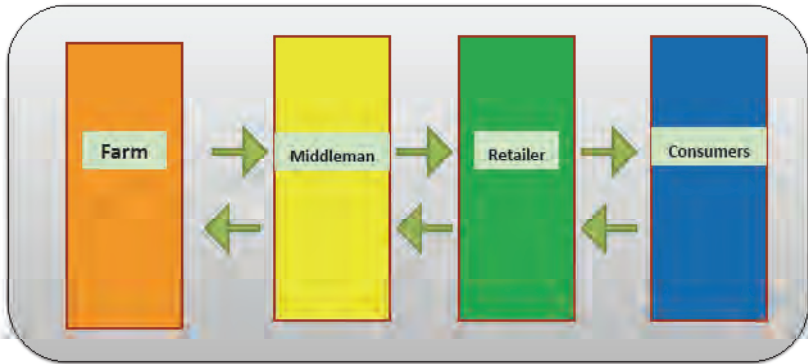


FARM



DINING TABLE

Traceability



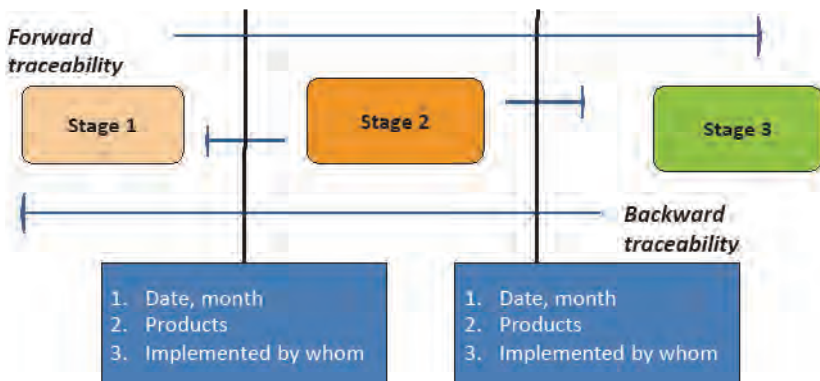
Benefits of traceability

- **Traceability meets the requirement of consumers:** knowing the origin of the food.
- Traceability ensures food safety

Only producers meeting the standards participate in the supply chain.

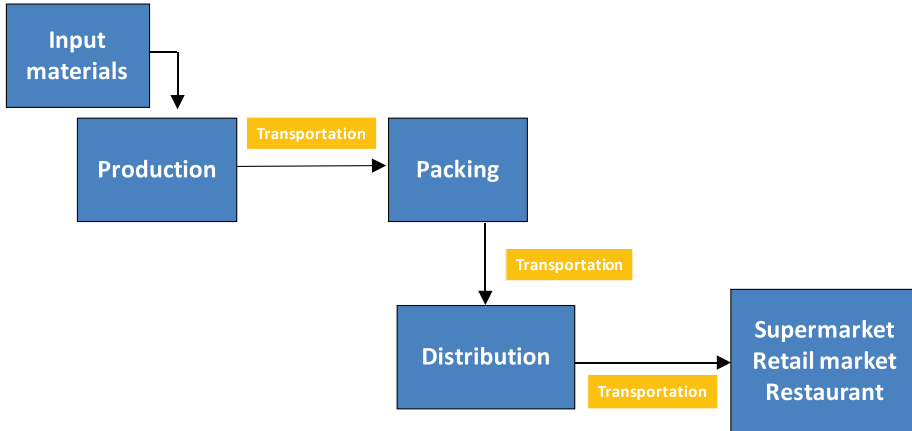
- **Traceability enables quick product recall**
 - When an incident occurs, causes for the mistake can be quickly investigated.
 - Defective products can be quickly retracted and recalled.
- **Traceability enables information exchange/ communication:** among producers, distributors and consumers.

Traceability process



Requirements on Basic Gap and origin traceability

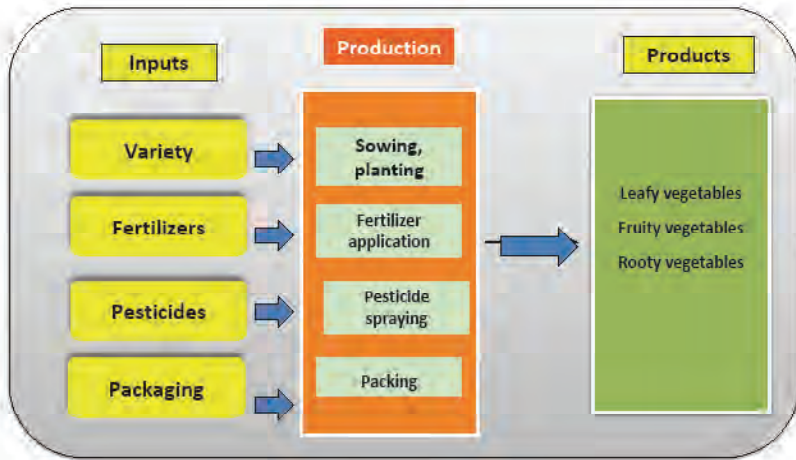
- Detailed records must be set up for every step of Basic GAP, VietGAP.
- Records must be kept.
- Products must have label so as to enable easy traceability.



Recording



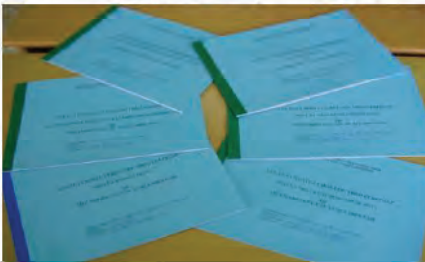
Producer...



Producer...

Records and traceability system???

Basic GAP implementation records



1. Map of production area; results of soil and water sample analysis;
2. **Basic GAP logbook for vegetables;**
3. Records on worker's trainings
4. Checklist of internal audit and evaluation;
5. Other documents.



GUIDANCE ON RECORDING

Purposes of recording:

- ✦ *Manage soil and field hygiene;*
- ✦ *Manage the use of fertilizers and amendments;*
- ✦ *Manage the use of water source in production;*
- ✦ *Manage the use of pesticides, chemicals;*
- ✦ *Manage the harvesting and post harvest handling;*
- ✦ *Manage the trainings and communication*

Trainings provided to workers



❖ Skills of recording:

- *How to record: describe in detail the practices, for example: the use of pesticides, dosage, quantity of pesticides used, etc.*
- *Where: at which plot, which farmer households?*
- *When: date and month of application*
- *Implemented by whom: the implementing person must sign on the record book.*

- ❖ Record keeping: Records must be kept, stored to serve as basis for inspection and monitoring

Records of Basic GAP application

Records of Basic GAP application: is one of tools helping to ease origin traceability including chemical, biological and physical hazards which can be arisen during production but affect product quality.

The recordings should be:

- Recorded after each working day and during production process.
- Recorded all information including the purchase, receipt, utilization of fertilizers, amendments, pesticides.
- Recorded information related to harvesting, production consumption.
- Carefully kept to avoid losing of materials.

TABLE1- PRODUCTION PRACTICE DIARY

Name of plot (No.): Area.....(m²/sào /ha) Date of transplanting:.....

Crop:..... Variety..... Expected harvesting: 1st time:.....Last time:.....

Working protective cloth: Yes (); No (). Waste is put in proper area: Yes (); No ().

Date	Work	Name of pesticides, fertilizer	Name of insect/disease	Quantity (kg, g, lit, ml, Pack)	Follow the instruction (mark x)	Warning board (mark x)	Risks detected	Implemented by

TABLE3- DIARY ON HARVESTING AND PRODUCTION SELLING

Area of pre-processing/ storage:.....

Address of retail markets:.....

Date/ month	Harvesting			Selling products					Risks detected/ handled (mark x)	Implemented by
	Type of crops	Name, code of plot	Number of interval days (days)	Quantity (kg, plant)	Price (đ/k, plant)	Ways of selling/ buyers				
						Retail selling (mark x)	Wholesale to whom	Contract-based sale to whom		

7. Recording on product receipt, pre-processing, packing and selling

TRẠI RAU HTX YÊN PHÚ
Người theo dõi: Nguyễn Thị Hiền

STT	Ngày nhận	Chủng loại	ĐVT	Số lượng	Nơi nhập	Đơn vị lấy hàng	Người xuất hàng
1	03/7/2017	Ngọt	Kg	9	Chú Đan, Mễ Hạ	Cô Đoàn, Vĩnh Khúc	Thanh
2	06/7/2017	Ngọt	Kg	10	Cô Lan, Mễ Hạ	Cô Đoàn, Vĩnh Khúc	Thanh
3	11/7	Ngọt	Kg	50	Cô Lan, Mễ Hạ	Hợp, Liễu Xá	Thanh
4		Ngọt	Kg	20	Chú Cao, Mễ Hạ	A Thái, Yên Mỹ	Thanh
5	13/7/2017	Rau muống	Kg	90	Cô Vân, Mễ Hạ	A Thái, Yên Mỹ	Thanh
6	14/7/2017	Dưa đông dư	kg	55	Cô Trung	A Thái, Yên Mỹ	Thanh
7		Dưa cái cũ	Kg	60	A Quý	A Thái, Yên Mỹ	Thanh
8		Cải ngọt	Kg	85	Cô Lan, Mễ Hạ	Hợp, cô Đoàn	Thanh
9	15/7	Củ cải	Kg	55	Mễ Hạ	A Thái, Yên Mỹ	Thanh
10	16/7	Củ cải	kg	50.0	Mễ Hạ	A Thái, Yên Mỹ	Thanh
	17/7	Cải ngọt	kg	50.0	Cô Lan, Mễ Hạ	Hợp, Liễu Xá	Thanh
		Cải ngọt	kg	70.0	Cô Lan, Mễ Hạ	A Thủy, Đồng Than	Thanh
	18/7	Bầu	kg	70.0	Chú Cao, Mễ Hạ	Hợp, Liễu Xá	Thanh
	19/7	Muối	kg	10.0	Cô Vân, Mễ Hạ	Cô Đoàn, Vĩnh Khúc	Thanh
	20/7	Cá tím	kg	30.0	Chị Hồng	Chú Phúc	Thanh
				50.0	Cô Lan, Mễ Hạ	Hợp, Liễu Xá	Thanh

Recording

Template: Pre-processing, packing, selling products

Date of harvesting	Type of vegetable harvested	Name of plot, area harvested	Quantity sold or shipped to warehouse	Means of transportation for shipping	Buyers/ location of product receipt	Người thu hoạch đóng gói	Người bán	Người sơ chế, đóng gói
15/7/2010	Rau muống	35-A-12-35m ²	15 sọt	Xe máy	Hãng	Anh (chồng)	Thu (vợ)	Hạnh

Code of production location

- Set up code for each land plot so as to identify and trace production location of each production batch.



Label/Name tag for containers

- Containers should label/name tag have to identify product batch when harvesting, receiving materials for preliminary handling and packing.



Traceability in the farm



Label / Name tag	Date of harvest:	Label / Name tag
	Code of production batch:	
	Harvester:	
	Product:	
	Quantity:	
	Kind:	

Labeling

Product label need to include basic information to enable traceability:

- **Product name**
- **Name, address of producer**
- **Code of product batch**

Eg: R01-28012009
 R01: Code of production batch
 28/01/2009: date of selling products



Using bar code to identify products after being handled and packed.



ATTACHMENT 4.2

TOF TRAINING COURSE ON BASIC GAP

1. OUTLINE OF TOF TRAINING COURSE

TOF training on Basic GAP shall be organized and conducted by PPMU members participated in TOT training as the trainers with assistance of JICA Project team. PPMU will apply Basic GAP as the technical procedures for the project and will utilize the “Basic GAP manual” developed by the previous JICA project.

- Objective

To enable participants to be aware of necessity of corrective action to keep safety and reliability of vegetable production according to Basic GAP.

To enable participants to understand and implement the procedures of production and post-harvesting according to the requirement of Basic GAP in order to produce vegetables with satisfaction of hygienic and safe requirements.

- Target participants

The expected participants are the group leader, technical inspector(s) and farmers participating in production, harvest and handling of vegetables.

- Number of participants:

20 – 25 persons/class

- Training schedules:

Trainings are expected to be conducted after implementation of TOT Basic GAP (tentatively September-October 2018).

- Training contents/topics:

The contents of TOF training will be designed by JICA Project team and CPMU including maintenance of checklist indicated in

the Basic GAP manual, internal audit procedures, quality assurance, nomination of quality control staff, etc.

- Trainers

PPMU technical staff participated in TOT training as the trainer with assistance of JICA Project Team

2. PROPOSED TOF TRAINING CONTENTS ON BASIC GAP

Time	Contents/ topic	Lessons required
07.30 – 08.00	Registration/ opening remarks of the TOF training	
08.00 – 08.15	The necessity of vegetable production under GAP	<p>1. Concern of consumers/ serious concern of society on current situation of food safety and hygiene in vegetable production:</p> <ul style="list-style-type: none"> - Existing issues during vegetable production and harvest process which cause food un-safety. - Negative impacts of residues of chemicals, heavy metal and micro-organisms in vegetable production affecting people’s health. <p>2. The necessity to apply GAP (good agriculture practices) in order to:</p> <ul style="list-style-type: none"> - Prevent, eliminate risks to food safety in product cultivation, harvesting and delivery; - Create products ensuring food safety, satisfying consumer’s requirements; - Build reputation of quality, food safety, improve economic benefit for producers.

08.15 – 08.30	Requirement of safe production area; water used for production in Cooperative, company	<ul style="list-style-type: none">- Recognize, analyze, determine the hazards (chemical, biological, physical) causing food un-safety from soil, irrigation water in safe vegetable production.- Evaluate production area and water source- Check and analyze the water source and soil ensuring the determination of safe production area.- Treatment measures to eliminate hazards affecting safe production area.
08.30 – 09.00	Good practices in fertilizer application	<ul style="list-style-type: none">- Guide standard practice procedure on fertilizers and supplemental fertilizers including:<ul style="list-style-type: none">+ Recognize, analyze hazards to food safety from fertilizers (in-organic, organic)+ Select and use fertilizers in safe and effective manner+ Measures of using fertilizers in safe vegetable production
09.00 – 09.15	Tea break	

09.15 – 10.00	The use of pesticides and chemicals in safe vegetable production	<ul style="list-style-type: none"> - Guide the implementation of standard practice procedure on pesticides and chemicals. In which, the following points are emphasized: <ul style="list-style-type: none"> + Analyze, recognize hazards causing food un-safety to products from the use of pesticides and chemicals. + Producer’s existing issues of pesticide utilization, hazards causing food un-safety. + Address to buy chemicals; + Select chemical types for use; + Safe and effective use of pesticides (dosage, treatment time; spraying technique; labor protective clothes, etc.) + Pre-harvest interval for harvesting products; + Warehouse to keep and preserve un-used pesticides and chemicals; + Treat the packs of pesticides and chemical after use; - Evaluate the contamination hazards from the use of pesticides, chemicals and treatment measures
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10.00 – 10.30	Good practices in stages of harvesting, pre-processing, packaging, loading and un-loading safe vegetables	<ul style="list-style-type: none"> - Analyze, determine the hazards to food safety and quality losses during harvesting. - Guide the implementation of standard practice procedure during the harvesting of fresh vegetables including: Pre-harvest interval; harvesting time; storage devices/ containers; labor hygiene; packaging in the field; water source, collection, delivery.
10.30 – 11.00	Guide the recording of field diary	<ul style="list-style-type: none"> - Training on recording skills for producers - Training on inspection and monitoring of recording for manager/ unit owner.
11.00 – 11.15	Discussion - Summary	<ul style="list-style-type: none"> - PPMU/ - Trainer group

For the presentation materials, please refer the website as below:

http://khuyennongvn.gov.vn/thu-vien-khuyen-nong/thu-vien-sach-kn_t244c28

TRAINING

Guide to implement basic criteria of Viet GAP (Basic GAP) in vegetable production

Basic GAP TOF materials

Project for Improvement of Reliability of Safe Crop Production in the Northern Region



What is the concept of safe vegetables?



I. DEFINITION OF SAFE VEGETABLES

- Vegetables are ensured to meet the quality requirements, both in appearance and nutrition concentration.

+ Quality requirements for appearance of safe vegetable:

- Harvested in a timely manner
- Not damaged, rotten, mixed with others, no diseases, properly packed.

+ Requirements for nutrition concentration

(Stipulated under Decision No. 46/2007/QĐ-BYT of Ministry of Health regarding the issuance of “Regulations on chemical and biological maximum residue level in food”)

- Concentration of some key heavy metals
- Micro-organism contaminated level
- Concentration of Nitrate (NO₃)
- Pesticide residue level

Adverse effects of Lead metal element (Pb)

- Lead (Pb): is an element that is highly toxic to people’s health.
- Outstanding feature: after being absorbed into the body, lead is not released but accumulated over time which can then be poisonous.
- - Lead is accumulated in bones, hindering the calcium metabolic process by hindering the Vitamin D metabolic process.
- - Lead enters the body via drinking water, air and lead-contaminated food.



- Nitrate Concentration (NO₃)

NO₃⁻ → NO₂⁻

NO₂⁻ → Enters the body. Combined with the effect of enzymes in the body, nitrate metabolizes into nitrite. Nitrite aids in the creation of ni-

trosamines, which cause cancer.

NO_2^- → Oxidates iron in red blood cells. This reduces the metabolic process in the blood, as well as hindering oxygen dissociation in red blood cells. Therefore, organs cannot be provided with sufficient oxygen.



In real production conditions, why are there these elements in roots, fruits, and vegetables?



Guide to implementing basic criteria of Viet GAP (Basic GAP) in vegetable production



II. BASIC CONTENTS

Include 5 topics:

1. Conditions of production area.
2. Water source, fertilizer and additional additives.
3. Management of chemicals, pesticides.
4. Harvesting and processing
5. Guide to recording the field diary

1. Conditions of production area

- Select area and plan the area to ensure food safety conditions for vegetable production (geographic conditions, farming soil, irrigation water source, etc)



SỞ KHOA HỌC VÀ CÔNG NGHỆ ĐÀ NẴNG TRUNG TÂM ỨNG DỤNG TIẾN BỘ KHCN & KĐ KN Địa chỉ: Phường Quang Trung – Phố Lý – Hà Nam Tel : 0351.3841891, 3842049					
PHIẾU KẾT QUẢ THÍ NGHIỆM Số: 04.04.14/1-TN					
1. Cơ quan gửi mẫu: Trung tâm khuyến nông – Sở nông nghiệp & phát triển nông thôn					
2. Tên mẫu: Nước sử dụng tưới rau					
3. Ngày nhận mẫu: 25/03/2014					
4. Ngày phân tích: 25 - 04/04/2014					
STt	Thông số	Đơn vị tính	Phương pháp thử	Kết quả	QCVN 39: 2011/BTNMT
1	Cd	mg/l	TCVN 6197-1996	<0,001	0,01
2	Asen	mg/l	TCVN 6182-1996	0,0011	0,05
3	Thủy ngân	mg/l	TCVN 5991-1995	<0,0001	0,001
4	Chi	mg/l	TCVN 6193-1996	0,0015	0,05
5	FecalLeoli	Vi khuẩn/100ml	TCVN 6187-1996	0	200
<i>Kết luận: Các chỉ tiêu trên đạt yêu cầu theo QCVN 39: 2011/BTNMT Quy chuẩn kỹ thuật quốc gia về chất lượng nước dùng cho tưới tiêu.</i> Phú Lý, ngày 04 tháng 04 năm 2014					
GIÁM ĐỐC		PHÒNG LAS	KỸ THUẬT VIÊN		
Nguyễn Văn Út		Mã Thị Bích Nhàn	Trần Hồng Nhung		
<i>(Kết quả trên chỉ có giá trị đối với mẫu thử)</i>					

SỞ KHOA HỌC VÀ CÔNG NGHỆ ĐÀ NẴNG TRUNG TÂM ỨNG DỤNG TIẾN BỘ KHCN & KĐ KN Địa chỉ: Phường Quang Trung – Phố Lý – Hà Nam Tel : 0351.3841891, 3842049					
PHIẾU KẾT QUẢ THÍ NGHIỆM Số: 04.04.14/2-TN					
1. Cơ quan gửi mẫu: Trung tâm khuyến nông – Sở nông nghiệp & phát triển nông thôn					
2. Tên mẫu: Mẫu đất					
3. Ngày nhận mẫu: 25/03/2014					
4. Ngày phân tích: 25 - 04/04/2014					
STt	Thông số	Đơn vị tính	Phương pháp thử	Kết quả	QCVN 83: 2008/BTNMT
1	Asen	mg/kg	TCVN 6949-1999	0,052	12
2	Cd	mg/kg	TCVN 6949-1999	0,0017	2
3	Đồng	mg/kg	TCVN 6949-1999	1,2	50
4	Chi	mg/kg	TCVN 6949-1999	1,8	70
5	kẽm	mg/kg	TCVN 6949-1999	30	200
<i>Kết luận: Các chỉ tiêu trên đạt yêu cầu theo QCVN 83: 2008/BTNMT Quy chuẩn kỹ thuật quốc gia về giới hạn cho phép các kim loại nặng trong đất.</i> Phú Lý, ngày 04 tháng 04 năm 2014					
GIÁM ĐỐC		PHÒNG LAS	KỸ THUẬT VIÊN		
Nguyễn Văn Út		Mã Thị Bích Nhàn	Trần Hồng Nhung		
<i>(Kết quả trên chỉ có giá trị đối với mẫu thử)</i>					

2. Irrigation water source



Irrigation water source

Type of water	Water source
<ul style="list-style-type: none">→ Irrigation water,→ Infusion water: nutrition liquid, leafy fertilizer, pesticides;→ Water to wash working tools	<ul style="list-style-type: none">→ river,→ lake, big pond→ Drilled well,→ Water tank



Hazards of irrigation water

Hazard	Contamination sources	Method of causing contamination
Chemical	<ul style="list-style-type: none"> + Chemicals: are poured, leaked or flowed into water source from surrounding area + Surface water from river, streams going through industrial zone and area which is contaminated and has residues of chemicals and pesticides. 	<ul style="list-style-type: none"> → Use contaminated water, plants will absorb through roots and accumulate in eaten parts of plants. → Direct application of contaminated water into eaten parts of plants that are going to be harvested.
Biological	<ul style="list-style-type: none"> + Water from rivers and streams will be biologically contaminated if it goes through livestock or cattle area, domestic waste area or residential area. + Surface water from ponds, lakes whose water is biologically contaminated (corpses, feces of birds, mice, animals, etc). 	

Water used to treat products (Processing water)

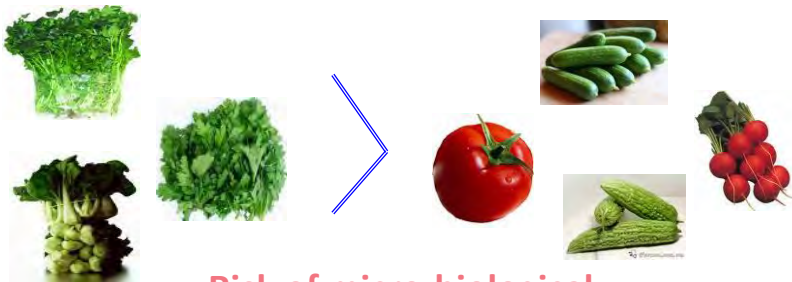
Type of water	Water source
<ul style="list-style-type: none"> Water to wash products, Water to infuse preservation chemicals Water for cleaning → Water to make ice covering the products 	<ul style="list-style-type: none"> Tap water → Water from drilled well Must meet standards

Please sympathize, the weather is too drought!!!!



Hazards of water used for post harvest handling

Hazards	Contamination source	Contamination Method
Chemical	<ul style="list-style-type: none"> + Drilled well water is contaminated such as Asen, mercury, etc. + Domestic water does not achieve standard + Washing water is provided from contaminated domestic water source 	<p style="color: #E91E63; font-weight: bold;">Directly</p> <p>Washing products by contaminated water</p>
Microbiological	<ul style="list-style-type: none"> + Drilled well water gets micro-biological contamination due to flow from contaminated area. + Water is contaminated from untreated waste water. 	



Risk of micro-biological contamination from irrigation water



Measures to eliminate hazards

Don't use the following water for watering

- ☞ Industrial waste water,
- ☞ Waste water from hospital,
- ☞ Water from residential area,
- ☞ Water from livestock farm,
- ☞ Water from slaughter-house
- ☞ Water from dung/ manure, untreated urine











Control animals



Use of watering water

- Should apply water from sprinkler in early morning so that leaves can dry quickly.
- Should use water source of best quality for sprinkler watering, pay attention to pre-harvesting.
- If possible, should not apply water from sprinkler at least 5 days before harvesting.
- If possible, apply dribbling method or watering for the bed near the harvesting time to eliminate contamination hazard to plants.
- When the water source is not clear or quality of water can't be controlled (ex. Water from river), apply furrow watering method.

Fertilizer and additive fertilizer



Chemical hazards

Hazard	Origin source	Contamination method
High contents of KLN (As, Pb, Cd, Hg,...)	The appearance of heavy metal (especially Cadimi) in fertilizers and additive fertilizers of such low level as gypsum, animal manure, composting, etc.	Contents of metal from fertilizer and additive fertilizers result in high content of metal in soil Which the plants then absorb.



High risk for root vegetables

Chemical hazards

Hazard	Origin source	Contamination method
High content of Nitrate	+ Soil has nitrogen (normally the organic nitrogen) + Overuse of nitrogen fertilizer (organic and chemical) or late application	The vegetables absorb too much nitrate from the origin source, causing high levels of nitrate accumulated in harvested products.



High risk for vegetables whose young parts are eaten (leaves, stems and flowers)

Biological hazard

Hazard	Origin source	Contamination method
Harmful microbes	Kinds of manure, human feces or urine and untreated animal urine or that does not meet the composting quality always contain a big amount of harmful microbes	+ Contamination may happen through direct contact between eaten parts and organic fertilizer during the time of application + Leafy and stem vegetables near the ground, root vegetables under the ground face hazards of bio-contamination with this fertilizer.

Selection of fertilizer and additive fertilizers



→ Only use fertilizers on the list of those approved for production and trading in Vietnam issued by MARD.

→ Only use fertilizer and additive fertilizers of clear utilization guidance

→ Do not use fertilizers of un-clear origin, no label or expired.

→ Do not apply untreated organic fertilizer to vegetables because they contain many harmful microbes.



Application of safe fertilizer: Organic fertilizer

→ Directly apply organic fertilizer to soil early and cover the fertilizer with soil.

→ Pay attention to not let fertilizer directly touch the eaten parts of vegetables;

→ Only apply organic fertilizer completely treated and stop applying at least 2 weeks before harvesting.



Application of safe fertilizers



Apply organic fertilizers in early season, cover the fertilizer with soil and use the proper covering materials

Application of safe fertilizer: Chemical fertilizers

- ▶ For chemical fertilizer: Apply sufficient dosage of nitrogen fertilizers according to technical regulations for each kind of vegetable; avoid overuse of nitrogen fertilizer; stop application of nitrogen fertilizers at least 15 days before harvesting



Other notes:

- Keep the application tools clean → Adjust the fertilizer measuring tools at least once/ year
- Treatment of safe fertilizer: Organic fertilizer/ manure

Treat safe fertilizer: Organic fertilizer/ manure

- Must be treated by composting for at least 6 weeks
- Regularly mix to ensure sufficient temperature, humidity to facilitate decomposition of organic substances
- Area for storage and treatment: should be separate from production, post-harvesting handling areas, and should have covering materials.
- Recording the time and method of treatment



Treatment of safe fertilizer: Chemical fertilizer




Warehouse to preserve fertilizer, mixing and packing area must be separate from production and post harvest areas; it should have the covering, good warehouse regulations, etc to eliminate the contamination hazard

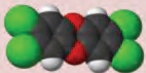
PESTICIDES AND CHEMICALS



HAZARD IDENTIFICATION

Hazards	Reasons
<p>Pesticides</p> 	<ul style="list-style-type: none"> + Use of prohibited pesticides; + Use of pesticides un-registered for vegetables; + Pre-harvesting intervals for pesticides are not ensured; + Pesticide improperly applied (mix many kinds of pesticides, increase dosage); + Low quality spraying equipment (leakage, incorrect quantity, etc); + Pesticides drift from adjacent areas; + Spraying pesticides near harvested products or packaging materials; + Pesticide residues accumulated in soil from previous uses; + Pesticides stick to product containers.

HAZARD IDENTIFICATION

Hazards	Reasons
<p>Other chemicals</p> 	<ul style="list-style-type: none"> + Use of preservation chemicals unapproved or improperly; + Improper use of chemicals for cleaning and washing, leaving residues left on equipment, containers, etc. + Fuel (oil, gasoline), paint, etc on equipment and tools for harvesting, packaging, delivering, resulting in direct contamination to products and product packs; + Soil and water are contaminated by chemicals from nearby industrial zones and chemical factories.

Selection and Purchase of PESTICIDES



Only buy pesticides from licensed shops

LIST OF PESTICIDES PERMITTED FOR USE IN VIETNAM
 (Issued together with Circular No. 09 /2009/ TT-BNN dated 03/03/2009 of MARD)
 For further detail information, refer to website of Plant Protection Department:

<http://www.ppd.gov.vn>

Only use pesticides from the permitted list



Do not buy pesticides which are banned, unlisted, low quality or fake, etc.

Transportation



Do not let children transport pesticides



Don't put pesticides with food stuff

Measures to eliminate and mitigate hazards



LOCATION/STOREHOUSE FOR PESTICIDES AND SPRAYING EQUIPMENTS

- There must be a storehouse for preservation of unused pesticides;
- Storehouse must be constructed on high land, dry location and far away from residential area as well as causing no impact to products in the production site.
- Storehouse must have warning board, locks and fire prevention equipment (big storehouse) and sand for timely treatment in case of pesticide leakage, break and spill;
- Pesticides in the storehouse must be well arranged to avoid break and spill; do not put them together with other materials to avoid confusion.

Warehouse to keep pesticides

Only keep pesticides which have origin and complete stamp, label

Do not keep pesticides with other materials (fertilizers containing ammonium nitrate, potassium nitrate or sodium nitrate, clo).

Pesticide containers must have clear label, do not move pesticides from its container to a different one.



Do not put pesticide of liquid form on shelves above the pesticide of powder form.



Divide the preservation areas into separate lots with notice board.

SELECTION, utilization of pesticides

- Only apply pesticide when insects and diseases affect yield (economic efficiency). Based on inspection results at the field (plant growth, insect concentration, disease ratio and weather conditions, etc)
- Only use pesticides from the list of those approved for use in Vietnam

- Should select pesticides with low toxic level (less toxic) based on color bars on the products.

+ Red: extremely toxic

+ Yellow: highly toxic

+ Blue: Less toxic (still dangerous)

Promote the use of biological pesticides, especially at the end of season.

SYMBOLS OF TOXICITY LEVEL

<i>Nhóm độc</i>	<i>Bảng màu</i>	<i>Biểu tượng</i>	<i>Cần lưu ý</i>
Nhóm I			"Rất độc"
Nhóm II			"Độc cao"
Nhóm III			"Nguy hiểm"

Pesticide utilization techniques

- Direct users of pesticides must be provided with training of safe and effective technique and first-aid methods for cases affected by pesticides

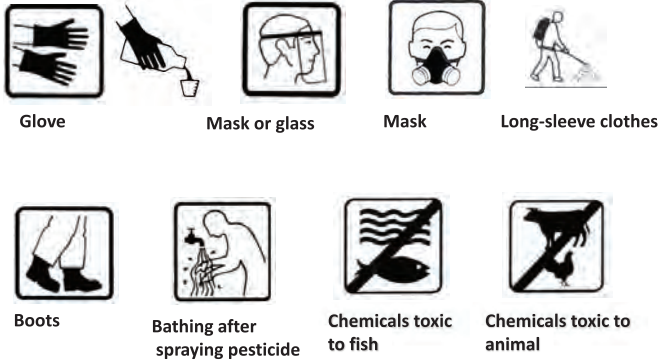
- Apply principle of "4 corrections": correct pesticide, correct time, correct dosage, and correct method.

- Correctly follow the guidance in terms of targeted insects and diseases, dosage, concentration (have tools to measure the amount of pesticides and water before mixing) and must ensure pre-harvesting interval according to the guidance of each kind of pesticide.

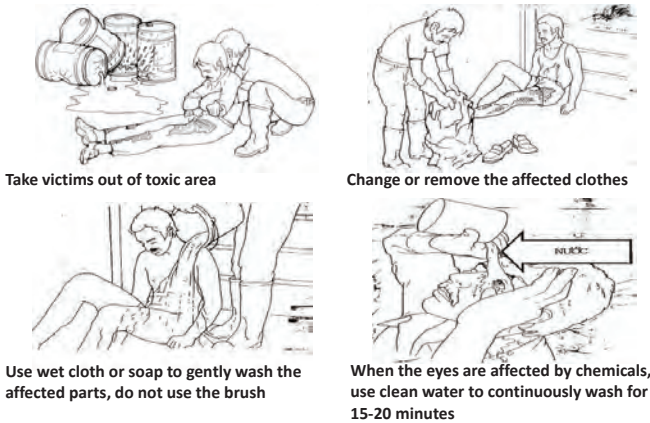
- Basing on crop areas to mix sufficient amount of pesticides, do not use the pesticides mixed from previous days.

