5. ALTERNATIVE PRODUCTIONS

5.1 METHODOLOGY OF THE IDENTIFICATION OF ALTERNATIVE PRODUCTION SYSTEMS

By definition in the theory of systems, it is defined as the set of elements that work in a joint and synchronous form to reach a common objective; the system is integrateted by 3 fundamental parts: the entrance, the process and the exit.

The previous definition applied to an agricultural production system can be explained as the set of natural and artificial elements that work synchronously and organizedly to obtain a defined objective, same that would be represented by a product that describes in the market (flower, vegetable or fruit), which, if properly commercialized, will give, as a result, a profitable production system.

In order to know the characteristics of the present and potential production systems of the 4 studied irrigation modules, all the information generated in work was compiled and analyzed next.

The main elements of the production system that were analyzed are the following ones:

- Soil
- Water
- Crops
- Irrigation systems
- Agrochemicals
- Mechanization
- Technical assistance and training
- Credit for agricultural activities
- Insurance for agricultural activities
- Commercialization and market

In order to evaluate the characteristics of the different elements from the production system, the methodology of a matrix of weighed values and numerical analysis was used. Next the charts of valuation of the elements for the present production system appear and, in the end the matrix of the numerical analysis that Integrate all the elements of the system.

VALUATION OF THE ELEMENT SOIL		VALUE WEIGH	QUALIFICATION	RESULT
MODULE 1 LAGUNA ENCANTADA	In the North part rockiness and compaction exists, deficiency in organic matter. Fertility from average to low, without Salinity problems.	12	0,5	6
MODULE 2 TLACOJALPAN-APROSIO	High humidity levels at time of rains by puddling due to the microrelief, deficient in organic matter. Average Fertility, grounds moderately compacted without Salinity problems.	12	0,6	7,2
MODULE 3 TESECH-CURAZAO	High humidity levels at time of rains by puddling due to the microrelief, deficient in organic matter. Average Fertility, grounds moderately compacted without Salinity problems. In addition in Tesechoacán the puddling also appears with irrigation so that it is to plow water.	12	0,5	6
MODULE 4 NARANJOS	High humidity levels at time of rains by puddling due to the microrelief and compaction of the ground, deficient in organic matter. Average Fertility, grounds moderately compacted without Salinity problems.	12	0,5	6

VALUATION OF THE ELEMENT WATER		VALUE WEIGH	QUALIFICATION	RESULT
MODULE 1 LAGUNA ENCANTADA	The water sources can provide the appropriate volumes and quality for irrigation.	12	1	12
MODULE 2 TLACOJALPAN-AMBROSIO	The water sources can provide the appropriate volumes and quality for irrigation.	12	1	12
MODULE 3 TESECH-CURAZAO	The water sources can provide the appropriate volumes and quality for irrigation.	12	1	12
MODULE 4 NARANJOS	The water sources can provide the appropriate volumes and quality for irrigation.	12	1	12

VALUATION OF THE ELEMENT CROPS		VALUE WEIGH	QUALIFICATION	RESULT
MODULE 1 LAGUNA ENCANTADA	Crops of maize, maize-bean in subsistence agriculture and cultivation of mango at semicommercial level in contrast to the cultivation of the tobacco for direct export commercialization.	12	0,3	3,6
MODULE 2 TLACOJALPAN-APROSIO	Main sugar cane cultivation, with use of Agrochemicals with extensive application and commercialization monopolized by the mill. Cultivation of mechanized, commercialized rice through buyers of other states.	12	0,6	7,2
MODULE 3 TESECH-CURAZAO	Main sugar cane cultivation, with use of Agrochemicals with extensive application and commercialization monopolized by the mill. Cultivation of mechanized, commercialized rice through buyers of other states.	12	0,6	7,2
MODULE 4 NARANJOS	Main sugar cane cultivation, with use of Agrochemicals with extensive application and commercialization monopolized by the mill. Mechanized and semimechanized Crops of rice, maize and papaya, commercialized through buyers of other states.	12	0,5	6

VALUATION OF THE ELEMENT IRRIGATION SYSTEMS		VALUE WEIGH	QUALIFICATION	RESULT
MODULE 1 LAGUNA ENCANTADA	The sprinkling irrigation system is in phase of operation tests. The tobacco cultivations have a splinking irrigation system private.	10	0,6	6
MODULE 2 TLACOJALPAN-APROSIO	2 of the 5 submodules have their of sprinkling irrigation system in construction. The 3 last sub-modules don´t has sprinkling irrigation system.	10	0,5	5
MODULE 3 TESECH-CURAZAO	In the submodule of Curazao the construction of the sprinkling irrigation system is finished. In the submodule Tesechoacan also the irrigation system is finished, but the irrigation is by to plow water.	10	0,5	5
MODULE 4 NARANJOS	Of the 5 submodules here included, only splinking irrigation system of Mondongo (well 5) is in operation. The 4 last submodules splinking irrigation system in construction.	10	0,6	6

VALUATION OF THE ELEMENT CREDIT		VALUE WEIGH	QUALIFICATION	RESULT
MODULE 1 LAGUNA ENCANTADA	For the subsistence agriculture repairing or provision credits do not exist. The tobacco culture should be handled as an agroexport company, which has access on credits of the bank.	8	0,2	1,6
MODULE 2 TLACOJALPAN-AMBROSIO	The figure of the credit as such does not exist, nevertheless the advance payments that the mill does towards the cane producers and the provision of Agrochemicals as such covers to a certain extent this element. For the rice culture, maize and mango does not exist the credit figure.	8	0,3	2,4
MODULE 3 TESECH-CURAZAO	The figure of the credit as such does not exist, nevertheless the advance payments that the mill does towards the cane producers and the provision of Agrochemicals as such covers to a certain extent this element. For the rice culture, maize and mango does not exist the credit figure.	8	0,3	2,4
MODULE 4 NARANJOS	The figure of the credit as such does not exist, nevertheless the advance payments that the mill does towards the cane producers and the provision of Agrochemicals as such covers to a certain extent this element. For the rice culture, maize and mango does not exist the credit figure.	8	0,3	2,4

VALUATION OF THE ELEMENT MECHANIZATION		VALUE WEIGH	QUALIFICATION	RESULT
MODULE 1 LAGUNA ENCANTADA	The level of mechanization in this module is mixed. On the one hand of animal traction is used in culture of subsistence and on the other hand, the high mechanization is observed in tobacco cultivation.	10	0,2	2
MODULE 2 TLACOJALPAN-APROSIO	Crops mechanized from the terrain preparation, seed, cultivate, fertilization and harvest; in some cases the application of plaguicides takes control of knapsack pumps.	10	0,6	6
MODULE 3 TESECH-CURAZAO	Crops mechanized from the terrain preparation, seed, cultivate, fertilization and harvest; in some cases the application of plaguicides takes control of knapsack pumps.	10	0,6	6
MODULE 4 NARANJOS	Crops mechanized from the terrain preparation, seed, cultivate, fertilization and harvest; in some cases the application of plaguicides takes control of knapsack pumps.	10	0,6	6

VALUATION OF THE ELEMENT TECHNICAL ASSISTANCE		VALUE WEIGH	QUALIFICATION	RESULT
MÓDULE 1 LAGUNA ENCANTADA	The subsistence agriculture does not haved these services. In the case of the tobacco, the agroexport company has contracted the services of professionals in agronomy and enterprise handling.	8	0,3	2,4
MODULE 2 TLACOJALPAN-AMBROSIO	For the culture of the sugar cane the service of technical assistance and training provided by the technicians of the sugar mills, that service is moderately efficient. The Crops of rice, maize and mango, the producers do not have these agronómic services.	8	0,3	2,4
MODULE 3 TESECH-CURAZAO	For the culture of the sugar cane the service of technical assistance provided by the technicians of the sugar mills, that service is moderately efficient. The Crops of rice, maize and mango, the producers do not have these agronómic services.	8	0,3	2,4
MODULE 4 NARANJOS	For the culture of the sugar cane the service of technical assistance provided by the technicians of the sugar mills, that service is moderately efficient. The Crops of rice, maize and mango, the producers do not have these agronómic services.	8	0,3	2,4

VALUATION OF THE ELEMENT INSURANCE		VALUE WEIGH	QUALIFICATION	RESULT
MODULE 1 LAGUNA ENCANTADA	This service is not available one for the agricultural activities.	8	0	0
MODULE 2 TLACOJALPAN-AMBROSIO	This service is not available one for the agricultural activities.	8	0	0
MODULE 3 TESECH-CURAZAO	This service is not available one for the agricultural activities.	8	0	0
MODULE 4 NARANJOS	This service is not available one for the agricultural activities.	8	0	0

VALUATION OF THE ELEMENT AGROCHEMICALS		VALUE WEIGH	QUALIFICATION	RESULT
MÓDULE 1 LAGUNA ENCANTADA	In the market the appropriate Agrochemicals for the different crops exist. Investigation results do not exist that allow making an efficient and rational use of the Agrochemicals.	10	0,4	4
MÓDULE 2 TLACOJALPAN-AMBROSIO	In the market the appropriate Agrochemicals for the different Crops exist. Investigation results do not exist that allow making an efficient and rational use of the Agrochemicals.	10	0,5	5
MÓDULE 3 TESECH-CURAZAO	In the market the appropriate Agrochemicals for the different Crops exist. Investigation results do not exist that allow making an efficient and rational use of the Agrochemicals.	10	0,5	5
MÓDULE 4 NARANJOS	In the market the appropriate Agrochemicals for the different Crops exist. Investigation results do not exist that allow making an efficient and rational use of the Agrochemicals.	10	0,5	5

VALUATION OF THE MARKETING AND MARKET ELEMENT		VALUE WEIGH	QUALIFICATION	RESULTS
MÓDULE 1 LAGUNA ENCANTADA	The production of subsistence agriculture is for self consumption, the excess comes when they are commercialized locally. The agrobusiness of the tobacco directly commercializes its production in finished product form, this means that it incorporates added value by the manufacture of its product; its main market is of export and a part for national market.	10	0,6	6
MÓDULE 2 TLACOJALPAN-AMBROSIO	The mills have monopolized the market and the commercialization of the sugar cane. The rice, maize and mango are commercialized by buyers of other states.	10	0,5	5
MÓDULE 3 TESECH-CURAZAO	The mills have monopolized the market and the commercialization of the sugar cane. The rice, maize and mango are commercialized by buyers of other states.	10	0,5	5
MÓDULE 4 NARANJOS	The mills have monopolized the market and the commercialization of the sugar cane. The rice, maize and mango are commercialized by buyers of other states.	10	0,5	5

MATRIX OF WEIGH VALUES AND NUMERIC ANALYSIS OF THE AGRICULTURAL PRODUCTION SYSTEMS IN THE 4 IRRIGATION MODULES												
MÓDULES	ELEMENTS	SOIL	WATER	CROP	IRRIGATION SYSTEM	MECHANISATIÓN	CRÉDIT	INSURANCE	ASSISTANCE	AGROCHEMICALS	MARKETING AND MARKET	RESULT
	PONDERED VALUE	12	12	12	10	10	8	8	8	10	10	100%
MÓDULE 1	QUALIFICATION	0,5	1	0,3	0,6	0,2	0,2	0	0,3	0,4	0,6	
LAGUNA ENCANTADA	RESULT	6	12	3,6	6	2	1,6	0	2,4	4	6	43,6
MÓDULE 2	QUALIFICATION	0,6	1	0,6	0,5	0,6	0,3	0	0,3	0,5	0,5	
TLACOJALPAN-APROSIO	RESULT	7,2	12	7,2	5	6	2,4	0	2,4	5	5	52,2
MÓDULE 3	QUALIFICATION	0,5	1	0,6	0,5	0,6	0,3	0	0,3	0,5	0,5	
TESECH-CURAZAO	RESULT	6	12	7,2	5	6	2,4	0	2,4	5	5	45
MÓDULE 4	QUALIFICATION	0,5	1	0,5	0,6	0,6	0,3	0	0,3	0,5	0,5	
NARANJOS	RESULT	6	12	6	6	6	2,4	0	2,4	5	5	50,8

5.2 IDENTIFICATION OF PRODUCTION ALTERNATIVES

For the improvement of the explained production systems described in the previous section, it is possible to start off the valid hypothesis in the sense of implementing actions that favor the qualification of the different evaluated elements in the systems.

Among the evaluated elements, there are some elements that can be improved significantly in the short term and others that require managements by governmental agencies so that the producers count on these specific services, such are the credit and agricultural insurance.

Next actions set out that allow to improve some of the elements of the production system.

- SOIL. - In the module of Laguna Encantada the incorporation of organic matter will allow to improve the edaphic characteristics of the site. For the 3 remaining modules it is required to carry out works of soil conservation that will imply the leveling of lands to correct micro relief and thus to avoid puddlings, also requires the construction of drains, besides to incorporate important volumes of organic matter to the ground to make it soft and with better quality of drainage.

- IRRIGATION SYSTEM. - The construction and/or completion of the pending systems of irrigation, as well as its correct operation will mean an improvement of the present agricultural production systems.

- CROPS. - For the case of the element Crops, proposing new species are much more complex than the 2 elements previously commented. In order to propose alternative crops, it was necessary to analyze, to cross and to interrelate information of different sources, same that next are mentioned:

- RESULT OF THE MARKET STUDY. - This work provided an initial listing of species of flowers, vegetables and fruits that have local or regional demand in reference to the study site. The complete study of market and commercialization appears in interjection 4,3 of the present document

- ECOCROP. - It is a data bank of the FAO that allows to the identification of 1710 different species of plants with excellent data of climate and ground for each one. This data bank was used by entering information to it of climate and ground, that gave as a product a matrix that enlists the obtained vegetable species that potentially can be cultivated in the study site.

The proposed crops are sugar cane, onion, cabbage, chayote, guava, maize, mango, melon papaya, cucumber, black pepper, watermelon, saladette tomato, green tomato.

- SPECIALIZED BIBLIOGRAPHY. - By consultation to the banks of information of the National Institute of Forest, Agricultural and Cattle Investigations (INIFAP) it was possible to obtain antecedents from potential Crops in the region,

including the technological packages for jalapeño Chile and Persian lemon; this last species was discarded because of its low prices.

- SAGARPA. - One of the important elements for the proposal of alternative Crops is the rural price; this data was obtained from the data bank of the office of Supports and Services to the Farming Commercialization (IT APPROACHES) of the Main directorate of Financial Operations of this Secretariat in the following electronic direction www.sagarpa.gob.mx.

- PREVIOUS EXPERIENCES. – As a result of the works of field and the interaction with the producers of each module, it was possible to obtain the proposal of some potential species, same that were gotten up to the evaluation process to know their probable yield; the species that have previous experience in the region are: green tomato, rambután, litchi, maracuya, soursop and rice.

- FIELD INFORMATION. – As a result of the works of field during the systematic ground sampling, description of profiles, identification of limitant factors as well as of vegetation, it could be known that the modules of Tlacojalpan-Ambrosio, Tesechoacán-Curazao and Naranjos, during the time of rains they present puddlings by the microrelief, this, turns out to be an obstacle to cultivate vegetables and flowers in the spring-summer cycle (PV), reason why the proposal for this type of species is to produce them in the autumn-winter cycle (OI) under irrigation.

With the result of the integration of the different sources of intelligence before explained, it was possible to establish the following proposal of alternative Crops:

- Sugar cane
- Black pepper
- Onion
- Watermelon
- Cabbage
- Saladette Tomato
- Chayote
- Green tomato
- Guava
- Vanilla
- Maize
- Rambután
- Mango
- Litchi
- Melon
- Maracuya
- Papaya
- Soursop
- Cucumber
- Rice
- Jalapeño Chile

In order to integratete the technological packages of the alternative Crops, the consecutive script was followed:

- Common name and scientific name.
- Cycle of production (Annual OI) (Perennial or Semiperennial)
- Introduction
- Edaphoclimatic Requirements
- Terrain preparation
- Density and method of sowing
- Varieties
- Irrigation
- Fertilization
- Control of weeds
- Plagues
- Diseases
- Harvest
- Production costs: The gross income is related to the production cost to determine the probable gain of the alternative culture.

5.3 TECHNOLOGICAL PACKAGES

Next appear the summary of 21 technological packages of the proposed alternative crops, in extensive the technological packages are integrateted to the GIS

SUMMARY TECHNOLOGICAL PACKAGE FOR THE PLANTING OF MAIZE IN THE PAPALOAPAN RIVER BASIN

Name: Maíz (*Zea mayz).*

1. **Introduction:** Culture of original annual cycle of Mexico that as much has a great economic and nutritional importance in the interior as abroad, since it is a basic food in many countries of the world.
2. **Edaphoclimatic requirements:**

Edaphoclimatic rquirements	Abs Min.	Opt Min.	Opt Max.	Abs Max.	KillingTemp.
Temp. ºC	10	18	33	47	0
Annual Precipitation	400	600	1200	1800	
Soil pH	4.5	5	7	8.5	

Environmental Factors	Optimum	Range	Days to harvest
Light requirements (hours)	12	12-14	80 to 200 depending on the variety.
Photoperiod	Neutral		
Soil Texture	Ca (Sandand Loam)	Wide	
Soil Depth	50-150cm	50-150cm	
Soil Drainage	Well drained	Well drained	
Salinity	Less than 4	Less than 4	
Fertility	Moderate	Low	
Altitude		0-3000msnm.	

3. **Terrain preparation:** leaf fallow, and furrowed tracking.
4. **Density and method of sowing:** 35000 to 40000 plants by hectare, depositing of 3 to 4 seeds by linear meter in furrows.
5. **Varieties:** DEKALAB D-875, ASGROW CABBAGET, HARTZ Z-21, ASGROW DEER, PIONEER 30G40, H-428 and ASGROW H-438 PANTHER.
6. **Irrigation:** It can be rolled or by aspersion applying it every 7 or 10 Days depending of the environmental conditions and the plant until before initiating the flowering (panícula.
7. **Fertilization:** N = 70-80 kg/ha, P = 20-50 kg/ha. K = 30-40 kg/ha.
8. **Control of weeds:** Manual with grub hoe or machete and applying chemical agents like Glifosato (1-2 l/ha), 2.4 D Amine (1-2 l/ha), Atrazina (1 l/ha), etc.
9. **Plagues:** Gusano trozador (*Peridroma saucia*), Gusano cogollero (*Spodoptera frugiperda*), Gusano elotero (*Helicoverpa zea*), chinches apestosas (*Nezara uridula*), Chicharrita del maíz (*Dalbulus maidis*), and some others such as gusano saltarin, the pulguita negra and trips.
10. **Illnesses:** Strangulate of stem (*Pandthium spp and Erwinia carotovora*), Roanda (*Puccinia polandsora*), Mancha foliar (*Alternaria*), Hoja cabbageorada (*Dalbulus Maydis*), Pudricion de tallos and raíces (*Fusarium moniliforme* and *Cephalosporium spp*), Antracnosis *(Cabbageletotrichum graminocabbageum*) and carbón of maíz (*Ustilaug Maydis*).
11. **Harvest:** it is harvested when panicula (jilote) already is well developed and in milky state.
12. **The methodology to define the potential of cultivation:** Was a screen of information with the following sequence.
    First, the data of weather and around of the studied places were come into the data bank of the FAO named ECOCROP and the result was a preliminary list of 1710 species of potential cultivation. Second, this list was inter-related: with the results of marketing studies, with the banks of information of the Institute of Forest Investigation, Agricultural and Livestock, (IFIAL) and the rural prices, published by (SAGARPA) in its page of Support and the Commercialization Agricultural Services (SCAS).
    Furthemore, the information of previous experiences and the specific generated study that we are seeing, for exemple, the restrictive factors of agricultural production in each studied irrigation.
13. **Recommendations:** The cultivation of corn is a suggested for all modules, on the cycle autum-winter (a-w) when in the Mexican high plateau is not produced because of cold, and when the rain in the Papaloapan River Basin has finished. That is to say that com cannot stand the flooding, overall in its vegetative state before the fructification.
    Before the sowing it is recommended to level the ground and the irrigation has to be with caution in order to prevent fungus diseases such as the strangling of the stem, the rotting of stems and roots that affect this gramineae.
14. **Disadventages:** Nowadays there is no credit, agricultural insurance or technical assistance even though the last one can be solved by (INIFAP) the National Institute of Forest Agricultural and Livestock Investigation and the (SEDARPA) Secretariat of Agricultural, Rural, Forest and Feeding Developing, the last one is a state agency and its objective is agricultural developing.
15. **Advantages:** Sure market of harvest sale in the Papaloapan River Basin in Veracruz, Xalapa, Coatzacoalcos and Acayucan.

The producers on modules III have experience on this cultivation. The following diagram shows the productivity per hectare for the com cultivation in the Papaloapan River Basin.