- If there is need to use a new kind of pesticide, there should be guidance provided by a professional expert on pesticides.

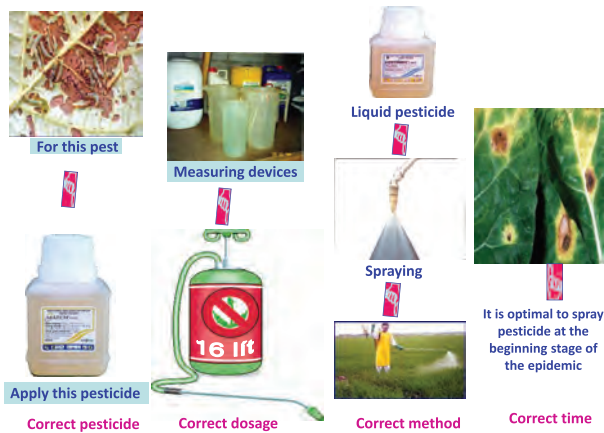
SAFETY WARNING SYMBOLS



FIRST-AID FOR PERSON who directly touches or uses PESTICIDE



“4 corrections” principle for using pesticide







Follow the instructions on the pesticide label



☞ Before using pesticide, it is the most important to read carefully and clearly, specifically understand all the information and instructions on the pesticide label!

Follow the instructions on the pesticide label

CAREFULLY READ THE PESTICIDE LABEL BEFORE USING

<p style="text-align: center;">INSTRUCTION FOR USE</p> <p>:: Crops</p> <p>:: Pest</p> <p>:: Dosage</p> <p>:: Mixing method</p> <p>:: Water amount for use</p> <p>:: Treatment time</p> <p>:: Number of treatments/season</p> <p>:: Pre-harvest interval</p> <p>:: Some important notes</p>	 <p>Type of pesticide</p> <p>NAME OF PRODUCTS* 123 XX</p> <p>Purpose: abc def ghi jkl mno pqr stu vwxyz abc def ghi</p> <p>Active substance: zzz 12.3%</p> <p>Weight</p> <p>Volume</p> <p>Registration No. Name, address of producers</p> <p>Quality reg. No. </p> <p>Production date </p> <p>Expire date </p>	<p style="text-align: center;">SAFETY INSTRUCTIONS</p> <p>*Pesticides must be kept in packs, store in dry place, out of children's reach, away from foodstuff and livestock.</p> <p>*Wear safety clothes when applying. Spraying pesticide should always operate in wind direction. Avoid pesticides to drift by the neck, mouth.</p> <p>*Do not eat, drink, smoke during the spraying. Have a bath, change clothes after spraying.</p> <p>*Do not wash sprayer, mixing or tank in canals, ditches, ponds, lakes or other water sources. When pesticides are used up, packs must be disposed and dumped properly.</p>
		<p style="text-align: center;">FIRST AID</p> <p>*If pesticides stick on skin: take off clothes. Continuously flush water on affected skin. Clean skin and hair carefully with soap.</p> <p>*If pesticides stick on eyes: Quickly wash eyes with clean water. Keep eyes open and wash eyes in the water for 15 minutes.</p> <p>*If the pesticides are swallowed: take the victims to the nearest clinics, remember to bring the pesticide label along.</p>



Mix pesticides to have safe and effective treatment



- Mix pesticides sufficient for use to apply in treatment area.
- Do not use the pesticides mixed from previous day for use.



Súc rửa bình xuống sông rạch



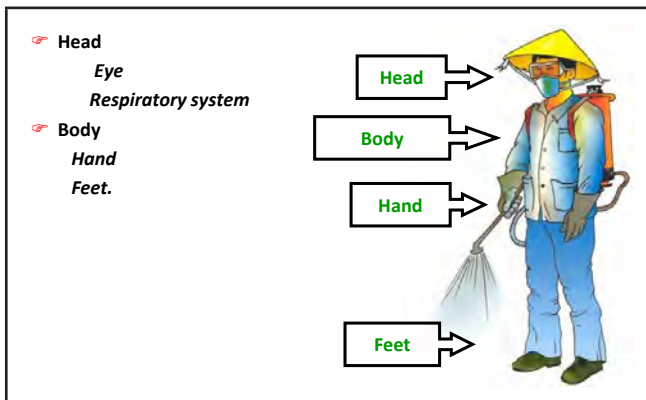
- Surplus of mixed chemicals and pesticides must be properly treated to avoid environment contamination.
- The surplus of mixed pesticides should be collected and treated in a proper manner, do not pour into farming land and water source.

Safety for contact with pesticides and chemicals

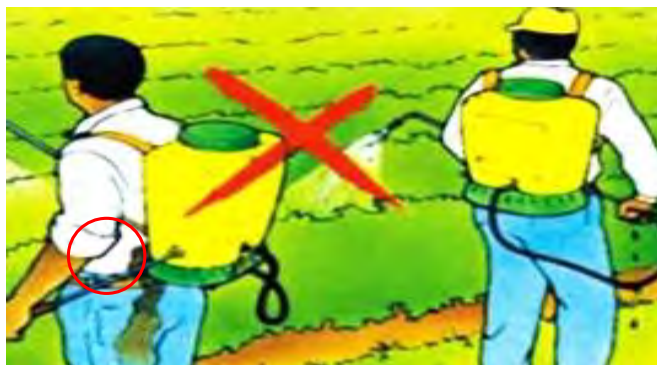
Wear protective clothes during the application of pesticides



Parts of the body need to be protected



Spraying devices



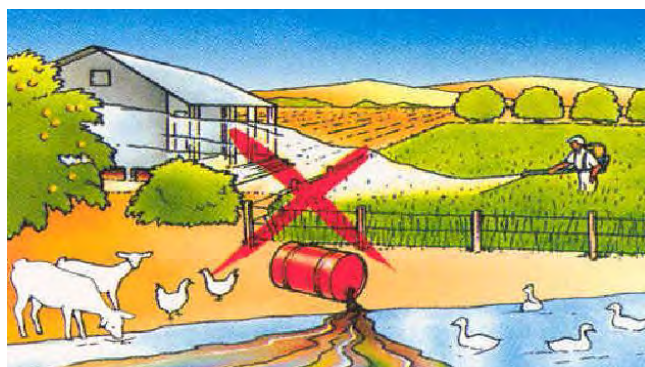
Do not use leaking, damaged, low quality sprayers

Cleaning the spraying devices



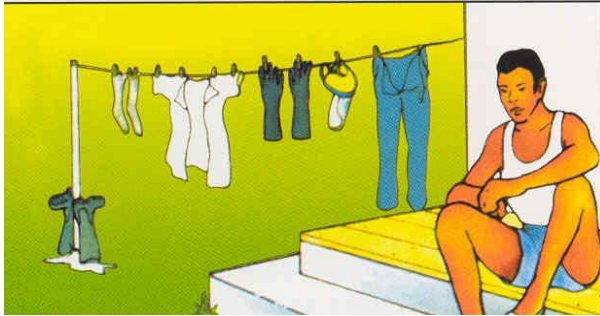
✘ Clean and check spraying devices after each working day

Safety for use



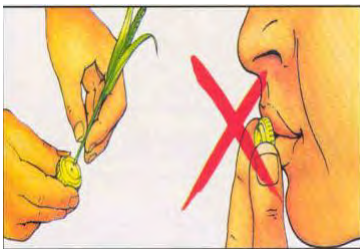
🚫 Do not pollute the environment due to improper pesticide utilization.

Safe labor



☞ Wash and clean clothes and protective devices after each working day

Safe labor



- ☞ Do not clean the sprayer valve by mouth. Clean it by water or a soft stick.
- ☞ Do not carelessly place pesticides and pesticide containers.

Management of pesticide packaging

- Pesticide packaging must be collected and properly treated after use.

Do not carelessly throw packages in order to avoid contamination to products and environment.

Do not use pesticide packages for other purposes such as containing, chocking and holding products.

Manage pesticide packages properly.



Pesticide packaging, expired pesticides and prohibited pesticides must be collected and stored in a safe place to await proper treatment.

Do not carelessly throw pesticide packaging in production field after use

Pesticide packaging



- ☞ Production field should have designated area to keep pesticide packs
- ☞ Pesticide packs must be collected and treated in a proper way

Check and monitor the use of pesticides

- Regularly check the warehouse. Take maintenance actions for improper conditions.

Regularly check techniques of pesticide application to have corrective actions.

Record the purchase, preservation and utilization of pesticides

All activities related to purchase, storage, preservation and utilization of pesticides must be fully recorded (time of purchase, kind of pesticide, volume, time of use, crops, sprayed plot, etc)

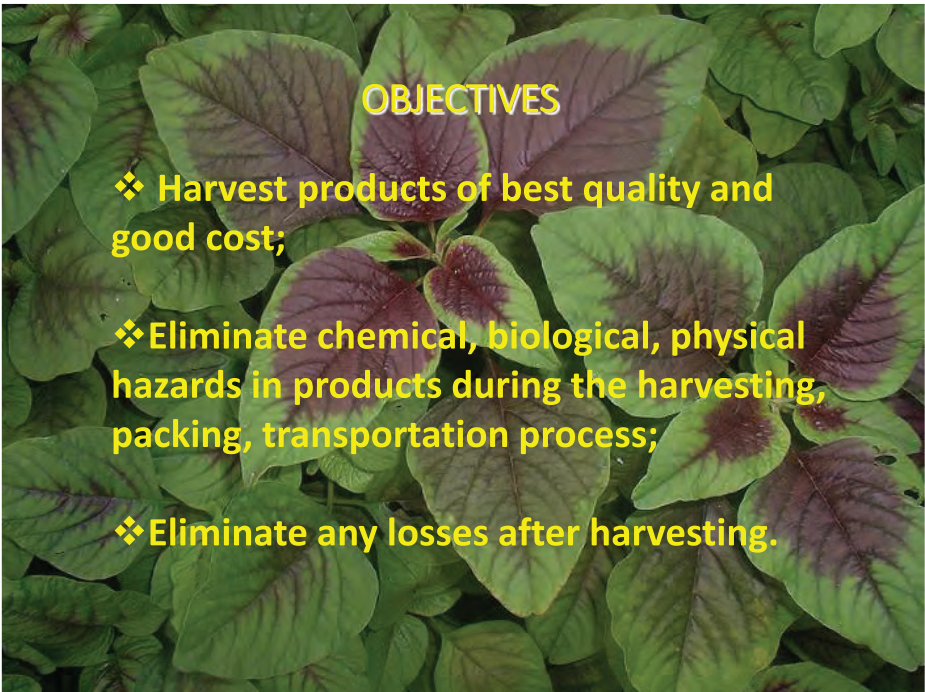
Corrective action to mitigate or prevent hazards of pesticide preservation and utilization

- In case the pesticide residues exceed the Maximum Residue Level (MRL), the following actions should be taken:
- Determine the reason for contamination by reviewing the pesticide utilization record
- Stop harvesting the products, continue to monitor until pesticide residue is lower than MRL and then start harvesting again
- Have such measures to avoid the re-occurrence of this situation as: re-train the labor, standardize the tools and equipment, spraying methods, storage renovation, etc.



Good Harvesting Practices

TOF materials on good harvesting practices of Basic GAP in vegetable production



OBJECTIVES

- ❖ Harvest products of best quality and good cost;
- ❖ Eliminate chemical, biological, physical hazards in products during the harvesting, packing, transportation process;
- ❖ Eliminate any losses after harvesting.

CHEMICAL HAZARDS

Hazards	Reasons
<p>▶ Pesticide residues exceed MRL;</p> <p>▶ Other chemicals oil, cleaning substances, sterilization substances, etc.</p>	<ul style="list-style-type: none"> ■ Pre-harvest interval not ensured; ■ Due to the pesticide application of nearby plots; ■ Leakage onto equipment, tools that directly touch the products; ■ Leakage during the transportation process; ■ Chemical residues accumulated in tanks which keep chemicals, fertilizers; ■ Improper use of sterilization substances.

BIOLOGICAL HAZARDS

Hazards	Reasons
<ul style="list-style-type: none"> ● Harmful microbes such as <i>E.coli</i>..... ● Such parasitic creatures as worm, sessile hydatid, etc. 	<ul style="list-style-type: none"> ● Products directly touch soil, ground during the harvesting process; ● Unsafe conditions of Equipment, tools and containers that directly touch products; ● Contaminated water source used for washing products during the harvesting process; ● Animals/ harmful creatures (cockroaches, mouse) or waste from animals (urin, etc.) directly touch products; ● Labor does not comply with individual hygiene process; ● Labor contracts infectious diseases; ● Unsafe means of transportation.

PHYSICAL HAZARDS

Hazards	Reasons
<ul style="list-style-type: none">● Miscellaneous objects such as: soil, stones, glass, metal, plastic, jewelry;● Damaged products	<ul style="list-style-type: none">● Damaged or unsafe conditions of tools for harvesting, packing, preserving, transporting products.● Miscellaneous objects such as jewelry, gloves, etc. are dropped into products during the harvesting and transportation process.● The products are not gently and softly moved, resulting in damage to products.

Losses after harvesting

- Reduced quality;
- Food safety not ensured;
- Reduced yield;
- Reduced nutritional value of the products;
- Economic losses – reduced value of products due to the reduction of quality and yield.

Changes of product quality after harvesting

Chlorophyll decomposition – reduced perceptible quality of products, especially leafy vegetables.

Dehydration due to evaporation – freshness decreases, causing faded vegetables and softened tissue structure.

Respiration continues – reduced concentration of nutrients in the products.

Pre-harvesting

Check Pre-harvest Interval (PHI): ensure number of days from last pesticide application to harvesting point is in line with the stipulations.

If PHI is not long enough, wait until it meets the stipulated number of days before harvesting products.

Check the record of pesticide use to confirm the exact PHI.

Harvesting point

- Define the exact point to harvest products:
- Ensure economic benefit;
- Ensure perceptible quality, nutritional quality:
 - Early harvested products do not meet expected quality standards;
 - Late harvested products will be old, fibred and the quality will be reduced.
- **Ensure food safety** – correct PHI



Amaranth: 4 weeks after sowing the seeds

Green mustard: 28-32 days after transplanting the seedlings



Hydroponic morning glory
30 days after sowing the seeds

HARVESTING POINT



Cabbage: 8-11 weeks after transplanting the seedlings

Harvesting time

- Harvesting time: at the coolest time of the day – early morning or late in the afternoon.
- Do not harvest products in rainy or high humid weather – wet products easily generate temperature if they are not preserved in ventilated air condition, therefore easily rotten.



- Post-harvest products should be placed in cool places (in shade or under the roof, etc) if they are not immediately transported to pre-processing house or selling house.

Harvesting

- Tools: knife, sickle, scissors, etc.
- Product containers: tray, plastic containers, bamboo baskets, nylon bags, jute bags, etc.
- Product lining materials, containers: canvas, nylon, etc.

>>> must be clean and ready for use when harvesting products.

- *Check, ensure hygiene of tools, devices, containers before use to eliminate product contamination hazards..*



Use plastic baskets to store products

- Don't use containers and devices if they can't be cleaned or product contamination hazards can't be eliminated.
- Devices, containers in direct contact with products must be made from non-toxic materials.
- Devices and containers must be structured to ease washing and cleaning.
- Do not directly place products on the ground or floor.
- Materials used to line, separate products from soil (canvas, paper, etc) must be clean and do not cause contamination.



Do not use fertilizer bags to line products

- Do not use containers, bags from chemicals, fertilizers, waste to store products.
- Tools, devices, containers must be regularly maintained to avoid chemical and physical hazards to products.
- Devices, containers must be separated from storage areas of chemicals, fertilizers or soil amendments.
- There should be measures to distinguish product containers used for harvesting and product containers used in the pre-processing house: different shapes and colors.
- If various production batches are harvested at the same time, the symbols of each production batch should be clearly noted on the containers to enable product batch identification.
- Container identification symbols must be on non-removable waterproof material so it will not be removed or torn during transportation.



Product containers without symbols

Worker's hygiene

- Workers must be trained to comply with hygiene practices when harvesting, details as following:
 - Wash hands before contact with products;
 - Wash hands after use of toilets, contact with animals, eating, smoking, contact with wastes;
 - Open wound or scratch must be bandaged, avoid direct contact with products;
 - Do not eat, smoke, spit during harvesting;
 - Do not wear watches, jewelry or others during harvesting.

- If gloves are used for harvesting, clean them after use;
- Workers must wear protective cloths when necessary to avoid production contamination hazards;
- Workers having infectious diseases (for example, Hepatitis A, diarrhea, etc) can't participate in harvesting products.

Do not put the products directly on the ground



Packing products

- If products are packed to sell right in the field: must use canvas to line products, do not let products directly touch the soil.
- Check, ensure hygiene conditions for bags and containers before use to eliminate product contamination hazards.



Check the packs, bags when packing in the field

Water source

- If water is used to wash products in the field: water source must meet required standards for water used in preliminary handling.
- Do not wash products by water from lakes, ponds, irrigation water from ditches, water used for cleaning devices, etc

Collecting products before transporting to the pre-processing house

- Products must be collected in places which do not cause contamination to products.



Gathering products right on the side of the ditch and road

- Do not put products in areas for storing chemicals, fertilizers.

Transporting the products

- Products must be separately transported from fertilizers, soil amendment, pesticides, animals, etc.
- Notes during transportation: check the bottom of containers, ensure no soil, dirt, etc. to prevent products in the container below from being contaminated by direct contact with the bottom of the container above.
- Check means of transportation, ensure no dirt, soil, miscellaneous objects, etc to avoid contamination to products.
- If animals are used to transport products: ensure that animals do not directly contact products, avoid direct and indirect contamination to products.
- Do not let livestock access harvesting and pre-processing areas.



Place containers directly on the ground – Pay attention to checking the bottom of the containers



Field diary Recording and Traceability program

Basic GAP TOF materials

*Project for Improvement of Reliability of Safe Crop
Production in the Northern Region*

1

Traceability is imperative



FARM

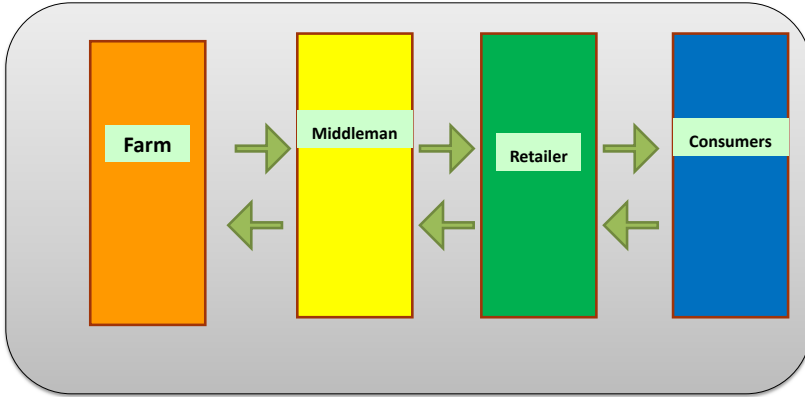


DINING TABLE

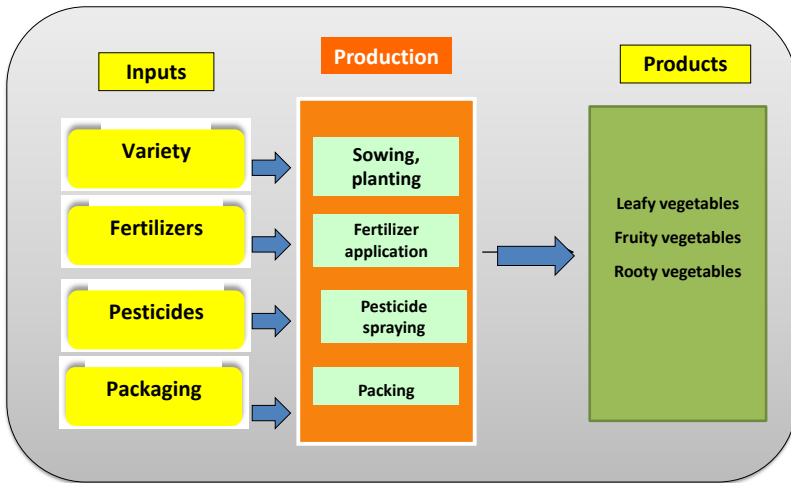
Consumers want to know about the produce they buy



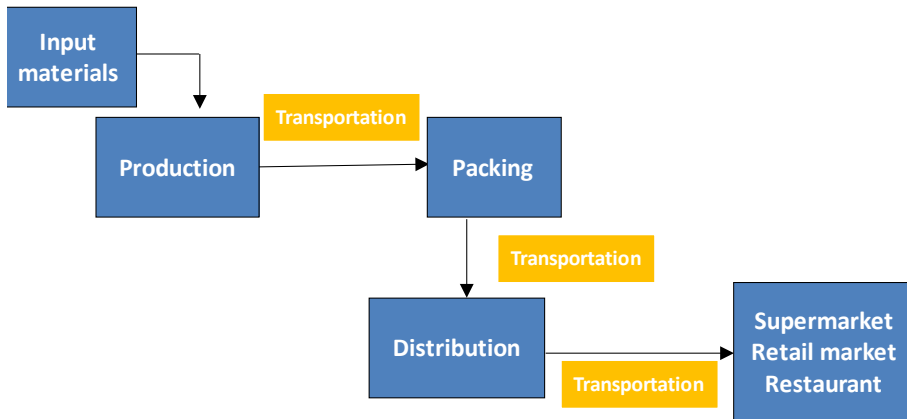
Traceability is economically beneficial



Producers must be as transparent as possible



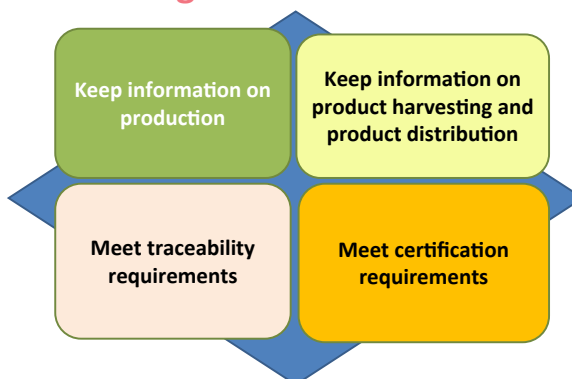
Production process



Benefits of traceability

- Traceability meets the requirement of consumers: to know the origin of the food.
- Traceability ensures food safety
 - Only producers meeting the standards participate in the supply chain.
- Traceability enables quick product recall
 - When an incident occurs, causes for the mistake can be quickly investigated.
 - Defective products can be quickly retracted and recalled.
- Traceability enables information exchange/ communication: among producers, distributors and consumers.

Benefits of Recording



BOOK 1- FIELD DIARY

GUIDANCE FOR USE

- 1. Target of use:** farmers/ producers
- 2. Reason for recording Field diary:** to prove production activities, monitor the outgoing and incoming flow of money, calculate economic turnover, adjust schedule/ plan for next season
- 3. Guidance for use:** record and keep activities including production, purchase of agricultural materials, harvesting and selling products
- 4. How to record:** record production activities (following forms in the book)
- 5. How to keep records:** farmers/ producers should regularly record and keep diary of production practices (hanging on the wall, place seen daily to facilitate convenient use).

Note: Checklist and evaluation table including 26 control points are used to monitor, evaluate internally during the process of production practices (following GAP)

Based on basic principles of this book, producers can split or detail to make it suitable to each specific condition.

FIELD DIARY

SAMPLE PAGE– DIARY OF PRODUCTION PRACTICES

Name of field plot (No.): 01 Area: 0,5 sào Planted date: 5/9/2010

Name of crop: cabbage; Varieties: KAKACROSS; Expected harvest time: 1st time: 24/11

Last time: 5/12

Protective cloth: Yes () No (); Waste disposal is placed in proper place: Yes (), No ()

Date, (Solar year)	Activities	Name of pesticides and fertilizers	Name of disease	Quantity (kg, g, litre, ml, pack)	Follow the guidance	Warning board (x)	Risks detected	Implemented by
2/10	Fertilizing	Composted manure		50 kg			No warning board	Trần Thị Mỹ
7/10	Applying nitrogen with water irrigation	Nitrogen Urea		2 kg				Mỹ
13/10	Spraying pesticide	Regent	Diamond-black moth, flea beetle	0,2		x	Plot No.3 is sprayed 3 times more than usual	Mỹ
20/10	Spraying pesticide	Abamectin	Deep blue	0,2		x		Mỹ

TABLE 1 - DIARY OF PRODUCTION PRACTICES

Name of field plot (No.):Area..... Planted date.....
 Name of crop:..... Varieties..... Expected harvesting time: 1st:.....Last time
 Protective cloth: Yes () No (); Waste disposal is put in proper place : Yes () No ()

Record from planting to harvesting; One separate table for each kind of crop to facilitate convenient monitoring

Date, (Solar year)	Activities	Name of pesticides and fertilizers	Name of disease	Quantity (kg, g, litre, ml, pack)	Follow the guidance	Warning board (x)	Risks detected	Implemented by

TABLE 2 – DIARY OF BUYING AGRICULTURAL SUPPLIES FOR PRODUCTION

Place to keep pesticides, fertilizer.....

The stores which provide agricultural supplies must have a business license, under the control of legal agencies

Date (Solar year)	Name of pesticides, fertilizers	Quantity (Kg, g, liter, ml, bottle, pack)	Price (đồng/ kg, liter, bottle, pack)	Purchased at stores of Cooperative/ household owner, mark (x)	Purchased at other stores		Buyer/ User (Full name, sign)
					Name	Address	

TABLE 3. DIARY OF HARVESTING AND SELLING PRODUCTS

Area of pre-processing/preservation:.....Address of retail markets :.....

Note: This table is commonly used for many kinds of vegetables harvested from different field plots; Number of isolation days: from last

day of spraying pesticides to harvesting day;
 At the column of retail and risk detected.. If any, just mark (x)

Date/ month (solar year)	Harvesting			Selling products					Risk detect- ed/ already addressed the hazard (mark x)	Implement- ed by
	Kind of crop	Name/ code of field plot	Isola- tion time (day)	Quan- tity (kg, plant)	Price (đ/kg, plant)	Selling ways/ buyers				
						Retail (mark x)	Whole- sale to whom	Sold under contract to whom		

BOOK 2- PRODUCTION MANAGEMENT DIARY

GUIDANCE FOR USE

- 1. Target of use:** Head of Cooperative/ group leader/ Technical staff
- 2. Reasons for recording production management Diary and record keeping** Run production activities; manage quality of inputs, adjust unsafe behavior; evidence of traceability, improve management responsibility, etc.

3. Guidance for use:

How to record: record production management activities of Cooperative/ production unit/ farmers group (following form)

How to keep record:

Head of Coop/ head of unit/ respective technical staff/ leader of farmers group is responsible for monitoring production process, production management in the area and keeping the record.

Note: Checklist, evaluation table including 26 control points are used for internal auditing and evaluation (1-2 times/ year or 1/ season)

Results of internal auditing (for each household) are stored in Table 5-Production management in the area. In case of being not satisfactory, it requires corrective actions and re-check.

TABLE 4 – PRODUCTION CONDITIONS MANAGEMENT

Production unit.....Commune.....District.....Province.....
 Total area of vegetable cultivation (farming area).....(sào/ ha).....
 Source of irrigation water:.....Environmental conditions: Satisfactory.....Not satisfactory...
 Date of sampling.....Sampling person.....Unit which analyzes sample.....

Actual situation of production conditions			Risks detected and Corrective actions			
Condition	Factors that cause pollution	Current evaluation		Description of risk observed	Corrective actions	Implemented by
		Satisfactory	Not satisfactory			
Soil	Heavy metals					
Irrigation water	Heavy metals					
	Microbes					
Water for pre-processing, washing products	Heavy metals					
	Pesticides					
	Nitrate					
	Microbes					

- The limit of heavy metal in soil: National Technical Regulations: NTR No 03: 2008/BTNMT;
- The limit of heavy metal in irrigation water: National Technical Regulations. 39:2001/BTNMT;
- Quality of water used for washing and pre-processing products: Following QCVN số 02: 2009 /BYT of Ministry of Health regarding the quality of water

TABLE 5 – PRODUCTION ACTIVITY MANAGEMENT IN THE AREA

Production unit..... Commune..... District:..... Province.....

Total cultivation area (vegetable):.....(ha); Number of members:.....; Season/ year.....

Area of model site:(ha); Number of farmer households participating in the model.....

Technical guidelines, advanced technology (if applied): Type of key products.....

Note: If the production unit has many members, members are divided into groups, each group/ table;

Results of internal evaluation every season/ year (following form) are stored in this table

No.	Field management			Results of internal evaluation		
	Name of household	Production area (m ²)	Code of field plot	Date/ contents	Results	
					Satisfactory	Not satisfactory
1						
2						
3						
4						
5						
6						
7						

TABLE 6 – MANAGEMENT OF PRODUCTION INPUTS (BUYING PESTICIDES, FERTILIZERS, SEED)

Name of shop:..... Address:.....Storage:.....
 Code/ Paper licensed for business:..... Full name of store owner:.....
 Production unit..... Inspector (if any):.....

Date/month/year	Name of pesticides, fertilizer, seeds, etc (correct name on pack)	Quantity (bottles, boxes, packs)	Unit (g, kg, ml, litre)	Producer/distributor

Note: can make a separate record book (Record book of agricultural materials of production unit)

TABLE 7 – MANAGEMENT OF PRODUCTION INPUTS (SELLING/ PROVIDING AGRICULTURAL MATERIALS)

Production unit.....
 Inspector (if any):.....

Date/ month/ year	Name of pesticides, fertilizers, seeds, etc (correct name on package)	Quantity (bottles, boxes, packages)	Unit (g, kg, ml, litre)	Store	Buyers

Note: can make a separate record book (Record book of agricultural materials of production unit)

TABLE 8 – MANAGEMENT OF TRAINING, COMMUNICATION

Production unit.....Commune.....District.....Province.....

Full name of unit leader..... Technician in charge.....

Date/ month/ year	Training				Communication		
	Number of farmers (list attached)	Contents of training	Duration of training (day)	Certification (mark x)	Communication contents	Response to communication (mark x)	Opinion/ initiatives (if have)

TABLE 9 – TABLE OF CHECKLIST

No.	Practices	Level	Notes
I	Production conditions		
1	Is production site suitable for planning of the Government and localities for produced crop expected?	A	
2	Production area is satisfactory in terms of safety (quality of soil, irrigation water) according to regulations?	A	
II	Management of planting soil and field hygiene		
3	Has analysis and evaluation of potential chemical, biological, physical risks in soil been conducted?	A	
III	Manage the use of fertilizers and additives		
4	Are only fertilizers that are on the list of those approved for use in Vietnam used?	A	
5	Are only organic fertilizers that have been treated and documented applied?	A	
6	When the fertilizers and additives are purchased and put into use, are they recorded and stored in the book?	A	
IV	Manage the use of water source for production		
7	Quality of water used for irrigation and post-harvest handling is assured according to current standards or not?	A	

V	Manage the use of pesticides and chemicals		
8	Have farmers, organizations and individuals been trained on the management and utilization of agrichemicals?	A	
9	Are measures of Integrated Pest Management (IPM) and Integrated Crop Management (ICM) applied?	B	
10	Are used chemicals/ plant protection products/ biological medicines included on the list of those approved for use?	A	
11	Are chemicals, plant protection products and other agricultural materials purchased from licensed stores?	B	
12	Have plant protection products, chemicals been used in accordance with guidance of technical staff and instruction shown on package and label?	A	
13	Do farmers have diary and record to monitor the utilization of plant protection products and chemicals?	A	
14	Are chemicals and packaging destroyed strictly in compliance with the State's regulations?	A	
15	Are there unscheduled and periodic inspections to check the production process and chemical residues on crop products?	A	
VI	Harvesting and post-harvest handling		
16	Are the products isolated properly before harvesting?	A	
17	Are areas of pre-processing, packaging and product preservation isolated from storehouses, sites containing chemicals and other materials?	A	
18	Is clean water used to wash harvested products?	A	
19	Is quality of water used for the post-harvest handling process in accordance with the State's regulations?	A	
VII	Waste management and treatment		
20	Is wastewater, garbage collected and treated properly in accordance with regulations?	A	
VIII	Training, communication		
21	Are farmers provided with training and sufficient knowledge on Integrated Pest Management (IPM), Integrated Crop Management (ICP) and Good Agriculture Practices (GAP)?	A	
22	Are there warning signs displayed in production areas that have just been sprayed?	B	

IX	Recording of production diary, record keeping, traceability		
23	Are Field diary, production management diary fully recorded?	A	
24	Have internal audits, recording, keeping of internal audit records been conducted?	A	
25	Do products have product origin or label to facilitate the traceability?	A	
X	Internal audit		
26	Has an internal audit and evaluation been carried out at least one per crop/ year?	A	

ATTACHMENT 4.3

TRAINING PROGRAM ON GOOD PRACTICES ON VEGETABLE POST HARVEST HANDLING

1. **Time:** 01day/province x 3 provinces, between 25 and 30 September
2. **Venue:**
3. **Objectives:** To help participants (the persons directly in involve in post harvest handling activities) understand and implementation of properly GMP in fresh vegetables handling to ensure food safety.
4. **Number of participants:** 15 - 20 persons; they are owners of pre-processing, packing house and workers who directly in volve in vegetables post-harvest handling activities.
5. **Training program:**

Time	Contents	Person in charge
8.00 – 8.15	Participant registance	Organization Board
8.15 - 8.30	Opening Introduction of TOT training objective, program	PPMU, JICA project team
8.30 - 9.00	Good practices on Harvesting, Packing, Handling Fresh Vegetables at Farm Level	Mr. Nguyen Van Doang, Senior vegetables production Expert

9.00- 9.45	<p>-Required infrastructures, handling equipment, facility of packing house for safe fresh vegetable pre- process and packaging according to the National technical regulation QCVN 01-09:2009/BNNPTNT</p> <p>- Sep-up of a fresh vegetable handling house (Location, design, set-up of handling house; and installation of handling equipment; Water drainage system, waste disposal; Lighting system; Facilities and worker's hygiene area)</p>	Mr. Nguyen Van Doang, Senior vegetables production Expert
9.45 -10.00	Tea break	
10.00-10.45	<p>-Requirement from buyers for Application good handling practice on safe vegetable production.</p> <p>-Requirements for post-harvest handling by different buyers based on the contract</p> <p>-Explanation about buyers' requirements in terms of volume, appearance, freshness, insect damage, color, size, form of delivery; wash, cut, pack, volume per pack, traceability; logo, label, record based on the buyer's specification</p> <p>-Presenting Good cases and bad cases</p>	Ms. Loc/ Mr. Cuong, JICA project team

10.45-11.30	Guidance on good practices in vegetables packing house and transportation (Sorting, cutting, Washing and drying; Packing and labeling; Storage before shipping; Transportation)	Mr. Nguyen Van Doang, Senior vegetables production Expert
11.30– 12.00	Guidance on Recording, documentation, and traceability (Explanation, good practices and lessons of using the recording formats)	Mr. Tho (Mr. Doang/ Ms. Loc) , Jica project team
12.00 – 13.30	Lunch	
13.30 – 15.00	Site visit and valuation in packing house of one target group	Trainer, Jica project team
15.00 – 16.00	Group discussion on assessment report for shortcoming equipment and materials for upgrading conditions to ensure food hygiene and safety in production and handling	Trainer, Jica project team
16.00 – 16.15	Evaluation and closing on Post harvest handling training results (by questionnaire)	Trainee; PPMU, JICA project team

ATTACHMENT 4.4

CHECKLIST FOR MONITORING CONTROL POINTS AT HARVESTING - COLLECTING - PACKAGING - DELIVERY

Date: _____

Name of target group: _____

Name of person in charge of monitoring: _____

(1) Harvest point

Risk of contamination	Agreed conditions at Initial check	Result of monitoring
Dirty water	<input type="checkbox"/> Do not touch harvested vegetable with dirty water such as irrigated water and puddle.	
Soil	<input type="checkbox"/> Do not contaminate or touch vegetable with soil when harvesting.	
	<input type="checkbox"/> Do not put vegetable directly on the field, but use clean sheet or box to put harvested vegetable.	
	<input type="checkbox"/> Do not keep harvested vegetable at open field when it takes time until shipping, but keep it in the closed condition such as in the room, in the truck or cover with sheet, to avoid contamination with dust.	

Risk of contamination	Agreed conditions at Initial check	Result of monitoring
Garbage	<input type="checkbox"/> Do not put harvested vegetable close to garbage including package of agrochemical and fertilizer and compost.	
	<input type="checkbox"/> Keep garbage including rotten or waste vegetables away from harvest and be collected every day	
Chemical	<input type="checkbox"/> Do not use fertilizer bag or dirty sheet to put harvested vegetable, but use clean bag, sheet or box.	
	<input type="checkbox"/> Do not harvest vegetable before “appropriate days after last agrochemical application have been passed”.	
	<input type="checkbox"/> Do not harvest when neighbor farmer is applying or just finished applying agrochemical or fertilizer.	

Risk of contamination	Agreed conditions at Initial check	Result of monitoring
Biological	<input type="checkbox"/> Do not keep vegetable where animals, insects, birds or manure of above animals can enter.	
	<input type="checkbox"/> Do not harvest by dirty hand, but wash hand after workers went rest room or after workers did another works.	
	<input type="checkbox"/> Do not harvest when health condition of worker is not good such as have diarrhea, vomiting or fever.	
	<input type="checkbox"/> Do not use dirty tools such as knife and packing bag, but use clean tools.	

Risk of contamination	Agreed conditions at Initial check	Result of monitoring
Quality control/ Traceability	<input type="checkbox"/> Do not harvest early (immature) vegetable nor late (overmatured) vegetable, but harvest on appropriate moment.	
	<input type="checkbox"/> Do not harvest roughly, but harvest gently to avoid torn, fold, break or hit.	
	<input type="checkbox"/> Do not push vegetable strongly when packing, do not bind vegetable strongly when binding.	
	<input type="checkbox"/> Do not harvest when temperature is high, but harvest on morning or evening.	
	<input type="checkbox"/> Do not harvest in the rainy or high humid weather because vegetable will be easily rotten, or keep at ventilated condition after harvesting.	
	<input type="checkbox"/> Do not keep harvested vegetable under high temperature, but keep in cool places such as in shade or under the roof	
	<input type="checkbox"/> Do not harvest with weeds or other foreign matters, but select only vegetable.	
	<input type="checkbox"/> Do not mix with vegetable which were harvested from other field, but put information on the harvested vegetable such as label.	

(2) Transportation

Risk of contamination	Agreed conditions at Initial check	Result of monitoring
Dirty water	<input type="checkbox"/> Do not keep vegetable where water or rain come in or under high humidity condition.	
Soil	<input type="checkbox"/> Do not bring soil into transportation means, but remove soil from containers before loading.	
	<input type="checkbox"/> Do not keep vegetable at open field, but protect it by using plastic to cover or use truck, to avoid contamination with dust.	
Garbage	<input type="checkbox"/> Do not use dirty means of transportation, but clean it before loading the products.	
Chemical	<input type="checkbox"/> Do not use fertilizer bag or dirty sheet to put vegetable, but use clean bag, sheet or box.	
	<input type="checkbox"/> Do not transport vegetable with other materials such as fertilizers and agrochemicals.	

Risk of contamination	Agreed conditions at Initial check	Result of monitoring
Biological	<input type="checkbox"/> Do not keep vegetable where animals, insects, birds or manure of above animals can enter.	
	<input type="checkbox"/> Do not touch vegetable by dirty hand, but wash hand after workers went rest room or after workers did another works.	
	<input type="checkbox"/> Do not touch vegetable when health condition of worker is not good such as have diarrhea, vomiting or fever.	
Quality control/ Traceability	<input type="checkbox"/> Do not treat vegetable roughly, but treat gently to avoid torn, fold, break or hit.	
	<input type="checkbox"/> Do not pile up vegetable to avoid damage by pressure if material of package is soft, or keep in the package of hard material such as plastic box.	
	<input type="checkbox"/> Do not keep vegetable under high temperature, but keep in cool places such as in shade or under the roof.	
	<input type="checkbox"/> Do not mix with vegetable which were harvested from other field, but put information such as label.	
	<input type="checkbox"/> Do not eat, drink, smoke, spit in transportation means, and do not wear jewelry, watch or other objects when bring products.	

(3) Collection point

Risk of contamination	Agreed conditions at Initial check	Result of monitoring
Dirty water	<input type="checkbox"/> Do not touch vegetable with dirty water such as irrigation water or rain.	
Soil	<input type="checkbox"/> Do not put vegetable directly on the field, but use sheet or box to put vegetable.	
	<input type="checkbox"/> Do not keep vegetable at open field, but keep it in the closed condition such as in the room, in the truck or cover with sheet, to avoid contamination with dust.	
Garbage	<input type="checkbox"/> Keep garbage including package of agrochemical and fertilizer and compost away from vegetables.	
Chemical	<input type="checkbox"/> Do not use fertilizer bag or dirty sheet to put vegetable, but use clean bag, sheet or box.	
	<input type="checkbox"/> Do not keep vegetable close to field where neighbor farmer is applying or just finished applying agrochemical or fertilizer.	

Risk of contamination	Agreed conditions at Initial check	Result of monitoring
Biological	<input type="checkbox"/> Do not keep vegetable where animals, insects, birds or manure of above animals can enter.	
	<input type="checkbox"/> Do not touch vegetable by dirty hand, but wash hand after workers went rest room or after workers did another works.	
	<input type="checkbox"/> Do not touch vegetable when health condition of worker is not good such as have diarrhea, vomiting or fever.	
	<input type="checkbox"/> Do not use dirty tools such as packing bag, sheet to put on the field, but use clean tools.	
Quality control/ Traceability	<input type="checkbox"/> Do not receive vegetable which are not satisfied quality condition requested to farmers.	
	<input type="checkbox"/> Do not bring vegetable roughly, but bring gently to avoid torn, fold, break or hit.	
	<input type="checkbox"/> Do not keep vegetable under high temperature, but keep in cool places such as in shade or under the roof.	
	<input type="checkbox"/> Do not mix with vegetable which were harvested from other field, but put information such as label.	

(4) Preprocessing point

Risk of contamination	Agreed conditions at Initial check	Result of monitoring
Dirty water	<input type="checkbox"/> Do not wash vegetable by using dirty water such as ponds water, puddle water and non-analyzed water, but use water which satisfy national standards.	
	<input type="checkbox"/> Do not touch vegetable with dirty water such as washed water or rain.	
	<input type="checkbox"/> Do not keep used water in the floor, but drain all.	
Soil	<input type="checkbox"/> Do not put vegetable directly on the field, but use sheet or box to put vegetable.	
	<input type="checkbox"/> Do not treat vegetable at open field, but treat it in the closed condition such as in the room, to avoid contamination with dust.	
Garbage	<input type="checkbox"/> Keep garbage including package of agrochemical and fertilizer and compost away from vegetables.	
	<input type="checkbox"/> Do not scatter garbage such as removed leaf or root on the floor, but throw away in the garbage box.	
	<input type="checkbox"/> Do not throw away garbage in the open field, but cover and throw in the separated area from preprocessing point.	

Risk of contamination	Agreed conditions at Initial check	Result of monitoring
Chemical	<input type="checkbox"/> Do not use fertilizer bag or dirty sheet to put vegetable, but use clean bag, sheet or box.	
	<input type="checkbox"/> Do not treat vegetable close to detergent or another tools to cleanup preprocessing tools.	
	<input type="checkbox"/> Do not use unregistered agro-chemical for post-harvesting treatment.	
	<input type="checkbox"/> Keep storage of pesticide, fertilizer and other agro-chemicals isolated from preprocessing area.	
	<input type="checkbox"/> Do not use toxic materials to packing, labeling and binding.	
Biological	<input type="checkbox"/> Do not treat vegetable where animals, insects, birds or manure of above animals can enter.	
	<input type="checkbox"/> Do not touch vegetable by dirty hand, but wash hand after workers went rest room or after workers did another works.	
	<input type="checkbox"/> Do not touch vegetable when health condition of worker is not good such as have diarrhea, vomiting or fever.	
	<input type="checkbox"/> Do not use dirty tools such as knife, packing bag, sheet to put on the field, but use clean tools.	

Risk of contamination	Agreed conditions at Initial check	Result of monitoring
Quality control/ Traceability	<input type="checkbox"/> Do not treat vegetable roughly, but treat gently to avoid torn, fold, break or hit.	
	<input type="checkbox"/> Do not push vegetable strongly when packing, do not bind vegetable strongly when binding.	
	<input type="checkbox"/> Do not treat vegetable under high temperature, but treat in cool places.	
	<input type="checkbox"/> Do not mix with vegetable which were harvested from other field, but put information such as label.	
	<input type="checkbox"/> Do not install “two-way processing system” but install “one-way processing system” to avoid cross-contamination.	
	<input type="checkbox"/> Do not eat, drink, smoke, spit in production area, and do not wear jewelry, watch or other objects when treat products.	
	<input type="checkbox"/> Product has a label or is packed in the package with information of producer and contact.	

(5) Storing point

Risk of contamination	Agreed conditions at Initial check	Result of monitoring
Dirty water	<input type="checkbox"/> Do not keep vegetable where rain come in or under high humidity condition.	
Soil	<input type="checkbox"/> Do not put vegetable directly on the field, but use sheet or box to put vegetable.	
	<input type="checkbox"/> Do not keep vegetable at open field, but keep it in the closed condition such as in the room, in the truck or cover with sheet, to avoid contamination with dust.	
Garbage	<input type="checkbox"/> Keep garbage including package of agrochemical and fertilizer and compost away from vegetables.	
Chemical	<input type="checkbox"/> Do not use fertilizer bag or dirty sheet to put vegetable, but use clean bag, sheet or box.	
	<input type="checkbox"/> Do not keep vegetable with other materials as fertilizers, agrochemicals and cleaning tools.	

Risk of contamination	Agreed conditions at Initial check	Result of monitoring
Biological	<input type="checkbox"/> Do not keep vegetable where animals, insects, birds or manure of above animals can enter.	
	<input type="checkbox"/> Do not touch vegetable by dirty hand, but wash hand after workers went rest room or after workers did another works.	
	<input type="checkbox"/> Do not touch vegetable when health condition of worker is not good such as have diarrhea, vomiting or fever.	
Quality control/ Traceability	<input type="checkbox"/> Do not treat vegetable roughly, but treat gently to avoid torn, fold, break or hit.	
	<input type="checkbox"/> Do not pile up vegetable to avoid damage by pressure if material of package is soft, or keep in the hard material such as plastic box.	
	<input type="checkbox"/> Do not keep vegetable under high temperature, but keep in cool places such as in shade or under the roof.	
	<input type="checkbox"/> Do not mix with vegetable which were harvested from other field, but put information such as label.	
	<input type="checkbox"/> Do not eat, drink, smoke, spit in storing area, and do not wear jewelry, watch or other objects when treat products.	

ATTACHMENT 4.5

TOT FOLLOW-UP TRAINING

TOT training Workshop on review/ share experience on basic GAP and Good post harvest handling practices application

1. *TOT training Workshop on review/ share experience on basic GAP and Good post-harvest handling practices application will be organized by JICA Project Team with support of PPMU*
2. *Time: tentatively: 01 day in August, 2018.*
3. *Vietnamese lecturers on GAP, technicals with support of JICA project Team*
4. *Proposed program of TOT training Workshop on review/ share experience on basic GAP and Good post- harvest handling*

<i>Time</i>	<i>Content</i>	<i>Conducted by</i>
8.00 - 08.15	<i>Registration of trainees</i>	<i>Organization Board</i>
08.15 - 08.30	<i>Opening: Introduction of TOT training Workshop objective, program</i>	<i>PPMU, JICA project team</i>
08.30 - 09.30	<i>Experiences shared by Jica project on Implementing pilot project model of safe vegetables production applying GAP</i>	<i>Mr. Nguyen Van Doang, Senior vegetables production Expert, JICA project</i>
09.30 - 10.00	<i>Experiences shared on Application of good practices on Harvesting, Packing, Handling and Storing Fresh Vegetables</i>	<i>Mr. Nguyen Van Doang, Senior vegetables production Expert, JICA project</i>

10.00 - 10.15	<i>Tea break</i>	
10.15 - 11.15	<i>Experiences shared on guidance and monitoring pesticides application, fertilizers and record of farmer field diary/ Logbook</i>	<i>Mr. Ngo Van Tho, vegetables production Expert, JICA project</i>
11.15 - 12.00	<i>Discuss on organisation of vegetable production applying GAP and joint sales; Experiences sharing on monitoring pesticides application, fertilizers and record of farmer field diary/ Logbook</i>	<i>Trainee / Target groups</i>
12.00 - 13.30	<i>Lunch</i>	
13.30 - 14.30	<i>Introduce and Guide on applying some cultivation methods and new production input materials for improvement of quality and safety vegetable products</i>	<i>Mr. Dao Phu Loi, vegetables production Expert, JICA project</i>
14.30 - 15.00	<i>Discussion</i>	<i>Trainee / Trainer</i>
15.00 - 16.00	<i>Each Target group presents a developed complete action plan for production and post- harvest practices for join sale</i>	<i>Target groups</i>
16.00 - 16.15	<i>Introduce Pilot project Implementation Plan of Production Activities of Second Year from April, 2018 to March 2019</i>	<i>JICA project team</i>
16.15 - 16.30	<i>Evaluation on TOT training results / Closing</i>	<i>Trainee / Trainer</i>

For the presentation materials, please refer the website as below:
[http://khuyennongvn.gov.vn/thu-vien-khuyen-nong/thu-vien-sach-
kn_t244c28](http://khuyennongvn.gov.vn/thu-vien-khuyen-nong/thu-vien-sach-
kn_t244c28)



Project for Improvement of Safe crop Production in the
Northern region

**EXPERIENCE OF JICA PROJECT ON
IMPLEMENTING PILOT PRODUCTION
MODEL ON SAFE VEGETABLE
PRDODUCTION APPLYING GAP**

JICA consultant team

I. SELECTION OF PRODUCTION AREA



Chemical hazard identification

Hazards	Reason
Heavy metal (Lead, Cadmium, Mercury, Arsenic, etc)	High concentration of heavy metals accumulated in soil and water of cultivation sites due to previous existence or application of many fertilizers containing heavy metals for long time.

Biological hazards

Hazards	Reason
+ Bacteria, fungi + Virus + Parasites	Soil and water in production site are contaminated with microbiology from husbandry waste water, domestic, hospital and industrial sewage, etc.

1.1. Confirmation of condition for safe crop production

In the following cases, soil and water will be tested to confirm the safety of pilot project sites

Production area hasn't been confirmed as the one which complies with condition for safe production.

Certificate on condition for safe production has expired or will expire in project time.

Production area expanded is the new pilot project sites.

Potential risks are assessed as un-safe for production area due to the change of irrigation water source or soil contamination.

Testing results by DARD and/ or any relevant agencies show residues of heavy metal from product samples produced in pilot project sites.

Soil and water will be tested in accordance with current standards and regulation.

Results of confirming safety of production area

Group name	Results of soil testing		Results of irrigation water testing	
	Have results of lab test	Assessing results against MRL	Have copies of results of lab test	Assessing results against MRL
Hải Dương				
Tan Minh Duc Cooperative	Yes	Pass	Yes	Pass
Duc Chinh Cooperative	No	-	No	-
Thanh Ha safe vegetable, fruit company	Yes	Pass	Yes	Pass
Ha Nam				
Hiep farm group	Yes	Pass	Yes	Pass
Ha Vy Cooperative	Yes	Pass	Yes	Pass
Hưng Yên				
YEN PHU Cooperative	Yes	Pass	Yes	Pass
Japan-Vietnam Company	Yes	Pass	Yes	Pass

1.2. Assessing by taking soil and water samples then analyze the residues

- Taking samples is conducted by correct methodology: Method of sampling cultivation soil in accordance with TCVN 4046-85:
 - Equal land area (from 1 to 5 ha) and un-equal land area (from 0.5 to 1 ha), 12 sub-samples are mixed into one sample at cultivation layer (depth: 20 cm)
 - Sampling position and pattern: randomly take samples with

Certificate on condition for safe production		Viet GAP certificate			Proposal
Have copies of certificate	Valuable until	Have copies of certificate	Valuable until		
No		Yes (27,2ha)	21/12/2019		
Yes	10/12/2019	Yes (23,67ha)	4/1/2020		
Yes	19/08/2019	Yes (10,4ha)	03/03/2018		
Yes	26/12/2019	No (Basic GAP)			
Yes	12/11/2018	No (Basic GAP)			
Yes	20/05/2018	Yes (15,5 ha)	17/03/2018		
No	-	Yes (1,0 ha)	23/10/2018		

“W” pattern reflected in Photo 1 in the cultivation plot and in depth of 20 cm.

- Guidance on sampling water samples in accordance with TCVN 6000-1995 on quality of water - sampling underground water.
- Send samples to qualified lab appointed or recognized.

It is able to check the appearance of E.coli bacteria to show the level of biological contamination of water source.

MRL of some heavy metals in soil in accordance with National technical regulations QCVN 03-MT:2015/BTNMT

No.	Element	MRL (Mg/kg of dry soil)
1	Arsenic (As)	15
2	Cadmium (Cd)	1.5
3	Lead (Pb)	70
4	Copper (Cu)	100
5	Zinc (Zn)	200
6	Crom (Cr)	150

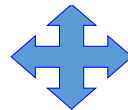
MRL of some heavy metals in irrigation water (QCVN 08-MT:2015/ BTNMT)

No.	Element	MRL (mg/lit)	Trial method
1	Mercury (Hg)	0.001	TCVN 5941:1995
2	Cadimi (Cd)	0.01	TCVN 665:2000
3	Arsen (As)	0.05	TCVN 665:2000
4	Lead (Pb)	0.05	TCVN 665:2000
5	Fecal. Coli	200 (quantity of bacteria or CFU/100 ml)	Apply for salad vegetables and fruits

1.3. Evaluating risks of biological and chemical contamination

Planned area

Nearby area



What factors should be considered?



Livestock pasturing?	Manufactures, industrial zones, hospitals?
Waste?	Area is spread out with chemicals in the war?
Domestic waste water?	Accumulated chemical?
	Waste dumping?

Industrial husbandry	Place for chemical storage?
Sewage system?	Nearby industrial zones, factories?
Pet's movement?	

🔗 Evaluating risks of biological and chemical contamination



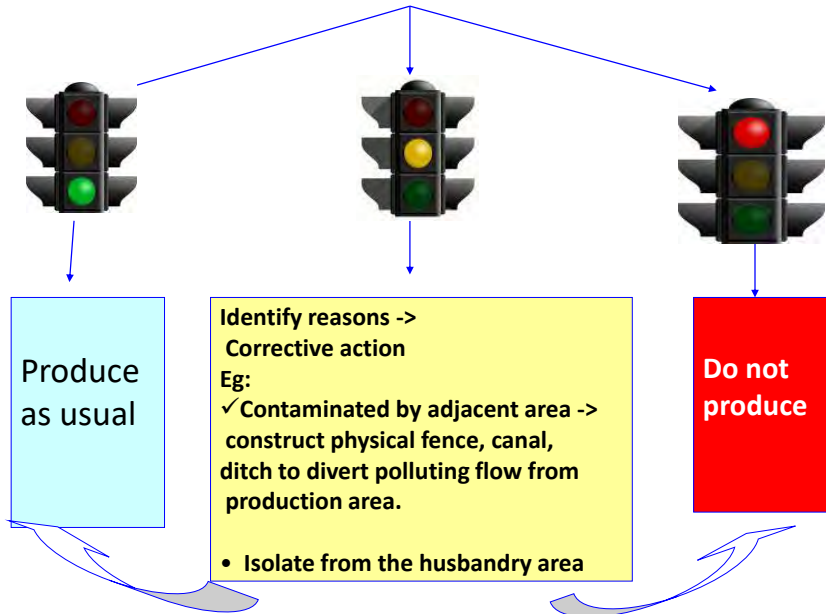
How can such dirty water be used for watering GAP safe vegetables?



This garbage ground may affect my production field?

Potential hazards?

After assessing and analyzing the contamination level



II. GUIDANCE FOR APPLYING GAP IN SAFE VEGETABLE PRODUCTION

- Apply fertilizers
- Apply pesticides
- Record and check recording of production diary



Check recording of farmers in Yen Phu Cooperative (Hung Yen 22 September 2017)

2. 1. APPLY FERTILIZERS IN SAFE VEGETABLE PRODUCTION



Biological hazards

Hazards	Origin	Ways of causing pollution
High level of KLN content (As, Pb, Cd, Hg, etc.)	The presence of heavy metals (especially cadmium) in fertilizers and supplemental matters such as plaster, animal dung, compost, etc.	Content of heavy metals in fertilizers and supplemental matters contributes to the high level of heavy metals in soil → Plants absorb these heavy metals.
High content of nitorat	+ Soil has nitrogen (normally it is organic nitrogen) + Apply fertilizers which have nitrogen (in-organic) too much or too late	Because of the surplus of NO ₃ , vegetables absorb too much, resulting in the surplus of NO ₃



High risks for leafy, flower and stem vegetables Biological hazards

Biological hazards

Hazards	Origin	Ways of causing pollution
Pathogenic organism	Animal dung and urine which hasn't been treated or has been composted but un-satisfactory quality contain a big amount of pathogenic organism	+ Pollution can occur through direct contact of organic fertilizers with edible parts of vegetables while fertilizing, irrigating or indirectly through contaminated soil. + Leafy, stem vegetables near the ground and root vegetables in the soil have high risk of biological contamination because of this fertilizer.

Select fertilizers and supplemental matter

- Only buy and use fertilizers in the list allowed for production and business in Vietnam issued by MARD.
- Only use fertilizers whose expire date is clear
- Do not use fertilizers which do not have clear origin, do not have label or those are expired.
- Do not use organic fertilizers which hasn't been treated to apply for vegetables because they contain many pathogenic organisms.

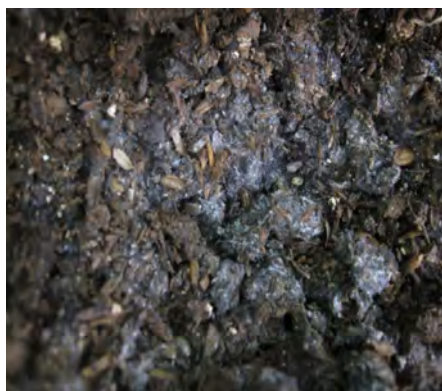
Safe utilization of fertilizers for chemical fertilizers

- Need to apply enough dosage following technical process for each type of vegetable
- Avoid overuse of nitrogen fertilizers
- Stop applying nitrogen fertilizers at least **10** days before harvesting



Treating compost/dung/organic waste

- Must be treated for at least 2 months
- Regularly mix to ensure adequate temperature, moisture for organic matters to be decomposed.
- Fertilizer treatment and storage sites: **be isolated** from production, post-harvest handling sites, and with **full covering**



Check composting after 6 weeks in Duc Chinh Cooperative – Hai Duong

Safe application of fertilizers: Organic fertilizers

- Organic fertilizers should be applied to the soil directly, early and well covered with soil (otherwise causing contamination to adjacent crops through wind drift or rainfall runoff); do not let fertilizers contact directly to the edible vegetable parts;
- Only apply well-treated organic fertilizers and stop applying fertilizers at least 60 days before harvest.



Apply organic fertilizers early and cover with soil, use shading materials

2.2. APPLICATION OF PESTICIDES

❖ How to select pesticides

- Priority given to chemicals which have low toxic level, fast decomposition, not affect natural enemies and environment.
- Select biological and plant-origin pesticides
- Chemicals belonging to groups of toxic level III; IV








❖ Correct utilization of pesticides (Follow 4 correct principle)

- 1) **Correct time:** Apply when baby worm is small and just newly appear. Plants in the growth period: apply in early morning or cool afternoon, not rainy time, etc.
- 2) **Correct pesticides:** for each type of harmful target, rotate chemicals, etc.
- 3) **Correct method:** Correctly mix the chemicals following instruction for each chemical, etc.
- 4) **Correct dosage and concentration:** Follow the instruction of each chemical type (in term of dosage and water amount)

Mistakes usually encountered during the application of pesticides in safe vegetable production

- Apply wrong target crops; apply the chemicals whose active substances are not recommended for vegetables
- Over apply the dosage, concentration against guidance of each chemical (in term of chemical amount, quantity of water for mixing chemicals)
- Apply chemical in periodic manner, even when there is no appearance of insects and diseases
- Mix many kind of chemicals which are effective for controlling the same insects/ diseases
- Apply pesticides which have long pre-harvest interval (PHI) during the product harvesting time

Signal of toxic level of pesticides

Toxic group	Signal on the label			Ghi chú
	Vạch màu biểu thị	Signal	Letter written on label	
I (Very toxic)	Red 		Very toxic	Already prohibited
II (Highly toxic)	Yellow 		Highly toxic	Limited use on vegetables
III (Less toxic)	Blue 		Dangerous	
IV (least toxic)	Green 	No signal	Be careful	Priority given to application for vegetables

List of chemicals prohibited for use - VinEco according to Circular 03 /2018/TT-BNNPTNT dated 9/2/2018

No.	General name	Trade name
1	Aldrin	Aldrex, Aldrite...
2	BHC, Lindane	Beta - BHC, Gamma - HCH, Gamatox 15 EC, 20 EC, Lindafor , Carbadan 4/4 G; Sevidol 4/4 G
3	Cabofuran	
4	Endosulfan	Cyclodan 35EC, Endosol 35EC, Tigiodan 35ND, Thasodant 35EC, Thiodol 35ND
5	Methamidophos	Dynamite 50 SC, Filitox 70 SC, Master 50 EC, 70 SC, Monitor 50EC, 60SC, Isometha 50 DD, 60 DD, Isosuper 70 DD, Tamaron 50 EC...
6	Methiocard	
7	Methomyl	

8	Methyl-parathion	Danacap M 25, M 40; Folidol - M 50 EC; Isomethyl 50 ND; Metaphos 40 EC, 50EC; (Methyl Parathion) 20 EC, 40 EC, 50 EC; Mil-ion 50 EC; Proteon 50 EC; Romethyl 50ND; Wofatox 50 EC ...
9	Methamidophos	
10	Parathion	
11	Parathion methyl	Alkexon , Orthophos , Thiopphos ...
12	

List of chemicals prohibited for use on vegetables - VinEco according to Circular 03/ 2018/TT-BNNPTNT dated 9/2/2018

No.	General name	SUMMARY OF INFORMATION
1	Profenofos	Do not apply for vegetables, fruits
2	Lambda-cyhalothrin	Do not apply for vegetables, fruits
3	Permethrin	Do not apply for vegetables, fruits
4	Cypermethrin	Do not apply for vegetables, fruits
5	Alpha- Cypermethrin	Do not apply for vegetables, fruits
6	Deltamethrin	Do not apply for vegetables, fruits
7	Acetamiprid	Do not apply for vegetables, fruits
8	Imidacloprid	Do not apply for vegetables, fruits
9	Diazinon	Do not apply for vegetables, fruits
10	Chlorfenapyr	Do not apply for vegetables, fruits
11	2,4-D	Do not apply for vegetables, fruits It is prohibited for use in other countries

12	Glyphosate	Do not apply for vegetables, fruits It is prohibited for use in other countries Vietnam applies 2-year roadmap for prohibiting the use this chemical
13	Paraquat	Do not apply for vegetables, fruits
14	Aldicarb	Do not apply for vegetables, fruits
15	Fipronil	Do not apply for vegetables, fruits Can consider to apply for tomato because it is active substance for treating soil
16	Cholorpyrifos	It is registered for apply in onion. Consider to apply for onion and potato
17	Acephate	Only accept detection on crops which were registered according to Circular 03 and do not exceed MRL.
18	Carbendazin	Circular 03/2016/TT-BNNPTNT
19	Benomyl	Circular 03/2016/TT-BNNPTNT
20	Thiophanate-methy	Circular 03/2016/TT-BNNPTNT

LIST OF INSECTS AND DISEASES FOR CONTROLLING WORM, JASSID,

No.	Name of pesticide	Active substance	Target
1	Match 050 EC	Lufenuron (min 96 %)	Diamond-black moth/ vegetable; deep blue/ green bean; tobacco; leaf folder/rice
2	DuPont™ Prevathon® 5SC	Chlorantranilip- role (min 93%)	5SC: Leaf maggot/ tomato, water melon; deep blue/ water melon; Papilio, fruit miner/ soybean, onion; leaf folder, stem miner/rice; diamond black moth/cabbage; deep blue/ tomato, flea beetle/ bok choy, army- worm/peanut
3	Tập Kỳ 1.8EC	Abamectin	1.8EC: Diamond-black moth/cabbage
4	Reasgant 1.8EC 3.6EC	Abamectin	1.8EC, 3.6EC: Diamond-black moth, deep blue, armyworm/cabbage; deep blue/ tomato; thrips/ watermelon
5	Radiant 60SC	Spinetoram (min 86.4%)	Papilio/ onion, peanut, soybean; leaf maggot, fruit miner, thrips/ tomato; thrips/ water melon, grape, mango; thrips, leaf maggot/ chili; diamond-black moth, white butter- fly/cabbage; thrips/rose, tea; thrips, stem miner, leaf folder/rice