Productivity by hectare

YIELD FRUIT / HA	SALE PRICE/FRUIT	GROSS INCOME	PRODUCTION COST	PROFIT
25.000	U.S. Dollar $0.06	U.S. Dollar $1,521.70	U.S. Dollar $429.90	U.S. Dollar $1,091.80

Note: One dollar = $11.50 Mexican pesos.

PrODUCTION COSTS

YEAR 1	CYCLE	CROP	SURFACE/HA	PLANTING	HARVEST
2004-2005	O-I	CORN	1		

LABORS	CODE	STAGE	DATE	HOW IT WAS DONE	PERSONS EMPLOYED	FOR HOW LONG	WAGE/HR	UNITARY COST	AMOUNT
Fallow		1	Oct-Nov	6	1	6	6	600	600
Raking	15	1	Oct-Nov	6	1	6	6	600	600
Furrowing	60	1	Oct-Nov	6	1	6	6	400	400
Planting	77	1	Nov-Dec	6	4	24	6	70	280
Fertilization	8	2	Nov-Dec	6	4	24	6	70	280
Agrochemicals	11	2	Nov-Dec	6	2	12	6	70	140
Irrigation	62	2	Nov-Dec	6	2	12	6	70	140
Harvest	80	3	Dec-Jan	6	5	30	6	70	350
								TOTAL=	2790

CHART OF CONSUMABLES

GENERIC NAME	STAGE	DATE	AMOUNT KG	SPECIFIC CONCEPT	PRICE	UNIT	PRESENTATION	AMOUNT
Seed	1	October	25	Corn	800	Kg.	Sack	800
Fertilization	2	Nov-Dec	150	Urea	154	Kg.	Sack	462
Fertilization	2	Nov-Dec	50	DAP	172	Kg.	Sack	172
Fertilization	2	Nov-Dec	10	Micros	20	Kg.	Bag	200
Agrochemical	2	Nov-Dec	2	Herbicide	80	Lt.	Container	160
Agrochemical	2	Nov-Dec	2	Fungicide	80	Kg.	Bag	160
Agrochemical	2	Nov-Dec	2	Insecticide	100	Lt.	Container	200
							TOTAL=	2.154

Specialty fertilizers and agrochemicals (organic and biologic)

PRODUCTION AND DESTINATION

YIELD TON/HA	SALE PRICE /TON	GROSS INCOME	PRODUCTION COST	PROFIT
25.000	0.70	17.500	4.944	12.556

*Ear of corn

$ 0.70 Ear in field

SUMMARY TECHNOLOGICAL PACKAGE FOR THE MANGO CULTURE IN THE PAPALOAPAN RIVER BASIN

Nombre: Mango (*Mangifera indica L.*)

1. **Introduction:** Original culture of India and the Philippines, of great importance in tropical Mexico since it is the main exporter in Latin America, is consumed Preferredly as fresh fruit, but also it is used in the preparation of jams, ice creams, candy, pickles, etc.
2. **Edaphoclimatic requirements:**

Edaphoclimatic rquirements	Abs Min.	Opt Min.	Opt Max.	Abs Max.	KillingTemp.
Temp. ºC	15	24	35	40	0
Annual Precipitation	700	1250	1700	2800	
Soil pH	5	5.5	5.7	7.5	

Environmental Factors	Optimum	Range	Days to harvest
Light requirements (hours)	8	16-8 hrs.	100-110
Photoperiod	Neutral		
Soil Texture	Sandand, muddand, I sand argillaceous, I claand muddand	Ample	
Soil Depth	More o 150		
Soil Drainage	Drained weell	well drain	
Salinity	Less of 4	Less of 4	
Fertility	Discharge in M.O S	Average	
Altitude	0-600 msnm.		

3. **Terrain preparation:** Outline of Plantation, to make a deep working for the opening of stocks and the later transplant.
4. **Density of Plantation:** 70 Plants/ha to distances of 12x12 m.
5. **Varieties:** Haden, Irwin, Kent, Keit, Palmer and Tommand atkins.
6. **Irrigation:** During its first Days after the transplant, the tree needs 16-20 lts water each third day, until the tree settles down.
7. **Fertilization:**

Age	Amount	Element	Region
(YEARs)	(kg/ha)		
1-4	0.2/.0.1/0.1	N-P-K	Gula of Mexico
5-10	0.4/0.2/0.4		
11-15	0.6/0.3/0.6		
16-20	0.8/0.4/0.8		
<20	1.0/0.5/1.0		
1-5	0.4/0.2/0.2	N-P-K	South Pacific
>5	0.7/0.7/0.7		
1-4	0.4/0.2/0.2	N-P-K	North Pacific
5-10	1.3/0.55/0.85		
10-15	2.8/0.9/1.8		

8. **Plagues:** Mosca de la fruta (*Anastrepha oblicua and A. ludens*), Escamas (*Coccus mangiferae*), Hormigas (*Conomandrma sp and Ectatomma ruidum*).

9. Illnesses: Antracnosis (*Cabbageletotrichum gloesporoides*), Roña (*Elsinoe mangiferae*), Fumagina (*Eapnodium mangiferae P*).
10. Harvest: initiate when the fruit initiates its physiological maturity, so that it can support the packing and the transport.
11. The methodology to define the potential of cultivation: Was a screen of information with the following sequence.
    First, the data of weather and around of the studied places were come into the data bank of the FAO named ECOCROP and the result was a preliminary list of 1710 species of potential cultivation. Second, this list was inter-related with the results of marketing studies, with the banks of information of the Institute of Forest Investigation, Agricultural and Livestock, (IFIAL) and the rural prices, published by (SAGARPA) in its page of Support and the Commercialization Agricultural Services (SCAS).
    Furthemore, the information of previous experiences and the specific generated study that we are seeing, for exemple, the restrictive factors of agricultural production in each studied irrigation.
12. Recommendations: The cultivation of mango is good for modules I, III, IV. Cultivation of mango under irrigation would advance the period of harvest, the production will be on April instead of May as occur regularly on the region. In order to have mature fruits in February and March, it is recommended to make planting with ATAULFO variety which belongs to manila's group in the Papaloapan River Basin.
    In the first months of the year the price of mango is attractive at national level.
    Before making the plantation it is recommended to level the land and make the stock of plantation, this will let a good ventilation of the roots of the mangoes at the moment of transplanting.
13. Disadvantages: Nowadays there is no credit, agricultural insurance or technical assistance even though the last one can be solved partially by (INIFAP) the National Institute of Forest Agricultural and Livestock Investigation and the (SEDARPA) Secretariat of Agricultural, Rural, Forest and Feeding Developing. This secretariat is in charge agricultural developing.
14. Advantages: Sure market for selling harvest in the Papaloapan River Basin, Veracruz, Xalapa, Coatzacoalcos, Acayucan and Mexico City.
    Some of the products on modules II and III have already experience on this cultivation. We present the diagram of productivity by hectare for the cultivation of mango in the Papaloapan River Basin, making clear that in the first years there is not production starting from the fifth year when it is available to sell having a productive life for some years, it is a perennial cultivation.

Productivity by hectare

YIELD TON/HA	SALE PRICE/TON	GROSS INCOME	PRODUCTION COST	PROFIT
20	U.S. Dollar $347.80	U.S. Dollar $6,956.50	U.S. Dollar $860.20	U.S. Dollar $6,096.30

Note: One dollar = $11.50 Mexican pesos.

PrODUCTION COSTS

YAER 1	CYICLE	CROP	SURFACE/HA	PLANTING	HARVEST
2004-2005		MANGO	1		

LABORS	CODE	STAGE	DATE	HOW IT WAS DONE	PERSONS EMPLOYED	FOR HOW LONG	WAGE/HR	UNITARY COST	AMOUNT
Planting	77	1	May-Jun	6	3	18	6	70	210
Fallow	15	1	May-Sep	6	1	6	6	600	600
Raking	60	1	May-Sep	6	1	6	6	600	600
Ahoyado	6	1	May-Sep	6	5	30	6	70	350
Planting	57	2	Jun-Oct	6	8	48	6	70	560
Fertilization	8	2	Feb-Jun-Sept	6	5	30	6	70	350
Irrigation	62	2	Nov-Abr	6	4	24	6	70	280
Pruning	55	2	Jul-Sept	6	6	36	6	70	420
Weeding	38	2	Dic-Nov	6	10	60	6	70	700
Foliar asp.	12	2	Sep-Nov	6	5	30	6	70	350
Agrochemicals.	11	2	Nov-Feb	6	5	30	6	70	350
								TOTAL=	4770

CHART OF CONSUMABLES

GENERIC NAME	STAGE	DATE	AMOUNT/ KG	SPECIFIC CONCEPT	PRICE	UNIT	PRESENTATION	AMOUNT
Plant	1	Jun-Jul	120	Plant	3.000	Pieza	Piece	3000
Fertilizer	2	Feb-Sept	250	UREA	770	Kg.	Sack	770
Fertilizer	2	Feb-Sept	100	DAP	344	Kg.	Sack	344
Fertilizer	2	Feb-Sept	25	Micronutrients	1500	Kg.	Bag	1500
Agrochemical	2	Sept-Nov	2	Insecticide	400	Lt.	Bottle	400
Agrochemical	2	Sept-Nov	2	fungicide	400	Kg.	Bag	400
Agrochemical	2	Nov-Feb	2	Herbicide	140	Lt.	Bottle	140
							TOTAL=	6.554

Specialty fertilizers and agrochemicals (organic and biologic)

PRODUCTION AND DESTINATION

YIELD TON /HA	SALE PRICE/TON	GROSS INCOME	PRODUCTION COST	PROFIT
0	0	0	11.324	0

PRODUCTION COSTS

YEAR 2	CYCLE	CROP	SURFACE/HA	PLANTING	HARVEST
2005-2006		MANGO	1		

LABORS	CODE	STAGE	DATE	HOW IT WAS DONE	PERSONS EMPLOYED	FOR HOW LONG	WAGE/HR	UNITARY COST	AMOUNT
Fallow	15	1	May-Sep	6	1	6	6	600	600
Fertilization	8	2	Feb-Jun-Sep	6	5	30	6	70	350
Irrigation	62	2	Nov-Apr	6	4	24	6	70	280
Pruning	55	2	Jul-Sep	6	6	36	6	70	420
Weeding	38	2	Dec-Nov	6	8	48	6	70	560
Foliar Asp.	12	2	Sep-Nov	6	6	36	6	70	420
Aplic. Agroquim.	11	2	Nov-Feb	6	6	36	6	70	420
								TOTAL=	3050

CHART OF CONSUMABLES

GENERIC NAME	STAGE	DATE	AMOUNT/KG KG	SPECIFIC CONCEPT	PRICE	UNIT	PRESENTATION	AMOUNT
Fertilizer	2	Feb-Sept	250	UREA	154	Kg.	Sack	770
Fertilizer	2	Feb-Sept	150	DAP	172	Kg.	Sack	516
Agrochemical	2	Sept-Nov	2	Insecticide	200	Lt.	Bottle	400
Agrochemical	2	Sept-Nov	2	Fungicide	200	Kg.	Bottle	400
Agrochemical	2	Nov-Feb	2	Herbicide	70	Lt.	Bottle	140
Fertilizer	2	Feb-Sept	100	KCL	160	Kg.	Sack	320
Fertilizer	2	Feb-Sept	25	Micronutrients	350	Kg.	Sack	350
							TOTAL=	2.896

Specialty fertilizers and agrochemicals (organic and biologic)

PRODUCTION AND DESTINATION

YIELD TON/HA	SALE PRICE/TON	GROSS INCOME	PRODUCTION COST	PROFIT
0	0	0	5.946	0

PRODUCTION COSTS

YEAR 3	CYCLE	CROP	SURFACE/HA	PLANTING	HARVEST
2006-2007		MANGO	1		

LABORS	CODE	STAGE	DATE	HOW IT WAS DONE	PERSONS EMPLOYED	FOR HOW LONG	WAGE /HR	UNITARY COST	AMOUNT
Fallow	15	2	May-Sep	6	1	6	6	600	600
Fertilization	8	2	Feb-Jun-Sept	6	5	30	6	70	350
Irrigation	62	2	Nov-Apr	6	4	24	6	70	280
Pruning	55	2	Jul-Sept	6	6	36	6	70	420
Weeding	38	2	Dec-Nov	6	8	48	6	70	560
Foliar Asp.	12	2	Sep-Nov	6	6	36	6	70	420
Agrochemicals	11	2	Nov-Feb	6	6	36	6	70	420
HARVEST	80	2	Feb-May	6	15	90	6	100	1500
								TOTAL=	4550

CHART OF CONSUMABLES

GENERIC NAME	STAGE	DATE	AMOUNT/KG KG	SPECIFIC CONCEPT	PRICE	UNIT	PRESENTATION	AMOUNT
Fertilizer	2	Feb-Sept	250	T-17	157	Kg.	Sack	785
Fertilizer	2	Feb-Sept	150	12-12-17-2	320	Kg.	Sack	960
Fertilizer	2	Feb-Sept	25	Micronutrients	350	Kg.	Sack	350
Agrochemical	2	Sept-Nov	2	Insecticide	200	Lt.	Bottle	400
Agrochemical	2	Sept-Nov	2	Fungicide	200	Kg.	Bag	400
Agrochemical	2	Nov-Feb	2	Herbicide	80	Lt.	Bottle	160
							TOTAL=	3.055

Specialty fertilizers and agrochemicals (organic and biologic)

PRODUCTION AND DESTINATION

YIELD TON/HA	SALE PRICE/TON	GROSS INCOME	PRODUCTION COST	PROFIT
12	4.000	48.000	24.875	23.125

PRODUCTION COSTS

YEAR 4	CYCLE	CROP	SURFACE/HA	PLANTING	HARVEST
2007-2008		MANGO	1		

LABORS	CODE	STAGE	DATE	HOW IT WAS DONE	PERSONS EMPLOYED	FOR HOW LONG	WAGE /HR	UNITARY COST	AMOUNT
Fallow	15	2	May-Sep	6	1	6	6	600	600
Fertilization	8	2	Feb-Jun-Set	6	6	36	6	70	420
Irrigation	62	2	Nov-Apr	6	5	30	6	70	350
Pruning	55	2	Jul-Sept	6	6	36	6	70	420
Weeding	38	2	Dec-Nov	6	10	60	6	70	700
Foliar Asp.	12	2	Sep-Nov	6	6	36	6	70	420
Agrochemicals	11	2	Nov-Feb	6	6	36	6	70	420
HARVEST	80	3	Feb-May	6	15	90	6	100	1500
								TOTAL=	4830

CHART OF CONSUMABLES

GENERIC NAME	STAGE	DATE	AMOUNT/KG KG	SPECIFIC CONCEPT	PRICE	UNIT	PRESENTATION	AMOUNT
Fertilizer	2	Feb-Sept	250	T-16	157	Kg.	Sack	785
Fertilizer	2	Feb-Sept	150	12-12-17-2	320	Kg.	Sack	960
Fertilizer	2	Feb-Sept	25	Micronutrients	350	Kg.	Sack	350
Agrochemical	2	Sept-Nov	3	Insecticide	200	Lt.	Bottle	600
Agrochemical	2	Sept-Nov	3	Fungicide	200	Kg.	Bag	600
Agrochemical	2	Nov-Feb	3	Herbicide	80	Lt.	Bottle	240
							TOTAL=	3.535

Specialty fertilizers and agrochemicals (organic and biologic)

PRODUCTION AND DESTINATION

YIELD TON/HA	SALE PRICE/TON	GROSS INCOME	PRODUCTION COST	PROFIT
15	4.000	60.000	8.365	51.635

PRODUCTION COSTS

YEAR 5	CYCLE	CROP	SURFACE/HA	PLANTING	HARVEST
2008-2009		MANGO	1		

LABORS	CODE	STAGE	DATE	HOW IT WAS DONE	PERSONS EMPLOYED	FOR HOW LONG	WAGE /HR	UNITARY COST	AMOUNT
Fallow	15	2	May-Sep	6	1	6	6	600	600
Fertilization	8	2	Feb-Jun-Sep	6	6	36	6	70	420
Irrigation	62	2	Nov-Apr	6	5	30	6	70	350
Pruning	55	2	Jul-Sept	6	6	36	6	70	420
Weeding	38	2	Dec-Nov	6	10	60	6	70	700
Foliar Asp.	12	2	Sep-Nov	6	6	36	6	70	420
Agrochemicals	11	2	Nov-Feb	6	6	36	6	70	420
HARVEST	80	2	Feb-May	6	20	120	6	100	2000
								TOTAL=	5330

CHART OF CONSUMABLES

GENERIC NAME	STAGE	DATE	AMOUNT /KG KG	SPECIFIC CONCEPT	PRICE	UNIT	PRESENTATION	AMOUNT
Fertilizer	2	Feb-Sept	300	T-16	157	Kg.	Sack	942
Fertilizer	2	Feb-Sept	200	12-12-17-2	320	Kg.	Sack	1280
Fertilizer	2	Feb-Sept	50	Micronutrients	350	Kg.	Sack	700
Agrochemical	2	Sept-Nov	3	Insecticide	200	Lt.	Bottle	600
Agrochemical	2	Sept-Nov	3	Fungicide	200	Kg.	Bag	600
Agrochemical	2	Nov-Feb	3	Herbicide	80	Lt.	Bottle	240
							TOTAL=	4.362

Specialty fertilizers and agrochemicals (organic and biologic)

RODUCCION AND DESTINO

YIELD TON/HA	SALE PRICE/TON	GROSS INCOME	PRODUCTION COST	PROFIT
20	4.000	80.000	9.892	70.108

SUMMARY TECHNOLOGICAL PACKAGE FOR THE CULTURE OF LITCHI IN THE PAPALOAPANRIVER BASIN

Name: Litchi (*Litchi chinensis Sonn*).

1. Introduction: Fruit tree with great potential due to its great climatic adaptability to different zones of the State of Veracruz, in addition from being very profitable, since it is an exotic fruit tree and that it has a great demand in the export market.
2. Edaphoclimatic requirements:

Edaphoclimatic rquirements	Abs Min.	Opt Min.	Opt Max.	Abs Max.	KillingTemp.
Temp. ºC	15	20	35	40	- 3
Annual Precipitation	700	1250	1700	2800	
Soil pH	5	5.5	6.5	8.5	

Environmental Factors	Optimum	Range	Days to harvest
Light requirements (hours)	8	16-8 hrs.	100-110
Photoperiod	Neutral		
Soil Texture	Arenosa, limosa, Sandand claand, lime claand.	Wide	
Soil Depth	More than 150.	20-50cm	
Soil Drainage	Well drained	Well drained	
Salinity	Less than 4	Less than 4	
Fertility	High in O.M.	Medium	
Altitude	200-300 msnm.	0-1000 msnm.	

3. Terrain preparation: To select a flat land, to make I leave fallow and a good tracking.
4. Density of Plantation: Marks of Plantation of 12x6 and 12x12 with 138 and 70 are recommended respectiveland Plants/ha.
5. Varieties: Amboina, Bengal, Brewster, Groff, Hak IP, Kwa Luk, Mauritus, nonMai Tze and Tai Tsao, in our country the most cultivated the Brewster.
6. Irrigation: Important work mainly at the beginning of growth, the most recommended is the one of micro aspersion.
7. Fertilization: An average fertilization of 600 is recommended gr/arbol of N, 100 of P and 500 of K.
8. Control of weeds: It is made of manual form at the beginning of the Plantation, already later is possible to be made the application Herbicides.
9. Plagues: The main one is the Fly of the fruit (*Anastrepha sp.* and *Capitata ceratitis*).
10. Diseases: Green spot (*Cephaleuros virens*), Antracnosis (*Cabbageletotrichum gloesporoides*) and *Alternaria sp.*
11. Harvest: It is made of manual form when the fruit is of a red cabbage or uniform to the interior and the outside of the rind and when the protuberances of the fruit have been smoothed.
12. The methodology to define the potential of cultivation: was a screen of information with the following sequence.

First, the data of weather and around of the studied places were come into the data bank of the FAO named ECOCROP and the result was a preliminary list of 1710 species of potential cultivation. Second, this list was inter-related with the results of marketing studies, with the banks of information of the Institute of Forest Investigation, Agricultural and Livestock, (IFIAL) and the rural prices, published by (SAGARPA) in its page of Support and the Commercialization Agricultural Services (SCAS).
Furthemore, the information of previous experiences and the specific generated study that we are seeing, for exemple, the restrictive factors of agricultural production in each studied irrigation.