EPHID ON VEGETABLE

	Pre-harvest interval	Guidance for use	Name of producing Co
	7	20ml/ tank (16 lit) 1.5 tanks/ sao	Syngenta Vietnam limited Co
	3	20m/ tank (10 lit) 1 tank/1 sao	DuPont Vietnam Ltd
	3	6-8ml/tank (16 lit, 3 tanks/ sao)	Agricultural Genetics Institute
	7	5ml/tank (10 lit) 2 tanks/sao	Viet Thắng limited company
	3	1 package/ tank (16 lit) 1 tank/sao	Dow AgroSciences B.V

GUIDANCE ON THE USE OF PESTICIDES APPLIED IN CABBAGE

Insects/diseases	Pesticide	Chemical properties
		Active substances
Diamond-black moth	Radiant 60SC	Spinetoram
	Prevathon 5SC	Chlorantraniliprole
	Match 050EC	Lufenuron
	Brightin 1.8EC	Abamectin
	Abatin 5.4EC	Abamectin
	Neem Nim Xoan Xanh green 0.3EC	Azadirachtin
	Proclaim 1.9EC	Emamectin benzoate
	Tasieu 1.9EC	Emamectin benzoate
	Pegasus 500SC	Diafenthiuron
	Delfin 32WG	Bacillus thuringiensis
White butterfly	Actimax 50WG	Emamectin benzoate
	Prevathon 5SC	Chlorantraniliprole
	Match 050EC	Lufenuron
	Brightin 1.8EC	Abamectin
	Radiant 60SC	Spinetoram
	Delfin 32WG	Bacillus thuringiensis
Armyworm, black cut worm	Reasgant 3.6EC	Abamectin
	Delfin 32WG	Bacillus thuringiensis
	Tasieu 1.9EC	Emamectin benzoate
	Anisaf SH-01 2SL	Polyphenol Bò kết, Hy thiêm, Đơn buốt, Cúc liên chi dại
	Plutel 3.6EC	Abamectin

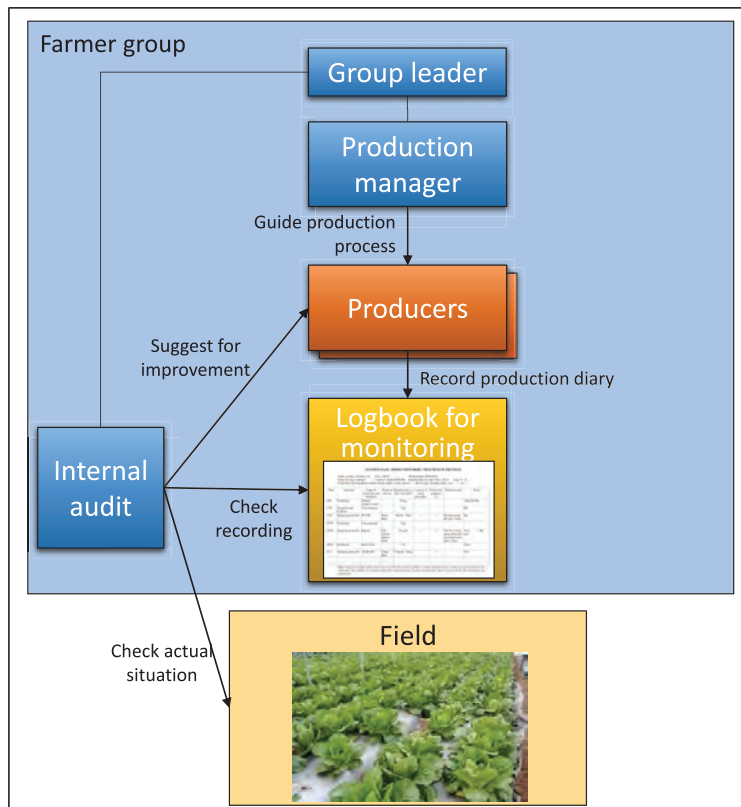
	Pre-harvest interval (days)	Dosage (g, ml/sao)		Amount of water (lit/ sao)		Note
		Min	Max	Min	Max	
	3	13.5	21.6	14.4	21.6	5-7 days after the peak appearance time of butterflies
	3	10.8	21.6	14.4	21.6	
	7	14.4	36	14.4	28.8	
	7	18	27	14.4	21.6	
	7	5.76	10.8	11.52	21.6	
	3	45	67.5	14.4	21.6	
	3	7.2	18	14.4	28.8	
	7	7.2	14.4	17.28	28.8	
	3	14.4	36	11.52	28.8	
	1	18	54	21.6	28.8	
	7	7.2	13.5	11.52	21.6	5-7 days after the peak appearance time of butterflies
	3	10.8	21.6	14.4	21.6	
	7	14.4	36	14.4	28.8	
	7	18	27	14.4	21.6	
	3	13.5	20.16	14.4	21.6	
	1	18	54	21.6	28.8	5-7 days after the peak appearance time of butterflies or many butterflies go into the traps
	7	5.4	9	14.4	21.6	
	1	18	54	21.6	28.8	
	7	7.2	14.4	17.28	28.8	
	7	27	36	14.4	21.6	
	7	5.4	9	18	21.6	

3. ON-FIELD GUIDANCE ON BASIC GAP APPLICATION

- ❑ Establish internal quality management system

Member of internal quality management system:

- 1) Group leader/ Chair the management of internal quality
- 2) Production manager
- 3) Internal audit



Develop cultivation plan based on market demand

Ví dụ về lập kế hoạch sản xuất

TT	Loại rau	Diện tích (m ²)	Ngày gieo	Thời gian sinh trưởng (ngày)	Dự kiến thời gian bắt đầu thu hoạch
TỔNG SỐ:		20740			
1	Bắp cải	720	17/10-20/10/2017	100	20/1/2017
2	Su hào	1500	1/10 - 17/10/2017	70	20/12/2017
3	Cà chua	1080	1/10/2017-10/10/2017	150	25/12/2017
4	Dưa lê	1080	25/8-30/8/2017	60	30/10/2017
5	Cà chua bi	360	20/8-25/8/2017	70	15/10/2017
6	Rau mồng tơi	360	28/7/2017	50	20/9/2017
7	Rau ăn lá (cải ngồng, cải xanh..)	3600	17/10/2017	35	20/11/2017
8	Bầu bí	720	1/10/2018-	90	1/12/2018-
9	Cà tím	360	1/10/2018-	60	1/1/2017-
10	Dưa chuột	1080	20/8-5/9/2017	45	20/10-25/10/2017
11	Đậu đũa	720	25/10/2017-	60	25/12/2017
12	Đậu Hà Lan	360	09/10/2017	50	11/10/2017

	Dự kiến sản lượng (kg)	Sản lượng rau thu hoạch theo tháng (kg)						
		Tháng 9/2017	Tháng 10/2017	Tháng 11/2017	Tháng 12/2017	Tháng 1/218	Tháng 2/2018	Tháng 3 /2018
	96700	450	5110	5720	7920	28600	27700	20900
	40000					13000	14000	13000
	3000				1500	1500		
	4500					1500	1500	1500
	1800		1800					
	2000		400	800	800			
	3250	450	800	800	800	400		
	15000			1000	3500	3500	3500	3500
	3000				700	700	700	700
	1200					400	400	400
	4500		2000	2500				
	1500					700	700	
	450		110	120	120	100		

On-field guidance on Basic GAP application

- ❑ **On-field guidance and monitoring of production diary**
 - Internal auditor and production manager of Cooperative will guide farmers how to cultivate with GAP application and how to record production diary.
 - Technical auditor of PPMU visits the field in Cooperative/ Company once per week for checking and guiding the recording of production diary and on-field practices
- ❑ **Organize internal audit meeting**
 - Internal audit meeting will be organized every month.
 - Participants are person in charge of production, internal auditor, technical auditor of PPMU and farmers for sharing experience and providing guidance on Basic GAP application to farmers.
- ❑ **Internal assessment**
 - Internal assessment will be conducted 1-2 times/year basing on list of control points of Basic GAP (26 control points)
 - Technical auditor of PPMU will participate in internal assessment to provide guidance on implementation for Cooperative manager

Mistakes of recording production diary encountered by farmers & corrective action

Mistakes	Contents written in wrong manner	Corrective action
Do not record sufficiently for each plot, each vegetable.	- Only record the diary for big plot, vegetables of main season.	- Review production plan for each vegetable season, which serves as basis for monitoring farmer's recording
Do not sufficiently record information of the form	- Record deficit information on cultivation area, vegetable type, template for recording product harvesting	- Review and timely add more deficit information
Record wrong name of pesticides, active substances	- Just write the abbreviation of pesticide name, slang name.	- When pesticides are applied, full name of pesticides and active substances must be written on a piece of paper, so that they can write on the recording logbook at home
Record deficit information on concentration or application dose	Record deficit information on concentration or application dose	Guide how to sufficiently write information and regularly monitor, check the recording logbook for timely adding more information

Must fully record the chemical utilization process



Content:

- Name of pesticides
- Controlling target
- Using amount
- Date of application.....
- Quarantine period (PHI)

Note: Recording method is guided in the part which is about diary recording and production practice

TABLE 1 - DIARY OF PRODUCTION PRACTICES

Name of plot (No.): Area.....(m²/sào /ha)

Date of transplanting.....

Name of crop:..... Variety..... Expected first harvesting..... Final harvesting.....

Protective cloths: yes () ; no ().

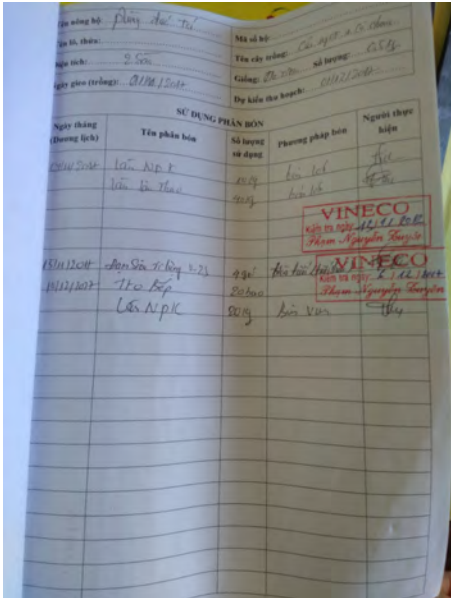
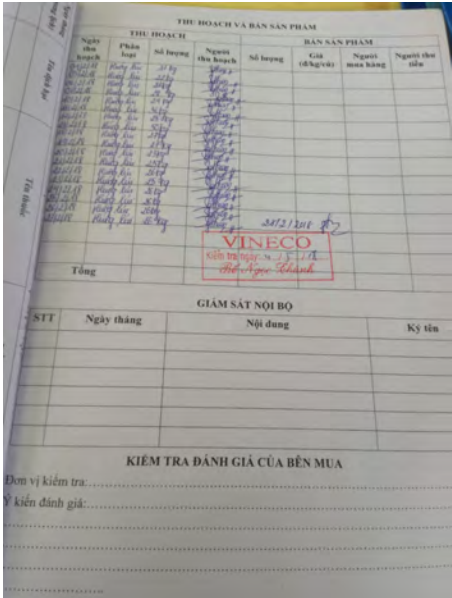
Throw waste of pesticides in the right place: yes () ; no ().

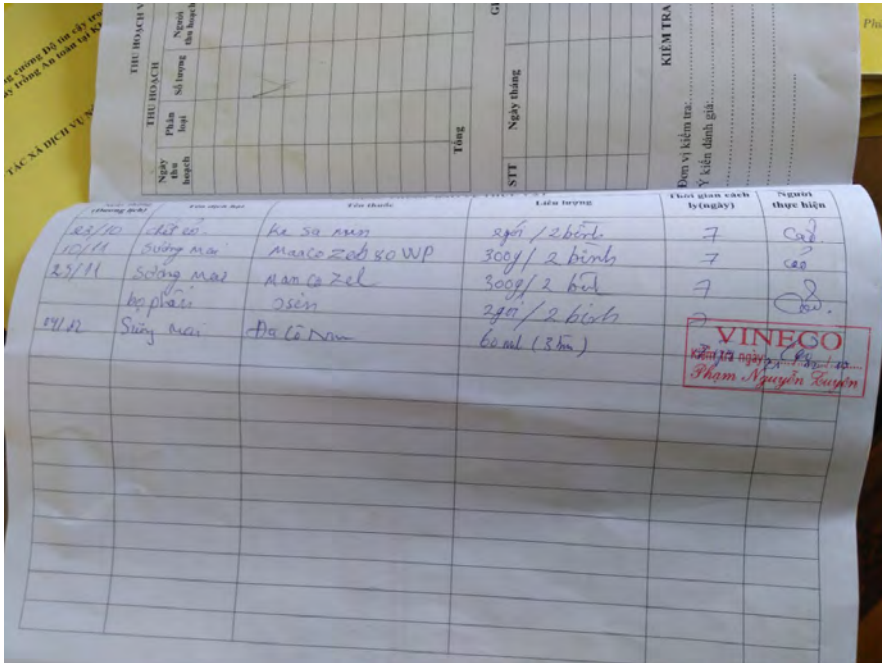
Date (lunar calendar)	Item	Name of pesticides/ fertilizers, etc.	Name of insects/ disease	Quantity (kg, g, lit, ml, package)	Follow the guidance (mark X)	Warning board (mark X)	Detect risk	Implemented by

TABLE 3 - DIARY OF HARVESTING AND PRODUCT SALE
Area of pre-processing/ preservation.....
Address of retail market.....

Date (lunar calendar)	Harvesting			Products sale			Detect the risk / already handle the risk (mark x)	Implemented by		
	Name of crop	Name/ code of plot	Pre-harvest interval (days)	Quantity (kg, plant)	Price (d/kg, plant)	Mode of selling/ buyer				
						Retail selling (mark x)			Whole sale to whom	Contract-based sale to whom

Recording activities in some target groups





FACTORS FOR PROMOTING, ENSURING THE MAINTENANCE OF RECORDING FIELD DIARY BY FARMERS

- Regularly guide, monitor, adjust the recording of each farmer, formulate farmer's recording habit
- Arrange PPMU staff in charge of target group, periodically monitor and provide guidance to production team leader/ internal auditor of Cooperative and farmers.
- Periodically organize group meeting for sharing good experience and mistakes that they always encounter.
- Monitoring by buyers (supermarket, canteens, etc) and requirements on Quality - Safety are motivation and compulsory conditions for producer's compliance.

III. CHECKING RESIDUES OF PESTICIDES, HEAVY METAL AND MICROORGANISM IN PRODUCTS

- Analyze and quick test the pesticide residues.
- Check, analyze samples in lab to check residue of pesticides, heavy metal and micro-organism.



3.1. Quick Testing residues of pesticides by quick test

Province	Target groups	Number of tests	Number of times when no residue is detected	Number of times when residue is detected, but still at safe level	Number of times when residue is detected, but still at un-safe level
Hải Dương	Tan Minh Duc Coop:	7	3	3	1*
	Duc Chinh Coop:	9	8	1	0
	Thanh Ha Company:	4	3	1	0
Ha Nam	Hiep farm group:	4	3	1	0
	Ha Vy Co-operative:	3	2	1	0
Hưng Yên	Yen Phu Cooperative	10	8	1	1*
	Ja-pan-Viet-nam Company:	23	18	5	0
Total		60	45	13	2

Note: * kiểm soát mẫu phát hiện dư lượng không an toàn (mẫu được lấy tại ruộng khi chưa đủ thời gian cách ly trước khi thu hoạch)

Kiểm tra nhanh
(quick test)
tại ruộng



3.2. SAMPLING FRESH VEGETABLES IN THE FIELD/ PRODUCTION GARDEN (TCVN 9016-2011)

Plan for sampling vegetables in the field

- Look through the map of farm land, crop type, expected productivity;
- Consider production and harvesting season of crops;
- Consider production dossier of units to determine sampling target, quantity of samples taken;
- Determine sampling position in the farm land map.

Determine the minimum quantity of pilot samples and sub-samples

- ***Case 1: Production plot is managed by 1 household or 1 company:***
 - Production plot has area ≤ 05 ha, take at least 1 pilot sample in each plot
 - Production plot has area > 05 ha, divide that big area into small areas of ≤ 05 ha, take at least 1 pilot sample in each plot.

Minimum number of sub- samples/ 1 testing sample depending on kind of crop and lot area, details:

Type of crop	Lot area	Minimum number of pilot sample	Minimum number of sub- samples/ 1 pilot sample
Vegetable is graded as big size (average weight > 250 gr/ unit)	≤ 05 ha	01	05
Vegetable is graded as small and medium size (average weight < 250 gr/ unit)	≤ 0.1 ha	01	05
	0.1 – 1 ha	01	05 - 08
	01 - 05 ha	01	08 - 12
	05 ha	01	12 - 16

➤ **Case 2: production lot is managed by many households (Cooperative, group)**

- Production lot has area ≤ 05 ha: at least 1 pilot sample/ 1 lot.
- Production lot has area > 05 ha: divide this big lot into many lots of ≤ 05 ha, 1 pilot sample/ 1 small lot divided.
- Minimum number of sub- samples/ 1 pilot sample depends on number of production households in that lot (n).
- Minimum number of sub- samples = number of households have minimum samples taken \sqrt{n} , but ≥ 5 samples
- If the lot is managed by many households with different production conditions, take separate sample of each household and that sample just represents that household only.

Results of lab test on residues of pesticides, heavy metals and microorganism in products

Province	Target group	Quantity of samples	Heavy metal	E.Coli. Salmonella	Pesticide
Hải Dương	HTX Tân Minh Đức:	3	0	0	0
	Duc Chinh Coop:	5	5(0)	0	4(<u>1</u>)
	Thanh Ha Company:	6	4(0)	0	0
Ha Nam	Hiep farm group:	3	0	0	0
	Ha Vy Cooperative:	2	0	0	0
Hưng Yên	Yen Phu Cooperative	3	3(0)	0	1(0)
	Japan-Vietnam Company:	3	3	0	0
Total		25	15(<u>1</u>)	0	5(<u>1</u>)

*(**): * -- detect, (**) -- detect the exceed of MRL

Samples detected:



Pesticide (Difenoconazole) 0.243mg/kg
(MRL 0.2mg/kg)
Carrot

Summarize main contents/ requirements of Basic GAP in safe vegetable production

- **Determine safe production area.**
- **Manage quality of production inputs.**
- **Good agriculture practices (GAP) in production:**
 - Fertilizer and irrigation water.
 - Pesticides.
 - Good post-harvesting practices.
- **Record field diary and record keeping.**
- **internal monitoring and inspection.**
- **Check residues of pesticides, heavy metal and micro-organism accumulated in products.**

LESSION 2

GOOD PRODUCTION PRACTICES IN HARVESTING, PACKAGING IN THE FIELD

MATERIAL OF TOT TRAINING ON BASIC GAP

OBJECTIVE

- ❖ Obtaining products of best quality with suitable cost;
- ❖ Reduce chemical, biological and physical hazards for products during harvesting, packaging, delivery;
- ❖ Minimize the loses during harvesting.

LOSES AFTER HARVESTING

- Reduce quality
- Do not ensure food safety;
- Reduce volume;
- Reduce nutrition value of products;
- Economic loses - reduce product value because of quality and volume reduction.

LOSES AFTER HARVESTING

- Reduce quality
- Do not ensure food safety;
- Reduce volume;
- Reduce nutrition value of products;
- Economic loses - reduce product value because of quality and volume reduction.

CHANGES OF PRODUCT QUALITY AFTER HARVESTING

- Chlorophyll decomposition - reducing perceptual quality of products, especially leafy vegetables.
- Dehydration due to evaporation - decrease the freshness, causing faded vegetables, soften the tissue structure.
- Respiration process keeps on working - reduce nutrition concentration of products.

HARVESTING POINT

Determine the proper point for harvesting products:

- Ensure yield, product quantity;
- Ensure perceptual quality, nutrition quality:
 - Products which are harvested at pre-mature time do not satisfy expected quality standard.
 - Products which are harvested at over mature time will be old, fibered, reducing the quality.
- Ensure food safety:
 - accurate pre-harvest interval.

BEFORE HARVESTING

- To ensure pre-harvest interval (PHI) for pesticides and organic fertilizers, farm manager should check diary of using pesticides and fertilizers to ensure:
 - Interval from applying pesticides and fertilizers to harvesting is proper as regulated.
 - Only harvest products which ensure pre-harvest interval as regulated.
 - If the pre-harvest interval is not ensured, the harvesting should be delayed until it ensures the PHI as regulated.



Green mustard:
30 days after sowing



Green choysum:
30 days after sowing seeds



Morning glory produced by seeds:
25 days after sowing seeds

HARVESTING POINT

Amaranth:
40-45 days after sowing seeds



Kohlrabi: 55-60 days after transplanting



Cabbage: 70-80 days after transplanting



Tomato: 50 days after transplanting

HARVESTING POINT

Broccoli: 65-70 days after transplanting



HARVESTING TIME

- ❖ Harvesting time: Coolest time of day - early in the morning or late in afternoon
- ❖ Do not harvest products in rainy or highly humid weather - Products are wet, and easy to generate temperature. If products are not preserved in ventilated conditions, it is easy to be rotten.
- ❖ Post harvest products should be placed in cool area (in shaded area) if they are not shipped immediately to pre-processing house or selling point.



EQUIPMENT, TOOLS, CONTAINERS

- Tools: Knife, scissor, etc.
- Product containers: Tray, plastic box, bamboo basket, nylon bags, jute bags, etc.
- Materials for line, containing products: Canvas, nylon, etc.

>>> **Must be clean and ready for use during the harvesting.**

- *Check, ensure hygiene of tools, equipments, containers before using to eliminate contamination hazards.*
- If it is unable to make it clean or remove product contamination hazards from tools, containers, it is better to not use it.

EQUIPMENT, TOOLS, CONTAINERS

- Tools, equipment, containers should be maintained regularly to avoid chemical or physical hazards to products.

- Tools, containers must be isolated from area which keeps chemical, fertilizers or additives.
- Need to have measures for differentiating containers used during harvesting and containers used in pre-processing house: Use containers which have different shape and colors.

GOOD PRACTICES IN HARVESTING VEGETABLES

- Check the field diary, ensuring the PHI for pesticides applied before harvesting
- Harvest vegetables in early morning or late afternoon to deliver to buyers within the day.
- Workers must pay attention during harvesting fresh vegetables to eliminate that the products directly touch soil.

CÔNG TY CỔ PHẦN HÀNG VIỆT - HANOI VEGEPRO		CỘNG HÒA XÃ HỘI CHỦ NGHĨA VIỆT NAM Độc lập - Tự do - Hạnh phúc	
NHẬT KÝ SẢN XUẤT			
Số tờ sổ sản xuất: 1.1.1.1.1		Loại sản phẩm: Bắp Cải	
Ngày tháng năm: 1.1.1.1.1		Ngày ghi chép:	
01/01/2014	Nội dung công việc làm đất, từ 0 giờ sáng, hơn 10h, tưới và xử dụng...	Người thực hiện: []	
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03/01/2014	Thụ lộc, tưới nước tưới	[]	
04/01/2014	Thụ lộc, tưới nước tưới	[]	
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27/01/2014	Thụ lộc, tưới nước tưới	[]	
28/01/2014	Thụ lộc, tưới nước tưới	[]	
29/01/2014	Thụ lộc, tưới nước tưới	[]	
30/01/2014	Thụ lộc, tưới nước tưới	[]	



GOOD PRACTICES IN HARVESTING VEGETABLES

- Must cover vegetables or bring vegetables to pre-processing house immediately to avoid direct sunlight.
- Except for root vegetables, workers must handle carefully to avoid damages and soil on products.
- Remove strange objects, damaged, rotten products and plant residues out of harvested products.



Không để sản phẩm trực tiếp trên đất

PRE-PROCESS AND PACKAGE AT THE HARVESTING PLACE

- Select suitable place for pre-processing and packaging fresh vegetables to avoid cross-contamination. Must use lining canvas for lining harvested products, do not let products directly touch soil.
- Check, ensure hygiene of tools, equipments, containers before using to eliminate contamination hazards.
- Pay attention during working to avoid damage, broken and causing biological, physical, chemical contamination on products.



COLLECT, DELIVER VEGETABLES FROM PRODUCTION AREA TO PRE-PROCESSING, PACKING HOUSE

- Products must be collected to a place which do not cause contamination on products.
- Use canvas and basket to keep vegetables in the field and deliver vege to pre-processing house
- Collect small quantity in each time.
- Do not pile up and strongly press vegetables.



GOOD PRACTICES OF TRANSPORTING PRODUCTS

- Transporting vehicle must be cleaned while arranging products.
- Protect products and containers to avoid dust, dirty contamination hazard while arranging and transporting.
- Pay attention to avoid contamination on products while using animals (buffalo, cow, horse, etc) for transporting.

PRE-PROCESSING AND PACKAGING IN PREPROCESSING HOUSE

- Only use clean water for washing products - *Water used in agriculture*
- Water for washing products must be regularly replaced. Do not wash products for more than 3 minutes to avoid water and micro-organism from entering into the products.

- Use plastic basket to store products after washing to ensure no cross contamination.
- Fully avoid the direct contact between packaged products and un-packaged products.
- After packaging, products must be labeled to facilitate product traceability.

GOOD PRACTICES IN VEGETABLE WASHING STAGE

- Gently wash to avoid damage
- Wash the root in some cases only
- Arrange vegetables into the basket, do not put too many
- Put basket onto the shelves or using the fan for drying vegetables before packaging



GOOD PRACTICES IN CUTTING, PRUNING VEGETABLES

- Prune all old leaves and un-mature leaves – easy to be damaged.
- Sort the uniform size following buyer's standard
- Gently arrange to avoid damage for vegetable
- Do not strongly arrange vegetables onto hard objects, which makes vegetable stems damaged.
- Can put into vinegar 2% to avoid micro-organism contamination (possible, especially in early summer)
- All pre-processing workers must be trained and guided with standard practices of pre-processing, packaging

GOOD PRACTICES IN PACKAGING VEGETABLES

- Use nylon bags with holes in the bottom and middle.
- Do not pack vegetables when they are still wet.
- Do not fully seal the bag top
- Vegetables are neatly arranged in the bag
- Consider to design packs suitable with customer's requirements.



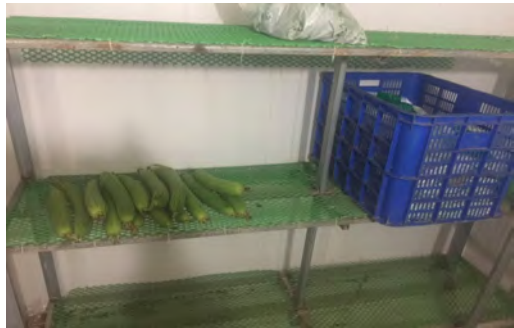
GOOD PRACTICES OF PRESERVING VEGETABLES

- Products must be preserved in clean, dry area, avoiding contamination hazard. Products should not be preserved together with fertilizers, agriculture chemicals and cleaning agents, disinfection.
- Except for root vegetables, post-harvested vegetable products should not be directly put on ground or floor to avoid chemical, biological and physical contamination.



GOOD PRACTICES OF PRESERVING VEGETABLES

- Preserve vegetables in cool, ventilated condition
- If vegetables are preserved in cooling condition, adjust the temperature not too low to avoid the temperature sock.
- Record date of pre-processing, packaging and monitor products to avoid supply supermarkets and hotels with vegetables of previous day



PRE-PROCESSING, PACKAGING VEGETABLES DO NOT SATISFY REQUIREMENTS



Vegetables got the rotten root (mustards)

PRE-PROCESSING, PACKAGING VEGETABLES DO NOT SATISFY REQUIREMENTS



Rotten root, many yellow leaves

PRE-PROCESSING, PACKAGING VEGETABLES DO NOT SATISFY REQUIREMENTS



Vegetables are damaged, vegetables are not packed in neat and attractive manner.

REASON AND CORRECTIVE MEASURES

- **Reason:**
 - Pruning, cutting technique results in bacteria contamination
 - The rainy and hot weather makes vegetable easy to be damaged.
 - Vegetables are stored for long time.
 - Effect from heat shock during cooling preservation
- **Corrective measures:**
 - Need to refer to cutting, pruning technique for application (need to put the vegetable roots into vinegar liquid for disinfection, etc)
 - Need to tightly control all the stages from caring (amount of water, etc), harvesting, pre-processing, packaging and delivery to customers.
 - Sort the products to deliver to each target customer.

LESSON 3**PART II.****THE UTILIZATION OF PESTICIDES AND CHEMICALS****PESTICIDES AND CHEMICALS**

- I. MISTAKES USUALLY ENCOURERED IN APLYING PESTICIDES
- II. MEASURES FOR ELIMINATING AND AVOIDING HAZARDS
- III. SOME ACTIONS NECESARRY TO BE DONE FOR OVERCOMING THE HAZARDS OF PESTICIDES AND CHEMICALS.

1. MISTAKES ALWAYS ENCOUNTERED IN APPLYING PESTICIDES

- Use of banned pesticides; pesticides not in the list;
- Use of pesticides unregistered for vegetable crop;
- Improper use of pesticides against regulation;
- Do not ensure the pre-harvest interval for pesticides;

- Pesticides are sprayed near products which have been harvested
- Pesticides are stick on product containers and packing materials
- Not yet collect packs of pesticides into proper areas
- Unsafe spraying equipment.....
- Use of banned pesticides, not in the list:



Banned pesticide



Pesticide not in the list of legal pesticides

- Use of pesticides not approved for vegetable crop :

For example: Pursuance to Circular No.03/2018/TT-BNN Trichlorogon (90SP, Dip 80SP, Terex 50 EC, Ofatox 400EC, etc) are not allowed to apply in Vietnam and for vegetable. However, these pesticides are being used for vegetable



- Improper use of pesticides against regulation:
 - Pesticides selected are not suitable for diseases
 - Overdose, many times higher than the instruction
 - Mixture of many kinds, etc.



Farmers used to mix 7 types of pesticides/ tank to spray onion.

Do not ensure pre-harvesting interval for pesticides:



HƯƠNG DÀN
 Hoạt chất **Alpha-Cypermethrin**
 tên thương mại khác nhau ở (1)
 thân, cuốn lá, bộ trí hại lúa sâu (2)
 (que), bộ xịt, bộ nháy hại vài thì
 quýt rau màu và cây ăn quả.
FMTOX 25EC đặc trị sâu cuốn
 khoang hại lạc, Rệp sáp hại c
 điều.
Liều dùng: - Lúa: 0.8 - 1.0 lit,
 - Cà phê: 0.2- 0.3
Cách pha phun: Pha một gói/
 dầu hoặc phun theo nồng độ%
Lượng nước phun: 400 - 600
 Có thể hỗn hợp với các loại
 khác. T₁ thuốc có tính kiềm.
Thời gian cách ly: 14 ngày



Pesticides are sprayed in area whose products have been harvested



Pesticides are left on product containers and packing materials



Pesticide residue accumulated in soil, irrigation water from previous use



2. IDENTIFY HAZARDS CAUSED BY OTHER CHEMICALS

- Soil, water is contaminated by chemicals from industrial zones, chemical factories nearby.
- Apply chemicals not in the list approved for use:
- Inappropriate chemicals or improper use of chemicals for cleaning and washing, leaving residue in equipments, containers, etc.
- Fuel (oil and gasoline), paints, etc on equipments of harvesting, packing and delivery, causing direct contamination to products and packing;
- Soil, water is contaminated by chemicals from industrial zones, chemical factories nearby.



- Apply chemicals not in the list approved for use
- For example: Waste water is applied for morning glory



- Inappropriate chemicals or improper use of chemicals for cleaning and washing, leaving residue in equipments, containers, etc
- For example: Apply Natrihidrosulfit (NaHSO_3 , a chemical used in textile industry, to make radish white and fresh
- Or fruits is soaked with antibiotic chemical or Carbendazim chemical to avoid the rotten.



- Fuel (oil and gasoline), paints, etc on equipments of harvesting, packing and delivery, causing direct contamination to products and packing



Do not use prohibited substances in food perservation



PART II: MEASURES TO AVOID AND MINIMIZE HAZARDS

Control the use of pesticides and other chemicals

Control farming soil, irrigation water source, etc.

1. USE OF CHEMICALS



- Promote the application of IPM, ICM
- Good management of following activities:
 - Buy, receive and manage pesticides (preservation, store)
 - Use of chemicals (spray chemicals)
 - Manage well the waste (package) of pesticides after use

PROMOTE THE APPLICATION OF IPM AND ICM TO MINIMIZE THE USE OF PESTICIDES AND OTHER CHEMICALS

- Integrated Pest Management (IPM): aims at suppressing pest populations below economic injury level and pesticides are only used when pest populations are at higher level than economic injury level.