13. **Recommendations**: Cultivation of litchi is suggested for modules II, III and IV. Cultivation of litchi under irrigation will let manage the time of harvest, production will be on market when the price is attractive. It is recommended as organic cultivation whit the purpose of having acces to exportation market in the United States a Europe and consequently majour selling prices.
    Before making the plantation is suggested to level the ground and make furrows over which stock of plantations are made, this will let a good ventilation of litchi roots at the moment of transplanting.
14. **Disadvantages**: Nowadays there is no credit, agricultural insurance or technical assistance even though the last one can be solved partially by (INIFAP) the National Institute of Forest Agricultural and Livestock Investigation and the (SEDARPA) Secretariat of Agricultural, Rural, Forest and Feeding Developing. This secretariat is in charge agricultural developing.
15. **Advantages**: Sure market for harvest sale in the Papaloapan basin, Veracruz, Xalapa, Coatzacoalcos, Acayucan and even Mexico City.
    Some producers of modules II have already experience on this cultivation.
    The following diagram shows the productivity for litchi cultivation in the Papaloapan Basin, making clear that on first years there is no production and since the fifth year can be considered the market value, having a productive life of many years; it is a perennial cultivation.

Productivity by hectare

YIELD TON/HA	SALE PRICE/TON	GROSS INCOME	PRODUCTION COST	PROFIT
4830	U.S. Dollar $2,608.70	U.S. Dollar $12,600	U.S. Dollar $1,074.78	U.S. Dollar $1,1525

Note: One dollar = $11.50 Mexican pesos.

PRODUCTION COSTS

YEAR 1	CYCLE	CROP	SURFACE/HA	PLANTING	HARVEST
2004-2005	O-I	LITCHI	1	sep-04	-05

LABORS	CODE	STAGE	DATE	HOW IT WAS DONE	PERSONS EMPLOYED	FOR HOW LONG	WAGE /HR	UNITARY COST	AMOUNT
Fallow	15	1	sep	2	1	3	3	600	600
Raking	60	1	sep	2	1	3	3	600	600
Plantation tracing	69	1	sep	6	2	12	6	70	140
Opening of furrows	6	1	sep	6	5	30	6	70	350
Plantation	57	2	oct	6	5	30	6	70	350
Fertilization	8	2	oct-aug	6	10	60	6	70	700
Irrigation	62	2	sep-aug	6	8	48	6	70	560
Weeding	38	2	Dec-nov	6	20	120	6	70	1400
Pruning	55	2	feb-mar	6	2	12	6	70	140
								TOTAL=	4840

CHART OF CONSUMABLES

GENERIC NAME	STAGE	DATE	AMOUNT/KG KG	SPECIFIC CONCEPT	PRICE	UNIT	PRESENTATION	AMOUNT
Plant	1	oct	160 Plants	Plant	50	Piece	Piece	8000
Fertilizer	2	nov	150	nitrate	150	Sack	50 kg	450
Fertilizer	2	mar	100	DAP	172	Sack	50 kg	344
Fertilizer	2	jun	50	KCL	140	Sack	50 kg	140
Fertilizer	2	oct-jun	75	nutrients	280	Sack	25 kg	840
Agrochemicals	2	oct-jun	2	Fungicides	140	frasco	1 L	280
							TOTAL=	10054

PRODUCTION AND DESTINATION

YIELD TON/HA	SALE PRICE/TON	GROSS INCOME	PRODUCTION COST	PROFIT
0	0	0	14894	0

PRODUCTION COSTS

YEAR 2	CYCLE	CROP	SURFACE/HA	PLANTING	HARVEST
2005-2006	O-I	LITCHI	1	sep-05	aug -06

LABORS	CODE	STAGE	DATE	HOW IT WAS DONE	PERSONS EMPLOYED	FOR HOW LONG	WAGE /HR	UNITARY COST	AMOUNT
Fertilization	8	2	sep-aug	6	10	60	6	70	700
Weeding	38	2	sep-aug	6	20	120	6	70	1400
Pruning	55	2	feb-mar	6	8	48	6	70	560
Irrigation	62	2	sep-aug	6	6	36	6	70	420
								TOTAL=	3080

CHART OF CONSUMABLES

GENERIC NAME	STAGE	DATE	AMOUNT/KG KG	SPECIFIC CONCEPT	PRICE	UNIT	PRESENTATION	AMOUNT
Fertilizer	2	sep-aug	450	20/10/2010	160	Sack	50 kg	1440
Agrochemicals	2	sep-aug	6	NES	50	gallon	2 L	300
Fertilizers	2	sep-aug	100	nutrients	300	Sack	25 KG	1200
Agrochemicals	2	sep-aug	2	Insecticide	85	liter	1 L	170
								260
							TOTAL=	3110

PRODUCTION AND DESTINATION

YIELD TON/HA	SALE PRICE/TON	GROSS INCOME	PRODUCTION COST	PROFIT
0	0		6190	0

PRODUCTION COSTS

YEAR 3	CYCLE	CROP	SURFACE/HA	PLANTING	HARVEST
2006-2007	O-I	LITCHI	1	sep-06	aug -07

LABORS	CODE	STAGE	DATE	HOW IT WAS DONE	PERSONS EMPLOYED	FOR HOW LONG	WAGE /HR	UNITARY COST	AMOUNT
Fertilization	8	2	sep-aug	6	10	60	6	80	800
Weeding	38	2	sep-aug	6	20	120	6	80	1600
Pruning	55	2	feb-mar	6	8	48	6	80	640
Irrigation	62	2	sep-aug	6	8	48	6	80	640
Harvest	80	3	May	6	6	36	6	80	480
								TOTAL=	4160

CHART OF CONSUMABLES

GENERIC NAME	STAGE	DATE	AMOUNT /KG KG	SPECIFIC CONCEPT	PRICE	UNIT	PRESENTATION	AMOUNT
Fertilizer	2	sep-aug	500	17-17-17	157	Sack	50 kg	1570
Agrochemicals	2	sep-aug	8	NES	50	gallon	2 L	400
Fertilizar	2	sep-aug	100	nutrients	300	Sack	25 kg	1200
Agrochemicals	2	sep-aug	2	Insecticide	90	liter	1 L	180
							TOTAL=	3350

PRODUCTION AND DESTINATION

YIELD TON/HA	SALE PRICE/TON	GROSS INCOME	PRODUCTION COST	PROFIT
828 kg	30000	24840	14894	
			6190	
			7510	
		TOTAL=	28594	-3754

PRODUCTION COSTS

YEAR 4	CYCLE	CROP	SURFACE/HA	PLANTING	HARVEST
2007-2008	O-I	LITCHI	1	sep-07	aug -08

LABORS	CODE	STAGE	DATE	HOW IT WAS DONE	PERSONS EMPLOYED	FOR HOW LONG	WAGE /HR	UNITARY COST	AMOUNT
Fertilization	8	2	sep-aug	6	10	60	6	80	800
Weeding	38	2	sep-aug	6	20	120	6	80	1600
Pruning	55	2	feb-mar	6	8	48	6	80	640
Irrigation	62	2	sep-aug	6	8	48	6	80	640
Harvest	80	3	May	6	10	60	6	80	800
								TOTAL=	4480

CHART OF CONSUMABLES

GENERIC NAME	STAGE	DATE	AMOUNT /KG KG	SPECIFIC CONCEPT	PRICE	UNIT	PRESENTATION	AMOUNT
Fertilizer	2	sep-aug	650	17-17-17	165	Sack	50 kg	2145
Agrochemicals	2	sep-aug	10	NES	53	gallon	2 L	530
Fertilizer	2	sep-aug	150	nutrients	300	Sack	25 kg	1800
							TOTAL=	4475

PRODUCTION AND DESTINATION

YIELD TON/HA	SALE PRICE/TON	GROSS INCOME	PRODUCTION COST	PROFIT
1500 KG	30000	45000	3754	
			8955	
		TOTAL=	12709	$32.291

PRODUCTION COSTS

YEAR 5	CYCLE	CROP	SURFACE/HA	PLANTING	HARVEST
2008-2009	O-I	LITCHI	1	sep-08	aug -09

LABORS	CODE	STAGE	DATE	HOW IT WAS DONE	PERSONS EMPLOYED	FOR HOW LONG	WAGE /HR	UNITARY COST	AMOUNT
Fertilization	8	2	sep-aug	6	12	72	6	100	1200
Weeding	38	2	sep-aug	6	20	120	6	100	2000
Pruning	55	2	feb-mar	6	10	60	6	100	1000
Irrigation	62	2	sep-aug	6	8	48	6	100	800
Harvest	80	3	May	6	10	60	6	100	1000
								TOTAL=	6000

CHART OF CONSUMABLES

GENERIC NAME	STAGE	DATE	AMOUNT /KG KG	SPECIFIC CONCEPT	PRICE	UNIT	PRESENTATION	AMOUNT
Fertilizers	2	sep-aug	750	17-17-17	173	Sack	50 kg	2595
Agrochemicals	2	sep-aug	12 L	NES	56	gallon	2 L	672
Fertilizers	2	sep-aug	150	nutrients	300	Sack	25 kg	1800
							TOTAL=	5067

PRODUCTION AND DESTINATION

YIELD TON/HA	SALE PRICE/TON	GROSS INCOME	PRODUCTION COST	PROFIT
2760	30000	82800	11067	$71.733

PRODUCTION COSTS

YEAR 6	CYCLE	CROP	SURFACE/HA	PLANTING	HARVEST
2009-2010	O-I	LITCHI	1	sep-08	aug -09

LABORS	CODE	STAGE	DATE	HOW IT WAS DONE	PERSONS EMPLOYED	FOR HOW LONG	WAGE /HR	UNITARY COST	AMOUNT
Fertilization	8	2	sep-aug	6	10	60	6	100	1000
Weeding	38	2	sep-aug	6	20	120	6	100	2000
Pruning	55	2	feb-mar	6	10	60	6	100	1000
Irrigation	62	2	sep-aug	6	8	48	6	100	800
Harvest	80	3	May	6	12	72	6	100	1200
								TOTAL=	6000

CHART OF CONSUMABLES

GENERIC NAME	STAGE	DATE	AMOUNT /KG KG	SPECIFIC CONCEPT	PRICE	UNIT	PRESENTATION	AMOUNT
Fertilizers	2	sep-aug	850	17-17-17	180	Sack	50 kg	3060
Agrochemicals	2	sep-aug	15 L	NES	60	gallon	2 L	900
Fertilizers	2	sep-aug	200	nutrients	300	Sack	25 kg	2400
							TOTAL=	6360

PRODUCTION AND DESTINATION

YIELD TON/HA	SALE PRICE/TON	GROSS INCOME	PRODUCTION COST	PROFIT
4830	30000	144900	12360	$132.540

SUMMARY TECHNOLOGICAL PACKAGE FOR THE SUGAR CANE CULTURE IN THE PAPALOAPAN RIVER BASIN

Name: Sugar cane (*Saccharum spp.*).

1. Introduction: the cane is a culture of great economic and industrial importance due to the great capacity to create a source of uses, in addition to the generation and pick up of currencies; it has importance like calorific supplement of the human diet, in the production of alcohol, nutritional components, etc.
2. Edaphoclimatic requirements:

Edaphoclimatic rquirements	Abs Min.	Opt Min.	Opt Max.	Abs Max.	KillingTemp.
Temp. °C	15	24	37	41	-2
Annual Precipitation	1000	1500	2000	5000	
Soil pH	4.5	5	8.0	9	

Environmental Factors	Optimum	Range	Days to Harvest
Light requirements (hours)	12	12-14	100-120
Photoperiod	Neutral		
Soil Texture	Migajon arcillo limoso	Wide	
Soil Depth	More than 150.	50-150cm	
Soil Drainage	Well drained	Well drained	
Salinity	Less than 4	Medium de 4-10	
Fertility	Alta	Moderada.	
Altitude		0-1000msnm.	

3. Terrain preparation: To make 5 dray passages in form crossed to 40 cm of depth, made level and furrowed with 1,3 distances that go of a1.5 m between furrows.
4. Density of Plantation: This is made through sticks and the used amount goes from 8 to 10 ton/ha, to a depth of 20 to 25
5. Irrigation: It can be rolled or by dripping, in the low water is made each 8 to 10 Days depending of the necessities on the plant.
6. Fertilization: 100 are recommended doses of kg/ha, equivalent to 7 ammonium nitrate coats.
7. Control of weeds: It is made of manual form or by means of it earths up with tractor. Also chemical agents can be used.
8. Plagues: Hen blinds (*Phandlophaga spp*), Driller of the sugar cane (*Elasmopalpus lignosellas*), Barrenador of the stem (*Diatraea spp*), Aphids (Sipha flava), Nemátodos (*Pratandlenchus, Helicotandlenchus, Tandlenchorhandndus*), Rats (*Reithodonmands spp*).
9. Diseases: Coal (*Scitaminea ustilaug*), annular Spot (*Lepthosphaeria sacchari*), Roanda *(Puccinia erianthi*), Escaldadura to foliar (*Xanthomonas albilineans*), red Raand (*Pseudomonas rubrilineans*), Mosaic of the cane (*Polivirus*).
10. Harvest: One begins to the 9 months when the cane has reached the amount of saccharose necessary to be processed in the talent, is a culture semiperennial until by 5 years.

11. **The methodology to define the potential of cultivation**: was a screen of information with the following sequence. First, the data of weather and around of the studied places were come into the data bank of the FAO named ECOCROP and the result was a preliminary list of 1710 species of potential cultivation. Second, this list was inter-related with the results of marketing studies, with the banks of information of the Institute of Forest Investigation, Agricultural and Livestock, (IFIAL) and the rural prices, published by (SAGARPA) in its page of Support and the Commercialization Agricultural Services (SCAS).
    Furthemore, the information of previous experiences and the specific generated study that we are seeing, for exemple, the restrictive factors of agricultural production in each studied irrigation.
12. **Recommendations:** Cultivation of sugar cane is suggested for modules II, III and IV, because it stands some weeks in high leves of humidity of soil, for that reason it has developed in the Papaloapan basin.
    The use of irrigation in low water season can be substantially better for the value, probably up to 150 ton/ha, this can be an incentive for the stablishment of local agroindustries that has the purpose the production of ethyl alcohol and sugar loaf for exportation to the United States. That is to satisfy the demand of sugar of Spanish people who live there. This recommendation wil give more value to sugar production.
    In order to avoid the flooding on sugar cane plantation it is suggested to level the ground and make irrigation channels to favour the superficial drainage of soil.
13. **Disadvantages:** Nowadays, producers of sugar cane have social-economic dependence with sugar mills of the region. This has favoured the monocultivation; consequently, it has closed the possibility of introduction of other potential cultivation. The prices are stablished by sugar mills buyers and consequently the utility is for the factory owner. Recently, Mexican government decree that sowing, cultivation and industrialization of sugar cane are not of public interest.
14. **Advantages:** Sure market for harvest sale on regional sugar mills such as Tres Valles, San Cristobal, Carlos A. Carrillo and San Gabriel. Another advantage is that cultivation on the region has reached apropiate levels of mechanization, for example, the harvest is mechanized. The granting of advances in technical assistance and social security for producers by the sugar mill, make that this cultivation be accepted among regional population.
    Producers on modules II, III and IV have already experience on this cultivation. The following diagram shows the productivity per hectare for sugar cane cultivation. Sugar cane is semi-perenne cultivation.

Productivity by hectare

YIELD TON/HA	SALE PRICE/TON	GROSS INCOME	PRODUCTION COST	PROFIT
120	U.S. Dollar $34.78	U.S. Dollar $4,173.91	U.S. Dollar $1,764	U.S. Dollar $2,410

Note: One dollar = $11.50 Mexican pesos

PRODUCTION COSTS

YEAR 1	CYCLE	CROP	SURFACE/HA	PLANTING	HARVEST
2004-2005	O-I	Sugar cane	01-00-00		

LABORS	CODE	STAGE	DATE	HOW IT WAS DONE	PERSONS EMPLOYED	FOR HOW LONG	WAGE /HR	UNITARY COST	AMOUNT
Fallow	15	1	Sep-oct	6	1	6	6	600	600
Raking	60	1	Sep-oct	6	1	6	6	600	600
Furrowing	76	1	Sep-oct	6	1	6	6	500	500
PLANTING	77	1	Nov-feb	6	10	60	6	100	1000
Fertilization	8	2	Janr-April	6	10	60	6	100	1000
Aplic. Agroquim.	11	2	Janr-April	6	6	36	6	100	600
Irrigation	62	2	Jun-oct	6	7	42	6	100	700
Harvest	80	3	Nov-May	6	20	120	6	100	2000
Transportation	30	3	Dec-May	6	7	42	6	700	4900
Weeding	38	3	Janr-Aug	6	10	60	6	100	700
								TOTAL=	12600

CHART OF CONSUMABLES

GENERIC NAME	STAGE	DATE	AMOUNT /KG KG	SPECIFIC CONCEPT	PRICE	UNIT	PRESENTATION	AMOUNT
Seed	1	Janr-mar	10000	caña/seed	0,2	Kg	Ton	2.000
Fertilization	2	Feb-mar	250	urea	154	Kg	Sack	770
Fertilization	2	Feb-mar	150	Dap	172	Kg	Sack	516
Fertilization	2	Jun-jul	400	12-12-17-2	200	Kg	Sack	1600
Agrochemical	2	Apr-Jun	3	Herbicide	90	Kg	Container	270
Agrochemical	2	Apr-Jun	3	Insecticide	160	Kg	Container	480
Agrochemical	2	Apr-Jun	5	Fungicides	200	Kg	BAG	600
Fertilization	2	Feb-mar	5	Ac. Humicos+nutr.	200	Kg	Container/BAG	1000
Fertilization	2	Feb-jun	15	Micronutrients	30	Kg	BAG	450
							TOTAL=	7.686

Specialty fertilizers and agrochemicals (organic and biologic)

PRODUCTION AND DESTINATION

YIELD TON/HA	SALE PRICE/TON	GROSS INCOME	PRODUCTION COST	PROFIT
120	400	48.000	20.286	27.715

SUMMARY TECHNOLOGICAL PACKAGE FOR THE CULTURE OF YELLOW MARACUYA IN THE PAPALOAPAN RIVER BASIN AUTUMN-WINTER

Name: Maracuya (*Pasiflora edulis flavicarpa*).

1. Introduction: Nontraditional, original culture of Brazil and with great potential to be cultivated in Veracruz, since it is a fruit tree used in the elaboration of many products, as much nutritional, as industrialists, for example, in the drink manufacture, candies, oils, inks and varnishes, at the present time in the country already exist commercial Plantations.
2. Edaphoclimatic requirements:

Edaphoclimatic factors	Abs. Min.	Min. Opt	Max. Opt	Max. Abs	Killing Temp.
Temp. °C	21	23	25	32	0
Annual Precipitation	650	800	1750	2000	
Soil pH	4.5	5.5	7.0	8	

Environmental Factors	Optimum	Range	Days to harvest
Light requirements (hours)	11	10-14	50-60 después de la antesis.
Photoperiod	Neutral		
Soil Texture	Areno-arcillosos	Wide	
Soil Depth	More than 50	50-90	
Soil Drainage	Well drained	Well drained	
Salinity	Less than 4	Medium de 4-10	
Fertility	Alta	Moderada.	
Altitude	300-900 msnm	0-900msnm.	

3. Terrain preparation: Scanning, fallow and positioning of tutors in lines to hold the galvanized wire.
4. Sowing: It is carried out from seed plot generally, later to transplant to the definitive place.
5. Density: A distance between plants of 2,5 xs 2,5 is recommended to have a 1600 population Plants/ha.
6. Irrigation: To provide to water avoiding puddlings not to favor the development of fungi.
7. Fertilization: It is recommended to use installments with the formulas: 15-15-15 or 12-12-12, as much to the ground as to the foliage
8. Control of weeds: Manual through plate or using Agrochemicals to maintain the corridors clean.
9. Plagues: Gusano (*Dione Juno Juno*), Fly of the fruit (*Anastrepha spp*), Pulgones (*Mandzus persicae, Aphis gossandpi*), red Acaro (*Tetranichus sp*).
10. Diseases: Antracnosis (*Cabbageletotrichum gloesporoides*), Badland of talluelo (*Pandthium sp, Phandtophthora sp*), Verrugosis or roña (*Cladosporium herbarum*), Marchitez (*Fusarium oxandsporum*).
11. Harvests: This is made when the fruits have a yellowish green coloration, since if they are harvested later its weight diminishes and the low yield.
12. The methodology to define the potential of cultivation: Was a screen of information with the following sequence.

First, the data of weather and around of the studied places were come into the data bank of the FAO named ECOCROP and the result was a preliminary list of 1710 species of potential cultivation. Second, this list was inter-related with the results of marketing studies, with the banks of information of the Institute of Forest Investigation, Agricultural and Livestock, (IFIAL) and the rural prices, published by (SAGARPA) in its page of Support and the Commercialization Agricultural Services (SCAS).

Furthemore, the information of previous experiences and the specific generated study that we are seeing, for exemple, the restrictive factors of agricultural production in each studied irrigation.

13. **Recommendations:** Cultivation of Maracuya is suggested for all modules. It can the producers to stablish an agroindustry for making syrup for sodas and ice at national level. Before the plantation it is recommended to level the ground and make furrows for the stock plantation, this will let a good ventilation of roots of maracuya at the moment of transplantation. This specie is sensitive to fungus deseases like bad stem, withering, antracnosis and verrugosis.

    In order do have better sell prices, it is suggested to prodece the maracuya like organic cultivation to acces exportation market in United States and Europe.

14. **Disadvantages:** Nowadays there is no credit, Agricultural insurance or technical assistance eventhough the last one con be solved by (INIFAP), the National Institute of Forest Agricultural and livestoke Investigations, and the (SEDARPA), Secretarial of Agricultural, Rural, Forest and Feeding developing, the last one is a estate agency and its objective is the agricultural developing.

15. **Advantages:** Sure market for harvest sale as fresh fruit in the Papaloapan basin in Veracruz, Xalapa, Coatzacoalcos, Acayucan and Mexico City. For soda industry in Mexico City and ice industry in Guadalajara. Some producers in Module III already have experience in this cultivation. The following diagram presents the productivity per hectare for cultivation of maracuya in the Papaloapan basin. Maracuya is a perennial cultivation.

Productivity by hectare

YIELD TON / HA	SALE PRICE/TON	GROSS INCOME	PRODUCTION COST	PROFIT
	U.S. Dollar	U.S. Dollar	U.S. Dollar	U.S. Dollar
20	$217.40	$4,347.80	$1,642.20	$2,705.65

Note: One dollar = $11.50 Mexican pesos.

PRODUCTION COSTS

YEAR 1	CYCLE	CROP	SURFACE/HA	PLANTING	HARVEST
2004-2005	O-I	MARACUYA	1		

LABORS	CODE	STAGE	DATE	HOW IT WAS DONE	PERSONS EMPLOYED	FOR HOW LONG	WAGE/ HR	UNITARY COST	AMOUNT
Fallow	15	1	Apr-May	6	1	3	3	600	600
Raking	60	1	Apr-May	6	1	3	3	600	600
Trazo	69	1	May	6	2	12	6	70	140
Ahoandado	6	1	May	6	10	60	6	70	700
Transplant	66	2	May-Jun	6	10	60	6	70	700
Alambrado		2	May	6	5	30	6	70	350
Tying	5	2	Jun-Jul	6	4	24	6	70	280
Pruning Cond.	55	2	Jul-Aug	6	4	24	6	70	280
Pruning Renov.	55	2	May-Apr	6	8	48	6	70	560
Weeding	38	2	May-Apr	6	18	108	6	70	1260
Fertilization	8	2	May-Apr	6	10	60	6	70	700
Agrochemicals	11	2	May-Apr	6	5	30	6	70	350
Harvest	80	3	Jan-Feb	6	20	120	6	70	1400
								TOTAL=	7920

CHART OF CONSUMABLES

GENERIC NAME	STAGE	DATE	AMOUNT /KG KG	SPECIFIC CONCEPT	PRICE	UNIT	PRESENTATION	AMOUNT
Plant	1	May	1800	Plant	2,5	Piece	Piece	4.500
Fertilizer	2	Jun-Jul	150	Urea-DAP	163	Kg.	Sack	489
Fertilizer	2	Sep-Oct	200	T-16	153	Kg.	Sack	612
Fertilizer	2	May-Apr	25	Micronut	300	Kg.	Sack	300
Agrochemical	2	May-Apr	4	Insecticide	350	Lt.	Bottle	1400
Agrochemical	2	May-Apr	4	Fungicide	400	Kg.	BAG	1600
Alambre No.12	1	May	129	Alambre	16	Kg.	Piece	2064
							TOTAL=	10.965

Specialty fertilizers and agrochemicals (organic and biologic)

PRODUCTION AND DESTINATION

YIELD TON/HA	SALE PRICE/TON	GROSS INCOME	PRODUCTION COST	PROFIT
20	2.500	50.000	18.885	31.115

SUMMARY TECHNOLOGICAL PACKAGE FOR THE CULTURE OF RICE IN THE PAPALOAPAN RIVER BASIN AUTUMN -WINTER

Name: Rice (*Orandza sativa*).

1. Introduction: Original annual culture of Asia and great importance in Mexico and Veracruz, due to the great demand that it has, since like the maize, comprises of the basic basket of national feeding and many countries.
2. Edaphoclimatic requirements:

Edaphoclimatic Factors	Abs. Min.	Opt Min.	Opt Max.	Abs Max.	killing Temp.
Temp. ºC	10	20	30	36	0
Annual Precipitation	1000	1500	2000	4000	
Soil pH	4.5	5.5	7	9	

Environmental Factors	Optimum	Range	Days to harvest
Light requirements (hours)	12	12-14	100-120
Photoperiod	Neutral		
Soil Texture	Medium	Wide	
Soil Depth	More than 150.	50-150cm	
Soil Drainage	Saturado Less thanl 50% al YEAR.		
Salinity	Less than 4	Medium de 4-10	
Fertility	Alta	Moderada.	
Altitude		800-1400 msnm	

3. Terrain preparation: make 2 Fallows to a depth of 25 cm and 2 dray passages.
4. Density and method of sowing: 130 are used normally kg/ha of seed, and seedtime is made to the air.
5. Varieties: The recommended ones are: Morelos A-92 and Morelos A-98, with YIELDs of around 9 to 10 ton/ha.
6. Irrigation: For this culture, the most used it is the rolling or by flood, since it is a culture that can be developed in conditions of excess of water.
7. Fertilization: It is made to the air with a product that contains formula 20-45-45, before the last dray passage and it is suggested to make three applications later.
8. Control of weeds: It is normally carried out with the application of Herbicides in two stages, first before the grain germinates and second when the weeds have 2 true leaves. 5 doses from 4 to l/ha.
9. Plagues: Red worm *(Ortocladius sp.)*, Bug of the rice field (*Eusarcoris insconspicus*), Driller of the rice (*Chilo supressalis*), Tijeretas of the rice field (*Ephanddridae familand*), Doughnut (*Mandthimna*), Pulgones (*Aphidae familand*).
10. Diseases: (*Pandricularia orandzae*), (*Rizoctonia solarium*), Rot of the stem (*Moniliforme fusarium*), brown Spot (*Cochliobolus miandabeanus*), Tungro (Virus) and Nemátodos (*Graminicabbagea meloidogandne, M. incognita, M. javanica* and *M. arenaria*).

11. **Harvests:** It is made of mechanical form or manual, when panicula reaches its physiological maturity (when 95 % of grains have the cabbageor straw and the rest is yellowish) and the humidity of the grain is from the 20 to 27 %.
12. **The methodology to define the potential of cultivation:** Was a screen of information with the following sequence.
    First, the data of weather and around of the studied places were come into the data bank of the FAO named ECOCROP and the result was a preliminary list of 1710 species of potential cultivation. Second, this list was inter-related with the results of marketing studies, with the banks of information of the Institute of Forest Investigation, Agricultural and Livestock, (IFIAL) and the rural prices, published by (SAGARPA) in its page of Support and the Commercialization Agricultural Services (SCAS).
    Furthemore, the information of previous experiences and the specific generated study that we are seeing, for exemple, the restrictive factors of agricultural production in each studied irrigation.
13. **Recommendations:** Cultivation of rice is recommended for steps II, III and IV on cycle autumn-winter (a-w) when the rain season has finished.
    Before sowing it is recommended to level the ground and does irrigation whit caution in order to control fungus diseases like putrefaction of stem and brown stain.
14. **Disadvantages:** Nowadays there is no credit Agricultural insurance or technical assistance eventhough the last one con be solved by (INIFAP), the National Institute of Forest Agricultural and livestoke Investigations, and the (SEDARPA), Secretarial of Agricultural, Rural, Forest and Feeding developing, the last one is a estate agency and its objective is the agricultural developing.
15. **Advantages:** Cultivation of rice with irrigation is probable that increase value up to 10 tons per hectare. This cultivation has a sure market for harvest sale to foreign industries buyers from Cordova, Ver., and other countries like Puebla and Guadalajara.
    Another advantage is that in the region there are mechanical combine harvesters.
    Some producers of modules II and IV they have already experience on this cultivation. The following diagram shoes the productivity per hectare of rice.

Productivity by hectare

YIELD TON/HA	SALE PRICE/TON	GROSS INCOME	PRODUCTION COST	PROFIT
	U.S. Dollar	U.S. Dollar	U.S. Dollar	U.S. Dollar
6	$304.34	$1,826	$523.73	$1,302.34

Note: One dollar = $11.50 Mexican pesos.

PRODUCTION COSTS

YEAR 1	CYCLE	CROP	SURFACE/HA	PLANTING	HARVEST
2004-2005	O-I	RICE	1		

LABORS	CODE	STAGE	DATE	HOW IT WAS DONE	PERSONS EMPLOYED	FOR HOW LONG	WAGE/HR	UNITARY COST	AMOUNT
Fallow	15	1		6	1	6	6	600	600
Raking	60	1		6	1	6	6	600	600
PLANTING	77	1		6	4	24	6	70	280
Fertilization	8	2		6	6	36	6	70	420
Aplic. Agroquim.	11	2		6	3	18	6	70	210
Irrigation	62	2		6	4	24	6	70	280
Harvest	80	3		6	1	6	6	400	400
								TOTAL=	2790

CHART OF CONSUMABLES

GENERIC NAME	STAGE	DATE	AMOUNT /KG KG	SPECIFIC CONCEPT	PRICE	UNIT	PRESENTATION	AMOUNT
Seed	1		130	Seed	8	Kg.	Sack	1.040
Fertilizer	2		250	Urea	154	Kg.	Sack	770
Fertilizer	2		100	DAP	172	Kg.	Sack	344
Fertilizer	2		100	Potasio	157	Kg.	Sack	314
Agrochemical	2		3	Herbicide	90	Lt.	Bottle	270
Agrochemical	2		3	Insecticide	85	Lt.	Bottle	255
Agrochemical	2		3	Fungicide	80	Kg.	BAG	240
							TOTAL=	3.233

Specialty fertilizers and agrochemicals (organic and biologic)

PRODUCTION AND DESTINATION

YIELD TON/HA	SALE PRICE/TON	GROSS INCOME	PRODUCTION COST	PROFIT
6	3.500	21.000	6.023	14.977

SUMMARY TECHNOLOGICAL PACKAGE FOR THE CULTURE OF THE CHAYOTE IN THE PAPALOAPAN RIVER BASIN AUTUMN -WINTER

Name: Chayote (*Sechium edule*).

1. **Introduction:** Culture of great importance in the State of Veracruz, since it has a great acceptance in the national market and of export, in addition to a very good climatic adaptation, which takes to us to consider it like a good alternative for the agriculturists of the River basin of the Papaloapan to improve its economic surroundings.
2. **Edaphoclimatic requirements:**

Edaphoclimatic Factors	Abs. Min.	Opt Min	. Opt Max	Abs Max.	Killing Temp.
Temp. ºC	12	19	30	40	0
Annual Precipitation	600	800	2000	2600	
Soil pH	4.3	5.5	7	8	

Environmental Factors	Optimum	Range
Light requirements (hours)	14	14
Photoperiod	Long to Neutral day	
Soil Texture	Ample	Ample
Soil Depth	Little deep (20-50 cm.)	Little deep (20-50 cm.)
Soil Drainage	Drained well	Drained well
Salinity	low (less than 4)	Medium (4-10)
Fertility	High	Moderated

3. **Terrain preparation:** make 2 Fallows in form crossed to a depth of 45 cm and next a
4. tracking, furrowed and positioning of support of the plants with trunks and galvanized wire.
5. **Density and method of sowing:** It is made using distances of 2 ms between plants and 4 between furrows for a total of 1250 Plants/ha, seedtime is carried out of direct form planting a fruit by blow.
6. **Irrigation:** It is made every 3 or 4 Days depending of the necessities on the culture of manual form or establishing a system of irrigation by dripping.
7. **Fertilization:** The nutritional requirements of chayote Kgs/ha are:

N	P	K
150	250	180

8. **Control of weeds:** This is made of manual form during his first stage of growth with plate or with grub hoe, once the Plant grows sufficient the control is natural through the blockade of the light.
9. **Plagues:** Red spider (*Tetranandchus spp*), Worm of the fruit (*Zea heliothis*), white Fly (*Bemisia tabaci*), Hen blinds (*Phandllophaga sp*).
10. **Diseases:** Scabies or roña, Spot of the leaf (*Cingucan glomerella*), Antracnosis (*Cabbageletotrichum sp.*).

11. **Harvest**: The fruits can be collected by hand or with knife in diverse phases of their development, in agreement with the market exigencies. Normally the harvest point is the tender fruit with size of 10-15 cm, which happens to the 10-15 Days after the opening of the flowers.
12. **The methodology to define the potential of cultivation**: was a screen of information with the following sequence.
    First, the data of weather and around of the studied places were come into the data bank of the FAO named ECOCROP and the result was a preliminary list of 1710 species of potential cultivation. Second, this list was inter-related with the results of marketing studies, with the banks of information of the Institute of Forest Investigation, Agricultural and Livestock, (IFIAL) and the rural prices, published by (SAGARPA) in its page of Support and the Commercialization Agricultural Services (SCAS).Furthemore, the information of previous experiences and the specific generated study that we are seeing, for exemple, the restrictive factors of agricultural production in each studied irrigation.
13. **Recommendations**: Cultivation of chayote is suggested for modules I and IV, in the cycle autumn-winter (a-w) when rain season has finished in the Papalopan Basin. Before showing it is recommended to leval the ground and form furrows that favour the superficial drainage of soil. Furthermore do irrigation with caution to control by this way fungus disease like itch, leaves stain and an atracnosis.
14. **Disadvantages**: Nowadays there is no credit Agricultural insurance or technical assistance eventhough the last one con be solved by (INIFAP), the National Institute of Forest Agricultural and livestoke Investigations, and the (SEDARPA), Secretarial of Agricultural, Rural, Forest and Feeding developing, the last one is a estate agency and its objective is the agricultural developing.
    Cultivation of chayote can´t stand high humidity in soil, a short period of flooding finishes the cultivation.
    Producers of the Papaloapan Basin doesn´t have experience on cultivation of chayote.
15. **Advantages**: Sure market for harvest sale in Veracruz, Xalapa, Coatzacoalcos, Acayucan and even Mexico City. The following diagram shows the productivity per hectare on cultivation of chayote.

Productivity by hectare

YIELD BOXES/HA	SALE PRICE/BOXES	GROSS INCOME	PRODUCTION COST	PROFIT
1000	U.S. Dollar $2.60	U.S. Dollar $2,608.69	U.S. Dollar $706.95	U.S. Dollar $1,901.73

Note: One dollar = $11.50 Mexican pesos.

PRODUCTION COSTS

YEAR	CYCLE	CROP	SURFACE/HA	PLANTING	HARVEST
2004-2005	O-I	CHAYOTE	1 ha	aug-04	Jan-05

LABORS	CODE	STAGE	DATE	HOW IT WAS DONE	PERSONS EMPLOYED	FOR HOW LONG	WAGE/HR	UNITARY COST	AMOUNT
Fallow	15	1	Jul	1	1	3	3	600	600
Raking	60	1	Jul	1	1	3	3	600	600
Positioning of tutors		1	Aug	6	4	24	6	70	280
Wire drawing		1	Aug	6	4	24	6	70	280
Agrochemicals	11	1	Aug	6	1	6	6	70	70
Planting		1	Aug	6	2	12	6	70	140
Fertilization	8	1	Aug-Janr	6	48	6	6	70	3360
Harvest	80	3	Dec-Jan	6	40	180	6	70	2800
						101			8130

INSUMOS PICTURE

GENERIC NAME	STAGE	DATE	AMOUNT/KG	CONCEPT SPECIFAND	PRICE	UNIT	PRESENTATION	COSTO
Barbed wire	1	aug	15k	wire	12	rollo		180
Smooth wire	1	aug	15k	wire	14	rollo		210
8	2	aug-enr	1.5 ton	triple 17	3140	Sack	50k	4710
11	1	aug	10k	manzate	60	kg	1l	600
11	1	aug	1lt	folei	75	liter	1lt	75
Seed	1	aug	500	Michoacán	2000	kg	sack	2000
								5775

PRODUCTION And DESTINATION

YIELD BOX /HA	SALE PRICE/TON	GROSS INCOME	PRODUCTION COST	PROFIT
1000	30	30000	8130	21870

SUMMARY TECHNOLOGICAL PACKAGE FOR THE CROP OF ONION IN THE PAPALOAPAN RIVER BASIN FALL-WINTER

Name: Onion (*Allium cepa*)

1. Introduction: Vegetable of Asian origin of great importance, due to the great demand that it has in all the markets of the world, since it is used for the preparation of an endless number of subjects mainly, having medicinal applications and even like controller of plagues in combination with other products, is by these reasons that can be an important alternative for the agriculturists from San Andrés Tuxtla.
2. Edaphoclimatic requirements:

Edaphoclimatic Factors	Abs. Min	Opt Min.	Opt Max.	Abs Max.	Killing Temp.
Temp. ºC	4	12	25	30	0
Annual Precipitation	300	350	600	2600	
Soil pH	4.3	6.0	7	8.3	

Environmental Factors	Optimum	Range
Light requirements (hours)	12	13
Photoperiod	Short and large	
Soil Texture	Sandand franc	Wide
Soil Depth	50-150	50-150
Soil Drainage	Drained well	Drained well
Salinity	Less than 4	Less than 4
Fertility	Moderated	Low

3. Preparation of the land: A Fallow with a plow with blades is due to make to cut the roots of the weeds and of some crops that has settled down, later 2 dray passages, furrowed leveling are made and.
4. Density and method of planting: The Density of Plantation is from 200 to 250 thousands Plants/ha and the planting method is from seed plots, soon to make the transplant.
5. Irrigation: It is made to the 8 Days after the transplant, later they are due to make from 8 to 10 Irrigations depending on the type of ground and the necessities of the crop.
6. Fertilization: It is fertilized with a mixture of formula 17-17-17, which is due to appland before the formation of the bulb to approximateland doses of 400 Kgs/ha.
7. Control of weeds: this it is made normally through repeated weedings, also with the intention of ventilating the land, interrupting the capillaritand and therefore to eliminate the bad grass.
8. Plagues: Beetle of the onion (*merdigera Landlandoderands*), Fly of the onion (*old Handlemia*), Trips (*Thrips tabaci*), Polilla of the onion (*Acrolepia assectella*), Nemátodos (*Dandtolenchus dipsaci*).
9. Diseases: Botritis of the onion (*Botritis cinerea*), Roanda (*Puccinia sp.*), Coal of the onion (*Turbucinia cepulae*), white Podredumbre (*Sclerotium sp.*)

10. **Harvest**: One is due to make when it is had from 30 to 40 % of doubled dry foliage and the bulb reaches its maximum development.
    Days to Harvest: 120-150.
11. **The methodology to define the potential of cultivation**: Was a screen of information with the following sequence. First, the data of weather and around of the studied places were come into the data bank of the FAO named ECOCROP and the result was a preliminary list of 1710 species of potential cultivation. Second, this list was inter-related with the results of marketing studies, with the banks of information of the Institute of Forest Investigation, Agricultural and Livestock, (IFIAL) and the rural prices, published by (SAGARPA) in its page of Support and the Commercialization Agricultural Services (SCAS).
    Furthemore, the information of previous experiences and the specific generated study that we are seeing, for exemple, the restrictive factors of agricultural production in each studied irrigation.
12. **Recommendations**: Cultivation of onion is suggested for modules I, II and IV on cycle autumn-winter (a-w) when rain season has finished in the Papalpan basin. Before transplating in October, it is suggested to level the ground and form parallel furrows to the sloping of ground in order to favour the superficial drainage of soil. Furthermore, irrigation has to be with caution in order to control fungus diseases such as white putrefaction, coal of onion and mildew.
13. **Disadvantages**: Nowadays there is no credit Agricultural insurance or technical assistance eventhough the last one con be solved by (INIFAP), the National Institute of Forest Agricultural and livestoke Investigations, and the (SEDARPA), Secretarial of Agricultural, Rural, Forest and Feeding developing, the last one is a estate agency and its objective is the agricultural developing.
14. **Advantages**: According to marketing studies, onion is the more saled vegetable in the Papaloapan Basin, that´s why it has a sure market at local level and in Veracruz, Xalapa, Coatzacoalcos and Acayucan.
    Some producers on module IV hace already experience on this cultivation. The following diagram shows the productivity per hectare for onion cultivation in the Papaloapan Basin.