- Integrated Crop Management (ICM): Manage to facilitate the good development of crops to minimize the use of chemicals and fertilizers (3 reductions 3 increases)

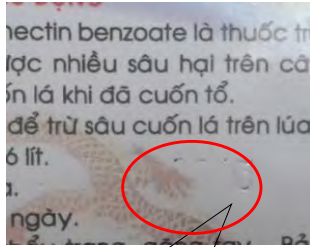
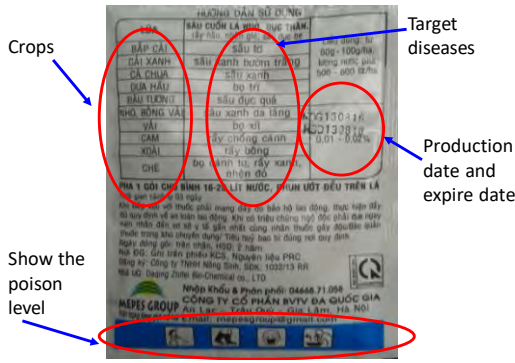


SELECT, BUY, RECEIVE PESTICIDES

- Only buy pesticides from suppliers/shops licensed by competent authorities
- Carefully read the instruction to know the expiration date, the suitability of pesticides on crops, etc.
- Do not buy pesticides not in the list approved and banned pesticides
- Only use pesticides in the list approved for use in Vietnam. Priority should be given to less toxic pesticides (blue color) and chemicals of plant origin, biological chemicals, especially in the end of crops
- Only buy pesticides from suppliers/ shops licensed by competent authorities










- Carefully read instruction to know information such as: expiration date, poison level, target pest, target crop of pesticides, etc.



Production date is erased, new one is created





Toxic level symbols of pesticides

Toxic group	Symbols			Notes
	Color	Symbols	Notes on the label	
I (extremely toxic)	Red 		Extremely toxic	Banned
II (highly toxic)	Yellow 		Highly toxic	Limited use for vegetable
III (less toxic)	Blue 		Dangerous	
IV (least toxic)	Green 	No symbols	Be careful	Priority should be given to vegetable

Toxic level symbols of pesticides(since 2018)

Theo Thông tư số 21/2015/TT-BNNPTNT ngày 08/6/2015 của Bộ trưởng Bộ Nông nghiệp và PTNT. Độ độc sẽ được ký nhiệm như sau:

Độc cấp tính

Yếu tố ghi nhãn	Loại 1	Loại 2	Loại 3	Loại 4	Loại 5
Hình đồ cảnh báo					Không sử dụng Hình đồ cảnh báo
Tên gọi hình đồ	Đầu lâu xương chéo	Đầu lâu xương chéo	Đầu lâu xương chéo	Dấu chấm than	
Từ ký hiệu	Nguy hiểm	Nguy hiểm	Nguy hiểm	Cảnh báo	Cảnh báo
Cảnh báo nguy cơ: Miệng	Chết nếu nuốt phải	Chết nếu nuốt phải	Ngộ độc nếu nuốt phải	Có hại nếu nuốt phải	Có thể có hại nếu nuốt phải
Cảnh báo nguy cơ: Da	Chết khi tiếp xúc với da	Chết khi tiếp xúc với da	Ngộ độc khi tiếp xúc với da	Có hại khi tiếp xúc với da	Có thể có hại khi tiếp xúc với da
Cảnh báo nguy cơ: Hô hấp	Chết nếu hít phải	Chết nếu hít phải	Ngộ độc nếu hít phải	Có hại nếu hít phải	Có thể có hại nếu hít phải
Vạch màu	Đỏ	Đỏ	Vàng	Vàng	Lam

SELECT, BUY, RECEIVE PESTICIDES

- Do not buy pesticides not in the list approved and banned pesticides, etc (usually pesticides with red color bar, no Vietnamese language, no label, etc)



Banned pesticides (red color bar)



Pesticides not in Vietnamese language

- Only use pesticides in the list approved for use on crops in Vietnam (Circular No.03/2016/TT-BNNPTNT and Circular No.06/2017/TT-BNNPTNT). Priority should be given to less toxic

chemicals (blue and green color) and chemicals of plant origin, biological chemicals, especially at the end of season.



Chemical of plant origin



Microbiological chemicals

PRESERVE AND STORE PESTICIDES

(applied for household, vegetable production farm; not for stores, pesticide trading agencies)

Warehouses (stores to keep chemicals):

- Located in high land area to avoid flood, far away from children 's reach
- Do not affect products in production area.
- Should have warning board, lock, etc
- Pesticides are neatly arranged to avoid the mixture with other agriculture materials.



USE OF PESTICIDES



Only use pesticides when needed.

Must comply with following:

- Principles of 4 correction
- Safety principle
- Fully record the process of pesticide utilization.

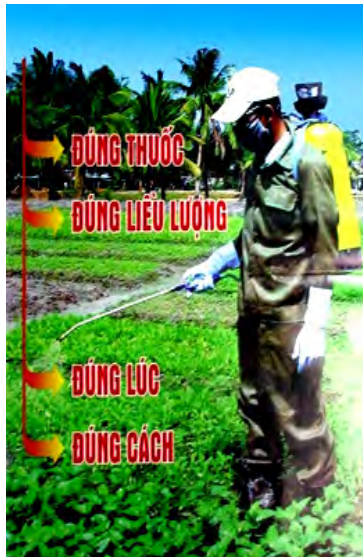
Only use pesticides when needed

- Regularly check and visit the field, combine with analysis on weather and crops
- Only apply pesticides when the pests and diseases are at economic injury level.



Pesticides must be applied in accordance with principles of 4 rights

- Right pesticides: suitable for target diseases, pests, etc.
- Right dosage: Follow the instruction on label (amount of pesticides/ amount of water for one area unit)
- Right time: apply pesticides for the diseases of early growth stage (diseases are easy to be killed, newly occurred diseases)
- Right using method: Follow the instruction (only spray leaves or root)
- Chemical users must carefully read instruction before use



USE PESTICIDES ACCORDING TO THE LABEL'S INSTRUCTIONS

ALWAYS READ THE LABEL CAREFULLY BEFORE USE

USAGE INSTRUCTIONS :: Crops :: Pest :: Dosage :: Mixing method :: Water quantity to be used :: Treatment time :: Number of treatment/crop :: Pre-harvest interval :: Important notes	 DANGEROUS KEEP OUT OF CHILDREN'S REACH	Kind of pesticide NAME OF PRODUCT®123 XX Use: abc def ghi jkl mno pqr stu vwxyz abc def ghi Active element: zzz 12.3% Net weight Net volume Reg. No. Na the producer Quality Reg. No. Production date Expiry date	DANGER If pesticide is spilled on the skin, wash it off immediately with plenty of water. If it gets into the eyes, wash them out with water for at least 15 minutes. If it gets into the mouth, spit it out and do not swallow. If it gets into the nose, sniff it out. If it gets into the ears, wash them out with water. If it gets into the hair, wash it out with water. If it gets into the clothes, remove them and wash them. Do not burn or dump. Do not burn.
			EFFECTS If pesticide is spilled on the skin, wash it off immediately with plenty of water. If it gets into the eyes, wash them out with water for at least 15 minutes. If it gets into the mouth, spit it out and do not swallow. If it gets into the nose, sniff it out. If it gets into the ears, wash them out with water. If it gets into the hair, wash it out with water. If it gets into the clothes, remove them and wash them. Do not burn or dump. Do not burn.
			

Comply with principles of safety during the pesticide use

Equipped with full set of equipment to fix and open the bottle (knife, scissor, etc)



Comply with principle of safety during the use of pesticides

- Calculate the sufficient amount of chemical to avoid surplus of chemical. In case of chemical surplus, the destroy process should be suitable (land should be far away from water source, make a hole, mix chemical surplus with lime, and then cover hole with soil)
- Do not pour chemical surplus into water or fish ponds



Comply with principle of safety during the use of pesticides

Packages of chemicals after use should be collected and treated in accordance with proper process to avoid the contamination for environment and products



Comply with principle of safety during the use of pesticides



Bathing and washing clothes, protective equipments after spraying chemicals

First aid for poisoned person due to direct contact or use of pesticide

Quickly take the victim out of the toxic area

Depending on the toxic contaminated way to select proper first aid



Fully record the process of pesticide utilization



Contents:

Name of pesticides

Target of pesticides

Dosage

Sprayed date, etc.

Quarantine period (PHI)

Note: How to record is guided in the diary of production practices.

Recording activities in some target groups

Họ và tên: Phạm Hải Tuấn
 Mã số hộ: 06/001/10/000
 Tên cây trồng: Cà phê
 Ngày ghi chép: 01/11/2011
 Địa điểm ghi chép: 01/11/2011

SƠ ĐỒ DÙNG PHÂN BÓN			
Ngày tháng (tháng/niên)	Tên phân bón	Số lượng sử dụng	Người thực hiện
01/11/2011	Lân NPK	50g	Phạm Hải Tuấn
01/11/2011	Lân Đạm	50g	Phạm Hải Tuấn

VINEGO
 10/04/11 ngày...
 Phạm Nguyễn Sơn

THU HOẠCH VÀ SẢN SẢN PHẨM

Ngày thu hoạch	THU HOẠCH		SẢN SẢN PHẨM		Người thu mua	Ngày thu mua
	Phân loại	Số lượng	Phân loại	Số lượng		
01/11/11						
02/11/11						
03/11/11						
04/11/11						
05/11/11						
06/11/11						
07/11/11						
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09/11/11						
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09/12/11						
10/12/11						
11/12/11						
12/12/11						
Tổng						

VINEGO
 10/04/11 ngày...
 Phạm Nguyễn Sơn

GIAM SÁT NỘI BỘ			
STT	Ngày tháng	Nội dung	Ký tên

KIỂM TRA ĐÁNH GIÁ CỦA BÊN MUA

Đem về kiểm tra:

Y kiến đánh giá:

Ngày thu hoạch	Phân loại	Số lượng	Người thu mua	Ngày thu mua
01/11	Cà phê	100kg	Phạm Hải Tuấn	01/11/11
02/11	Sông mai	50kg	Phạm Hải Tuấn	02/11/11
03/11	Sông mai	50kg	Phạm Hải Tuấn	03/11/11
04/11	Ớt	50kg	Phạm Hải Tuấn	04/11/11
05/11	Sông mai	50kg	Phạm Hải Tuấn	05/11/11

Ngày tháng	Nội dung	Ký tên
01/11	kiểm tra	Phạm Hải Tuấn
02/11	kiểm tra	Phạm Hải Tuấn
03/11	kiểm tra	Phạm Hải Tuấn
04/11	kiểm tra	Phạm Hải Tuấn
05/11	kiểm tra	Phạm Hải Tuấn

VINEGO
 10/04/11 ngày...
 Phạm Nguyễn Sơn

II. MANUAL METHOD

Use light trap, yellow or blue stick catch to kill winged aphids, leafy maggot/fly, flea beetle; removing insect larvae, catching insects, destroying insect pests, treating seeds, etc.

III. BIOLOGICAL METHOD: EXPLOIT AND USE BENEFICIAL ORGANISM (NATURAL ENEMIES, ENEMIES OF PESTS), BIOLOGICAL PRODUCTS IN CONTROLLING HARMFUL PESTS.

- Protect natural enemies

- Ladybugs eating aphid, worm
- Bees parasiting on eggs, young worm, pupae of harmful insects
- Ants, beetles, spider, etc eating pests
- Using Pheromone trap: Attract mature pests into traps and kill them (these pests will become armyworm, white butterfly, diamond-back moth, etc)

Guide to control pest/diseases on mustard crops



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I. CULTIVATION METHOD

- Clean the field: Collect and destroy plant residues having disease sources such as soft rot, Scherotinia blight, downy mildew, etc

harmful to mustard crops, wild grass where harmful pests live, etc eliminate the spreading sources, etc.

- *Use healthy seedlings with no diseases, use seedlings with good resistance*
- Only use healthy seedlings, seeds with high germination rate, no diseases
- Should produce seedlings on bedding, ensuring quality of seedlings for production area
- **Caring:**
- Fertilizer and applying fertilizer: Apply with right technique, apply enough and balanced amount for each vegetable, each soil type, each season, in correct time to facilitate the growth, increase the resistance to diseases, promote the use of composting.
- Watering: Ensure enough humidity for veg field, not too much.
- Season: Select varieties suitable to season for good growth
- Rotate and intercrop

IV. CHEMICAL METHOD

- Use chemicals which are less toxic to human and environment
- Use chemicals which takes short time for decomposition
- Chemicals in the low toxic level (group 3, 4)

II. MANUAL METHOD

- Use light trap, yellow or blue stick catch to kill winged aphids, leafy maggot/fly, flea beetle; removing insect larvae, catching insects, destroying insect pests, treating seeds, etc.
- Biological method: Exploit and use beneficial organism (natural enemies, enemies of pests), biological products in controlling harmful pests.

- *Protect natural enemies*
- Ladybugs eating aphid, worm
- Bees parasiting on eggs, young worm, pupae of harmful insects
- Ants, beetles, spider, etc eating pests
- *Using Pheromone trap:* Attract mature pests into trays and kill them (these pests will become armyworm, white butterfly, diamond-back moth, etc)'

IV. CHEMICAL METHOD

- Use chemicals which are less toxic to human and environment
- Use chemicals which takes short time for decomposition
- Chemicals in the low toxic level (group 3, 4)



COMMON PESTS ON CRUCIFERAE CROPS:

DIAMOND-BACK MOTH (*PLUTELLA XYLOSTELLA*)

- The pest feed leaves of cruciferae crops, short life cycle: 12 – 30 days, high productivity (1 female moth laid more than 100 eggs), high level of pesticide resistance. A life of cruciferae crop faces 2-3 turns of diamond-back moth. The moth in the middle and end of season often has high density, harmful to crops. The most affected period is in November, December, February, and March.



Pesticides to be used

Radiant 60SC

Dupont Prevathon 5SC

Match 050EC

Brightin 1.8EC

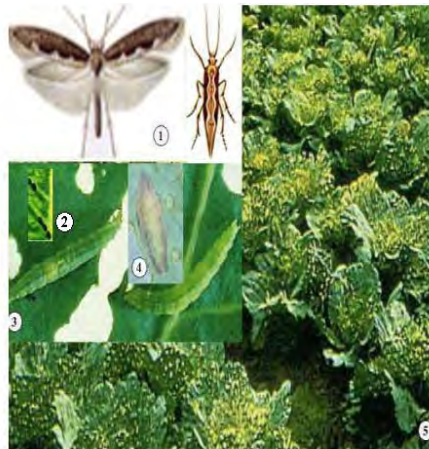
Abatin 5.4EC

Proclaim 1.9EC

Tasieu 1.9EC

Pegasus 500SC

Delfin 32WG



Sâu tơ - *Plutella xylostella* Linnaeus (Tên cũ: *Plutella maculipennis*)

1. Trưởng thành; 2. Trứng; 3. Sâu non; 4. Nhộng;
5. Rụng rau bị hại

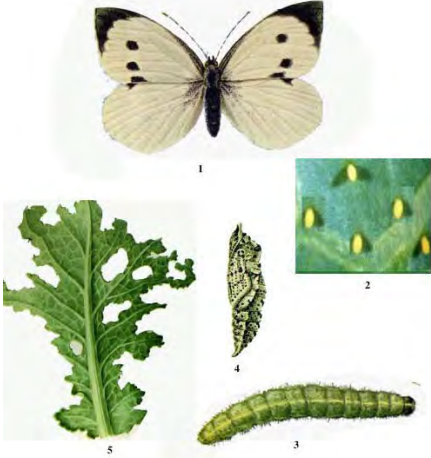
Deep blue *Pieris rapae*

Commonly harmful to cruciferae crops right from the un-mature time, feed the leaves and make many holes on leaves. This pest appear in the whole year, mostly in March-April, September-November



Deep blue *Pieris rapae*

Commonly harmful to cruciferae crops right from the un-mature time, feed the leaves and make many holes on leaves. This pest appear in the whole year, mostly in March-April, September-October



Sâu xanh bướm trắng- *Pieris rapae* Linnaeus

1. Trưởng thành; 2. Trứng; 3. Sâu non; 4. Nhộng; 5. Bộ phận bị hại

Pesticides to be used

Actimax 50WG

Prevathon 5SC

Match 050EC

Brightin 1.8EC

Radiant 60SC

Delfin 32WG



Aphid

(Brevicoryne brassicae)

Take nutrition mainly from the under side of leaf surface from young plant to harvesting, make plants stunted, deformed and yellowish. Aphid develops strongly in dry condition. If the aphid is not detected early, it is difficult to control later.



Pesticides to be used

Name of pesticides	Name of active substances
Movento 1000D	Spirotetramat
Sokupi 0.5SL	Matrine
Plutel 1.9EC	Abamectin
Reasant 3.6EC	Abamectin
Radiant 60SC	Spinetoram
Actara 25WG	Thiamethoxam
Tasieu 1.9EC	Emamectin benzoate
Brightin 1.8EC	
Radiant 60SC	
Delfin 32WG	

Flea beetle (*Phyllotreta striolata*)



- Baby worm affects root, mature worm feeds the leaves, creating many holes on the leaf. They develop throughout the year, the mature ones survive 2-3 months, even the whole year. The optimal temperature for laying eggs is 25-30°C

Pesticides

Dupont Prevathon 5SC

Oshin 20WP

Elsin 10EC

Sokupi 0.5SL



Armyworm (*Spodoptera litura*)



- Is vegetable multi-eaters, life cycle of 30-60 days. When eggs newly hatch, worm live in focused manner. If it is not detected and treated early, it is difficult to control. They usually damage vegetables of all seasons (except for winter season in the cold weather).

Pesticides

Reasgant 3.6EC	Abamectin
Delfin 32WG	Bacillus thuringiensis
Tasieu 1.9EC	Emamectin benzoate
Plutel 3.6EC	Abamectin



Black cutworm (*Agrotis ipsilon* Huf.)

Is vegetable-multi eater, strongly active in the night, the worm eat the body of the plant. The worm seriously damage when the seedlings are young and it is difficult to control because they live inside the soil

Name of pesticides	Active substances
Reasgant 3.6EC	Abamectin
Delfin 32WG	Bacillus thuringiensis
Tasieu 1.9EC	Emamectin benzoate
Plutel 3.6EC	Abamectin



Common diseases harmful to Cruciferae crops

- Method for diseases management:
 - Clean the field, cut off the infected leaves for destroying.
 - High beds, good drainage to avoid high humidity in the field.
 - Planting suitable density, not planted with high density resulting in serious damage.

- Select good, clean varieties with good disease resistance.
- Remove all residues of diseased plants after harvesting.
- Treat seeds with specific drugs for each disease before sowing.
- Some pesticides may be used for spraying when the disease is newly occurred and in favorable weather condition for the occurrence of harmful diseases:
- Damping off in seedbed:
- This disease affects the seed and seedling, caused by Pythium, Fusarium, Phytophthora, Rhizoctonia fungus, etc in soil. The diseased seedling is easy to die or rot near the ground when they fall and die.

Pesticides used when necessary:

Name of pesticides	Active substance name
Daconil 75WP	Chlorothalonil
Moren 25WP	Pencycuron
Validacin 5SL	Validamycin A
Score 250EC	Difenoconazole
Kasumin 2SL	Kasugamycin

Downy mildew:

This disease can affect both seedling and mature plant. The diseased plant has a layer of grey mold under the leaf. The upper side of the leaf has yellow color, after that yellowish or die. Heavily diseased leaves are withered and died. The disease develops seriously in high humidity.

- Pesticides used:

Pesticide name	Name of active substance
Vimonyl 72WP	Mancozeb+Metalaxyl
Biogreen 4.5SL	Chitosan
Daconil 75WP	Chlorothalonil
Forwanil 75WP	Chlorothalonil

+ **Ringspot:** Caused by *Alternaria brassicae* fungus.

The disease damages cruciferae crops and some other crops, causing serious damage even when the plants are mature. The disease trace has circle shape, many circles have the same center, link with each other. There is a mold on the leaf in high humidity.

Pesticides used:

Daconil 75WP	Chlorothalonil
Score 250EC	Difenoconazole
Nativo 750WG	Tebuconazole + Trifloxystrobin



- **Sclerotinia blight:** Caused by *Sclerotinia sclerotiorum* fungus on cabbage. The seedlings are rotten in the root and fall down. The mature plant got disease, the disease invades from the stem to head, causing rot from outside to inside. The diseased plant can die and rot in the field. The disease develops well in high humidity (November- April)



Pesticides used:

Biobus 1.00WP

Trichoderma viride

Moren 25WP

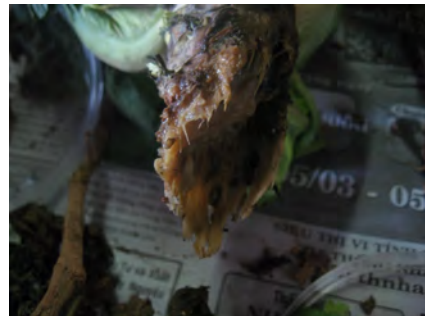
Pencycuron

Alfamil 25WP

Metalaxyl



- **Soft rot:** Resulted by *Erwinia carotovora fungus on cruciferae crops*. The disease often occurs when the plant are mature and got fast infection. The disease trace invades from the starting spot, causing rot, bad smell. The disease is serious at the end of late season. It even develops fast during the product preservation.



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How to control diseases resulted by bacteria

- For bacteria diseases, prevention is the key method. When it gets diseased, it is almost very difficult to control, most of products must be destroyed. The bacteria exists in soil, water, seedling, invade through mechanical injuries, etc.

- The died plant should be moved out of the field for destroy, use lime for sterilizing soil. To eliminate the spread of disease, apply more P and K, stop applying N.

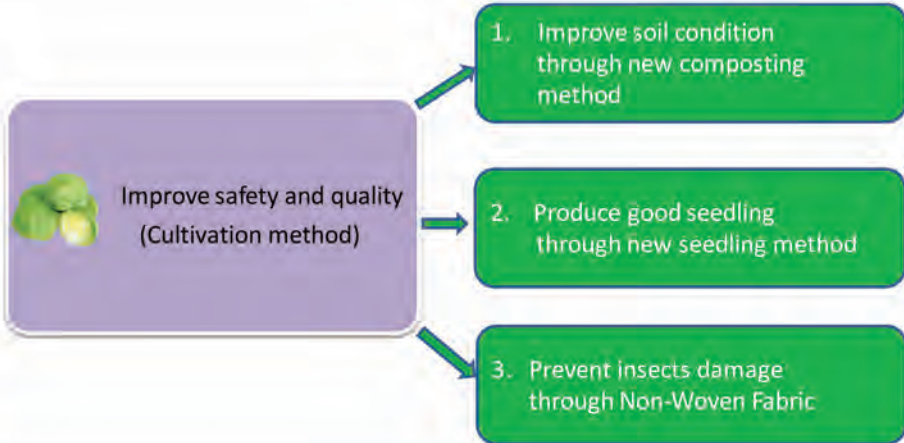
- **Pesticides:**

Pesticide name	Name of active substance
New Kasuran 16.6WP	Copper Oxychloride + Kasugamycin
DuPont™ Kocide 46.1WG	Copper Hydroxide
Kasumin 2SL	Kasugamycin
Alfamyl 25WP	Metalaxyl

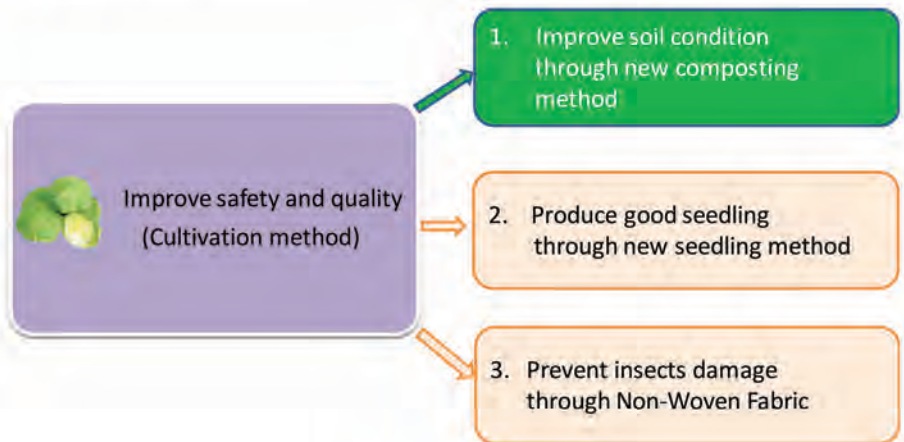


LESSON 4

Sharing experience on some solutions To improve safety and quality of vegetables



1. Improve soil condition through new composting method



1. Improve soil condition through new composting method



Four Benefits:

- 1) Possible to improve soil
- 2) Possible to use local materials
- 3) High nutrition contents
- 4) High efficiency for seedling nursery

1.1 Possible to improve soil

1) Main materials are different

Using buffalo, cow, pig dung



High efficiency for improving soil

Not using chicken dung



Low efficiency in improving soil



Compost helps the plant grow healthy and sustainable, increases the flavor and quality of vegetable

1.1 Possible to improve soil

2) Apply aerobic composting method

- Aeration is the important condition to develop micro-organism during the composting process.
- Micro-organism can change soil as soft



Make ventilated roof



Mix compost during the composting process to send air inside deeply

1.2 Possible to use local materials

1) Local wine yeast



Good points:

- Cheap price
- Easy to find
- High efficiency

Effects:

- Source of beneficial micro-organism during the composting

2) Local buffalo, cow, pig dung



Good points:

- Cheap price
- High efficiency

Effects:

- Make soft soil

3) Rice bran and Rice hush



Rice bran



Rice hush

Good points:

- Easy to find
- Cheap price

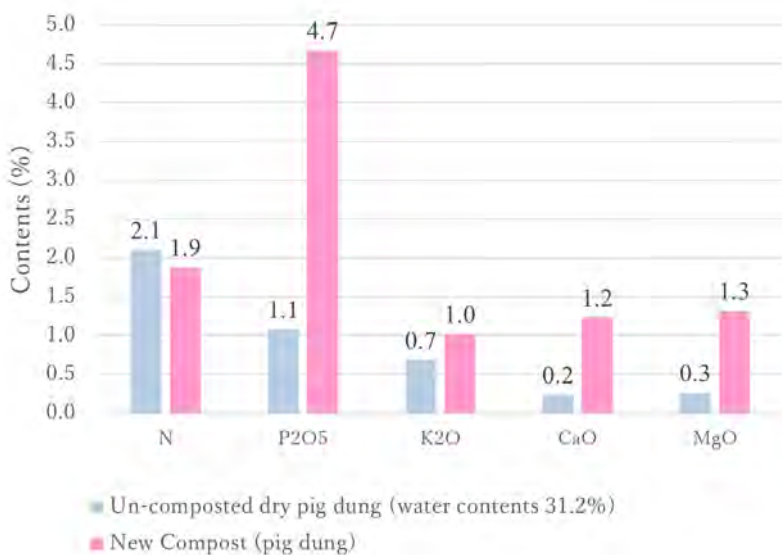
Effects :

- Promote the development of micro-organism during the composting process

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1.3 High nutrition contents

1) Nutrition contents are higher than low dung



1.4 High efficiency for seedling nursery



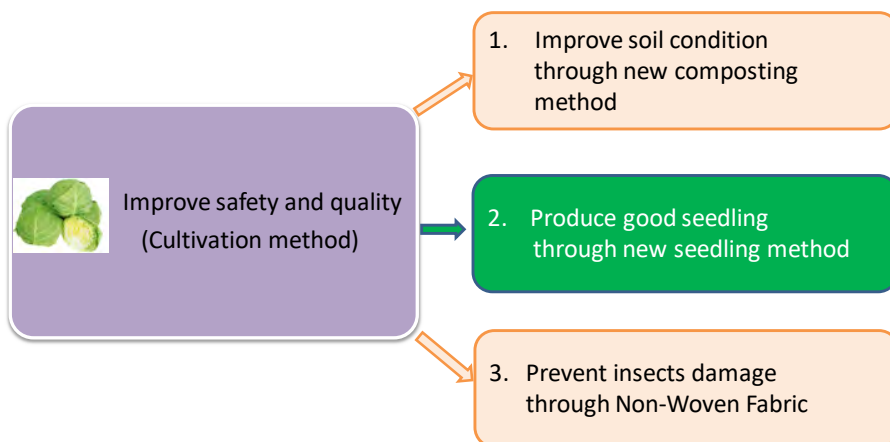
Mix compost
with seedling nursery bed



Seedlings grow well
on bedding

Annex 1: Technical guidance on making composting

2. Produce good seedling through new seedling method





2. Nurse seedlings on bedding

Solution for good quality seedlings



Three
benefits

1) Obtain healthy seedlings

2) Obtain seedlings of good uniformity

3) Those seedlings can be applied in grafting technique

2.1 Obtain healthy seedlings

When seedlings are pulled out for transplanting...

Broken 4% only



Bedding method

Broken 100 %



Traditional method

After seedlings are transplanted...

More than 94% survives



Bedding method

Less than 80 % survives



Traditional method

2.2 Obtain seedlings of good uniformity

Uniformity seedlings is important to harvest uniformed products at the same time.



The uniformity development on the bedding



The uniformity development in the field

2.3 Possible to apply grafting technique

Possible to apply grafting with root of disease-resistant seedlings



Bedding method

Unable to apply grafting

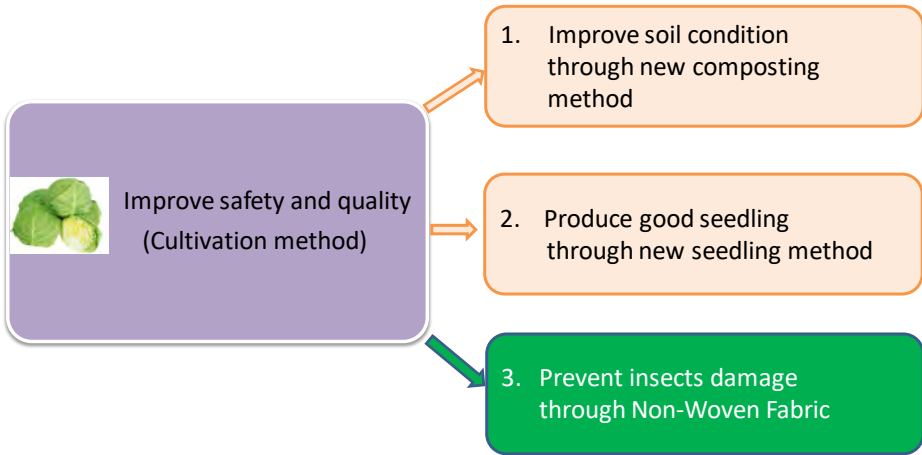


Traditional method

Annex 2: Technical guidance on nursing seedlings on bedding

Annex 3: Technical guidance on nursing grafting tomato seedlings

3. Prevent insects damage through Non-Woven Fabric



Non-Woven FabricT



- A thin, new fabric sheet made from fiber
- Help to protect vegetables from the attach of insects/ pests

Three benefits

1) Easy to use

2) Reduce the damage by insects/ pests

3) Reduce the pesticides application

3.1 Easy to use



- Light and durable
- Easy to move, easy to use in the field

3.2 Reduce the damage by insects/ pests

100% is damaged by insects/
pests



Do not apply Non-Woven Fabric

Only 4% is damaged by
insects/ pests



Apply Non-Woven Fabric

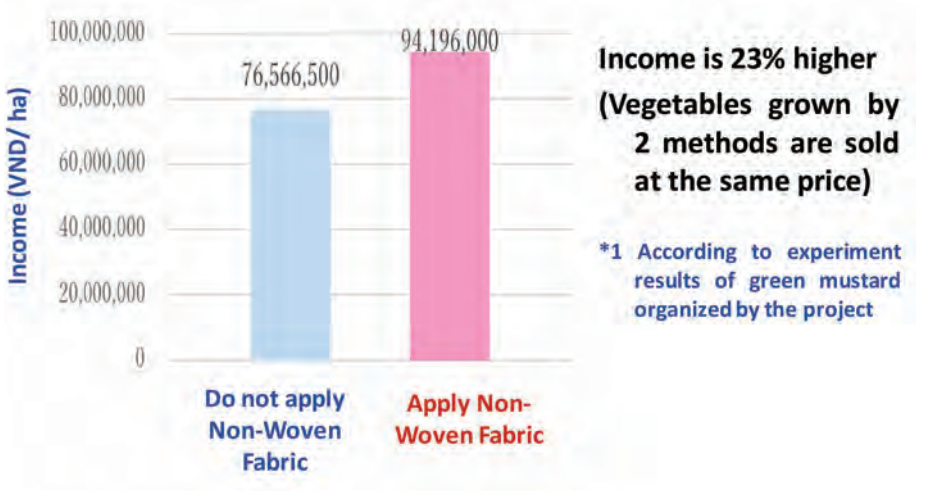
* According to experiment results of Cabbage organized by Project

3.3 Reduce the pesticides application



- Safer
- Less working labor
- Less cost

3.4 Profit earned from this method



3.5 High efficiency in cultivating vegetables



E.g., green mustard



E.g., cabbage

Possible to apply for:

- Chinese cabbage
- Choysom
- Spinach
- Mustard
- Green bok choy
- Cabbage
- Flowering choysom
- etc

3.6 Feedback from producers and buyers



- “I am really surprised because Non-Woven Fabric is not only easy to use but also very effective in controlling insects”, Mr. Gioi, Japan-Vietnam safe vegetables, fruit company
- “I want to buy safe vegetables with good quality, Non-Woven Fabric can satisfy my requirements”, buyer in Hanoi

Annex 4: Technical guidance on applying Non Woven Textile

ANNEX 1

TECHNICAL GUIDANCE ON MAKING COMPOSTING

Guidance on composting technique

Materials:

1: Dung 2 m3

2: Wine yeast: 1 kg

3: Rice bran: 50 kg

4: Rice hush: 5 bags.