Productivity by hectare

YIELD TON/HA	SALE PRICE/TON	GROSS INCOME	PRODUCTION COST	PROFIT
	U.S. Dollar	U.S. Dollar	U.S. Dollar	U.S. Dollar
18	$217.39	$3,913	$1,632.60	$2,280.43

Note: One dollar = $11.50 Mexican pesos.

PRODUCTION COSTS

YEAR	CYCLE	CROP	SURFACE/HA	PLANTING	HARVEST
2004-2005	O-I	ONION	1	jul-04	Dec-05

LABORS	CODE	STAGE	DATE	HOW IT WAS DONE	PERSONS EMPLOYED	FOR HOW LONG	WAGE /HR	UNITARY COST	AMOUNT
Planting	77	1	July	5	1	6	6	70	70
Fallow	15	1	July	2	1	3	3	600	600
Raking	60	1	augs	2	1	6	6	600	600
leveling		1	augs	2	1	6	6	500	500
furrowed	76	1	Sep	1	1	3	3	500	500
Plantation		2	Oct	5	10	60	6	70	700
Fertilization	8	2	Oct-Nov	5	40	240	6	70	2800
Agrochemicals	11	2	Oct-Nov	5	12	72	6	70	840
Irrigation		2	Oct-nov	6	20	120	6	70	1400
HarvesT	80	3	Dec	6	15	90	6	70	1050
					102				9060

INSUMOS PICTURE

GENERIC NAME		STAGE	DATE	AMOUNT /KG KG	CONCEPT SPECIFAND	PRICE	UNIT	PRESENTATION	AMOUNT
	Seed	1	July	1.5-2.0 Kg/ha	Mejorada	460	CAN	Libras	920
	Traands	1	July	100	Germinadoras	18	PIECE	200 cav.	1800
	Water	2	Oct-Nov		Water	100			100
	Soil	1	July	120 kg	Substrates	4,65	SACK	20 Kg.	560
8	Fertilization	1	Oct-Nov	950	UREA+18-46-00	153	BULK	50 Kg	2907
8	Fertilization	2	Oct-Nov	300	17-17-17/20-10-20	163	BULK	50 Kg	978
11	Agrochemicals	2	Oct-Nov	5	Insecticide	106	BOTTLE	1 Lt.	530
11	Agrochemicals	2	Oct-Nov	3	Fungicide	286	BAG	1 Kg.	860
11	Agrochemicals	2	Oct-Nov	1	Furadan 5G Ultra	400	SACK	20 Kg	400
11	Agrochemicals	2	Oct-Nov	2	Herbicide	330	BOTTLE	1 Lt	660
							316		9715

PRODUCTION AND DESTINATION

YIELD TON/HA	SALE PRICE/TON	GROSS INCOME	PRODUCTION COST	PROFIT
18	2500	45000	18775	26225

SUMMARY TECHNOLOGICAL PACKAGE FOR THE CROP OF JALAPEÑO CHILI IN THE PAPALOAPAN RIVER BASIN AUTUMN -WINTER

Name: Chile (*Capsicum annum* L.)

1. **Introduction**: Annual crop and of great importance, since the one of Oaxaca like the centers of origin of jalapeño Chile is considered along with to the state of Veracruz, which plays a very interesting role in the Mexican population, due to its high consumption in the gastronomy for the elaboration of many subjects.
2. **Edaphoclimatic requirements:**

Edaphoclimatic factors	Abs. Min.	Min. Opt	Max. Opt	Max. Abs	Killing Temp.
Temp. ºC	16	21	24	32	0
Annual Precipitation	300	500	600	2600	
Soil pH	5	6.3	7	7.5	

Environmental Factors	Optimum	Range
Light requirements (hours)	12	13
Photoperiod	Short and large	
Soil Texture	Areno-arcillosos	Ample
Soil Depth	50-90	50-150
Soil Drainage	Drained well	Drained well
Salinity		Less than 4
Fertility	High	Moderated

3. **Terrain preparation**: to later make a Fallow to a depth of 40 cm and a dray passage, next is made the furrowed one.
4. **Density and method of planting**: the distance between Plants to double row goes of 20-25 cm and 30 -35cm to simple row, and depending on the distance of the furrows the total population it can be 29000-40000 Plants by has. The planting is made from seed plot later to be transPlantdas to the definitive site.
5. **Irrigation**: it requires Irrigations light and frequent, with which a capacity of field can stay approximated to 70 %, sufficient to obtain yields economic profitable mind. It is possible to be applied by furrows, aspersion and dripping.
6. **Fertilization**: to appland 250 kg/ha of Nitrogen, 250 kg/ha of Phosphorus and 100 kg/ha of Potassium. It must be avoided to appland nitrogen at the time of the planting or of the transplant with the intention of avoiding to burn the roots of seedlings
7. **Control of weeds**: it is made of manual form with I plate or grub hoe or with the application of chemical agents.
8. **Plagues**: Babosa or Lenguilla (*Vaginulus sp.*), trozador Worm (*Agrotis spp*), Sapper of the leaves (*Liriomandza trifolii*), welded Worm (*Meager spodoptera*), Picudo (*Anthonomus eugenii*), Worm of the fruit (*Zea Heliothis*), white Acaro (*Polandphaug tarsonemus latus*), Red Spider (*Tetranandchus sp*).
9. **Diseases**: Marchitez (*Fusarium oxandsporum*), Tizón *(Phandtphthora capsici*), Pudrición of the stem (*Sclerotium rolfsii*).

10. **Harvest**: It is made of manual form choosing the uniform and clean fruits of lined by cork and spots purples, taking into account the market to which is going to be destined.
11. **The methodology to define the potential of cultivation**: Was a screen of information with the following sequence.
    First, the data of weather and around of the studied places were come into the data bank of the FAO named ECOCROP and the result was a preliminary list of 1710 species of potential cultivation. Second, this list was inter-related with the results of marketing studies, with the banks of information of the Institute of Forest Investigation, Agricultural and Livestock, (IFIAL) and the rural prices, published by (SAGARPA) in its page of Support and the Commercialization Agricultural Services (SCAS).
    Furthemore, the information of previous experiences and the specific generated study that we are seeing, for exemple, the restrictive factors of agricultural production in each studied irrigation.
12. **Recommendations**: The cultivation of chili is recommended for module I, III, and IV, on the cycle autum-winter (a-w) in the Mexican high plateau is not produced because of cold and estate demand that exist in this time by the culinary tradition of population in Veracruz. Before sowing it is recommended to level the ground and the irrigation has to be with caution in order to prevent fungus diseases such as earlier screen or last screen that affect tomatoes and chilies.
13. **Disadvantages**: Nowadays there is no credit, agricultural insurance or technical assistance (INIFAP), the National Institute of Forest Agricultural and Livestock Investigations and the (SEDARPA) Secretariat of Agricultural, Rural and Forest and Feeding Developing, the last one is an agency and its objective is the agricultural developing.
14. **Advantages**: Sure market of harvest sale in the Papaloapan River Basin in Veracruz, Xalapa, Coatzacoalcos and Acayucan.
    Some producers on module I, III and IV have wide experience on this cultivation. The following diagram shows productivity per hectare for the jalapeño chili cultivation in the Papaloapan River Basin.

Productivity by hectare

YIELD TON/HA	SALE PRICE/TON	GROSS INCOME	PRODUCTION COST	PROFIT
	U.S. Dollar	U.S. Dollar	U.S. Dollar	U.S. Dollar
10	$391.30	$3,913	$2,030.95	$1,882.10

Note: One dollar = $11.50 Mexican pesos.

PRODUCTION COSTS

YEAR	CYCLE	CROP	SURFACE/HA	PLANTING		HARVEST		
2004-2005	O-I	Chile	1	mar-04		Jan-05		

LABORS	CODE	STAGE	DATE	HOW IT WAS DONE	PERSONS EMPLOYED	FOR HOW LONG	WAGE /HR	UNITARY COST	AMOUNT
Planting	77	1	jan	5	3	18	6	70	210
Mowing	7	1	feb	2	1	3	3	550	550
Fallow	15	1	feb	2	1	3	3	550	550
Raking	60	1	march	2	1	6	6	550	550
Plantation		2	March	5	10	60	6	70	700
Fertilization	8	2	march-July	5	10	60	6	70	700
furrowing	76	1	March	1	1	3	3	500	500
agrochemicals	11	2	March-june	5	10	60	6	70	700
staking		2	April	5	12	72	6	70	840
Irrigation		2	March-june	6	6	36	6	70	420
Harvest	80	3	July-sep	6	20	120	6	70	1400
					75				7120

INSUMOS PICTURE

GENERIC NAME	STAGE	DATE	AMOUNT /KG KG	CONCEPT SPECIFAND	PRICE	UNIT	PRESENTATION	AMOUNT
seed	1	Jan	20000 sem		1300	envelop	5000 sem.	5.200
traands	1	Jan	110	germinators	18	plastico	200 hoandos	1.980
water	1	march-June			100			100
soil	1	Jan		substrate	4	BULK	20 Kg.	440
Fertilization	1	May-July	800	UREA+18-46	154	BULK	50K	2.464
Fertilization	2	March-May	200	17-17-17	163	BULK	50K	652
Agrochemicals	2	March-July	1	Insecticides	2800	LT.	1 L.	2800
Agrochemicals	2	march-July	5	Fungicides	280	BAG	1 Kg.	1400
Fertilization	2	March-July	100	nutrients	300	BULK	25 Kg.	1200
					267			16236

PRODUCTION AND DESTINATION

YIELD TON/HA	GROSS INCOME	SALE PRICE/TON	PROFIT
10	4,5	45000	21644

SUMMARY TECHNOLOGICAL PACKAGE FOR THE CROP OF SOURSOP IN THE PAPALOAPAN RIVER BASIN AUTUMN -WINTER

Name: Soursop (*Annona muricata*)

1. Introduction: Original species of the Southeast of South America, proposal like a very good productive alternative for the producers of the River basin of the Papaloapan, since given the characteristics of the species for different uses, have many possibilities of commerce in the national markets as as much international.
2. Edaphoclimatic requirements:

edaphoclimatic Factors	Abs. Min.	Opt Min.	Opt Max.	Abs Max.
Temp. °C	20	22	24	36
Annual Precipitation	1000	1300	1500	3000
Soil pH	4.5	5.5	6.5	8

Enviroment factors	Optimun	Range
Light requirements (hours)	Smaller short Days of 12 hours	Greater long Days of 14 hours
Photoperiod		
Soil Texture	heavand, medium	heavand, medium, light
Soil Depth	Deep but drained well	Average depth 80-150 cm.
Soil Drainage	Drained well	Deep Franc-sandand and they migaron argillaceous
Salinity	Low less than 4	Medium de 4-8
Fertility	Moderately	moderately

3. Terrain preparation: general cleaning of the land with mechanized plate, manual or with chemical agent, Fallow to 30 cm of depth, 2 dray passages, Plantation tracing and hoandado.
4. Density and method of planting: the recommended distance is of 7 xs 7 ms with a Density of 204 árboles/ha; the Plantation takes control of grafted material of a YEAR of age.
5. Irrigation: to make Irrigations constant every 5 or 6 Days, mainly when the time of drought is very long.
6. Fertilization: it is carried out according to the age of the Plant as it follows: 1 YEAR 0,250 kg/Plant, 2 YEARs 0,500 kg/Plant, 3 YEARs 0,750 kg/Plant, 4 YEARs 1,0 kg/Plant, 6. YEARs 2,0 kg/Plant and of 6 in ahead 2,5 kg/Plant.
7. Control of weeds: it is made each three or four months depending on the region, of the conditions of humidity, it is made of manual form with I plate or the application of Herbicides.
8. Plagues: Polilla of the Soursop (*Keand ortandgnus*), Wasp of the Soursop (*Bephra maculicabbagelis),* Bug of embroider (*Corithaica sp.),* driller of the stem (*Cratosomus sp.*).
9. Enfermedaes: Antracnósis (*Gloesporoides singucan, Glomerella* and *Ccabbageletotrichum*) secamiento of the branches (*Diplodia sp*), stains of the leaves (*Scabbageetotrichum sp*).

10. **Harvest**: it is made of manual form with garrochas or using stairs of wood or aluminum, scissors of Pruningr and a bag of canvas, harvests those fruits that already are in physiological maturity.
11. **The methodology to define the potential of cultivation**: Was a screen of information with the following sequence.
    First, the data of weather and around of the studied places were come into the data bank of the FAO named ECOCROP and the result was a preliminary list of 1710 species of potential cultivation. Second, this list was inter-related with the results of marketing studies, with the banks of information of the Institute of Forest Investigation, Agricultural and Livestock, (IFIAL) and the rural prices, published by (SAGARPA) in its page of Support and the Commercialization Agricultural Services (SCAS).
    Furthemore, the information of previous experiences and the specific generated study that we are seeing, for exemple, the restrictive factors of agricultural production in each studied irrigation.
12. **Recommendations:** Cultivation of soursop is suggested for modules III and IV. Cultivation of soursop will let manage the time of harvest, production will go out when the price of sell is attractive.
    Cultivation of soursop could incentive producers to stablish agroindustry for marking groups that soda industry asks for.
    Before makig the plantation is recommended to level the ground and make furrows stock plantation be, this will let a good ventilation of roots of soursop at the moment of transplanting.
13. **Disadvantages:** Nowadays there is no credit, agricultural insurance or technical assistance (INIFAP), the National Institute of Forest Agricultural and Livestock Investigations and the (SEDARPA) Secretariat of Agricultural, Rural and Forest and Feeding Developing, the last one is an agency and its objective is the agricultural developing.
    The handle of the fruit after harvest is very frail because of the softskin ands softconsistency of the pulp. Transportation or this fruit is a problem.
14. **Advantages:** Sure market for sell harvest as a fresh fruit in the Papalaopan basin, in Veracruz, Xalapa, Coatzacoalcos, Acayucan and even in Mexico City. For soda industryand ice industry in Mexico City and Guadalajara respectively.
    Some producers have experience on modules III and IV, they already have experience on this cultivation.
    The following diagram present the productivity per hectare for cultivation of soursop in the Papaloapan basin, makin clear that in the first years there is no production and since the fifth years the incomes are on market, having a productive life for many years; it is a pennial cultivation.

Productivity by hectare

YIELD TON/HA	SALE PRICE/TON	GROSS INCOME	PRODUCTION COST	PROFIT
	U.S. Dollar	U.S. Dollar	U.S. Dollar	U.S. Dollar
8	$434.78	$3,478.26	$834.34	$2,643.91

Note: One dollar = $11.50 Mexican pesos.

PRODUCTION COSTS

YEAR 1	CYCLE	CROP	SURFACE/HA	PLANTING	HARVEST
2004-2005		SOURSOP	1 Ha.	jun-jul-04	

LABORS	CODE	STAGE	DATE	HOW IT WAS DONE	PERSONS EMPLOYED	FOR HOW LONG	WAGE /HR	UNITARY COST	AMOUNT
Fallow	15	1	March	1	1	3	3	600	600
Raking	60	1	March	1	1	3	3	600	600
Outline	69	1	May	1	4	24	6	70	280
Cepa Apert.	6	1	May		5	30	6	70	350
Trasplant	66	2	June	6	6	36	6	70	420
Irrigation	62	2	June-feb	6	4	24	6	70	280
Weeding	38	2	June-feb	6	10	60	6	70	700
Fertilization	8	2	June-feb	6	10	60	6	70	700
								TOTAL=	3930

CHART OF CONSUMABLES

GENERIC NAME	STAGE	DATE	AMOUNT /KG KG	SPECIFIC CONCEPT	PRICE	UNIT	PRESENTATION	AMOUNT
Plant	1	june	220	Plant	25	Piece	Piece	5.500
Fertilizer	2	June-march	150	URE+DAP	163	KG	50 Kg.	450
Agrochemical	2	june-march	2	INSEC-FUNG.	100	liter	1 Lt.	200
							TOTAL=	6.150

PRODUCTION AND DESTINATION

YIELD TON/HA	SALE PRICE/TON	GROSS INCOME	PRODUCTION COST	PROFIT
0	0	0	10.080	0

PRODUCTION COSTS

YEAR 2	CYCLE	CROP	SURFACE/HA	PLANTING	HARVEST
2005-2006		SOURSOP	1 Ha.		

LABORS	CODE	STAGE	DATE	HOW IT WAS DONE	PERSONS EMPLOYED	FOR HOW LONG	WAGE/HR	UNITARY COST	AMOUNT
Fertilization	8	2	June-feb	6	10	60	6	70	700
Weeding	38	2	June-feb	6	15	90	6	70	1050
Pruning	55	2	June-feb	6	8	48	6	70	560
Irrigation	62	2	june-feb	6	6	36	6	70	420
								TOTAL=	2730

CHART OF CONSUMABLES

GENERIC NAME	STAGE	DATE	AMOUNT/KG KG	CONCEPT SPECIFAND	PRICE	UNIT	PRESENTATION	AMOUNT
Fertilizer	2	jun-feb	250	T-17	157	Kg	50	785
Agrochemical	2	jun-feb	6	NES	50	Lt.	2	300
Fertilizer	2	jun-feb	25	12-45-12	300	Kg	25	300
Fertilizer	2	jun-feb	4	Ac-humicos	150	Lt.	1	600
							TOTAL=	1.985

PRODUCTION AND DESTINATION

YIELD TON/HA	SALE PRICE/TON	GROSS INCOME	PRODUCTION COST	PROFIT
0	0	0	4.715	0

PRODUCTION COSTS

YEAR 3 CYCLE CROP SURFACE/HA PLANTING HARVEST

2006-2007 SOURSOP 1 Ha.

LABORS	CODE	STAGE	DATE	HOW IT WAS DONE	PERSONS EMPLOYED	FOR HOW LONG	WAGE/HR	UNITARY COST	AMOUNT
Fertilization	8	2	jun-feb	6	10	60	6	80	800
Weeding	38	2	jun-feb	6	15	90	6	80	1200
Pruning	55	2	jun-feb	6	8	48	6	80	640
Irrigation	62	2	jun-feb	6	6	36	6	80	480
Harvest	80	3	jun-feb	6	8	48	6	80	640
								TOTAL=	3760

CHART OF CONSUMABLES

GENERIC NAME	STAGE	DATE	AMOUNT/KG KG	CONCEPT SPECIFAND	PRICE	UNIT	PRESENTATION	AMOUNT
Fertilizer	2	jun-feb	350	20/10/2020	165	Kg.	50	1.155
Agrochemical	2	jun-feb	8	NES	50	Lt.	2	400
Fertilizer	2	jun-feb	50	20-20-20	220	Kg.	25	440
Agrochemical	2	jun-feb	2	Malathión	100	Lt.	1	200
							TOTAL=	2.195

PRODUCTION AND DESTINATION

YIELD TON/HA	SALE PRICE/TON	GROSS INCOME	PRODUCTION COST	PROFIT
3	5000	15000	20.750	-5750

PRODUCTION COSTS

YEAR 4 CYCLE CROP SURFACE/HA PLANTING HARVEST

2007-2008 SOURSOP 1 Ha.

LABORS	CODE	STAGE	DATE	HOW IT WAS DONE	PERSONS EMPLOYED	FOR HOW LONG	WAGE/HR	UNITARY COST	AMOUNT
Fertilization	8	2	jun-feb	6	10	60	6	80	800
Weeding	38	2	jun-feb	6	15	90	6	80	1200
Pruning	55	2	jun-feb	6	10	60	6	80	800
Irrigation	62	2	jun-feb	6	8	48	6	80	640
Harvest	80	3		6	10	60	6	80	800
								TOTAL=	4240

CHART OF CONSUMABLES

GENERIC NAME	STAGE	DATE	AMOUNT/KG KG	CONCEPT SPECIFAND	PRICE	UNIT	PRESENTATION	AMOUNT
Fertilizer	2	jun-feb	400	20/10/2020	165	Kg	50	1.320
Agrochemical	2	jun-feb	10	NES	50	Lt.	2	500
Fertilizer	2	jun-feb	75	Nutrients	250	Kg	25	750
Agrochemical	2	jun-feb	4	Insecticide	105	Lt.	1	420
							TOTAL=	2.990

PRODUCTION AND DESTINATION

YIELD TON/HA	SALE PRICE/TON	GROSS INCOME	PRODUCTION COST	PROFIT
6	5000	30000	12.980	17020

PRODUCTION COSTS

YEAR 5	CYCLE	CROP	SURFACE/HA	PLANTING	HARVEST
2008-2009		SOURSOP	1 Ha.		

LABORS	CODE	STAGE	DATE	HOW IT WAS DONE	PERSONS EMPLOYED	FOR HOW LONG	WAGE /HR	UNITARY COST	AMOUNT
Fertilization	8	2	jun-feb	6	10	60	6	90	900
Weeding	38	2	jun-feb	6	20	120	6	90	1800
Pruning	55	2	jun-feb	6	10	60	6	90	900
Irrigation	62	2	jun-feb	6	8	48	6	90	720
Harvest	80	3		6	15	90	6	90	1350
								TOTAL=	5670

CHART OF CONSUMABLES

GENERIC NAME	STAGE	DATE	AMOUNT /KG KG	CONCEPT SPECIFAND	PRICE	UNIT	PRESENTATION	AMOUNT
Fertilizer	2	jun-feb	500	20/10/2020	165	Kg	50	1.650
Agrochemical	2	jun-feb	15	NES	50	Lt.	2	750
Fertilizer	2	jun-feb	100	Nutrients	250	Kg	25	1000
Agrochemical	2	jun-feb	5	Insecticide	105	Lt.	1	525
							TOTAL=	3.925

PRODUCTION AND DESTINATION

YIELD TON/HA	SALE PRICE/TON	GROSS INCOME	PRODUCTION COST	PROFIT
8	5000	40000	9.595	30405

SUMMARY TECHNOLOGICAL PACKAGE FOR THE CROP OF THE GUAVA IN THE PAPALOAPAN RIVER BASIN

Name: GUAVA (*Psidium guajava*)

1. **Introduction**: Original crop of tropical America and that at the moment is very spread by the world since of him can be obtained diverse bJanfits due to its ample use, or like fresh fruit, for elaboration of juice, conserves, jellies, jams, etc.
2. **Edaphoclimatic requirements**:

edaphoclimatic Factors	Abs Min.	Opt Min.	Opt Max.	Abs Max.	Killing Temp.
Temp. ºC	15.5	23	34	40	3.2
Annual precipitation	400	1000	3000	3800	
pH suelo	4.5	6	7	8.2	

Enviroment factors	Optimun	Range
Light requirements (hours)	12	13
Photoperiod	Short day less than 12 hrs.	
Soil texture	Fertile, deep, rich in organic matter and drained well	Ample
Soil depth	Moderated (50-150)	Little deep (20-50 cm)
Soil drainege	Drained well	From poor to excessiveland drained
Salinity	Baja	Alta
Fertility	Alta	Baja

3. **Terrain preparation**: To make one general cleaning of the land where the Plantation will settle down, to make a subsoleo for very hard lands, outline of the Plantation and hoandado.
4. **Density and method of planting**: Distances between Plants to real frame of 7 xs are recommended respectively 7 and 6 xs 6 with 207 densities of 204 and Plants/ha. The Plants is obtained in their majoritand through the aerial or underground layer normally to be taken soon to the definitive site.
5. **Varieties**: Average Chinese, Chinese and Creole.
6. **Irrigation**: The most used they are the Irrigation by gravity and the pressurized one like the one of microaspersion, the Irrigations depend on the capacity of water retention of the ground, the climatologic necessities of the tree and conditions.
7. **Fertilization**: This must be made at least every three months with chemical installments and of being possible to fertilize every month applying some organic installment.
8. **Control of weeds**: it is made by means of I plate manual or applying to chemical agents at least 2 times by YEAR.
9. **Plagues**: Fly of the fruit: (Anastrepha spp), picudo of guava (*Conotrachelus spp*), Grudges (*Puluinaria spidii, Saissetia hemisphaerica*).
10. **Diseases**: Antracnósis (Cabbageletotrichum gloesporoides) and Nemátodos (*Meloidogine spp*).
11. **Harvest**: It is made of manual form when the fruit already is in physiological maturity.

12. **The methodology to define the potential of cultivation:** Was a screen of information with the following sequence.
    First, the data of weather and around of the studied places were come into the data bank of the FAO named ECOCROP and the result was a preliminary list of 1710 species of potential cultivation. Second, this list was inter- related with the results of marketing studies, with the banks of information of the Institute of Forest Investigation, Agricultural and Livestock, (IFIAL) and the rural prices, published by (SAGARPA) in its page of Support and the Commercialization Agricultural Services (SCAS).Furthemore, the information of previous experiences and the specific generated study that we are seeing, for exemple, the restrictive factors of agricultural production in each studied irrigation.
13. **Recommendations:** Cultivation of guava is suggested for all modules, it is native specie of Mexico.
    Stablishment of agroindustries for making craft jams. This specie is recommended as organic cultivation for having acces in to exportation market In the United States or Europe with a substantial increase on sale prices.
    Before making the plantation is suggested to level the ground and make furrows over which stock plantation are made, this will let a good ventilation of guava roots at the moment of transplanting.
14. **Disadvantages:** Nowadays there is no credit, agricultural insurance or technical assistance (INIFAP), the National Institute of Forest Agricultural and Livestock Investigations and the (SEDARPA) Secretariat of Agricultural, Rural and Forest and Feeding Developing, the last one is an agency and its objective is the agricultural developing.
15. **Advantages:** Sure market for harvest sale in Veracruz, Xalapa, Coatzacoalcos, Acayucan or even Mexico City.
    Some producers on module I already have experience on this cultivation. The following diagram shows the productivity per hectare for the cultivation of guava in the Papaloapan basin, makin clear that in the first years there is no production and since fifth year the incomes are on market, having a productive life for many years, it is a perennial cultivation.

Productivity by hectare

YIELD TON/HA	SALE PRICE/TON	GROSS INCOME	PRODUCTI ON COST	PROFIT
14	U.S. Dollar $521.73	U.S. Dollar $7,304.34	U.S. Dollar $1,817.39	U.S. Dollar $5,486.95

Note: One dollar = $11.50 Mexican pesos.

PRODUCTION COSTS

YEAR 1	CYCLE	CROP	SURFACE/HA	PLANTING	HARVEST
2004-2005		GUAVA	1 Ha.		

LABORS	CODE	STAGE	DATE	HOW IT WAS DONE	PERSONS EMPLOYED	FOR HOW LONG	WAGE /HR	UNITARY COST	AMOUNT
Fallow	15	1	April	2	1	3	3	600	600
Dray	60	1	April	2	1	3	3	600	600
Plant Traze	69	1	April	6	2	12	6	70	140
stock opening	6	1	May	6	5	30	6	70	350
Plantation	57	1	June	6	5	30	6	70	350
Irrigation	62	1	Apr-March	6	8	48	6	70	560
Fertilization	8	2	Jun-Nov	6	15	90	6	70	1050
Weeding	38	2	May-Apr	6	12	72	6	70	840
Pruning	55	2	Feb-Mar	6	2	12	6	70	140
Cont. Fitosanit.		2	May-Apr	6	5	30	6	70	350
								TOTAL=	4980

CHART OF CONSUMABLES

GENERIC NAME	STAGE	DATE	AMOUNT /KG KG	SPECIFIC CONCEPT	PRICE	UNIT	PRESENTATION	AMOUNT
Plant	1	June	333	Plant	12	Piece	Piece	3.996
compost	2	Jun-Nov	2500	Compost	2000	Kg	Sack	5000
Fertilization	2	Jun-Nov	200	Urea+DAP	165	Kg	Sack	660
Fertilization	2	Jun-Nov	200	T-17	157	Kg	Sack	628
Insecticide	2	Oct-Jun	4	NES	50	Lt.	Gallon	200
Fungicide	2	Oct-Jun	4	Benomandl	400	Kg	BAG	1600
Irrigation	2	Mar-Jun	6	Irrigation	100	Lt.	Litros	600
Fertilization	2	Jun-May	5	Nutrients	50	Kg	BAG	250
							TOTAL=	12.934

Specialty fertilizers and agrochemicals (organic and biologic)

PRODUCTION AND DESTINATION

YIELD TON/HA	SALE PRICE/TON	GROSS INCOME	PRODUCTION COST	PROFIT
8	0	0	17.914	0

PRODUCTION COSTS

YEAR 2	CYCLE	CROP	SURFACE/HA	PLANTING	HARVEST
2005-2006		GUAVA	1 Ha.		

LABORS	CODE	STAGE	DATE	HOW IT WAS DONE	PERSONS EMPLOYED	FOR HOW LONG	WAGE /HR	UNITARY COST	AMOUNT
Clumping		2	May-Jun	6	10	60	6	70	700
Compost Aplic.		2	Jun-Nov	6	8	48	6	70	560
Fertilization	8	2	Jun-Nov	6	8	48	6	70	560
Irrigation	62	2	Mar-Aug	6	6	36	6	70	420
Pruning	55	2	Feb-mar	6	5	30	6	70	350
Weeding	38	2	May-Apr	6	10	60	6	70	700
Cont. Fitosanit.		2	May-Apr	6	5	30	6	70	350
								TOTAL=	3640

CHART OF CONSUMABLES

GENERIC NAME	STAGE	DATE	AMOUNT/KG KG	CONCEPT SPECIFAND	PRICE	UNIT	PRESENTATION	AMOUNT
compst	2	Jun-Nov	2500	Compost	2000	Kg	Sack	5.000
Fertilizer	2	Jun-Nov	200	Urea+DAP	165	Kg	Sack	660
Fertilizer	2	Jun-Nov	200	20/10/2010	160	Kg	Sack	640
Insecticide	2	Oct-Jun	4	NES	50	Lt.	Gallon	200
Fungicide	2	Oct-Jun	4	Fosfonato P.	400	Lt.	Bottle	1600
Irrigation	2	Mar-Jun	6	water	100	Lt.	Litros	600
Fertilizer	2	Jun-May	10	Micronut	50	Kg	BAG	500
							TOTAL=	9.200

fetilizers and agrochemicals of specialties (organic and biologic)

PRODUCTION AND DESTINATION

YIELD TON/HA	SALE PRICE/TON	GROSS INCOME	PRODUCTION COST	PROFIT
0	0	0	12.840	0

PRODUCTION COSTS

YEAR 3	CYCLE	CROP	SURFACE/HA	PLANTING	HARVEST
2006-2007		Guava	1 Ha.		

LABORS	CODE	STAGE	DATE	HOW IT WAS DONE	PERSONS EMPLOYED	FOR HOW LONG	WAGE /HR	UNITARY COST	AMOUNT
Clumping		2	May-Jun	6	10	60	6	70	700
compost Aplic.		2	Jun-Nov	6	8	48	6	70	560
Fertilization	8	2	Jun-Nov	6	8	48	6	70	560
Irrigation	62	2	Mar-Aug	6	6	36	6	70	420
Pruning	55	2	Feb-Mar	6	5	30	6	70	350
Weeding	38	2	May-Apr	6	10	60	6	100	700
Cont. Fitosanit.		2	May-Apr	6	6	36	6	70	420
HARVEST	80	3	May-Apr	6	25	150	6	70	1750
								TOTAL=	5460

CHART OF CONSUMABLES

GENERIC NAME	STAGE	DATE	AMOUNT /KG KG	CONCEPT SPECIFAND	PRICE	UNIT	PRESENTATION	AMOUNT
Compost	2	Jun-Nov	5000	Compost	2000	Kg	Sack	10.000
Fertilizer	2	Jun-Nov	400	T-17	157	Kg	Sack	1256
Fertilizer	2	Jun-May	15	Micronut	60	Kg	BAG	900
Insecticide	2	Oct-Jun	8	NES	50	Lt.	Gallon	400
Fungicide	2	Oct-Jun	6	Beltanol	300	Lt.	Bottle	1800
Irrigation	2	Mar-Jun	6	water	100	Lt.	Liters	600
							TOTAL=	14.956

Specialty fertilizers and agrochemicals (organic and biologic)

PRODUCTION AND DESTINATION

YIELD TON/HA	SALE PRICE/TON	GROSS INCOME	PRODUCTION COST	PROFIT
6	6.000	36.000	51.170	-15.170

PRODUCTION COSTS

YEAR 4	CYCLE	CROP	SURFACE/HA	PLANTING	HARVEST
2007-2008		Guava	1 Ha.		

LABORS	CODE	STAGE	DATE	HOW IT WAS DONE	PERSONS EMPLOYED	FOR HOW LONG	WAGE /HR	UNITARY COST	AMOUNT
Clumping		2	May-Jun	6	10	60	6	70	700
compost Aplic.		2	Jun-Nov	6	8	48	6	70	560
Fertilization	8	2	Jun-Nov	6	8	48	6	70	560
Irrigation	62	2	Mar-Aug	6	6	36	6	70	420
Pruning	55	2	Feb-Mar	6	5	30	6	70	350
Weeding	38	2	May-Apr	6	10	60	6	70	700
Cont. Fitosanit.		2	May-Apr	6	6	36	6	70	420
Harvest	80	3	May-Apr	6	25	150	6	70	1750
								TOTAL=	5460

CHART OF CONSUMABLES

GENERIC NAME	STAGE	DATE	AMOUNT /KG KG	CONCEPT SPECIFAND	PRICE	UNIT	PRESENTATION	AMOUNT
compost	2	Jun-Nov	5000	Compost	2000	Kg.	Sack	10.000
Fertilizer	2	Jun-Nov	400	20/10/2020	160	Kg.	Sack	1280
Fertilizer	2	Jun-May	15	Micronut	60	Kg.	BAG	900
Insecticide	2	Oct-Jun	8	NES	50	Lt.	Gallon	400
Fungicide	2	Oct-Jun	6	Beltanol	300	Lt.	Bottle	1800
Irrigation	2	Mar-Jun	6	water	100	Lt.	Litros	600
							TOTAL=	14.980

Specialty fertilizers and agrochemicals (organic and biologic)

PRODUCTION AND DESTINATION

YIELD TON/HA	SALE PRICE/TON	GROSS INCOME	PRODUCTION COST	PROFIT
10	6.000	60.000	35.610	24.390

PRODUCTION COSTS

YEAR 5	CYCLE	CROP	SURFACE/HA	PLANTING	HARVEST
2008-2009		Guava	1 Ha.		

LABORS	CODE	STAGE	DATE	HOW IT WAS DONE	PERSONS EMPLOYED	FOR HOW LONG	WAGE /HR	UNITARY COST	AMOUNT
Clumping		2	May-Jun	6	10	60	6	70	700
compost Aplic.		2	Jun-Nov	6	8	48	6	70	560
Fertilization	8	2	Jun-Nov	6	8	48	6	70	560
Irrigation	62	2	Mar-Aug	6	6	36	6	70	420
Pruning	55	2	Feb-Mar	6	5	30	6	70	350
Weeding	38	2	May-Apr	6	10	60	6	70	700
C. Fitosanit.		2	May-Apr	6	6	36	6	70	420
Harvest	80	3	May-Apr	6	25	150	6	70	1750
								TOTAL=	5460

CHART OF CONSUMABLES

GENERIC NAME	STAGE	DATE	AMOUNT/KG KG	CONCEPT SPECIFAND	PRICE	UNIT	PRESENTATION	AMOUNT
compost	2	Jun-Nov	2000	Compost	2000	Kg	Sack	10.000
Fertilizer	2	Jun-Nov	180	17-17-17	180	Kg	Sack	1440
Fertilizer	2	Jun-May	60	Micronut	60	Kg	BAG	900
Insecticide	2	Oct-Jun	50	NES	50	Lt.	Gallon	400
Fungicide	2	Oct-Jun	350	several	350	Kg/Lt.	BAG/Bottle	2100
Irrigation	2	Mar-Jun	100	water	100	Lt.	Liters	600
							TOTAL=	15.440

Specialty fertilizers and agrochemicals (organic and biologic)

PRODUCTION AND DESTINATION

YIELD TON/HA	SALE PRICE/TON	GROSS INCOME	PRODUCTION COST	PROFIT
14	6.000	84.000	20.900	63.100

SUMMARY TECHNOLOGICAL PACKAGE FOR THE CROP OF THE CHINESE MELON IN THE PAPALOAPAN RIVER BASIN

Name: Chinese melon (*Cucumis melo*)

1. **Introduction**: Original crop of Asia and great importance in Mexico due to the great world-wide demand that is had of this product, Mexico is within the first five producing countries, the River basin of the Papaloapan counts on the optimal conditions for this CROP.
2. **Edaphoclimatic requirements**:

Factors edaphoclimatic	Abs.Min.	Opt Min.	Opt Max.	Abs Max.	Killing Temp.
Temp. ºC	15	25	30	29	1
anual Precipitation	300	400	1300	1600	
Soil ph	5.5	6	6.8	8	

Enviroment factors	Optimum	Range	Days to harvest
Light requirement (hours)	8	12-14	80-90
Photoperiod	Neutral		
Soil texture	sand claand muddand	Ample	
Soil depth	More than 50		
Soil drainege	Drained well	Drained well	
Salinity	Less than 4	Less than 4	
Fertility	high in M. O.	Medium	
Altitude	0-700 msnm.		

3. **Terrain preparation**: To make a Fallow and two passages of dray, leveling of the land and formation of beds.
4. **Density and method of planting**: The Density of planting goes from 14000 to 19000 Plants/ha using approximateland 500 seed g, the planting is made of direct form in beds of 2,5 to 4 meters wide seeding in double row or beds of 1,8 to 2,0 meters with a single row of remote Plants of 25 to 30 cm between Plants.
5. **Irrigation**: It is recommended to make a heavy Irrigation when the plant has 5 true leaves, following the Irrigations of aid are suggested to apply them with an interval of 12 to 15 Days.
6. **Fertilization**: To apply 115-160 kg of N/ha, 135-200 kg/ha of P and 200 kg/ha of K.
7. **Control of weeds**: This work is suggested to make it first with labors of earths up of the Plants and after manual form with machete; application of Herbicides is not suggested because it can damage the foliage of the Plant.
8. **Plagues**: Red spider (*Tetranichus urticae*), white Fly (*Trialeurodes vaporariorum*), pulgón (*Aphis gossandpii*), Sapper of the leaf (*Liriomandza trifollii*).
9. **Diseases**: Cenicilla (*Ergandsiphe cichoracearum*), Mildiu (*Pseudoperonospora cubensis*), Marchitez (*Fusarium oxandsporum*), Gomosis of the stem (*Didandmella brandoniae*).
10. **Harvest**: The fruits are collected when they are of color orange, with the formed affluent network and that it is given off with facility of the Plant.

11. **The methodology to define the potential of cultivation**: Was a screen of information with the following sequence.
    First, the data of weather and around of the studied places were come into the data bank of the FAO named ECOCROP and the result was a preliminary list of 1710 species of potential cultivation. Second, this list was inter-related with the results of marketing studies, with the banks of information of the Institute of Forest Investigation, Agricultural and Livestock, (IFIAL) and the rural prices, published by (SAGARPA) in its page of Support and the Commercialization Agricultural Services (SCAS).
    Furthemore, the information of previous experiences and the specific generated study that we are seeing, for exemple, the restrictive factors of agricultural production in each studied irrigation.
12. **Recommendations**: The cultivation of melon is recommended for module I, III, IV on the cycle autumn-winter (a-w) when the rain stops in the Papaloapan River Basin. High temperatures in this season of the year favour the content of sugar in the maturity of the fruit.
    Before sowing it is recommended to level the ground so that formation of bam, water goes trough with facility, further more the irrigation has to be with caution in order to prevent fungus diseases such as cenicilla, the mildiu or the drowning of the plant that affect cucurbitaceous family.
13. **Disadvantages**: Nowadays there is no credit, agricultural insurance or technical assistance even though the last one can be solved by (INIFAP), the National Institute of Forest Agricultural and Livestock Investigations and the (SEDARPA) Secretariat of Agricultural, Rural and Forest and Feeding Developing, the last one is an agency and its objective is the agricultural developing.
14. **Advantages**: Sure market of harvest sale in the Papaloapan River Basin in Veracruz, Xalapa, Coatzacoalcos and Acayucan.
    Some producers on module IV have experience on this cultivation. The following diagram shows the productivity per hectare for the cultivation of melon in the Papaloapan River Basin.

Productivity by hectare

YIELD TON/HA	SALE PRICE/TON	GROSS INCOME	PRODUCTION COST	PROFIT
	U.S. Dollar	U.S. Dollar	U.S. Dollar	U.S. Dollar
30	$2,17.40	$6,521.70	$1,385	$5,136.70

Note: One dollar = $11.50 Mexican pesos.