5: Rice hush charcoal: 5 bags

Step 1: Ferment rice bran



Grind 1 kg of wine yeast



Equally mix 1 kg of wine yeast with 50 kg of rice bran, add more water to reach humidity of 40-45%



Put the mix into bags and put those bags in ventilated place for 10 days,

Step 2: Burning rice hush



Burn to get smoldering and small fire inside the rice hush hill



After finish, use water to extinguish when the fire comes out



Rice hush charcoal after burning rice hush

Effect of rice hush charcoal

- Deodorize the bad smell of dung
- Create favorable condition for promoting the development of micro-organism during the composting process

Step 3: Mixing materials



Mix: Equally mix materials (dung, fermented rice bran, rice hush charcoal, rice hush) Control the humidity of 60-65%.

Reverse: Reverse every 20-25 minutes

Use: The compost is available for use after 2-2.5 months

ANNEX 2

TECHNICAL GUIDANCE ON NURSING SEEDLINGS ON BEDDING

Technical guidance for nursing seedlings on bedding



- Step 1: Prepare bedding (including 40% bud soil whose Ph and humidity has been treated, 40% rice hush charcoal, coconut coir treated, 20% compost)



- Step 2: Put bedding into foam trays, moderately press the bedding, sow the seeds, cover the seed with a thin layer of bedding on the top (seeds are soaked before sowing)



- Step 3: After sowing, need to water to maintain humidity, pile up foam trays, cover the foam tray pile with canvas or put in dark place from 2- 3 days to ease the germination



- Step 4: When seeds start germination, move foam trays on shelves to facilitate taking care. The shelves should be arranged above the ground. (at least 20 cm from the ground) to create ventilated condition.



Step 5: When the seeds germinate, shade the seeds from 50% of sunlight from 3-5 days (if the weather is not sunny, no need to use black net for shading the seeds)



Step 6: 3-5 days, totally take off black net in morning and afternoon, only use black net to shade the seeds in hottest time.



Step 7: Caring seedlings, water every day to keep enough moisture. Should not water late in the afternoon.



Apply additional NPK by mixing with water when necessary (**ratio 1 kg of NPK/ 600 lit of water**). Spray pesticides to control pests/diseases when needed. The seedlings are available for transplantation after 20 – 25 days of nursery. 3 days before transplantation, let the seedlings get familiar with outside natural condition.

ANNEX 3

TECHNICAL GUIDANCE ON NURSING GRAFTING TOMATO SEEDLINGS

Technical guidance on nursing grafting tomato seedlings

1) Nursing eggplant seedling for rootstock

Step 1: Sowing eggplant seed



1. Eggplant rootstock seed: Use of specialized eggplant seeds to make rootstock. Do not use hybrids of eggplant variety for rootstock
2. Preparing nursery bed: Mixing 40 % mud, 40 % Coir with 20 organic fertilizers then compost them in 1 month. Nursery bed must be met the following conditions: free of diseases, enough nutrition, porous.
3. Soaking eggplant seeds in water in 6 to 8 hours, then sow 1 or 2 seeds for each hole of sponge tray. Using sponge tray of type 84 holes
4. Placing the sponge tray on the sand base for the roots grow stably.

Step 2: Taking care eggplant seedling



Before selecting



After selecting

1. Watering to keep enough moisture, avoiding the wet condition in night time by stopping to water in late time of day.
2. After germination 10 -15 days, selecting, maintaining 1 healthy seedling/one sponge hole.
3. Opening shade cloth to seedlings gradually adapt to the outside environment
4. Fertilizing if seedling require (Ratio 100g (NPK)/60L water)
5. Preventing diseases and treating insect by using proper pesticide.
6. After germination 25 -30 days, it is necessary to select and move the big seedling into the same tray, small seedling into the same tray to easier take care daily

Steap3: Criteria of eggplant rootstock



1. Doing grafting when eggplant seedlings is about 45 -50 days from sowing.
2. Selecting healthy seedling to graft
 - + Height: 16 – 20 cm.
 - + The diameter of the tree is not too big, not too small (Around 3mm)

2) Nursing tomato seedling



Directly sowing in soil



Sowing in the sponge tray

1. Sowing tomato seed after sowing eggplant seed about 25, 30 days
2. Sowing can be applied both methods sowing directly in the soil and sowing in sponge tray.
3. Watering to keep enough moisture, avoiding the wet condition in night time by stopping watering in late time of day
4. Fertilizing if need (Ratio 100g (NPK)/60L water) .
5. Can do grafting when eggplant seedlings are about 45 -50 days and tomato is about 20 days from sowing

3) Building grafting chamber

Select the location to build grafting chamber



Grafting chamber



Grafting chamber

How to select the location?

1. Select a higher location than surrounding to avoid the flooding when it rain.

2. Select the shade location to avoid sunshine (under the tree).
3. Select the area that have base by soil to drain water quickly and keep moisture long time. (Should not select the base making by concrete)

● Method of building



Making base by soil and sand, making the frame by bamboo (height of frame 80cm, width 1.8m, length 3 m)



Covering the roof by vinyl to keep moisture and prevent rain.



Covering more 2 or 3 layers of shade cloth on vinyl to reduce the light



Making sure that the vinyl and shade cloth covered all part of the chamber.



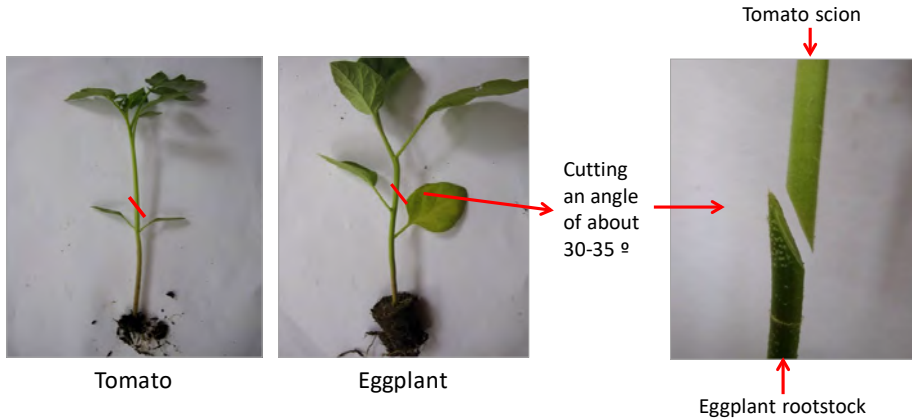
Covering a layer of fabric on the top to reduce high temperature in the sunny day

Grafting chamber need to ensure the following conditions:

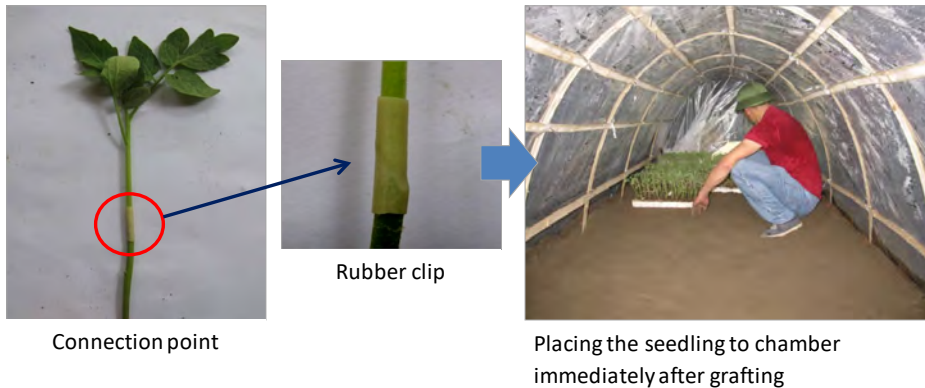
1. Create cool condition even on sunny days.
2. Can keep moist.
3. Reduce moisture quickly when needed.
4. Size is enough for 30 sponge trays

4) Grafting techniques

Step 1: Select tomatoes and eggplant seedling that have same size and cut (smooth cutting) the same angle.



Step 2: Using a rubber clip to connect the eggplant rootstock and tomato scion then place it into chamber.



Step 3: Keeping seedling in chamber 6 to 7 days, controlling the proper moisture (If high moisture, the plant will be died at graft point.

If low moisture, the tomato scion will be withered)



Day 1: After grafting, closing the chamber about 21 hours (1 night and 9 hours)



Day 2 and 3: Slowly open and adjust 2 holes of chamber to avoid the high moisture or lack of moisture condition



Day 4, 5, 6: Gradually open bigger and adjust 2 holes of chamber (Avoiding the high moisture or lack of moisture causing seedling dying at graft point or withered)



Day 7: Bring the seedlings out of chamber to place in seedling house, reducing sunshine by shade cloth in 6-8 days



Gradually open the shade cloth to seedling adapts with sunlight condition



Transplanting after grafting 12-15 days

5) Common problems in grafting

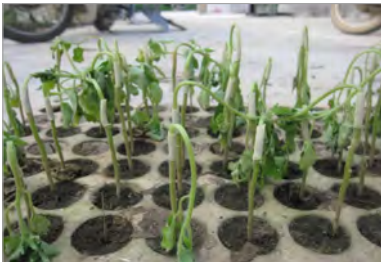


Moisture condition is too high in chamber

Reason:

- Rain water from the outside soaked into the house under the ground.
- Opening the chamber improperly, so make the moisture can not escape

Results: 90% seedling died



High temperature inside of grafting chamber

Reason:

- The chamber is located in a sunny place, thus increases the internal temperature.
- The chamber is only covered with shade cloth, not covered one more fabric layer on top of the roof

Results: 100% seedlings died

ANNEX 4

TECHNICAL GUIDANCE ON APPLYING NON - WOVEN FABRIC

Technical guidance on applying Non - Woven Fabric

1) Directly covering



Making soil: Preparing row of size 1,2m width. Applying fertilizer. Pre-germinated herbicide. Sowing seed



Directly cover Non-Woven Fabric on surface of row



Watering as normal cultivation



Opening NWF when apply fertilizer, fungicide and **harvest**

2) Tunnel method



Preparing land with row of size 1,2m width. Applying fertilizer, pre-germinated herbicide. Sowing seed



Covering NWF on tunnel, watering as normal cultivation



Vegetable grows well inside of tunnel



Opening NWF when apply fertilizer, fungicide and **harvest**



**Project for Improvement of
Reliability of Safe crop Production in
the Northern region**



**LESSON LEARNED FROM ACTUAL PRODUCTION AND
TRADING OF SAFE VEGETABLES
TÂN MINH ĐỨC COOPERATIVE**



August 21 2018

INTRODUCTION ABOUT TAN MINH DUC COOPERATIVE

- Tan Minh Duc Cooperative was established in August 2014.
- Quantity of Management members/ total production members: 7/ 168 households
- Total cultivation land area/safe vegetable area: 37/37 ha
- Vegetable area certified by VietGAP certificate: 27 ha
- Pilot model size for safe vegetable production and joint sale in JICA project: 7.5 ha; with 39 participating households.
- Vegetable supply capability: Total annual output: 2,468 tons
- Main vegetables: Cabbage, kohlrabi, green squash, pumpkin, sponge gourd, cucumber

Vegetable production Field



Total safe vegetable production area is 37 ha.

Key product

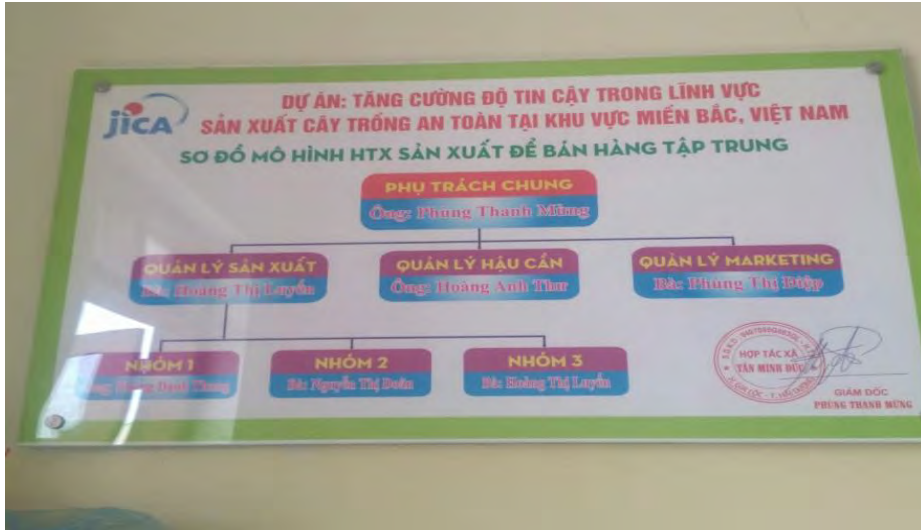


Strength of Coop: focus on production and consumption of 2 key products in winter season: cabbage and kohlrabi



In addition to cabbage and kohlrabi, Cooperative has other products such as green squash, pumpkin, bitter melon, sponge gourd, cucumber

ORGANIZATION STRUCTURE OF COOPERATIVE FOR PRODUCTION AND JOINT SALE



Cooperative is certified with Certificate of compliance with food safety and hygiene condition and VietGAP certificate

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ACTIVITIES TO IMPLEMENT PRODUCTION AND TRADE MODEL OF SAFE VEGETABLES

- Provide Cooperative managers and workers with training on Basic GAP.

- Comply with regulations of Basic GAP to produce safe products.
- Monitor, provide on-site guidance, guide how to record the field diary.
 - Internal auditor and production manager will guide farmers how to practice cultivation applying GAP and how to record production diary.
 - Technical auditor of PPMU visit the field in Cooperative 1 time/ week to check and guide the recording of production diary and on-site practice

ACTIVITIES TO IMPLEMENT PRODUCTION AND TRADE MODEL OF SAFE VEGETABLES

- Internal evaluation
 - Internal evaluation is organized 1-2 times/ year basing on list of Basic GAP control points (26 control points)
 - Technical auditor of PPMU participates in internal evaluation to guide Cooperative members how to check, monitor and take sample of vegetables for testing.
- Check, inspect and take samples for testing quality of vegetables.
 - Continuously check residue of pesticides by quick test tool
 - Get samples and send to laboratory for testing 1 time/ season
- Support to upgrade food safety and hygiene conditions in production, pre-processing and packaging area.
 - Support to access to market and product consumption area.

RESULT ACHIEVED AFTER PARTICIPATING JICA PROJECT

- Monitor production process, the use of pesticides in the approved list.
- Monitor and check product quality
- Already make effort to change packaging method to deliver products in the most convenient basis. Packaging specification satisfies buyer's requirement

- Upgrade pre-processing house.
- Best packaging products to ensure quality during delivery.
- Sort and screen products more carefully so that all partners will feel satisfied and have good evaluation.

ACTIVITIES TO IMPLEMENT PRODUCTION AND TRADE MODEL OF SAFE VEGETABLES

- Internal evaluation
 - Internal evaluation is organized 1-2 times/ year basing on list of Basic GAP control points (26 control points)
 - Technical auditor of PPMU participates in internal evaluation to guide Cooperative members how to check, monitor and take sample of vegetables for testing.
- Check, inspect and take samples for testing quality of vegetables.
 - Continuously check residue of pesticides by quick test tool
 - Get samples and send to laboratory for testing 1 time/ season
- Support to upgrade food safety and hygiene conditions in production, pre-processing and packaging area.
- Support to access to market and product consumption area.

RESULT ACHIEVED AFTER PARTICIPATING JICA PROJECT

- For farmers: Have formed habit of:
 - Using input materials (pesticides, fertilizers) suitable to target crop.
 - Farmers regularly record field diary, harvesting diary.
- For Cooperative:
 - Make production plan for many kinds of vegetables for each household.
 - The production has regular inspection and monitoring, therefore, products produced ensure the quality.

- Have stable business partners (sign the product consumption contract)

RESULTS OF TRADING VEGETABLES IN WINTER SEASON 2017

Buyer	Crop	Supply time	Volume (kg)	Ratio of producers participating in joint sale (%)
Big C	Cabbage	From October to next April	1.2 tons/day	20%
	Kohlrabi	From September to next April	420 kg/day	20%
	Cabbage	From October to next April	5,200 kg/ month	5%
HARUMIDORI	Kohlrabi	From September to next April	320 kg/ month	5%

Difficulties, challenges in production and trading of safe vegetables

- Production and trading of products
 - Farmers record field diary, harvesting diary in not regular manner.
 - Not yet obtain uniformity of quality
- Product distribution
 - Transportation fee is too high because of far distance
 - Some buyers are located far from Cooperative and they buy small quantity.
 - Price of safe vegetables is still low
- Marketing strategy
 - Do not get market information updated timely
 - Do not have professional marketing
 - Do not have stable and specific buyers to have stable production plan.

Trading objective and Action plan in next time

Detail goal and plan of Cooperative in trading and production for next year

- Vegetable types, quality standard
 - Mainly grow cabbage, kohlrabi, pear-shaped melon, watermelon, cucumber, asparagus, purple egg plant, tomato, etc.
 - Products already have sorting, pre-processing, label and packaging
- Distribution and delivery channel
 - Sell to some supermarkets such as VinEco, Big C, Lotte and some other buyers such as Harumidori, local buyers.
 - Cooperative has 8-ton truck to deliver vegetables
- Price/ cost:
 - Selling price is 10% higher than market price.
- Market strategy
 - Maintain contract with existing buyers
 - Find potential buyers and focus on buyers who buy big volume

Action plan for next year

- Vegetable types, quality standard:
 - Expand more members participating in joint sale
 - Grow leafy, root, fruit vegetables Develop to diversify products
 - Tightly control production stage to ensure good quality for products
 - Encourage the tight management on recording
 - Organize short-term training on pre-processing to workers who are directly involved in pre-processing, packaging, delivery
 - Collect products to Cooperative for sorting, pre-processing,

packaging

- Distribution and delivery channel
 - Organize sale to regular customers and wholesale markets
 - Organize delivery of products by direct delivery or in combination with other vehicles
- Price/ cost:
 - Try to increase management to reduce product price
 - Negotiate to sell at higher price which is from 10% to 20% higher than market price
- Market strategy
 - Once Cooperative has customer, it tries to maintain and develop that customer sustainably
 - Organize at least 2 face-to-face meetings/buyer and exchange information with buyers
 - Find potential buyers who buy big volume



Project for Improvement of Safe crop production in the Northern region



LESSONS LEARNED FROM ACTUAL SAFE VEGETABLE PRODUCTION AND TRADING IN DUC CHINH COOPERATIVE



August 21 2018

INTRODUCE ABOUT DUC CHINH COOPERATIVE

- Duc Chinh Cooperative was established in 1980, transferred under Cooperative law 2012
- Quantity of members: 1,636 members
- Total cultivation land area: 420 ha
- Cultivation area for carrot: 360 ha
- Vegetable area certified by VietGAP: 23.6 ha for carrot
- Size of pilot model on safe vegetable production and joint sale under JICA project: 30 ha with 278 households.
- Total annual output: 17,000 tons.

Carrot – key product

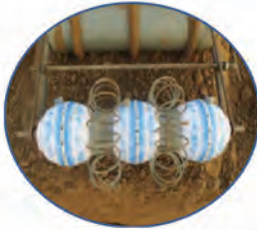


Sowing, transplanting from August to next February, harvesting from November to next May. Average volume: 17,000 tons/ year.

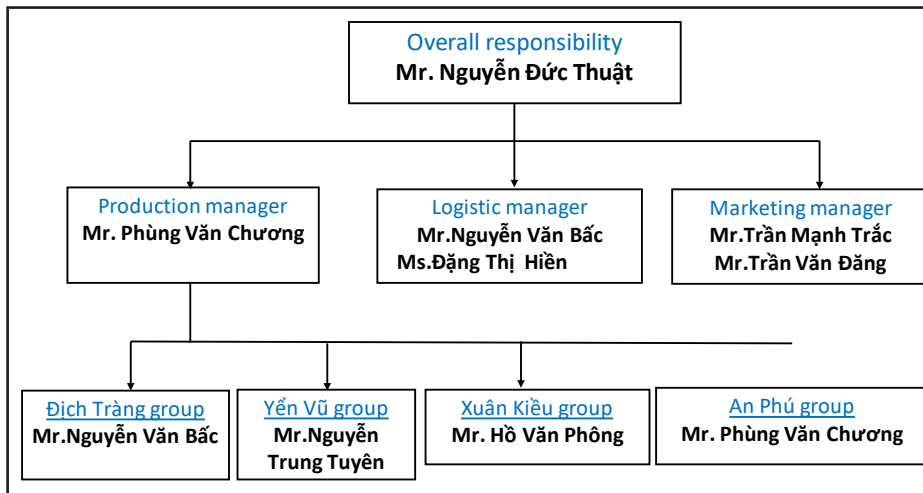
In addition, Cooperative also grows watermelon (150 ha) and sweet corn (40 ha) in Spring-Summer season, resulting in high economic value.



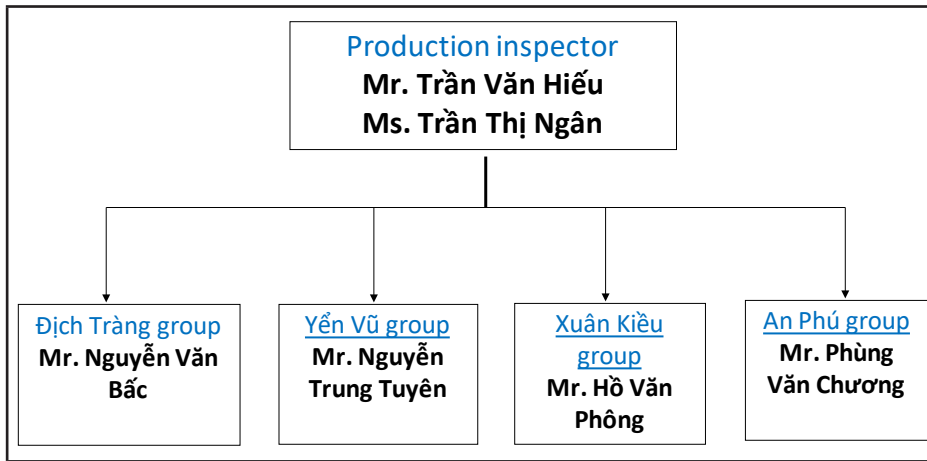
Duc Chinh farmers have many year experience in carrot cultivation. They are hardworking, creative, willing to learn. They have been applying science and technology, produced machineries serving production. Duch Chinh is the leading brand-name for product production and quality.



ORGANIZATION STRUCTURE OF COOPERATIVE MODEL FOR PRODUCTION AND JOINT SALE



SITEMAP OF INTERNAL AUDIT TEAM



RESULTS ACHIEVED FROM JOINING JICA PROJECT

● For Cooperative:

+ Make production plan.

+ There is regular monitoring and inspection for production, therefore, products are ensured in term of quality.

+ Construct transportation roads, ditches convenient for delivery of products and irrigation.

● For farmers: Have formed habit of:

+ Using input materials (pesticides, fertilizers) correct for target crop.

+ Comply with regulation of Basic GAP/VietGAP; regularly record field diary, harvesting diary as instructed to have safe products.

RESULTS OF TRADING VEGETABLES IN WINTER SEASON 2017

Buyer	Crop	Supply time	Volume (ton)	% of farmers participating in joint sale
Ms. Dịu – Hoài Đức	Carrot	Jan; Feb, Mar, Apr	113,74	26%
VietHarvest	Carrot	Jan; Feb, Mar, Apr	140,385	
Coopmart	Carrot	Jan; Feb, March, April	84,57	
Total			338,695	

Difficulty, challenges in applying Basic GAP in safe vegetable production

- Use pesticides for wrong target crop; use pesticides whose substances are not recommended for vegetable
- Apply over dosage and concentration as instructed (in term of using dosage, water amount)
- Periodically spray, even when there is no appearance of pests/ diseases.
- Mix many kinds of pesticides which have similar effect for controlling pests/ diseases.

Difficulty, challenges in safe vegetable production and trading

- **In product production and trading**
 - Disadvantaged weather condition (rain, flood), pest/disease affecting production activities.
 - Infrastructure is not systematic, not yet have its own pre-processing house; still have to link with enterprises to have pre-processing house.

- The uniformity of products is not high, appearance is not really good.

- **Product distribution**

- Not yet have specialized delivery vehicle.
- Deliver products in far distance, resulting in latent risk.
- In mid season – demand of buyers is not stable.

- **Market strategies**

- Have not many buyers.
- Have buyers far from production area, and they buy small quantity.

Production plan and trading for next year

● Vegetable product, quality standard

- Focus on monitoring, organizing joint sale for pilot groups in area of 30 ha, to be motivator for other areas.
- Apply techniques into production, to grow products of quality, uniformity and nice appearance; study to grow off-season carrot
- Apply machineries into agriculture production.
- Well satisfy customer's requirements on pre-processing, sorting products.

● Distribution and delivery channel

- Sign contract with 3 agents and supermarkets
- Through Project introduction, through trade fair, advertisement via information channels.
- Focus on supermarkets, wholesale markets, restaurants, canteens.
- Prepare vehicle for delivering products at least 5 hours in advance.

● Price/ cost:

- Price is 2-5% higher than market price
- Coop's Specific objectives on production and trading for next year

● Vegetable product, quality standard

- Focus on monitoring, organizing joint sale for pilot groups in area of 30 ha, to be motivator for other areas.
- Apply techniques into production, to grow products of quality, uniformity and nice appearance; study to grow off-season carrot
- Apply machineries into agriculture production.
- Well satisfy customer's requirements on pre-processing, sorting products.

● Distribution and delivery channel

- Sign contract with 3 agents and supermarkets

- Through Project introduction, through trade fair, advertisement via information channels.
- Focus on supermarkets, wholesale markets, restaurants, canteens.
- Prepare vehicle for delivering products at least 5 hours in advance.

● **Price/ cost:**

- Price is 2-5% higher than market price
- Action plan for next year

● **Vegetable types, quality standard:**

- Make production plan
- Buy agriculture materials to supply farmers (variety, fertilizers, pesticides, etc)
- Sowing, transplanting, caring, spraying pesticides; monitor promptly.
- Organize harvesting, pre-processing, sorting and sale
- Organize monitoring for production and post-harvest process.

● **Distribution and delivery channels:**

- Deliver products to supermarkets, restaurants, canteens by specialized vehicle.
- Deliver products directly or in combination with other vehicle.

● **Vegetable types, quality standard:**

- Make production plan
- Buy agriculture materials to supply farmers (variety, fertilizers, pesticides, etc)
- Sowing, transplanting, caring, spraying pesticides; monitor promptly.
- Organize harvesting, pre-processing, sorting and sale
- Organize monitoring for production and post-harvest process.

- **Distribution and delivery channels:**

- Deliver products to supermarkets, restaurants, canteens by specialized vehicle.
- Deliver products directly or in combination with other vehicle.

- **Price/cost:**

- Apply machineries into production to reduce cost
- Invest harvesting equipment to improve yield of harvesting, pre-processing, packaging.
- Change the mode of delivery to reduce cost
- Increase selling price 2-5% higher than market price

- **Marketing strategy:**

- Products are packed, labeled to satisfy requirement of each buyer.
- Find potential buyers who are stable buyers and have purchase plan in advance.



**Project for Improvement of Safe crop
production in the Northern region**



**LESSONS LEARNED FROM ACTUAL PRODUCTION AND TRADING OF
SAFE VEGETABLES IN THANH HA COMPANY**



Hải Dương, August 21 2018

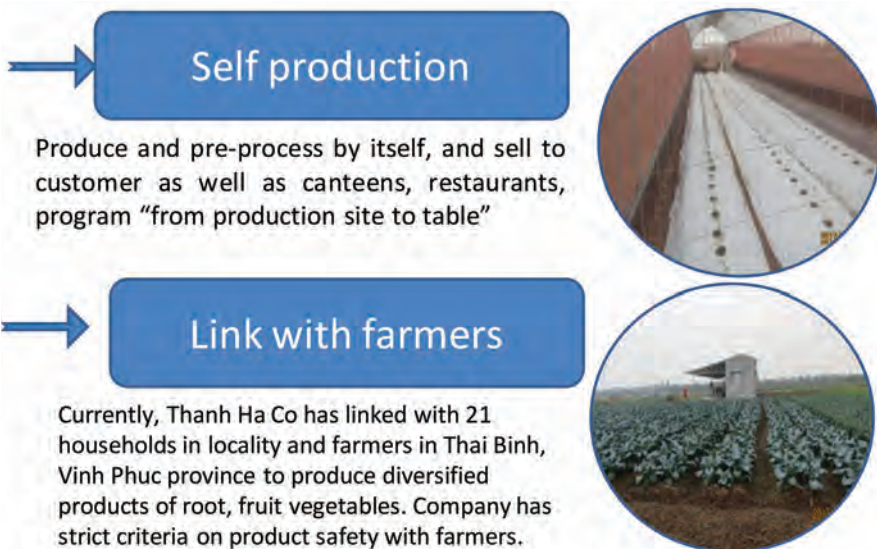
INTRODUCE ABOUT THANH HA COMPANY

● GENERAL INFORMATION

- Address: Dai Dien hamlet, Hong Lac commune, Thanh Ha District, Hai Duong province.
- Director: Pham Cong Toi; Phone No: 0904699730;
Email: rauthanhha@gmail.com
- Area of safe vegetable production: 5 ha
- Number of member households: 21 households

● ESTABLISHMENT HISTORY

- Thanh Ha Co. was established in 2013. However, Co has more than 10 years of experience in producing and trading safe vegetables. Initially Thanh Ha Company started from a safe vegetable production household fully satisfying conditions on food safety and hygiene.
- Operation structure



Diversified seasonal products



Products are diversified in term of types including mustard crops (kale, choysom, bok choy, etc), tomato, morning glory, string bean, squash, gourd, sponge gourd, etc. and some fruits such as dragon fruit, durian, etc which satisfy safety standard of VietGAP quality.

RESULTS OBTAINED FROM JOINING JICA PROJECT

● For company:

- Organize training on new cultivation technique for farmer household, labor, to satisfy standard of VietGAP safe vegetable production.
- Make production plan for vegetable types for each household.
- Soil and water is tested to satisfy standard
- Monitoring process of input material quality, process of pre-processing, products pre-processed, packed are ensured with food safety.
- Non-stop internal control and evaluation.
- Apply advanced cultivation technique to improve quality such as: using composting; use net-house and non-woven fabric; nurse seedlings on bedding; grafting tomato with root of egg plant, etc.

RESULTS OBTAINED FROM JOINING JICA PROJECT

● For company (cont):

- Sort, screen products carefully. Pack and label products to ensure

- quality during delivery.
- Actively find buyers to consume vegetable products.
 - Deliver vegetables to customer's hand.
 - For farmers: Have formed habit of:
 - Using input materials (pesticides, fertilizers) correct to target crops.
 - Comply with regulation of Basic GAP;
 - Fully record field diary, harvesting diary.

Strength of production



Has advantages in trading safe vegetable for many years; has strict requirements on product quality, have strict customers. It has been supported by JICA project from 2016 – 2020, company orients to better serving customers in next years, increase output and export to strict consumption markets.