PRODUCTION COSTS

YEAR	CYCLE	CROP	SURFACE/HA	PLANTING	HARVEST
2004-2005	O-I	MELÓN	1		

LABORS	CODE	STAGE	DATE	HOW IT WAS DONE	PERSONS EMPLOYED	FOR HOW LONG	WAGE/ HR	UNITARY COST	AMOUNT
PLANTING	77	1	Dec-jan	5	4	24	6	70	580
Fallow	15	1	Dec-jan	2	1	3	3	600	600
Raking	60	1	Dec-jan	2	1	3	3	600	600
leveling		1	Januarand	2	1	3	3	500	500
Plantation		2	Jan-Feb	5	20	120	6	70	1400
Fertilization	8	2	Feb-Apr	5	15	90	6	70	1050
Agrochemicals	11	2	Feb-Apr	5	12	72	6	70	840
Irrigation		2	Feb-Apr	6	8	48	6	70	560
Harvest	80	3	Mar-Apr	6	15	90	6	70	1050
								TOTAL=	7180

CHART OF CONSUMABLES

GENERIC NAME	STAGE	DATE	AMOUNT /KG KG	CONCEPT SPECIFAND	PRICE	UNIT	PRESENTATION	AMOUNT
Seed	1	Januarand	500 gr.	Seed	1200	Libra	Bote	1.200
Traands	1	December	100	Germinator	18	Piece	Piece	1800
Soil	1	December	100	Germinaza	4	Kg.	BAG	400
Fertilizer	2	Februarand	150	Urea+DAP	163	Kg.	Sack	489
Fertilizer	2	March	150	T-17	153	Kg.	Sack	459
Fertilizer	2	Feb-Apr	50	Micronut	300	Kg.	Sack	600
Agrochemical	2	Feb-Mar	3	Insecticide	833	Lt.	Bottle	2500
Agrochemical	2	Feb-Mar	4	Fungicides	400	Kg.	BAG	1600
							TOTAL=	9.048

Specialty fertilizers and agrochemicals (organic and biologic)

PRODUCTION AND DESTINATION

YIELD TON/HA	SALE PRICE/TON	GROSS INCOME	PRODUCTION COST	PROFIT
30	2500	75.000	15.928	59.072

SUMMARY TECHNOLOGICAL PACKAGE FOR THE CROP OF THE CABBAGE IN THE PAPALOAPAN RIVER BASIN AUTUMN -WINTER

Name: Cabbage (*Brassica oleracea*).

1. Introduction: Species of perennial, biennial behavior and of great importance in Mexico is all the year, the eatable parts are the modified leaves and it is consumed mainly in crude or cooked form in salad, although also in soups and other subjects.
2. Edaphoclimatic requirements:

edaphoclimatic Factors	Abs. Min.	Opt Min.	Opt Max.	Abs Max.	Killing Temp.
Temp. ºC	4.4	15	29.4	35	0
anual Precipitation	300	500	100	2500	
Soil Ph	5.5	6.2	6.5	6.8	

Enviromental Factors	Optimum	Range	Days to harvest
Light requirement (hours)	14	13	75-80
Photoperiod	De 12 a 14		
Soil texture	Ca (Sandy loam)	Ample	M o,w
Soil depth	20-50cm	20-50cm	
Soil drainege	Drained well	Drained well	
Salinity	Less than 4	Less than 4	
Fertility	Moderated	low	

3. Terrain preparation: A Fallow, a Raking, leveling and formation of beds or furrows.
4. Density and method of planting: The Density goes from 18000 to 22000 Plants per /ha of 90 xs 50 cm, the planting can be direct in the definitive place or from seed plots.
5. Irrigation: It is made depending on the capacity of water retention of the ground, and of the conditions of the Plantation, normally it is made by rolled Irrigation, but to the Irrigation by dripping or the one of microaspersion can also be applied.
6. Fertilization: The doses recommended in general vary between 100 and 225 kg/ha of triple 17, the Fertilizer will be distributed in one or three applications, in by both sides of the furrows, before the beginning of the formation of the heads.
7. Control of weeds: This work takes I finish by means of the labors of earths up or of manual form or with machinery, the chemical agent use is not recommended for the control of the weeds, because what it is consumed it is the foliage of the Plant.
8. Plagues: Hen blinds (*Phandllophaga sp.),* Worm of cabbage (*Leptophobia aripa Boisduval*), palomilla of back makes shine like diamonds (*Plutella xandlos tella*).
9. Diseases: Black Pudrición *(rustic Xanthomonas*), Marchitamiento (*Fusarium osxandsporum*), Hernia of the cruciferas (*Plasmodiopora brassicae Woronin*).
10. Harvest: This work is made of manual form, must to harvest firm, compact, or formed heads, with two or three external leaves, in order to protect the handling product during the transport.

11. **The methodology to define the potential of cultivation:** Was a screen of information with the following sequence.
    First, the data of weather and around of the studied places were come into the data bank of the FAO named ECOCROP and the result was a preliminary list of 1710 species of potential cultivation. Second, this list was inter-related with the results of marketing studies, with the banks of information of the Institute of Forest Investigation, Agricultural and Livestock, (IFIAL) and the rural prices, published by (SAGARPA) in its page of Support and the Commercialization Agricultural Services (SCAS).
    Furthemore, the information of previous experiences and the specific generated study that we are seeing, for exemple, the restrictive factors of agricultural production in each studied irrigation.
12. **Recommendations:** Cultivation of cabbage is guggested for modules I and IV on the cycle autum-winter (a-w) when the rain season in the Papaloapan basin has stopped.
    Before sowing is suggestd to level the ground and form parallel furrows to the sloping soil in order to favour the superfitial drainage of soil; furthermore, the irrigation has to be with caution to control fungus diseases like black putrefaction, whitering and rupture of cruciferous.
13. **Disadvanteges:** Nowadays there is no credit, agricultural insurance or technical assistance eventhough, the last one can be solved by (INIFAP) the National Institute of Forest Agricultural and Livestock Investigations, and (SEDARPA) Secretarial of Agricultural, Rural, Forest asn Feeding Developing, the last one is anestate agency and its objective is the agricultural developing.
14. **Advantages:** Sure market for harvest sale in the Papaloapan Basin, in Veracruz, Xalapa, Coatzazoalcos and Acayucan. Some producers on module IV have already experiece on this cultivation.
    The following diagram shows the productivity per hectare for cabbage cultivation in the Papaloapan basin.

Productivity by hectare

YIELD TON/HA	SALE PRICE/TON	GROSS INCOME	PRODUCTION COST	PROFIT
30	U.S. Dollar $330	U.S. Dollar $9,913	U.S. Dollar $1,303.56	U.S. Dollar $8,609.47

Note: One dollar = $11.50 Mexican pesos.

PRODUCTION COSTS

YEAR	CYCLE	CROP	SURFACE/HA	PLANTING	HARVEST
2004-2005	O-I	CABBAGE	1	jul-04	nov-05

LABORS	CODE	STAGE	DATE	HOW IT WAS DONE	PERSONS EMPLOYED	FOR HOW LONG	WAGE /HR	UNITARY COST	AMOUNT
PLANTING	77	1	July	5	1	6	6	70	70
Fallow	15	1	July	2	1	3	3	600	600
Raking	60	1	Augsto	2	1	3	3	600	600
Furrowed	76	1	Sept.	1	1	3	3	500	500
Plantation		2	Sept.	5	40	240	6	70	2800
Fertilization	8	2	Sept-Oct	5	10	60	6	70	700
Agrochemicals	11	2	Sept-Oct	5	12	72	6	70	840
Irrigation		2	Sept-Oct	6	10	60	6	70	700
Harvest	80	3	Nov.	6	20	120	6	70	1400
								TOTAL=	8210

CHART OF CONSUMABLES

GENERIC NAME	STAGE	DATE	AMOUNT/ KG KG	SPECIFIC CONCEPT	PRICE	UNIT	PRESENTATION	AMOUNT
Seed	1	July	600g/Ha	Improved	460	CAN	1 Kg.	920
Traands	1	July	150	Germinators	18	Plastico	200 hoandos	2700
Water	2	Sep-Oct			100			100
Soil	1	July	150	Soil	4			600
Fertilization	1	Sep-Oct	150	17-17-17	153	Sack	50 Kg.	459
Fertilization	2	Sep-Oct	200	UREA+18-46	163	Sack	50 Kg.	652
Agrochemicals	2	Sep-Oct	2	Diazinon	75	Bottle	1 Lt.	150
Agrochemicals	2	Sep-Oct	2	Foleand 50 E	75	Bottle	1 Lt.	150
Agrochemicals	2	Sep-Oct	3	Fungicide	350	BAG	1 Kg.	1050
							TOTAL=	6.781

Specialty fertilizers and agrochemicals (organic and biologic)

PRODUCTION AND DESTINATION

YIELD TON/HA	SALE PRICE/TON	GROSS INCOME	PRODUCTION COST	PROFIT
30	3.800	114.000	14.991	99.009

SUMMARY TECHNOLOGICAL PACKAGE FOR THE CROP OF THE WATERMELON IN THE PAPALOAPAN RIVER BASIN AUTUMN-WINTER

Name: Watermelon (*Citrullus lanatus*).

1. **Introduction**: Original tropical crop of central Africa of excellent importance, at the moment the state of Veracruz is one of the main producers, due to the existing climatic conditions in the state, is by such reason that turns out very interesting to propose this CROP for the agriculturists of the River basin of the Papaloapan, since they have the suitable conditions for the production at commercial level for export.
2. **Edaphoclimatic requirements**:

edaphoclimatic Factors	Abs. Min.	Opt Min.	Opt Max.	Abs Max.	Killing Temp.
Temp. °C	14	21	35	40	1
anual Precipitation	300	500	1500	1600	
Soil pH	5.5	5	6.8	8	

Enviromental factors	Optimum	Range	Days to harvest
Light requirement (hours)	10	8-14	80-100
photoperiod	Neutral		
Soil texture	Franco arenossos	Ample	
Soil depth	More than 50		
Soil drainege	Drained well	Drained well	
Salinity	Less than 4	Less than 4	
Fertility	high en M. O.	Medium	
Altitude	0-650 msnm.		

3. **Terrain preparation**: To make a Fallow, 2 passages of dray, leveling of the land and formation of beds.
4. **Density and method of planting**: The distance recommended is of 2 xs 2 ms and 4m x 1 m with densities of 2500 Plantation of Plants/ha, the PLANTING method is carried out of direct form or traverse of the seed plot soon to make transplant.
5. **Irrigation**: This work will be made according to the conditions of the ground, climatic conditions and the state of the Plantation, can be made of rolled form or applying a method of technified Irrigation.
6. **Fertilization**: For this CROP the organic Fertilization through green installments like frijol is recommended velvet (*Stizolobium sp*), or to appland of 30-40 ton /ha of cattle dung, applied during the process of terrain preparation or two months before the PLANTING.
7. **Control of weeds**: This it is made or it is carried out through cultural LABORS as it earths up or of manual form, does not recommend use Herbicides the product.
8. **Plagues**: Red spider (*Tetranandchus urticae*), white Fly (*Trialeurodes vaporarium* and *Bemisia tabaci*), Pulgón (*Aphis gossandpii*), Sappers of the leaf (*Liriomandza trifolii*), Nemátodos (*Meloidogandne sp*).
9. **Diseases**: Gomoso Chancro of the stem (*Didandmella brandoniae*), Ash (*Fuliginea sphaerotheca*).

10. **Harvest**: It is made of manual form when the bráctea and the earring are dry, the beautiful ones of pedúnculo fall and this it is put thinner, the green fruits produce a metallic sound, however the mature ones it has a deaf sound and the basal spot becomes YELLOW.
11. **The methodology to define the potential of cultivation**: Was a screen of information with the following sequence.
    First, the data of weather and around of the studied places were come into the data bank of the FAO named ECOCROP and the result was a preliminary list of 1710 species of potential cultivation. Second, this list was inter-related with the results of marketing studies, with the banks of information of the Institute of Forest Investigation, Agricultural and Livestock, (IFIAL) and the rural prices, published by (SAGARPA) in its page of Support and the Commercialization Agricultural Services (SCAS).
    Furthemore, the information of previous experiences and the specific generated study that we are seeing, for exemple, the restrictive factors of agricultural production in each studied irrigation.
12. **Recommendations:** Cultivation of watermelon is suggested for module I and IV on the cycle autumn-winter (a-w) when in the Papaloapan River Basin the rain has stopped. High temperatures in this season of the year are good for the content of sugar in the maturation of the fruit.
    Before sowing it is recommended to level the ground so that in formation of beams, water flows easier, furthermore the irrigation has to be with caution in order to control fungus diseases suchas cenicilla, the mildiu or the drowing of plants that affect the cucurbitacea's family.
13. **Disadvantages:** Nowadays there is not credit, agricultural insurance or technical assistance even though the last one can be solved by (INIFAP), the National Institute of Forest Agricultural and Livestock Investigations and the (SEDARPA) Secretariat of Agricultural, Rural and Forest and Feeding Developing, the last one is a state agency and its objective is the agricultural developing.
14. **Advantages:** Sure market of harvest sale in the Papaloapan River Basin in Veracruz, Xalapa, Coatzacoalcos, Acayucan and also Mexico City.
    Some producers on module IV have already experience on this cultivation. The following diagram shows the productivity per hectare for the watermelon cultivation in the Papaloapan River Basin.

Productivity by hectare

YIELD TON/HA	SALE PRICE/TON	GROSS INCOME	PRODUCTION COST	PROFIT
	U.S. Dollar	U.S. Dollar	U.S. Dollar	U.S. Dollar
30	$130.40	$3,913.05	$1,087.50	$2,825.60

Note: One dollar = $11.50 Mexican pesos

PRODUCTION COSTS

YEAR	CYCLE	CROP	SURFACE/HA	PLANTING	HARVEST
2004-2005	O-I	WATER MELON	1		

LABORS	CODE	STAGE	DATE	HOW IT WAS DONE	PERSONS EMPLOYED	FOR HOW LONG	WAGE /HR	UNITARY COST	AMOUNT
mowing	38	1	Oct.	6	4	24	6	70	280
Fallow	15	1	Oct-Nov	6	1	6	6	600	600
Raking	60	1	Oct-Nov	6	1	6	6	600	600
Lining	16	1	Nov-Dec	6	1	3	6	400	400
Trasplant	57	2	Januarand	6	10	60	6	70	700
Irrigation	62	2	Januarand	6	5	30	6	70	350
Fertilization	8	2	Jan-Apr	6	5	30	6	70	350
Agrochemicals	11	2	Jan-Apr	6	5	30	6	70	350
Harvest	80	3	Mar-Apr	6	8	48	6	70	560
								TOTAL=	4190

CHART OF CONSUMABLES

GENERIC NAME	STAGE	DATE	AMOUNT/KG KG	SPECIFIC CONCEPT	PRICE	UNIT	PRESENTATION	AMOUNT
Seed	1	Dec.	1,5	Seed	850	Libra	Bote	1.275
Soil	1	Dec.	15	Germinaze	4	Kg.	BAG	60
Traands	1	Dec.	12	traand	18	Piece	Piece 200 C	216
Fertilizer	1	Jan-Apr	250	Urea+Dap	163	Kg.	Sack	815
Fertilizer	2	Jan-apr	250	T-17	150	Kg.	Sack	750
Agrochemical	2	jan-Apr	6	Insecticide	400	Lt.	Bottle	2400
Agrochemical	2	Jan-Apr	6	Fungicide	300	Kg.	BAG	1800
Fertilizer	3	Jan-Apr	20	Microelement	50	Kg.	BAG	1000
							TOTAL=	8.316

Specialty fertilizers and agrochemicals (organic and biologic)

PRODUCTION AND DESTINATION

YIELD TON/HA	SALE PRICE/TON	GROSS INCOME	PRODUCTION COST	PROFIT
30	1500	45.000	12.506	32.494

SUMMARY TECHNOLOGICAL PACKAGE FOR THE CROP OF THE HUSK TOMATO IN THE PAPALOAPAN RIVER BASIN AUTUMN-WINTER

Name: Husk tomato (*Phandsalis ixocarpa*).

1. Introduction: Original CROP of Mexico of great nutritional importance that has extended in several states of the Republic, as well as in different parts from Central America and some parts of the United States. At the moment the demand of this product in winter is high, the produced thing is for national consumption, but in an east future CROP it can be exported to different countries.
2. Edaphoclimatic requirements:

edaphoclimatic Factors	Abs. Min.	Opt Min.	Opt Max.	Abs Max.	Killing Temp.
Temp. ºC	8	15	25	32	0
anual Precipitation	600	700	1000	1100	
Soil ph	5.0	6.0	7.0	8.0	

enviroment Factors	Optimum	Range	Days to harvest
Light requirement (hours)	12	13	70-80
photoperiod	short		
Soil texture	Ca (Sandand franc)	Ample	
Soil depth	20-50cm	50-150cm	
Soil drainege	Drained well	Drained well	
Salinity	Less than 4	Less than 4	
Fertility	high	Medium	

3. Terrain preparation: Fallow, a dray passage, furrowed leveling and.
4. Density and method of planting: This goes from 10000 to 12000 Plants/ha to distances of 30 cm between Plants, the PLANTING method normally is carried out first in seed plots, for later transPlantdas plántulas to the definitive site.
5. Irrigation: The system of Irrigation by dripping is recommended at the moment, since he is most effective, since a more rational use becomes of the water, and is much humidity, no factor that if it goes off much risk of plagues and diseases is.
6. Fertilization: It is made in bys to the sides of the furrows with 112-168 kg has of nitrogen, 80-90 kg/ha of phosphorus and 10-120 kg/ha of potassium.
7. Control of weeds: Manual control and mechanical control through earth up in the furrows of the Plants, are possible to be used some Herbicides for its control.
8. Plagues: Pulgón (*Mandzus sp*), Worm of the fruit (*Zea helicoverpa*), Sapper of the leaf (*Liriomandza spp.*), white Mosquita (*Bemisia argentifolii*).
9. Diseases: Ahogamiento or secadera of plántulas (*Pandthium spp, Rhizoctonia solarium, Fusarium spp* and *Phandtopthora spp*), Pudrición of the neck (*Sclerotium rolfsii*), Marchitamiento (*Fusarium oxandsporum*), Antracnosis of the fruit (*Cabbageletotrichum gloesporoides*).
10. Harvest: It is made of manual way when the leaves change of a green cabbageor to yellowish cabbageor, while the fruit still this green one.

11. **The methodology to define the potential of cultivation:** Was a screen of information with the following sequence.
    First, the data of weather and around of the studied places were come into the data bank of the FAO named ECOCROP and the result was a preliminary list of 1710 species of potential cultivation. Second, this list was inter-related with the results of marketing studies, with the banks of information of the Institute of Forest Investigation, Agricultural and Livestock, (IFIAL) and the rural prices, published by (SAGARPA) in its page of Support and the Commercialization Agricultural Services (SCAS).
    Furthemore, the information of previous experiences and the specific generated study that we are seeing, for exemple, the restrictive factors of agricultural production in each studied irrigation.
12. **Recommendations:** The cultivation of husk tomato is a suggested for modules I, III and IV on the cycle autum-winter (a-w) when in the Mexican high plateau is not produced because of cold.
    Before sowing it is recommended to level the ground and the irrigation has to be with caution in order to prevent fungus diseases such as earlier screen or past screen that affect tomatoes and chilies.
13. **Disadventages:** Nowadays there is no credit, agricultural insurance or technical assistance even though the last one can be solved by (INIFAP) the National Institute of Forest Agricultural and Livestock Investigation and the (SEDARPA) Secretariat of Agricultural, Rural, Forest and Feeding Developing.
14. **Advantages:** Sure market of harvest sale in Veracruz, Xalapa, Coatzacoalcos, Acayucan and in Mexico City.
    Some of the producers on modules III and IV have experience on this cultivation. The following diagram shows a productivity for the husk tomato cultivation.

Productivity by hectare

YIELD TON / HA	SALE PRICE/TON	GROSS INCOME	PRODUCTION COST	PROFIT
	U.S. Dollar	U.S. Dollar	U.S. Dollar	U.S. Dollar
12,5	$217.40	$2,717.40	$801.40	$1,916

Note: One dollar = $11.50 Mexican pesos.

PRODUCTION COSTS

YEAR	CYCLE	CROP	SURFACE/HA	PLANTING	HARVEST
2004-2005	O-I	TOMATILLO	1	aug-04	Jan-05

LABORS	CODE	STAGE	DATE	HOW IT WAS DONE	PERSONS EMPLOYED	FOR HOW LONG	WAGE /HR	UNITARY COST	AMOUNT
PLANTING	77	1	aug	5	1	6	6	70	70
Fallow	15	1	aug	1	1	3	3	600	600
Raking	60	1	sep	1	1	3	3	600	600
Fertilization	8	1	sep	5	1	6	6	70	70
furrowing	76	1	sep	1	1	3	3	600	600
trasplant		2	sep	5	10	60	6	70	700
Fertilization	8	2	oct	5	2	12	6	70	140
agrochemicals	11	2	oct	5	1	6	6	70	70
agrochemicals	11	2	nov	5	1	6	6	70	70
Harvest	80	3	dec	5	20	180	6	70	1400
Harvest	80	3	jan	5	20	180	6	70	1400
					59				5720

CHART OF CONSUMABLES

GENERIC NAME	STAGE	DATE	AMOUNT/ KG KG	SPECIFIC CONCEPT	PRICE	UNIT	PRESENTATION	AMOUNT
8	1	SEP	350	UREA+18-46-00	220	BULK	50K	1540
8	2	OCT	250	TRIPLE 17	157	BULK	50K	785
11	2	OCT	2	TAMARON	105	LITER	1 Lt.	210
11	2	NOV	2	LUCAVAN	113	LITER	1 LT	226
11	2	NOV	1	AMBUSH 34	450	LITER	1 LT.	450
SEED	1	AUG	0,3	RENDIDORA	950	BULK	1 K	285
					377			3496

PRODUCTION AND DESTINATION

YIELD TON/HA	SALE PRICE/TON	GROSS INCOME	PRODUCTION COST	PROFIT
12,5	2500	31250	9216	22034

SUMMARY TECHNOLOGICAL PACKAGE FOR THE CROP OF SALADETE TOMATO IN THE PAPALOAPAN RIVER BASIN AUTUMN-WINTER

Name: Saladette tomato (*Landcopersicum esculentum*).