Company always has technical staff for monitoring production. He is trained on high tech, application of advanced technology into safe vegetable production

Market

Target customers of Co. is big supermarket chain (Metro, BigC, VinEco, Coopmarat, AEON) in Hải Dương, Hải Phòng, Quảng Ninh, convenient in geography to link with focused economic regions, big cities in Red river Delta



RESULTS OF TRADING SAFE VEGETABLES IN WINTER SEASON 2017

Buyer	Crop	Supply time	Volume (ton)	% of farmers participating in joint sale (%)
EB service trading Co (BigC supermarket chain)	Leafy, root, fruit vegetables	Sep-Dec	25.43	100%
MM Mega Market Vietnam Co. (Metro supermarket chain)	Leafy, root, fruit vegetables	Sep-Dec	48.88	100%
VinEco Company	Leafy, root, fruit vegetables	Sep-Dec	1.26	100%
VINCOMMERCE	Leafy, root, fruit vegetables	Sep-Dec	7.28	100%

Difficulties, challenges in production, trading of safe vegetables

● Production and trading of products

- Production still depends on weather condition, affecting the yield and product quality
- Product uniformity is not yet high, production households not yet pay attention to producing quality products.
- Production plan is not fully developed. Not yet maximize potential resources and existing resources in the farm.

● Product distribution

- Not yet sufficient cooling delivery vehicle.
- Product price regularly fluctuates due to the change of weather and season.
- Labor cost for production, pre-processing, packaging increases.



ATTACHMENT 5.1

(1) List of management board members

Province: _____

District: _____

Commune: _____

Name of cooperative: _____

Position	Name	Gender	Phone number	Email

(2) List of member farmers

Name of organization:				Province:		
No	Name of farmer	Gender		Area (m2)	Vegetables	Target crops
		Male	Female			
Group 1						
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
Group 2						
13						
14						
15						
16						
17						
18						
19						
20						
21						
22						

23						
24						
Group 3						
25						
26						
27						
28						
29						
30						
31						
32						
33						
34						
35						
36						
37						
38						
39						
	Total					

ATTACHMENT 5.2

GROUP REGULATION FOR TARGET GROUPS (DRAFT)

JICA Project Team mandates or recommends to each target project to define the Group Regulation as below. For the target group which can not satisfy the obligated conditions below, PPMU and JICA Project Team will propose improvement plan. If the target group will not improve the conditions, that group will be eliminated from the project target.

1 Regulation of Joint Sales

- 1.1 The member farmers shall sale at least 20% of crops of own total production volume to the target group (Obligation)
- 1.2 The target group shall agree with member farmers at least one of following two conditions, to consider about farmers' profit (Obligation)
 - 1) To buy crops with higher price than local market price
 - 2) To buy crops with fixed price for long period such as more than one month
- 1.3 Farmer shall not mix crops which were harvested from registered field and not registered field (Obligation)

2 Regulation of Board Member

- 2.1 The target group shall allocate the Group leader, Sales manager, Logistic manager, Production manager, Internal auditor and Secretary/Accountant (Obligation)
- 2.2 The group leader or the sales manager shall have business experience (Recommendation)
(Note: Business experience means, experience of trading (buy and sell) of products exclude own agriculture products)
- 2.3 The internal auditor shall be a university graduate (Recommendation)

- 2.4 When there is no qualified person, target group shall employ out-group person (Recommendation)

3 Regulation of Agrochemical Usage

- 3.1 The target group shall keep the list of recommended agrochemicals for safe crop production (Obligation)
- 3.2 The target group shall implement joint purchase for recommended agrochemicals for member farmers (Recommendation)
- 3.3 The target group shall distribute the list of recommended agrochemicals to member farmers and enlighten them (Obligation)
- 3.4 The target group shall mandate member farmers to use only agrochemicals written in the list of recommended agrochemicals and not to use other agrochemicals (Obligation)

4 Regulation of GAP Implementation

- 4.1 The member farmers shall obey the production process control based on the GAP (Basic GAP/ VietGAP) (Obligation)
- 4.2 The member farmers shall record the field diary based on the GAP, and submit the record when it is required (Obligation)
- 4.3 The member farmers shall not record false information (Obligation)

5 Regulation of Punishment

- 5.1 The target group shall punish member farmers when they did obey following regulations (Obligation)
 - 5.1.1 When farmers applied not recommended agrochemical
 - 5.1.2 When farmers did not keep recording (verbal warning will be done for mistake of recording)
 - 5.1.3 When farmers record false information
 - 5.1.4 When farmers deliver crops from the not registered field
 - 5.1.5 When agrochemical is detected from crops through agrochemical residue analysis
 - 5.1.6 When farmers do not practice joint-sales for defined volume (more than 20% of total production volume)

- 5.2 The punishments are regulated as follows (recommended)
 - 5.2.1 For the first time: Instruct improvement thorough verbal warning
 - 5.2.2 For the second time: Stop delivery to the target group (for two months), and, pay fine (More than 50,000 VND). After two months, the target group assesses the current situation of the farmer and approves re-starting delivery when farmer's situation is appropriate.
 - 5.2.3 For the third and subsequent time: Stop delivery to the target group (for six months), and pay fine (More than 100,000 VND)

ATTACHMENT 6.1 PRODUCTION PLAN

Time

Cabbage

Kolhrabi

No.	Farmer's name	Land code	Vegetables	Area (m2)	Transplanting date
1			Cabbage	360	5/1/18
			Kolhrabi	520	26/11/17
2			Kolhrabi	1,080	25/12/17
			Kolhrabi	720	25/12/17
3			Kolhrabi	1,680	10/1/18
4			Kolhrabi	1,080	3/1/18
5			Kolhrabi	1,368	30/12/17
6			Kolhrabi	600	30/12/17
7			Kolhrabi	540	20/12/17
			Cabbage	1,080	22/10/17
8			Cabbage	720	20/12/17
9			Cabbage	360	22/10/17
			Kolhrabi	720	13/11/17
			Kolhrabi	600	13/11/17
10			Kolhrabi	480	25/12/17
			Cabbage	600	30/12/17
11			Kolhrabi	720	15/12/17
12			Kolhrabi	528	10/12/17
			Cabbage	540	22/10/17
			Kolhrabi	900	25/12/17
13			Kolhrabi	1,080	8/12/17
14			Kolhrabi	360	20/1/18
15			Cabbage	1,080	18/10/17

	Dec-17	Jan-18	Feb-18	Mar-18	Total
	0	15,300	0	8,400	23,700
	0	4,600	20,040	7,800	32,440

	Harvesting date	Estimated total volume (Kg)	Expected harvesting volume for month			
			Dec-17	Jan-18	Feb-18	Mar-18
	31/3/18	1,800				1,800
	25/1/18	1,300		1,300		
	23/2/18	2,700			2,700	
	23/2/18	1,800			1,800	
	11/3/18	4,200				4,200
	4/3/18	2,700				2,700
	28/2/18	3,420			3,420	
	28/2/18	1,500			1,500	
	18/2/18	1,350			1,350	
	15/1/18	5,400		5,400		
	15/3/18	3,600				3,600
	15/1/18	1,800		1,800		
	12/1/18	1,800		1,800		
	12/1/18	1,500		1,500		
	13/2/18	1,200			1,200	
	25/3/18	3,000				3,000
	13/2/18	1,800			1,800	
	8/2/18	1,320			1,320	
	15/1/18	2,700		2,700		
	23/2/18	2,250			2,250	
	6/2/18	2,700			2,700	
	21/3/18	900				900
	8/1/18	5,400		5,400		

ngày tháng năm 2018

Ban lãnh đạo HTX

ATTACHMENT 7.1

SAMPLE FORMAT TO MONITOR THE RECORD KEEPING OF FARMERS

No.	Farmer's name	MÃ LÔ	"DT (Sào)"	Sowing date	First check	
					Correct	Not correct
I. Leafy vegetables						
1		1	1.5	1-Nov	v	
2		7	2	20-Oct	v	
3		12	2	30-Oct		v
4		14	1.7	2-Nov		v
5		16	1.2	2-Nov		v
6		18	1	1-Nov		v
7		21	2	28-Oct		v
8		24	2	1-Nov		v
9		30	4	5-Nov		v
10		31	3	6-Nov		v
	Total				2	8

Progress on checking record of field diary							
		Second check			Third check		
	Comments	Correct	Not correct	Comments	Correct	Not correct	Comments
	All correct	v		All correct			
	All correct	v		All correct			
	Not yet record sowing, transplanting date	v		All correct			
	Not yet record sowing, transplanting date	v		All correct			
	Wrong target		v	Wrong target			
	Not correct name of pesticides, sowing date		v	Not correct name of pesticides, sowing date			
	Not correct name of pesticides, sowing date		v	Not correct name of pesticides, sowing date			
	Not yet record the area		v	Not yet record the area			
	Not yet record sowing date		v	Not yet record sowing date			
	Not correct name of pesticides, sowing date		v	Not correct name of pesticides, sowing date			
		4	6	Not yet record the harvesting	0	0	

No.	Farmer's name	MÃ LÔ	"DT (Sào)"	Sowing date	First check	
					Correct	Not correct
II. Cabbage Production Plan						
1		6	2.5	12-Sep	v	
2		11	2.5	20-Oct	v	
3		13	2	30-Sep	v	
4		17	3	8-Oct	v	
5		18	1	24-Oct	v	
6		28	2	22-Sep		v
7		30	6	20-Oct		v
8		31	4	9-Oct		v
9		35	1.5	20-Oct		v
10		40	2.5	1-Oct		v
	Total				5	5

Progress on checking record of field diary							
		Second check			Third check		
	Comments	Correct	Not correct	Comments	Correct	Not correct	Comments
	"Lack of crop name Expected harvesting date"		v	"Lack of crop name Expected harvesting date"			
	Expected harvesting date	v		All correct			
	Not yet record sowing date	v		All correct			
	"Two crops are recorded in the same diary Mistake in recording crop name"	v		All correct			
	Lack of crop name	v		All correct			
	All correct	v		All correct			
	All correct	v		All correct			
	All correct	v		All correct			
	All correct	v		All correct			
	All correct	v		All correct			
	All correct	v		All correct			
		9	1		0	0	

ATTACHMENT 7.2

INTERNAL AUDIT CHECKLIST

As Basic GAP request, internal audit should be conducted in each production group, farm, cooperative, which apply Basic GAP for production at least once per year. Internal audit activity, is regularly carried out by a team of the Cooperative/Groups of safe vegetable production. This team consists of 2-3 people, who conduct the supervision of safe vegetable producing process in line with Basic GAP. There are two ways: regular supervision and unscheduled check/ random check.

Before internal audit is conducted, representative of cooperative, farm have responsibility to inform all relevant sections, the internal audit will be performed based on the checklist (use below Form 04), after the completion of the internal audit, internal audit results will be consolidated using the following Form 05 – Summary of internal audit results, and a report on the non-compliance, proposed corrective actions should be produced.

Internal checklists form:

(NAME OF INSPECTION AGENCY)

SOCIALIST REPUBLIC OF VIETNAM
Independence – Freedom - Happiness

CHECKLIST FOR INTERNAL AUDIT

BASIC GAP BASED VEGETABLES PRODUCTION

(Used for internal evaluation in production of cooperative for 1-2 time/ year)

I. GENERAL INFORMATION:

1. Name of establishment:
2. Address:
3. Code number (*if applicable*):
4. Type of fruits, vegetable:
5. Date of audit:
6. Type of audit:
7. Composition of audit team: 1)
2).....
3)
8. Representative(s) of establishment:
1).....
2).....

I. AUDIT CRITERIA:

No	Criteria	Requirements of VietGAP (level)
1	Is the production site appropriate for the State's and local planning?	A
2	Do the quality of soil, irrigation water meet the standard for safe vegetable production condition?	A
3	Do the safe vegetable production site be assessed the potential chemical. Physical and microbiological risks?	A
4	Only have fertilizers included in the list of fertilizers approved for trading in Vietnam applied?	A
5	Are only treated organic fertilizers applied and is a record kept on these organic fertilizers?	A
6	Has a record been made and kept when fertilizers and soil additives are purchased and used?	A
7	Has the quality of irrigated water and water used after harvesting for production been ensured in accordance with current standards?	A
8	Have farmers been trained on the utilization of pesticides and other chemicals?	A
9	Are Integrated Pest Management (IPM) and Integrated Crop Management (ICM) measures applied?	B
10	Are the applied chemicals/plant protection products/biological medicines included in the lists of those approved for use?	A
11	Are pesticides purchased from licensed suppliers?	B
12	Are chemicals/plant protection products used strictly in accordance with label directions and guidance of technicians?	A
13	Have records been set up for monitoring the use and treatment of chemicals/plant protection products?	A

	Requirements of Basic GAP (level)	Assessment results		Description of non-compliance
		Pass	Failed	
	A			
	A			
	A			
	A			
	A			
	A			
	A			
	A			
	A			
	B			
	A			
	B			
	A			
	A			

No	Criteria	Requirements of VietGAP (level)
14	Are chemicals and those packages destroyed strictly in compliance with the State's regulations?	A
15	Is there any unscheduled and periodic inspection to check the production process and chemical residue of crop products?	A
16	Do farmers harvest products at the date after Pre-harvest Interval period (PIH) indicated in pesticide labels?	A
17	Are processing, packaging, and storage areas isolated from storehouses and containing sites of pesticides, fertilizers and other hazardous chemicals?	A
18	Is clean water used to wash products after harvesting?	A
19	Does the quality of clean water used to wash products meet the standard?	A
20	Is waste water, garbage collected and treated properly in accordance with regulations?	A
21	Have farmers been trained on Integrated Pest Management (IPM) and Integrated Crop Management (ICM)?	A
22	Have farmers worked on warning signs in the production site those just spraying pesticides?	B
23	Are field diary and production management diary fully recorded?	A
24	Has internal audit been conducted, recorded, and filed?	A
25	Do products have product origin or label to facilitate the traceability?	A
26	Has internal audit and evaluation been carried out at least one per crop/ year?	A

Note: A is required to performed; B is the level that should be encouraged to performed; Depending on requirements, the specific conditions for establishment of test and evaluation (test group consisting of representative of all stakeholders including management, technicians, producers, staff cooperative or local)

III. CONCLUSION OF AUDIT TEAM:

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IV. COMMENTS AND RECCOMENDATIONS OF AUDIT TEAM:

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V. COMMENTS OF ESTABLISHMENT'S REPRESENTATIVE:.....

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.....,Date

REPRESENTATIVE OF FARM/COOP

(Signature)

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....., *Date*

REPRESENTATIVE OF AUDIT TEAM

(Sign and seal)

ATTACHMENT 7.3

REFERENCE GUIDE FOR INTERNAL AUDIT BASIC GAP BASED VEGETABLES PRODUCTION

No	Criteria	Level	Requirement
1	Is the production site appropriate for the State's and local planning?	A	The production site is appropriate for the State's and local planning. e.g.) Non-compliance case - Location is not a part from industrial zone, polluted river, and other contaminated risk.
2	Do the quality of soil, irrigation water meet the standard for safe vegetable production condition?	A	The soil and water sampling and laboratory tests are conducted to check heavy metal and biological residues. The chemical, biological, physical risks in soil, irrigation water and washing water shall not exceed the maximum residual limit (Circular 49/2013/TT-BNNPTNT). e.g.) Non-compliance case - There is no record of the result of heavy metal and biological residue check. - There is no Certificate of safe production area.
3	Do the safe vegetable production site be assessed the potential chemical. Physical and microbiological risks?	A	There is no chemical, biological, physical risk in the safe vegetable production site. e.g.) Non-compliance case - There is no assessment on potential contamination risks - There is no corrective action to enable the avoidance, elimination and reduction of chemical, biological, physical pollution risks in food.
4	Only have fertilizers included in the list of fertilizers approved for trading in Vietnam applied?	A	Chemical fertilizers on the approved list by Vietnam are used. e.g.) Non-compliance case - Chemical fertilizers and soil additives are not approved by Vietnam, nor used.

Method	Reference
<ul style="list-style-type: none"> - Review of documents (Land use map and/or Certificate of safe production area) - On-site review of farm location 	<ul style="list-style-type: none"> - Land use map (commune level) - Certificate of safe production area
<ul style="list-style-type: none"> - Review the certificate of safe production area and/or laboratory test results. - Review record of heavy metal and biological residue check and/or laboratory test results 	<ul style="list-style-type: none"> - [MGT] Table1 – Production condition management - Certificate of safe production area - Circular 49/2013/TT-BNNPTNT on 19th November 2013 - National technical regulation QCVN 03-MT/2015/ BTNMT - Laboratory test results
<ul style="list-style-type: none"> - Review the record of field assessment for potential chemical, physical and microbiological risks. 	<ul style="list-style-type: none"> - [MGT] Table1 – Production condition management
<ul style="list-style-type: none"> - Review the production diary to check all chemical fertilizers and soil additives used on farm 	<ul style="list-style-type: none"> - [FARM] Table1 – Production diary – Practices in the Field

No	Criteria	Level	Requirement
5	Are only treated organic fertilizers applied and is a record kept on these organic fertilizers?	A	<p>Only treated organic fertilizers have are applied and a record is kept on these organic fertilizers.</p> <p>e.g.) Non-compliance case</p> <ul style="list-style-type: none"> - Farmers apply raw manure on farm without fermentation - Farmers apply organic fertilizers which are not adequately composted.
6	Has a record been made and kept when fertilizers and soil additives are purchased and used?	A	<p>Purchasing and using fertilizers and soil additives are recorded.</p> <p>e.g.) Non-compliance case</p> <ul style="list-style-type: none"> - There is no record of purchasing and using. - Sufficient information regarding purchasing and using is not recorded.
7	Has the quality of irrigated water and water used after harvesting for production been ensured in accordance with current standards?	A	<p>The quality of water used for irrigation and for post-harvest handling meets the current standards.</p> <p>e.g.) Non-compliance case</p> <ul style="list-style-type: none"> - On-farm level: Residual limit level of heavy metals or other quality criteria exceeds the requirements. - Packing level: Microbiological contamination level exceeds the requirements. - Note: In case on having doubts on analytical results, audit team shall take samples of water for analysis. The analytical results are the basis for evaluation of this criterion.
8	Have farmers been trained on the utilization of pesticides and other chemicals?	A	<p>The farmers are trained on the utilization of pesticides and other chemicals.</p> <p>e.g.) Non-compliance case</p> <ul style="list-style-type: none"> - There is no record to prove that the farmers are trained on safe use of pesticides.

Method	Reference
<ul style="list-style-type: none"> - Review the production diary - On-site review of the production site of organic fertilizers and storage, and conduct interview (if necessary). 	<ul style="list-style-type: none"> - [FARM] Table1 – Production diary – Practices in the Field
<ul style="list-style-type: none"> - Review the production diary - Review the record of buying agricultural supplies - On-site review and conduct interviews (if necessary) 	<ul style="list-style-type: none"> - [FARM] Table1 – Production diary – Practices in the Field - [FARM] Table 2 – Production Diary - Buying Agricultural supplies for production
<ul style="list-style-type: none"> - Review the analytical results of water at farm level and at packing house(if applicable) - On-site review and conduct sampling (if necessary) 	<ul style="list-style-type: none"> - Circular 49/2013/TT-BNNPTNT on 19th November 2013. for irrigation water - QCVN 02/2009/BYT for post-harvest handling - [MGT] Table1 – Production condition management - Laboratory test results
<ul style="list-style-type: none"> - Review the record of training activity - Conduct interview (if necessary) 	<ul style="list-style-type: none"> - [MGT] Table 5- Management training activity - Certificates of attendance on relevant training courses

No	Criteria	Level	Requirement
9	Are Integrated Pest Management (IPM) and Integrated Crop Management (ICM) measures applied?	B	<p>Integrated Pest Management (IPM) and Integrated Crop Management (ICM) measures applied.</p> <p>e.g.) IPM</p> <p>IPM uses environmentally sound ways to keep pests from invading and damaging plants. Sample ideas for IPM are as below;</p> <p>Prevention</p> <ul style="list-style-type: none"> - Prevent pests from invading or building up their populations in the first place. This might include removing the pests' sources of food, water, and shelter, or blocking their access into buildings or plants. <p>Cultural controls</p> <ul style="list-style-type: none"> - Cultural practices are things you can do to discourage pest invasion such as good sanitation, removing debris and infested plant material, proper watering and fertilizing, growing competitive plants, or using pest resistant plants. <p>Physical or mechanical controls</p> <ul style="list-style-type: none"> - Control pests with physical methods or mechanical devices such as knocking pests off of plants with a spray of water, using barriers and traps, cultivating, soil sterilization, or heat treatments. <p>Biological control</p> <ul style="list-style-type: none"> - Biological control is the use of beneficial organisms (called natural enemies) to manage pests. Encourage natural enemies by planting flowering and nectar-producing plants and avoiding the use of broad-spectrum pesticides. <p>e.g.) ICM</p> <p>ICM is a whole farm approach which is site specific and includes;</p> <ul style="list-style-type: none"> - Crop rotations - Appropriate cultivation techniques - Careful choice of seed varieties - Minimum reliance on artificial inputs such as fertilizers, pesticides and fossil fuels - Maintenance of the landscape - Enhancement of wildlife habitats <p>e.g.) Non-compliance case</p> <ul style="list-style-type: none"> - IPM and/or ICM are not applied.

Method	Reference
<ul style="list-style-type: none">- Review the production diary- On-site review on relevant materials with of IPM and/or ICM and conduct interviews (if necessary)	<ul style="list-style-type: none">- [FARM] Table1 – Production diary – Practices in the Field

No	Criteria	Level	Requirement
10	Are the applied chemicals/plant protection products/biological medicines included in the lists of those approved for use?	A	Only the pesticides included in the approved list by MARD are allowed to use. e.g.) Non-compliance case - Non-approved pesticides found on the record and/or in farmers' premises.
11	Are pesticides purchased from licensed suppliers?	B	Pesticides are purchased from licensed suppliers. e.g.) Non-compliance case - There is no evidence to prove that pesticides were not bought from licensed suppliers. - Evidence shows that pesticides were bought from non-licensed supplier.
12	Are chemicals/plant protection products used strictly in accordance with label directions and guidance of technicians?	A	Pesticides are used strictly in accordance with label directions. e.g.) Compliance case - Right pesticide is used for the right crop as stated on the label, - Right dosage is applied as stated on the label, - Pre-harvest interval from the last application is applied as stated on the label, and - Compatibility of pesticides is proved when 2 and more pesticides are mixed. e.g.) Non-compliance case - Pesticides are not used in accordance with label directions.
13	Have records been set up for monitoring the use and treatment of chemicals/plant protection products?	A	Farmers have records of pesticides usage. e.g.) Non-compliance case - There is no record of pesticide usage. - There is a record but not filled adequately.
14	Are chemicals and those packages destroyed strictly in compliance with the State's regulations?	A	Chemicals and those packages are properly taken out from the farm land and chemical waste bin by authorized companies/ persons. e.g.) Non-compliance case The chemicals and those packages are destroyed and/or burned on farm and/or farmers' premises.

Method	Reference
<ul style="list-style-type: none"> - Review the record of applied chemicals/plant protection products comparing with approved list - On-site inspection 	<ul style="list-style-type: none"> - [FARM] Table 1 – Production Diary - Practices in the Field
<ul style="list-style-type: none"> - Review the record and/or a receipt of buying agricultural supplies 	<ul style="list-style-type: none"> - [FARM] Table 2 – Production Diary - Buying Agricultural supplies for production
<ul style="list-style-type: none"> - Review the record of production diary comparing with label directions - On-site inspection and interview (if necessary) 	<ul style="list-style-type: none"> - [FARM] Table1 – Production diary – Practices in the Field - Label directions
<ul style="list-style-type: none"> - Review the record of pesticides 	<ul style="list-style-type: none"> - [FARM] Table1 – Production diary – Practices in the Field
<ul style="list-style-type: none"> - On-site inspection to investigate the practices of disposal - Conduct interviews (if necessary) 	

No	Criteria	Level	Requirement
15	Is there any unscheduled and periodic inspection to check the production process and chemical residue of crop products?	A	<p>There are the internal and external inspection to check the production process and chemical residue of crop products.</p> <p>e.g.) Compliance case</p> <ul style="list-style-type: none"> - Record of internal audit is documented. - Pesticides residues check by quick test is carried out and documented. - Laboratory test of vegetable samples is carried out and documented. - Unscheduled inspection and/or external audit is carried out and documented. <p>e.g.) Non-compliance case</p> <ul style="list-style-type: none"> - Internal audit is not carried out last one year. - Internal audit is carried out, but not recorded. - Pesticides residues check of vegetable samples are not carried out by either quick test nor laboratory tests.
16	Do farmers harvest products at the date after Pre- harvest Interval period (PIH) indicated in pesticide labels?	A	<p>Farmers/ workers harvest products at the date after Pre- harvest Interval period (PIH) and have to keep a record of harvesting products.</p> <p>e.g.) Non-compliance case</p> <ul style="list-style-type: none"> - Farmers harvest the date less than PIH. - There is no record on harvesting products.
17	Are processing, packaging, and storage areas isolated from storehouses and containing sites of pesticides, fertilizers and other hazardous chemicals?	A	<p>The processing, packaging, and storage areas are isolated from storage of pesticides, fertilizers and other hazardous chemicals.</p> <p>(This criterion is not applicable in the case that the Products are only harvested at the farm level and no further handling or storing)</p> <p>e.g.) Non-compliance case</p> <ul style="list-style-type: none"> - Design, construction and maintenance of handling, packaging, and storage areas do not meet requirement. - The handling, packaging, and storage areas are in potential risk of flooding and/or contamination.

Method	Reference
<ul style="list-style-type: none"> - Review the record of internal/ external audits. - Review quick test and laboratory test results of vegetable samples 	<ul style="list-style-type: none"> - Checklist of internal audit - Decision 46/2007/QĐ-BYT ngày 09/12/2007 - Circular 68/2010/TT-BNNPTNT on 02th December 2010 - National technical regulation QCVN 8-3:2012/BYT - Laboratory test results for pesticide residues check
<ul style="list-style-type: none"> - Review the record of harvesting products comparing with production diary 	<ul style="list-style-type: none"> - [FARM] Table1 – Production diary – Practices in the Field - [FARM] Table3 - Field diary for harvesting and selling products
<ul style="list-style-type: none"> - On-site inspection of processing, packaging and storage areas 	

No	Criteria	Level	Requirement
18	Is clean water used to wash products after harvesting?	A	Clean water is used to wash products after harvesting. e.g.) Non-compliance case <ul style="list-style-type: none"> - Quality of water used for post-harvest and packaging handling does not meet the requirement of QCVN 02/2009/BYT. - There is no test result of water quality.
19	Does the quality of clean water used to wash products meet the standard?	A	The post harvest washing water sampling and laboratory tests are conducted to check heavy metal and biological residues. The chemical, biological, risks in washing water shall not exceed the maximum residual limit (QCVN 02/2009/BYT). e.g.) Non-compliance case <ul style="list-style-type: none"> - There is no record of the result of heavy metal and biological residue check. - The laboratory test shows chemical, biological residues exceed the maximum residual limit.
20	Is waste water, garbage collected and treated properly in accordance with regulations?	A	Waste water is collected and properly treated and disposed. The garbage and solid waste are collected and put into the waste bin. e.g.) Non-compliance case <ul style="list-style-type: none"> - There is no waste bin and/or no proper place to dispose.
21	Have farmers been trained on Integrated Pest Management (IPM) and Integrated Crop Management (ICM)?	A	The farmers are trained on Integrated Pest Management (IPM) and Integrated Crop Management (ICM). e.g.) Non-compliance case <ul style="list-style-type: none"> - There is no record to prove that the farmers are trained on Integrated Pest Management (IPM) and Integrated Crop Management (ICM).
22	Have farmers worked on warning signs in the production site those just spraying pesticides?	B	Warning signs are placed at production site just after spraying pesticides. e.g.) Non-compliance case <ul style="list-style-type: none"> - Farmers do not have any warning sign board. - Warning signs are not placed at production site just after spraying pesticides.

Method	Reference
<ul style="list-style-type: none"> - Review the record of production condition and laboratory test results - On-site inspection of fresh water supply system 	<ul style="list-style-type: none"> - [MGT] Table1 – Production condition management - QCVN 02/2009/BYT for post-harvest handling - Laboratory test results
<ul style="list-style-type: none"> - Review record of heavy metal and biological residue check and/or laboratory test results. 	<ul style="list-style-type: none"> - [MGT] Table1 – Production condition management - QCVN 02/2009/BYT for post-harvest handling - Laboratory test results
<ul style="list-style-type: none"> - On-site inspection to investigate the usage of waste bin and disposal of garbage and waste sources - Conduct interview (if necessary) 	
<ul style="list-style-type: none"> - Review the record of training activity - Conduct interview (if necessary) 	<ul style="list-style-type: none"> - [MGT] Table 5- Management training activityCertificates of attendance on relevant training courses
<ul style="list-style-type: none"> - On-site inspection and conduct interview to investigate the usage of warning signs 	<ul style="list-style-type: none"> - Warning sign board

No	Criteria	Level	Requirement
23	Are field diary and production management diary fully recorded?	A	The manager and farmers/ workers record production management diary and field diary regularly and properly. e.g.) Non-compliance case - There is no record on Production management diary and Field diary. - There are records, but those are not fully nor properly recorded.
24	Has internal audit been conducted, recorded, and filed?	A	Internal audit is conducted more than once a year. The manager records and files the results of internal audit. e.g.) Non-compliance case There is no record on internal audit conducted.
25	Do products have product origin or label to facilitate the traceability?	A	Products are labeled with information of producers name and contact in order to facilitate the traceability. e.g.) Non-compliance case There is no information of name and contact on package and label of the products.
26	Has internal audit and evaluation been carried out at least one per crop/ year?	A	Internal audit is carried out at least once per crop/ a year. It is recommendable that internal audit shall be carried out once per crop season. e.g.) Non-compliance case - Internal audit is not carried out last one year. - Internal audit is carried out more than once a year, but it does not follow the requirements, and/or the results are not reflected into the practices of farmers/ workers.

Reference

[MGT] : Field Diary for Production Management
(for Cooperative manager)

[FARM] : Field Diary (for farmers)

Method	Reference
- Review the record of Production management diary and Field diary	- [MGT] Table1, 2, 3, 4 and 5 - [FARM] Table1, 2 and 3
- Review the record of internal audit conducted	- Checklist of internal audit
- On site check at packing and selling points	- Labels and packing bags
- Review the internal audit results	- [MGT] Checklist of internal audit

ATTACHMENT 8.1

ASSESSMENT OF SHORTCOMING EQUIPMENT AND MATERIALS FOR UPGRADING CONDITIONS TO ENSURE FOOD HYGIENE AND SAFETY IN PRODUCTION AND HANDLING

With consideration of market requirement, it is essential to upgrade the conditions to ensure food hygiene and safety in production area, pre-processing place and outlets. JICA Project team and PPMU will conduct a technical assessment and draft a list of necessary equipment and materials with budget estimate to equip the facilities.

The following table format is the sample list of shortcomings and its evaluation in relation with the project context. It also has to take into account specific agreements between the safe crop production project management and any stakeholder involved in the project.

Table Sample List of tools, facilities in safe vegetables production and handling

No.	Descriptions	Unit	Q'ty	Link with GAP/GMP	Comments and recommendations
I	Support on equipment, consumable materials in production area				
1	Support in constructing tank (bin) to contain used pesticide packages/containers, dimension 1,5m x 1m x 1,2	Piece			
2	Pesticide cabinet in family (made of wood, dimension 75cm x 40cm x 25cm)	Piece			
3	Protective clothing for farmers when applying pesticides (clothes, glasses, masks, gloves, boots)	Set			

4	Warning sign on pesticide application	Board			
5	Containers for harvested products (plastic baskets)	Piece			
6	Surrounding materials used in the field to protect the field against pests and pesticides from nearby fields				
-	Stake	Piece			
-	Nylon	Kg			
II	Upgrading conditions for handling vegetables				
1	Heat resistant ceiling of handling house	m ²			
2	Tiling floor of handling house	m ²			
3	Upgrading and expanding toilet: Wall, corrugated iron, floor tiles; wall tiles, toilet seat, lavabo set...	-			
4	Constructing basin to wash vegetables (1m x1m x 0,5m)	Piece			
5	Machine for bunching vegetables and sealing vegetable bag	Piece			
6	Centrifugal spinning machine to dry vegetables	Piece			
7	Cooling cabinet to preserve vegetables	Piece			
8	Construction lighting system	Set			
9	Sign board 4m x 0,8m	Piece			
III	Upgrading conditions of vegetables outlet/ shop				
1	3m-length stainless steel display shelves	Piece			
2	Information board (made of plastic panel of 1m x 0,7m dimension)	Piece			
3	Sign board of the outlet (3m x 0,8m)	Piece			
4	Waste plastic bin	Piece			
5	Cooling cabinet to preserve vegetables	Piece			
	Total				

ATTACHMENT 9.1

DAILY DEMAND PLAN AND HARVESTING PLAN

Crop:

Demand from buyer and Expected Harvesting amount		1	2	3	4	5	6	7	8	9	10	11	12	13	14
		W	T	F	S	S	M	T	W	T	F	S	S	M	T
Demand from buyer (kg)															
Buyer's name	Grade														
Buyer 1	1	50	50	50	50	50	50	50	50	50	50	50	50	50	50
	2	50	50	50	50	50	50	50	50	50	50	50	50	50	50
Buyer 2	1	100		100		100		100		100		100		100	
	2														
Buyer 3	1	50							50						
	2														
Total demand	1	200	50	150	50	150	50	150	100	150	50	150	50	150	50
	2	50	50	50	50	50	50	50	50	50	50	50	50	50	50
Expected Harvesting amount (kg)															
Farmer's name	Grade														
Farmer 1	1	100		100											
	2	20		20											
Farmer 2	1	80		80											
	2	20		20											
Farmer 3	1	80													
	2	20		20											
Farmer 4	1		30		30										
	2		30		30										
Farmer 5	1		30		30										
	2		30		30										
Farmer 6	1					100		100							

	2					20		20							
Farmer 7	1					80		80							
	2					20		20							
Farmer 8	1														
	2					20		20							
Farmer 9	1						30		30		30		30	30	
	2						30		30		30		30	30	
Farmer 10	1						30		30		30		30	30	
	2						30		30		30		30	30	
Farmer 11	1									100		100		100	
	2									20		20		20	
Farmer 12	1									80		80		80	
	2									20		20		20	
Farmer 13	1														
	2									20		20		20	
Farmer 14	1														
	2														
Farmer 15	1														
	2														
Total Har-vesting	1	260	60	180	60	180	60	180	60	180	60	180	60	180	60
	2	60	60	60	60	60	60	60	60	60	60	60	60	60	60

ATTACHMENT 9.2

RESULTS OF COLLECTION

- Why?: To record about amount of vegetable farmers brought
- When?: In the same day of farmers bring vegetable to cooperative
- Who and How?: 1) Logistick staff checks condition of vegetable,
2) receives good vegetables only,
3) makes payment for farmers and
4) records information
- Where?: At the collection point
- For which vegetable?: All vegetables in same page

#	Date	Name of farmer	Member code	Vegetable name	Results of Collection			Note
					Amount	"Unit price (VND/kg)"	Total payment to farmer	
Total								

ATTACHMENT 9.3 RESULTS OF SALES

- Why?: To record about payment amount from buyer to cooperative
- When?: In the same day cooperative sent vegetable to buyer
- Who and How?: Logistic staff keeps record after sales amount is defined
- Where?: At the collection point
- For which vegetable?: All vegetables in same page

Buyer's name	
--------------	--

#	Date	Name of farmer	Member code	Vegetable name	Results of Collection			Note
					Amount	"Unit price (VND/kg)"	Total payment to farmer	
Total								

ATTACHMENT 12.1

SAMPLE IMPLEMENTATION SCHEDULE

No.	Activity	Jun	Jul
		Summer	
Safe Crop Production Management System			
1 Selection of Target Groups in the Selected City/Province			
1-1	Nomination of candidate target groups		
1-2	Implementation of baseline survey		
1-3	Selection and Confirmation of target group		
2 Confirmation of safety of production area			
2-1	Review of the safety of production area		
2-2	Soil and water sampling and testing		
2-3	Issue of certificate of safe production area by DARD		
3 Trainings for basic GAP			
3-1	TOT for basic GAP		
3-2	TOT for cultivation method		
3-3	TOF for basic GAP		
3-4	Post harvest training		
3-5	Technical assessment for safety conditions		
3-6	TOT Follow-up training		
3-7	Study tour to advanced model		
3-8	Exposure visit among target groups		
4 Formulation of safe crop production group			
4-1	Nomination of management board members		
4-2	Confirmation of agreement among group members		
4-3	Formulation of Safe Crop Production Group		
5 Cultivation Planning based on Market Demand			
5-1	Preparation of production planning		
5-2	Procurement of materials (joint purchase)		
6 Cultivation method for Safe Vegetable			
6-1	Planning of demonstration farm		
6-2	Implementation of demonstration		
	Soil improvement by compost		
	Introduction of new variety seeds		
	Seedling improvement		
	New agriculture materials (non-woven fabric, etc.)		
6-3	Field visit on demonstration farm		
7 On field instruction for basic GAP application			
7-1	Field Instruction of application of basic GAP		
	Instruction on record keeping		
	Instruction on chemical application, etc.		
7-2	Internal meeting		
7-3	Internal audit		
8 Upgrading conditions to ensure food hygiene and safety			
8-1	Technical assessment for upgrading conditions		
8-2	Draft a list of necessary equipment and materials		
8-3	Upgrading of facilities and equipment		

No.	Activity	Summer	
		Jun	Jul
9 Joint sales management			
9-1	Establishment of joint sales system		
9-2	Field instruction for joint sales		
10 External inspection and auditing			
10-1	Guidance of sampling testing plan and external auditing		
10-2	Pesticide residue check (quick test)		
10-3	Pesticide residue check (laboratory test)		
10-4	External audit (by Gov. officer and JICA Project team)		
11 Monitoring and Evaluation			
11-1	Review of pilot activities		
11-2	Monitoring		
11-3	Evaluation		

Supply Chain Development System (Marketing)			
1 Dialogue with Market			
1-1	TOT and TOF on marketing		
	TOT marketing in Hanoi		
	TOF on marketing in each province		
1-2	Developing marketing tools		
1-3	Matching with buyers		
	One-to-one matching for each TG		
	Safe vegetable business forum in Hanoi		
	Provincial safe vegetable business forum in each province		
	Trade fair in each province		
1-4	Assisting in making contract for each TG		
2 Post Harvest and Distribution			
2-1	Mezoroekai for each TG		
2-2	Monitoring of collection and delivery for each TG		
	Initial check by PPMU and TG		
	Random check by PPMU		
2-3	Review and planning next season for each TG		
	Review meeting for each TG		
	TOF on marketing action plan in each province		
3 Monitoring and Evaluation			
3-1	Monitoring		
3-2	Evaluation		

Project Management			
1	Monitoring Sheet		
2	JCC meeting		

ATTACHMENT 13.1

UNIT COST SHEET FOR TRIAL ACTIVITIES IMPLEMENTED UNDER JICA PROJECT

I. PRODUCTION MANAGEMENT SYSTEM

No	Item	Description	Total cost	JICA Cost	PPMU Cost
1	<i>Selection of target groups</i>		9,000,000	0	9,000,000
1.1	Baseline survey and analysis	Allowance for field officers (interview survey)	9,000,000		9,000,000
1.2	Preparation of producer profile		0		
2	<i>Confirmation of safety of production area</i>		37,200,000	28,200,000	9,000,000
2.1	Sampling of soil and irrigation water at sites (Covered by PPMUs)	Allowance for field officers (sampling and sending samples to laboratory)	9,000,000		9,000,000
2.2	Laboratory test of soil and irrigation water (funded by JICA)	Laboratory test fee (2 soil samples and 2 water samples for each TG)	28,200,000	28,200,000	
3	<i>TOT for basic GAP</i>		123,556,667	122,356,667	22,950,000
3.1	TOT training courses on Basic GAP for pilot provinces (funded by JICA)	Venue, coffee break, lunch, allowance for the participants, lecturer fee, materials,	29,750,000	29,750,000	

3.2	TOF training courses on Basic GAP (covered by PPMUs). 6 courses for 01 province (2/01 target group x 03 target groups)	Venue, coffee break, lunch, allowance for the participants, lecturer fee, materials,			21,750,000
3.3	TOT training courses on Good post harvest handling practice/ Hygiene condition on packaging and transportation (funded by JICA)	Venue, coffee break, lunch, allowance for the participants, lecturer fee, materials,	11,750,000	11,750,000	
3.4	Technical assessment for safety conditions (Covered by PPMU)	Allowance for field officers	1,200,000		1,200,000
3.5	TOT Follow-up training (Funded by JICA)	Venue, coffee break, lunch, allowance for the participants, lecturer fee, materials,	11,750,000	11,750,000	
3.6	Study tour to advanced model (Funded by JICA)	Venue, coffee break, lunch, allowance for the participants, lecturer fee, materials,	59,606,667	59,606,667	
3.7	Exposure visit among target groups (Funded by JICA)	Venue, coffee break, lunch, allowance for the participants, lecturer fee, materials,	9,500,000	9,500,000	
4	Formulation of safe crop production group		1,200,000	0	1,200,000
4.1	Nomination of management board members				

4.2	Confirmation of agreement among group members				
4.3	Formulation of Safe Crop Production Group) (Covered by PPMU)	Allowance for field officers	1,200,000		1,200,000
5	<i>Cultivation Planning based on Market Demand</i>		7,200,000	0	7,200,000
5.1	Preparation of production planning - Allowance for field officers (Covered by PPMU)	Allowance for field officers	4,800,000		4,800,000
5.2	Procurement of materials (joint purchase) Allowance for field officers (Covered by PPMU)	Allowance for field officers	2,400,000		2,400,000
6	<i>Cultivation method for Safe Vegetable</i>		217,038,000	164,238,000	52,800,000
6.1	Planning of demonstration farm	Allowance for field officers	2,400,000		2,400,000
6.2	Implementation of demonstration				
6.2.1	Trainings on Cultivation Method (funded by JICA)	Venue, coffee break, lunch, allowance for the participants, lecturer fee, materials,	60,360,000	60,360,000	
6.2.2	Materials for Implementation of demonstration				
a)	Soil improvement by composting (funded by JICA)	Material costs	13,068,000	13,068,000	

b)	Introduction of new variety seeds (funded by JICA)	Material costs			
c)	Seedling improvement (funded by JICA)	Material costs	39,150,000	39,150,000	
d)	New agriculture materials (funded by JICA)	Material costs	51,660,000	51,660,000	
6.2.3	Field Monitoring for Demonstration (Covered by PPMU)	Allowance for field officers	50,400,000		50,400,000
7	<i>On field instruction for basic GAP application</i>		66,000,000	0	66,000,000
7.1	On-field instruction for Basic GAP application	Allowance for field officers	43,200,000		43,200,000
7.2	Organization of internal monthly meeting to share experiences on application of Basic GAP and new cultivation method	Allowance for field officers	18,000,000		18,000,000
7.3	Internal Audit	Allowance for field officers	4,800,000		4,800,000
8	<i>Upgrading conditions to ensure food hygiene and safety</i>		153,600,000	150,000,000	3,600,000
8.1	Technical assessment for upgrading conditions	Allowance for participants	1,800,000		1,800,000
8.2	Draft a list of necessary equipment and materials	-	0		

8.3	Upgrading of facilities and equipment (Material cost for facilities and equipment funded by JICA)	Material cost for facilities and equipment (labor cost borne by TG)	150,000,000	150,000,000	
8.4	Evaluation of the improvement of the condition compared with the previous conditions in terms of food hygiene and safety (Covered by PPMUs)	Allowance for field officers	1,800,000		1,800,000
9	Joint sales management		4,800,000	0	4,800,000
9.1	Establishment of joint sales system	Allowance for field officers	4,800,000		4,800,000
9.2	Field instruction for joint sales	Allowance for field officers (as it is integrated activity with Item 7.1)	0		0
10	Internal and external inspection and auditing		175,650,000	150,450,000	25,200,000
10.1	Guidance of sampling testing plan and external auditing	-	0		
10.2	Pesticide residue check (Quick Test) (funded by JICA)	Test kit materials, Allowance for field officers	51,600,000	51,600,000	
10.3	Pesticide residue check (laboratory test) (funded by JICA)	Laboratory test fee, Allowance for field officers, sampling and sending samples to laboratory	98,850,000	98,850,000	

10.4	External Inspection and Auditing of Basic GAP (Covered by PPMUs)	Allowance for participants	25,200,000		25,200,000
	Total		795,244,667	615,244,667	201,750,000

1. Selection of target groups

1.1 Baseline survey and analysis (Allowance for field officers (interview survey) covered by PPMU)

No.	Description	Unit	No. person	No. day	Q'ty	Unit Cost (VND)	"Amount (VND)"
	01 Province						
1	Target group 1		2	1	2	400,000	800,000
	Target group 2		2	1	2	400,000	800,000
	Target group 3		2	1	2	400,000	800,000
2	Car rental for sampling	trip		3	3	1,200,000	3,600,000
3	Fee for send sample to laboratory	pack		3	3	1,000,000	3,000,000
	Sub Total						9,000,000

2. Confirmation of safety of production area for 01 province

2.1 Sampling of soil and irrigation water at sites (Covered by PPMUs)

No.	Description	Unit	No. person	No. day	Q'ty	Unit Cost (VND)	"Amount (VND)"
	01 Province						
1	Target group 1		2	1	2	400,000	800,000
	Target group 2		2	1	2	400,000	800,000
	Target group 3		2	1	2	400,000	800,000
2	Car rental for sampling	trip		3	3	1,200,000	3,600,000

3	Fee for send sample to laboratory	pack		3	3	1,000,000	3,000,000
	Sub Total						9,000,000

2.2 Laboratory test of soil and irrigation water (funded by JICA) 2,400,000

Matri-ces/ Test items	MRLs	Unit of MRLs	No. of sam- ples	Total of sam- ples		Unit Cost (VND)	"Amount (VND)"
1. Soil							
<i>Heavy metals</i>							
As	15	mg/kg	15	15		400,000	6,000,000
Cd	1.5	mg/kg	15	15		100,000	1,500,000
Pb	70	mg/kg	15	15		100,000	1,500,000
Cu	100	mg/kg	15	15		100,000	1,500,000
Zn	200	mg/kg	15	15		100,000	1,500,000
Cr	150	mg/kg	15	15		100,000	1,500,000
			90	90			
	Sub- Total		-				13,500,000

2. Water for irrigation							
<i>Heavy metals</i>							
As	0.05	mg/L	15	15		400,000	6,000,000
Cd	0.01	mg/L	15	15		100,000	1,500,000
Pb	0.05	mg/L	15	15		100,000	1,500,000
Hg	0,001	mg/L	15	15		100,000	1,500,000
E.coli			15	15		150,000	2,250,000
	Sub-total		75	75			12,750,000
<i>Microbiological</i>							

Fecal. Coli	100	MP-N/100mL	15		15		130,000	1,950,000
	Sub-total							1,950,000
TOTAL (B):								28,200,000
TOTAL (A) + TOTAL (B)								37,200,000

3. Trainings on Basic GAP

3.1 TOT training courses on Basic GAP for pilot provinces (funded by JICA)

No.	Content	Q'ty	Unit Price (VND)	Amount (VND)
1	Remuneration for development of electronic training materials and lectures delivery; (2 trainers x 2 day x 1 course)	4	500,000	2,000,000
2	Meal for participants (35 persons x 2 days)	70	150,000	10,500,000
3	Coffee break (35 persons x 2 days)	70	50,000	3,500,000
4	Travel allowance for participants from far distance (outside of provincial center) (25 persons x 2 days x 50,000/day))	50	50,000	2,500,000
5	Printing materials and stationeries fee for participants	35	50,000	1,750,000
6	Venue, training room rental fee	2	3,500,000	7,000,000
7	Instructor tuition fee for field practice visits	1	500,000	500,000
8	Car rental fee for travelling field practice visits	1	2,000,000	2,000,000
	Total cost for 01 course			29,750,000

3.2 TOF training courses on Basic GAP (covered by PPMUs). 6 courses for 01 province (2/ 01 target group x 03 target groups)

No	Content	Q'ty	Unit Price (VND)	Amount (VND)
1	Remuneration for provincial lecturers; (2 trainers x 1 day x 1 course)	2	250,000	500,000
2	Meal allowance for participants (25 persons x 1 day)	25	50,000	1,250,000
3	Coffee break (25 persons x 1 day)	25	30,000	750,000
4	Printing materials and stationeries fee for participants	25	25,000	625,000
5	Venue, Banner	1	500,000	500,000
	Total cost for 01 course			3,625,000
	Total cost for 06 courses			21,750,000

3.3 TOT training courses on Good post harvest handling practice/ Hygiene condition on packaging and transportation (funded by JICA)

No.	Content	Q'ty	Unit Price (VND)	Amount (VND)
1	Remuneration for development of electronic training materials and lectures delivery; (1 trainers x 1 day x 1 course)	2	500,000	1,000,000
2	Meal, allowance for participants (30 persons x 1 day x 1 course)	30	150,000	4,500,000
3	Coffee break (30 persons x 1 day)	30	50,000	1,500,000
4	Printing materials and stationeries fee for participants	30	25,000	750,000
5	Venue, Banner	1	3,500,000	3,500,000
7	Instructor tuition fee for field practice visits	1	500,000	500,000
	Total			11,750,000

3.4 Technical assessment for safety conditions (Allowance for field officers)

No.	Description	No. person	No. day	Q'ty	Unit cost (VND)	Amount (VND)
	01 Province					
1	Target group 1	1	1	1	400,000	400,000
	Target group 2	1	1	1	400,000	400,000
	Target group 3	1	1	1	400,000	400,000
	Sub Total					1,200,000

3.5 TOT Follow-up training (Funded by JICA)

No.	Content	Q'ty	Unit Price (VND)	Amount (VND)
1	Remuneration for development of electronic training materials and lectures delivery; (1 trainers x 1 day x 1 course)	2	500,000	1,000,000
2	Meal, allowance for participants (30 persons x 1 day x 1 course)	30	150,000	4,500,000
3	Coffee break (30 persons x 1 day)	30	50,000	1,500,000
4	Printing materials and stationeries fee for 30 participants	30	25,000	750,000
5	Venue, Banner	1	3,500,000	3,500,000
7	Instructor tuition fee for field practice visits	1	500,000	500,000
	Total			11,750,000

3.6 Cost for Lam Dong study tour

Day	Contents	Cost	Unit	Unit price	Quantity	Sub-total
1	Participants moving from provinces to Hanoi	For participants from provinces to Noi Bai airport	car/1 way	1,500,000	4	6,000,000
	Vietjetair, Hanoi - Da Lat, VJ409 (17:25 -19:15)**		ticket (re-turn)	4,220,000	26	109,720,000
	Perdiem		day	150,000	26	3,900,000
	Move from Lien Khuong Airport to Da Lat	Airport taxi	car	350,000	6	2,100,000
	Accommodation allowance	Hotel	night	350,000	26	9,100,000
2	Perdiem	Meals	day	150,000	26	3,900,000
	Accommodation allowance	Hotel	night	350,000	26	9,100,000
	Site visits	29-seat bus	trip	4,500,000	1	4,500,000
3	Perdiem	Meals	day	150,000	26	3,900,000
	Accommodation allowance	Hotel	night	350,000	26	9,100,000
	Site visits	29-seat bus	trip	4,500,000	1	4,500,000
4	Perdiem	Meals	day	150,000	26	3,900,000
	Venue for workshop	Meeting room rent	trip	1,000,000	1	1,000,000
	Moving from Da Lat to Lien Khuong airport	Airport taxi	car	350,000	6	2,100,000
	Vietjetair, Da Lat - Hanoi, VJ 406 (18:45 – 19:35)					0
	From Airport to Hanoi center	0	0	0	0	0
	Moving back to provinces	For participants from Noi Bai airport to the provinces	car/1 way	1,500,000	4	6,000,000
	Total for 3 province					178,820,000
	Grant total for 01 province					59,606,667

3.7 Exposure visit among target groups

No.	Content	Q'ty	Unit Price (VND)	Amount (VND)
1	Meal, allowance for participants (30 persons x 1 day x 1 course)	30	150,000	4,500,000
2	Coffee break (30 persons x 1 day)	30	50,000	1,500,000
3	29-seat bus	1	3,000,000	3,000,000
4	Instructor tuition fee for field practice visits	1	500,000	500,000
	Total			9,500,000

4.3 Formulation of Safe Crop Production Group (Allowance for field officers) (Covered by PPMU)

No.	Description	No. person	No. day	Q'ty	Unit Cost (VND)	Amount (VND)
	01 Province					
1	Target group 1	1	1	1	400,000	400,000
	Target group 2	1	1	1	400,000	400,000
	Target group 3	1	1	1	400,000	400,000
	Sub Total					1,200,000

5.1 Preparation of production planning (Allowance for field officers) (Covered by PPMU)

No.	Description	No. person	No. day	Q'ty	Unit Cost (VND)	Amount (VND)
	01 Province					
1	Target group 1	1	4	4	400,000	1,600,000
	Target group 2	1	4	4	400,000	1,600,000
	Target group 3	1	4	4	400,000	1,600,000
	Sub Total					4,800,000

5.2 Procurement of materials (joint purchase) (Covered by PPMU)

No.	Description	No. per-son	No. day		2,400,000	Amount (VND)
	01 Province					
1	Target group 1	1	2	2	400,000	800,000
	Target group 2	1	2	2	400,000	800,000
	Target group 3	1	2	2	400,000	800,000
	Sub Total					2,400,000

6. Cultivation Method for Safe Vegetables (funded by JICA)

6.1 Planning of demonstration farm (Allowance for field officers) (Covered by PPMU)

No.	Description	No. person	No. day	Q'ty	Unit Cost (VND)	Amount (VND)
	01 Province					
1	Target group 1	1	1	2	400,000	800,000
	Target group 2	1	1	2	400,000	800,000
	Target group 3	1	1	2	400,000	800,000
	Sub Total					2,400,000

6.2.1 Trainings on Cultivation Method (funded by JICA)

No.	Description	Unit	Q'ty	Unit Price	Amount (VND)
1	Training				
2	Printing materials and stationeries fee for participants (25 farmers/group x 4 page x 300 VND/page)	Farmers . Seasons	100	300	30,000
3	Meal for participants in Training (25 farmers/group x time/season)	Farmers	25	150,000	3,750,000
4	Tea/water	Farmers	25	50,000	1,250,000
5	Sub Total for 1 target group/time				5,030,000
	Sub Total for 1groups, 1season (4times/season)				20,120,000
	Total of 01 provinces				60,360,000

6.2.2 Materials for demonstration farm

A Soil improvement by composting (material cost funded by JICA)					
I.	Material for 02 m ³ compost support for 01 farmer	Unit	Quantity	Price (VND)	Amount (VND)
	Pig dung	m ³	2	500,000	1,000,000
	Rice bran	kg	60	6,000	360,000
	Rice hush	bag	14	12,000	168,000

	Canvas	m ²	20	15,000	300,000
	Yeast (which used to make alcohol)	kg	1	50,000	50,000
	Steel pipe 1.5m length	item	1	300,000	300,000
	Sub- Total				2,178,000
	Total of 01 provinces - 6 farmers				13,068,000

C	Seedling improvement (material cost funded by JICA)				
I.	Budget for material of seedling improvement activity for 01 farmer	Unit	Quantity	Price (VND)	Amount (VND)
	Sponge tray	tray	50	22,000	1,100,000
	nursery bed	kg	50	5,000	250,000
	Material for making shelf tray (seedling shelf tunnel)	tunnel	1	3,000,000	3,000,000
	Sub- Total				4,350,000
	Total of 01 provinces - 9 farmers				39,150,000

D	New agriculture materials (material cost funded by JICA)				
I.	Budget for Non women textile (NWT) for 01 demonstration for 01 target group	Unit	Quantity	Price (VND)	Amount (VND)
	02 sets of NWT sheet size (200m x 2,1m)	m ²	840	10,500	8,820,000
	2 sets of NWT sheet size (200m x 2,7m)	m ²	1080	6,000	6,480,000
	Steel frame	item	160	12,000	1,920,000
	Sub- Total				17,220,000
	Total of 01 provinces - 3 target group				51,660,000

6.2.3 Field Monitoring for Pilot Farms (Covered by PPMU)

No.	Description	Unit	Q'ty	Unit Price	Amount (VND)
1.3	Allowance for Extension Worker (1days/week x 1weeks/month x 12 months x 150,000 VND/ person/day)	Day	12	150,000	1,800,000
1.3.1	Gasoline for travelling field practice visits (1 day//week x 1week/month x 12 months)	Day	12	50,000	600,000
1.3.2	Allowance for Extension Worker (1days/week x 1week/month x 12 month)	Day	12	150,000	1,800,000
1.3.3	Sub Total for 1 group, 1season				4,200,000
1.3.4	Sub Total for 1 group, 4season				16,800,000
	Total of 01 provinces (03 target groups)				50,400,000

7. On-Field Instruction for Basic GAP Application (covered by PPMUs)

7.1 On-field instruction for Basic GAP application

No.	Description/ Activity	Q'ty	Unit price (VND)	No. person/ time	Amount (VND)
	Cost estimation for On-field instruction for 01 Pilot project				
1	Travel allowance for PPMU's technical inspector(s) conduct on-field instruction for farmers applying basic GAP and new cultivation method for 9 months (4 times/ month x 1 day/times x 9 months)	36	50,000	1	1,800,000
2	Intensive allowance for PPMU's technical inspector(s) conduct on-field instruction for farmers applying basic GAP and new cultivation method for 9 months (4 times/ month x 1 day/times x 9 months)	36	150,000	1	5,400,000
	Sub Total cost for 01 target group				7,200,000
	Sub Total cost for 01 target group (for two years)				14,400,000
	Total of 01 provinces				43,200,000

7.2 Organization of internal monthly meeting to share experiences on application of Basic GAP and new cultivation method

No.	Description/ Activity	Q'ty	Unit price (VND)	Number of meeting	Amount (VND)
	Cost estimation for organisation of internal meetings for 01 Pilot project				
1	Coffee break (25 farmers x 1 meeting/month x 9 months)	25	15,000	9	3,375,000
2	Printing materials and stationeries	25	5,000	9	1,125,000
	Sub Total cost for 01 target group				4,500,000
	Sub Total cost for 01 target group (for two years)				9,000,000
	Total of 01 provinces				18,000,000

7.3 Internal Audit

No.	Descriptions	Q'ty	Unit price (VND)	No. person/time	Amount (VND)
	Travel allowance for PPMU's technical inspectors (1 time/season)	1	50,000	2	100,000
	Intensive allowance for PPMU's technical inspectors	1	150,000	2	300,000
	Sub Total for 1 target group				400,000
	Total for 1group, 4seasons				1,600,000
	Total of 01 provinces				4,800,000

8. Upgrading Conditions to ensure Food Hygiene and Safety

8.1 Conduct a technical assessment and develop a plan to upgrade the conditions for production area and pre-processing place (Covered by PPMUs)

No.	Descriptions	Unit	Q'ty	Unit Price (VND)	Amount (VND)
	Travel allowance for PPMU's technical inspectors	persons	3	50,000	150,000
	Intensive allowance for PPMU's technical inspectors	persons	3	150,000	450,000
	Sub Total for 1 target group				600,000
	Total of 01 provinces				1,800,000

8.3 Upgrading of facilities and equipment (Material cost for facilities and equipment funded by JICA)

No.	Descriptions	Unit	Q'ty	Unit Price (VND)	Amount (VND)
I	Support on equipments, consumable materials in production area				
1	Support in constructing tank (bin) to contain used pesticide packages/containers, dimension 1,5m x 1m x 1,2	Piece			
2	Pesticide cabinet in family (made of wood, dimension 75cm x 40cm x 25cm)	Piece			
3	Protective clothing for farmers when applying pesticides (clothes, glasses, masks, gloves, boots)	Set			
4	Warning sign on pesticide application	Board			
5	Containers for harvested products (plastic baskets)	Piece			
II	Upgrading conditions for packaging, handling houses				
1	Heat resistant ceiling of packaging, handling house	m ²			

2	Tiling floor of packaging, handling house	m ²			
3	Upgrading and expanding toilet: Wall, stainless steel, floor tiles; wall tiles, toilet seat, lavabo set...	-			
4	Constructing basin to wash vegetables (1m x1m x 0,5m)	Piece			
5	Machine for bunching vegetables and sealing vegetable bag	Piece			
6	Centrifugal spinning machine to dry vegetables	Piece			
7	Cooling cabinet to preserve vegetables	Piece			
8	Construction of lighting system	Set			
9	Sign board 4m x 0,8m	Piece			
	Sub-total for 01 target group (based on average actual expenditures)				150,000,000
	Total of 01 provinces				450,000,000

8.4 Evaluation of the improvement of the condition compared with the previous conditions in terms of food hygiene and safety (Covered by PPMUs)

No.	Descriptions	Unit	Q'ty	Unit Price (VND)	Amount (VND)
	Travel allowance for PPMU's technical inspectors	persons	3	50,000	150,000
	Intensive allowance for PPMU's technical inspectors	persons	3	150,000	450,000
	Sub Total for 1 target group				600,000
	Total of 01 provinces				1,800,000

9. Joint sales management (Covered by PPMUs)

9.1 Establishment of joint sales system

No.	Description	No. person	No. day	Q'ty	Unit Cost (VND)	Amount (VND)
1	Target group 1	1	4	4	400,000	1,600,000

	Target group 2	1	4	4	400,000	1,600,000
	Target group 3	1	4	4	400,000	1,600,000
	Total of 01 provinces					4,800,000

9.2 Field instruction for joint sales

No.	Description/ Activity	Q'ty	Unit price (VND)	No. person/ time	Amount (VND)
	Cost estimation for Field instruction for joint sales for 01 target group				
1	Travel allowance for PPMU's technical inspector(s) conduct on-field instruction for farmers applying basic GAP and new cultivation method for 9 months (4 times/ month x 1 day/times x 9 months)	36	50,000	1	1,800,000
2	Intensive allowance for PPMU's technical inspector(s) conduct on-field instruction for farmers applying basic GAP and new cultivation method for 9 months (4 times/ month x 1 day/times x 9 months)	36	150,000	1	5,400,000
	Sub Total cost for 01 target group				7,200,000
	Sub Total cost for 01 target group (for two years)				14,400,000
	Total of 01 provinces *				43,200,000

*** The cost shall be uncounted If this activity is organized together with Item 7.1 On-field instruction for Basic GAP application**

10. External Inspection and Auditing

10.2 Pesticide residue check (Quick Test) (funded by JICA)

No.	Description	Unit	Q'ty	Unit price (VND)	Amount (VND)
(1)	Quick Test kit				
1	GT pesticides residual test kit (for two years) for 03 target group	Package box (10 test)	24	800,000	19,200,000
2	Tool use for GT Pesticides Residual Test Kit	Set	2	900,000	1,800,000
	Sub Total for 1 province				21,000,000

(2)	Allowance for field officers of sampling and testing by Quick test				
	Remuneration for appointed PPMU's staff conducting vegetable sampling and conducting quick test (2 persons x 1day x 6 times x 1 target group)	Person/day	12	800,000	9,600,000
	Travel allowance for appointed PPMU's staff conducting vegetable sampling (2 persons x 1 day x 6 times x 1 target group)	Trip	12	50,000	600,000
	Sub Total for 1 target group				10,200,000
	Sub Total for 1 province				30,600,000
	Total for 01 province (1)+(2)				51,600,000

10.3 Pesticide residue check (laboratory test) (funded by JICA)

(1) Laboratory test fee

No.	Description	Unit	Q'ty	Unit price (VND)	Amount (VND)
(1)	Laboratory test fee				
	Laboratory test Pesticide, Heavy metal, microbiological for 2-3 samples per TG per year	Sample	5	5,362,000	26,810,000
	Sub Total for 1 province				80,430,000
(2)	Allowance for field officers of sampling and sending samples to laboratory				
I	Estimate budget for sampling and conduct quick test				10,200,000
	Remuneration for appointed PPMU's staff conducting vegetable sampling and conducting quick test (2 persons x 1day x 2 times x 3 target group)	Person/day	12	800,000	9,600,000
	Travel allowance for appointed PPMU's staff conducting vegetable sampling (2 persons x 1 day x 2 times x 3 target group)	Trip	12	50,000	600,000
II	Estimate budget for send samples to laboratory for testing				6,300,000
	Fee for send sample to laboratory	pack	6	1,000,000	6,000,000

	Cost for Buying vegetables samples (5samples x 2kg/sample x 3 target group)		15	20,000	300,000
III	Cost for buying sampling tools, sample reservation				1,920,000
	PE zipper bags (box 100 bags)	box	3	50,000	150,000
	Foam box (70x50x50cm)	box	6	150,000	900,000
	Disposable gloves (100 piece box)	box	3	10,000	30,000
	Alcohol 70%	Lọ	3	70,000	210,000
	Pens to write on glassess (box 10 pens)	box	3	150,000	450,000
	Labeling stickers (10 sheet packs)	pack	6	5,000	30,000
	PE box to contain samples	box	3	50,000	150,000
	Sub Total for 1 province				18,420,000
	Total for 01 province (1)+(2)				98,850,000

10.4 External Inspection and Auditing of Basic GAP (Covered by PPMUs)

No.	Description/ Activity	Unit	Q'ty	Unit price (VND)	Amount (VND)
1	Remuneration for staff appointed PPMU staff conducting the assessment (2 persons/ pilot project x 1 day/ pilot project x 2 inspection times/ year)	person	4	1,000,000	4,000,000
2	Travel Allowance (2 persons/pilot project x 1 day/pilot project x 2 inspection times/year)	person	4	50,000	200,000
	Sub Total cost for 01 target group/ year				4,200,000
	Sub Total cost for 01 target group (for two years)				8,400,000
	Total of 01 provinces				25,200,000

MANUAL FOR

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ISBN 978-604-3-28546-8



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