1. Introduction: CROP of excellent importance in Veracruz and in all country, due to his high index of consumption by Mexican, is species that can to adapt very either to lands of agriculturists of river basin of papaloapan, since in them edaphologic conditions as climatologic that they can very either be taken advantage of for the commercial CROP of the species, mainly at the time of winter are had as much that is when the main producing states as Sinaloa does not produce due its conditions of climate.
2. Edaphoclimatic requirements:

Edaphoclimatic factors	Abs. Min.	Opt. Min.	Opt. Max.	Max. Abs	Killing Temp.
Temp. ºC	7	20	27	35	0
Annual precipitation	400	600	1300	1800	
soil pH	5	5.5	7.5	8	

Environmental factors	Optimum	Range
Light requirement (hours)	1-2	
Photoperiod	N de 12 a 14 hrs.	
Soil texture	alto contenido de materia orgánica	Wide
Soil Depth	De 20-50 cm.	Poco profundo de 20-50
Soil Drainage	Well drained	Well drained
Salinity	Baja Less than 4	Baja Less than 4
Fertility	Alta	Moderada

3. Terrain preparation: It is required to make a deep Fallow of 40 cm, later to make two dray passages with teeth in crossed form, furrowed, positioning of the tape of Irrigation and later positioning of tutors.
4. Density and method of PLANTING: The Density of Plants is going from 17000 to 20000 Plants/ha to distances that go of 40 to 50 cm, depending on the variety to establish, the PLANTING is made first in seed plots, later to be transplanted to the definitive site.
5. Irrigation: This it is possible to be made by gravity, but the most recommended at the moment it is the Irrigation by dripping, and this it is applied of prudent to the climatic conditions of the place and the state in which is the Plant.
6. Fertilization: This it is possible to be made by means of the system of Irrigation, and 350 the most common doses are 250ª kg/ha of N, 60 to 100 of P and 200 to 300 of K.
7. Control of weeds: It is made of manual form or with different LABORS from it earths up, or applying allowed Herbicides products that do not cause dyear to the Plant.
8. Plagues: Red spider (*Tetranandchus spp*), Sappers of the leaf (*Liriomandza spp*), Trips (*Frankliniela spp, Caliothrips phaseoli*), Worm of the fruit (*Verpazea helico*), white Mosquita (*Bemisia tabaci*).

9. **Diseases**: Black spot of the tomato (*Pseudomonas sandrigae*), earland Tizón (*Alternaria solarium*), Marchitamiento (*Fusarium oxandsporum*), Tizón tardio (*Phandtophthora infestans*).
10. **HARVEST**: It is made of manual way, and it is carried out mainly being based on the color of the fruit and the distance from the market to which one is going away to commercialize.
11. **The methodology to define the potential of cultivation**: Was a screen of information with the following sequence.
    First, the data of weather and around of the studied places were come into the data bank of the FAO named ECOCROP and the result was a preliminary list of 1710 species of potential cultivation. Second, this list was inter-related with the results of marketing studies, with the banks of information of the Institute of Forest Investigation, Agricultural and Livestock, (IFIAL) and the rural prices, published by (SAGARPA) in its page of Support and the Commercialization Agricultural Services (SCAS).
    Furthemore, the information of previous experiences and the specific generated study that we are seeing, for exemple, the restrictive factors of agricultural production in each studied irrigation.
12. **Recommendations:** The cultivation of saladette tomato is recommended for module I, III, IV on the cicle autumn-winter (a-w) when in the Mexican high plateau is not produced because of cold, or because bringing it from the estate of Sinaloa is very expensive.
    Before sowing it is recommended to level the ground and the irrigation has to be with caution in order to prevent fungus diseases such as earlier screen or past screen that affect tomatoes and chilies.
13. **Disadventages:** Nowadays there is no credit, agricultural insurance or technical assistance even though the last one can be solved by (INIFAP) the National Institute of Forest Agricultural and Livestock Investigation and the (SEDARPA) Secretariat of Agricultural, Rural, Forest and Feeding Developing, the last one is a state agency end its objective is the agricultural developing.
14. **Advantages:** Sure market of harvest sale in the Papaloapan River Basi, in Veracruz, Xalapa, Coatzacoalcos and Acayucan.
    Some producers of modules IV have already the experience on this cultivation. The following diagram shows the productivity by hectare for the cultivation of Saladette tomato.

Productivity by hectare

YIELD BOXES / HA	SALE PRICE/BOXES	GROSS INCOME	PRODUCTION COST	PROFIT
1500	U.S. Dollar $6.10	U.S. Dollar $2,424.30	U.S. Dollar $9,130.40	U.S. Dollar $6,706.10

Note: One dollar = $11.50 Mexican pesos.

PRODUCTION COSTS

YEAR	CYCLE	CROP	SURFACE/HA	PLANTING	HARVEST	TIME
2004-2005	O-I	Saladette Tomato	1		May-04	sep-nov

LABORS	CODE	STAGE	DATE	HOW IT WAS DONE	PERSONS	FOR HOW LONG	WAGE/ HR	UNITARY COST	AMOUNT
planting	77	1	May	5	1	3	6	70	70
Fallow	15	1	jun	2	1	6	3	600	600
Raking	60	1	jun	2	1	3	3	600	600
furrowing	76	1	jun	2	1	3	3	600	600
transplant		2	jun	6	10	3	6	70	700
other activities		2	jul	6	8	60	6	70	560
Fertilization	8	2	jul-sep	6	4	48	6	70	280
agrochemicals	11	2	jun	6	4	24	6	70	280
agrochemicals	11	2	aug	6	4	24	6	70	280
Harvest	80	3	sep	6	20	24	6	70	1400
Harvest	80	3	oct	6	20	120	6	70	1400
						120			6770

CHART OF CONSUMABLES

GENERIC NAME	STAGE	DATE	AMOUNT/KG	SPECIFIC CONCEPT	PRICE	UNIT	PRESENTATION	TOTAL COST
Agroconsumables	1	May	100	substrate	4	Sack	20 k	400
Agroconsumables	1	May	100	traands	18	Piece	200 cav	1800
Agroconsumables	1	jun	1000	stick	1,2	Piece	UNIT	1200
Agroconsumables	1	jun	50	rafia	14	Piece	5 kg	700
8	1	jul-sep	3	baandfolan	70	container	1 kg	210
11	1	jun	1	furadan	400	Sack	20kg	400
11	2	jun	1	confidor	3500	container	1 lt	3500
seed	1	May	1	toro	5000	Piece	lb	5000
8	1and2	jun-aug	1250	Fertilizers	220	Sack	50kg	5500
8	1and2	jun-aug	400	nutrients	300	Sack	50 kg	2400
								21110

PRODUCTION AND DESTINATION

YIELD BOX /HA	SALE PRICE/TON	PRODUCTION COST	TOTAL INCOME	PROFIT
1500	70	27880	105000	77120

SUMMARY TECHNOLOGICAL PACKAGE FOR THE CROP OF RAMBUTÁN IN THE PAPALOAPAN RIVER BASIN

Name: Rambután (*Nephelium lapacenun*).

1. Introducción: Fruit tree of Malayan origin, considered within the nontraditional ones, on characteristics very similar to the Litchi also from recent introduction to Mexico and that can be a very profitable alternative for the producers of the River basin of the Papaloapan, since counts on required edaphologic and climatic conditions for this commercial species of which already they have plantations in the state of Chiapas with excellent results.
2. Edaphoclimatic requirements:

Edaphoclimatic factors	Abs. Min.	Min. Opt	Max. Opt	Max. Abs	Killing Temp.
Temp. ºC	10	21	35	42	4
Precipitation	1400	2000	3000	4000	
soil pH	4.5	5	6.5	7.5	

Environmental factors	Optimum	Range	Days to Harvest
Light requirement (hours)	8	16-8 hrs.	100-120
Photoperiod	Neutral		
Soil texture	Sandand claand, lime claand.	Wide	
Soil Depth	More than 150.	50-150cm	
Soil Drainage	Well drained	Well drained	
Salinity	Less than 4	Less than 4	
Fertility	High in O.M.	Medium	
Altitude		0-1950msnm.	

3. Terrain preparation: One is made general cleaning from the area to plant, the Plantation draws up and 60 xs 60 are opened to the corresponding stocks of 60 xs.
4. Density and method of PLANTING: The 70 Density is of 204 and Plants/ha to distances of 12 xs 12 and 7 xs 7 respectiveland, the Plants propagate by aerial layer or by yolk graft and soon they are taken to the definitive site.
5. Irrigation: It is made according to the edaphologic and climatologic conditions, recommends a system of Irrigation by microaspersion, that is most effective.
6. Fertilization: G/Plant of NPK is due to fertilize during the first YEAR every three months with 100 (6-6-6 Or 8-8-8), following the YEARs to fertilize three times by YEARs increasing until arriving at 250 g by application.
7. Control of weeds: It is made of manual form with I plate or the application of Herbicides, mainly near the stem to reduce the losses of humidity.
8. Plagues: Larva (*Acrocercops-cramerella*), barrenador Escarabajo (*Diaprepes abbrevatus*) some others like the rats, the birds and bats.
9. Diseases: Dustand Mildiu (*Oidioum nephelii*), Cancers of the trunk (*Dolapra nepheliae, Ophioceras sp*), Fungus (*Pseudocercospora nephelii*), Spot to foliar (*Cephaleurus sp*).
10. Harvest: It is made of manual form collecting panícula finds out, which takes place with scissors or with a blade adapted to a hook in the end of the hanger.

11. **The methodology to define the potential of cultivation**: Was a screen of information with the following sequence.
    First, the data of weather and around of the studied places were come into the data bank of the FAO named ECOCROP and the result was a preliminary list of 1710 species of potential cultivation. Second, this list was inter-related with the results of marketing studies, with the banks of information of the Institute of Forest Investigation, Agricultural and Livestock, (IFIAL) and the rural prices, published by (SAGARPA) in its page of Support and the Commercialization Agricultural Services (SCAS).
    Furthemore, the information of previous experiences and the specific generated study that we are seeing, for exemple, the restrictive factors of agricultural production in each studied irrigation.
12. **Recommendations:** Cultivation of rambutan is suggested for modules I, III and IV. It is recommended as an organic cultivation with the purpose of having acces to the exportation market in United States and Europe, so the prices of sale are high.
    Before the platation is made, it is recommended to the level the ground and make furrows for the plantation stoks, this will let a good ventilation of roots of rambutan at the moment of transplanting.
13. Disadvantages: Nowadays there is no credit, agricultural insurance or technical assistance eventhough the last one can be solved by (INIFAP), the National Institute of Forest Agricultural and Livestok Investigations, and the (SEDARPA) Secretarial of Agricultural, Rural, Forest and Feeding developing, this last one is on estate agency and its objective is the agricultural developing.
14. **Advantages:** Sure market for harvest sale in Veracruz, Xalapa, Coatzacoalcos and even in Mexico City.
    Some producers on module I have already experience on this cultivation. The following diagram shows the productivity per hectare for cultivation of rambutan in the Papaloapan river basin, makin clear that in first years there is no production and it is since the fifth year that we consider the market value, having a productive life for many years. It is a perennial cultivation.

Productivity by hectare

YIELD TON / HA	SALE PRICE/TON	GROSS INCOME	PRODUCTION COST	PROFIT
7	U.S. Dollar $2, 174	U.S. Dollar $15,217	U.S. Dollar $1,765	U.S. Dollar $13,452

Note: One dollar = $11.50 Mexican pesos.

PRODUCTION COSTS

YEAR 1	CYCLE	CROP	SURFACE/HA	PLANTING	HARVEST
2004-2005	O-I	RAMBUTAN 1			

LABORS	CODE	STAGE	DATE	HOW IT WAS DONE	PERSONS EMPLOYED	FOR HOW LONG	WAGE/HR	UNITARY COST	AMOUNT
Fallow	15	1	Apr	2	1	3	3	600	600
Raking	60	1	Apr	2	1	3	3	600	600
Tracing	69	1	Apr	6	2	12	6	70	140
Ditching	6	1	May	6	5	30	6	70	350
Plantation	57	1	Jun	6	5	30	6	70	350
Irrigation	62	1	Apr-Mar	6	8	48	6	70	560
Fertilization	8	2	Jun-Nov	6	15	90	6	70	1050
Weeding	38	2	May-Apr	6	12	72	6	70	840
Pruning	55	2	Feb-Mar	6	2	12	6	70	140
Phytosanitary Control.	83	2	May-Apr	6	5	30	6	70	350
								TOTAL=	4.980

CHART OF CONSUMABLES

GENERIC NAME	STAGE	DATE	AMOUNT/ KG KG	SPECIFIC CONCEPT	PRICE	UNIT	PRESENTATION	AMOUNT
Plant	1	Jun	200	Plant	40	Piece	Piece	8.000
Fertilizer	2	Jun-Nov	2500	Compost	2000	Kg.	Sack	5000
Fertilizer	2	Jun-Nov	200	Urea+DAP	165	Kg.	Sack	660
Fertilizer	2	Jun-Nov	200	17-17-17	157	Kg.	Sack	628
Insecticide	2	Oct-Jun	4	NES	50	Litro	Gallon	200
Fungicide	2	Oct-Jun	4	Benomandl	400	Kg.	BAG	1600
Fertilizer	2	Jun-May	5	Nutrients	50	Kg.	BAG	250
							TOTAL=	16.338

Fertilizers and agrochemicals specialty (organic and biologic)

PRODUCTION AND DESTINATION

YIELD TON/HA	SALE PRICE/TON	GROSS INCOME	PRODUCTION COST	PROFIT
			21.318	

PRODUCTION COSTS

YEAR 2	CYCLE	CROP	SURFACE/HA	PLANTING	HARVEST
2005-2006	O-I	RAMBUTAN	1		

LABORS	CODE	STAGE	DATE	HOW IT WAS DONE	PERSONS EMPLOYED	FOR HOW LONG	WAGE /HR	UNITARY COST	AMOUNT
Clumping		2	May-Jun	6	10	60	6	70	700
Applic. of Fertilizer	8	2	Jun-Nov	6	8	48	6	70	560
Fertilization	8	2	Jun-Nov	6	8	48	6	70	560
Irrigation	62	2	Mar-Aug	6	6	36	6	70	420
Pruning	55	2	Feb-Mar	6	5	30	6	70	350
Weeding	38	2	May-Apr	6	10	60	6	70	700
Phytosanitary Control.		2	May-Apr	6	5	30	6	70	350
								TOTAL=	3.640

CHART OF CONSUMABLES

GENERIC NAME	STAGE	DATE	AMOUNT /KG KG	SPECIFIC CONCEPT	PRICE	UNIT	PRESENTATION	AMOUNT
Fertilizer	2	Jun-Nov	2500	Compost	2000	Kg.	Sack	5.000
Fertilizer	2	Jun-Nov	200	Urea+DAP	165	Kg.	Sack	660
Fertilizer	2	Jun-Nov	200	20-10-10	160	Kg.	Sack	640
Insecticide	2	Oct-Jun	4	NES	50	Litro	Gallon	200
Fungicide	2	Oct-Jun	4	Fosfonato p	400	Litro	Bottle	1600
Fertilizer	2	Jun-May	10	Micronut	50	Kg.	BAG	500
							TOTAL=	8.600

Specialty fertilizers and agrochemicals (organic and biologic)

PRODUCTION AND DESTINATION

YIELD TON/HA	SALE PRICE/TON	GROSS INCOME	PRODUCTION COST	PROFIT
			12.240	

PRODUCTION COSTS

YEAR 3	CYCLE	CROP	SURFACE/HA	PLANTING	HARVEST
2006-2007	O-I	RAMBUTAN	1		

LABORS	CODE	STAGE	DATE	HOW IT WAS DONE	PERSONS EMPLOYED	FOR HOW LONG	WAGE /HR	UNITARY COST	AMOUNT
Clumping		2	May-Jun	6	10	60	6	70	700
Aplic. Fertilizer		2	Jun-Nov	6	8	48	6	70	560
Fertilization	8	2	Jun-Nov	6	8	48	6	70	560
Irrigation	62	2	Mar-Aug	6	86	36	6	70	420
Pruning	55	2	Feb-Mar	6	5	30	6	70	350
Weeding	38	2	May-Apr	6	10	60	6	70	700
Phytosanitary Control.		2	May-Apr	6	6	36	6	70	420
HARVEST	80	3	May-Apr	6	25	150	6	70	1750
								TOTAL=	5.460

CHART OF CONSUMABLES

GENERIC NAME	STAGE	DATE	AMOUNT/KG KG	SPECIFIC CONCEPT	PRICE	UNIT	PRESENTATION	AMOUNT
Fertilizer	2	Jun-Nov	2500	Compost	2000	Kg.	Sack	5.000
Fertilizer	2	Jun-Nov	400	T-17	157	Kg.	Sack	1256
Fertilizer	2	Jun-Nov	15	Micronut	60	Kg.	BAG	900
Insecticide	2	Oct-Jun	8	NES	50	Litro	Gallon	400
Fungicide	2	Oct-Jun	6	Beltanol	300	Litro	Bottle	1800
							TOTAL=	9.356

Specialty fertilizers and agrochemicals (organic and biologic)

PRODUCTION AND DESTINATION

YIELD TON/HA	SALE PRICE/TON	GROSS INCOME	PRODUCTION COST	PROFIT
4	25.000	100.000	48.374	51.626

PRODUCTION COSTS

YEAR 4	CYCLE	CROP	SURFACE/HA	PLANTING	HARVEST
2007-2008	O-I	RAMBUTÁN	1		

LABORS	CODE	STAGE	DATE	HOW IT WAS DONE	PERSONS EMPLOYED	FOR HOW LONG	WAGE /HR	UNITARY COST	AMOUNT
Clumping		2	May-Jun	6	10	60	6	70	700
Aplic. Fertilizer		2	Jun-Nov	6	8	48	6	70	560
Fertilization	8	2	Jun-Nov	6	8	48	6	70	560
Irrigation	62	2	Mar-Aug	6	6	36	6	70	420
Pruning	55	2	Feb-Mar	6	5	30	6	70	350
Weeding	38	2	May-Apr	6	10	60	6	70	700
Phytosanitary Control.		2	May-Apr	6	6	36	6	70	420
HARVEST	80	3	May-Apr	6	25	150	6	70	1750
								TOTAL=	5.460

CHART OF CONSUMABLES

GENERIC NAME	STAGE	DATE	AMOUNT/KG KG	SPECIFIC CONCEPT	PRICE	UNIT	PRESENTATION	AMOUNT
Fertilizer	2	Jun-Nov	5000	Compost	2000	Kg.	Sack	10.000
Fertilizer	2	Jun-Nov	400	20/10/2020	160	Kg.	Sack	1280
Fertilizer	2	Jun-Nov	15	Micronut	60	Kg.	BAG	900
Insecticide	2	Oct-Jun	8	NES	50	Litro	Gallon	400
Fungicide	2	Oct-Jun	6	Beltanol	300	Litro	Bottle	1800
							TOTAL=	14.380

Specialty fertilizers and agrochemicals (organic and biologic)

PRODUCTION AND DESTINATION

YIELD TON/HA	SALE PRICE/TON	GROSS INCOME	PRODUCTION COST	PROFIT
6	25.000	150.000	19.840	130.160

PRODUCTION COSTS

YEAR 5	CYCLE	CROP	SURFACE/HA	PLANTING	HARVEST
2007-2008	O-I	RAMBUTÁN	1		

LABORS	CODE	STAGE	DATE	HOW IT WAS DONE	PERSONS EMPLOYED	FOR HOW LONG	WAGE /HR	UNITARY COST	AMOUNT
Clumping		2	May-Jun	6	10	60	6	70	700
Aplic. Fertilizer		2	Jun-Nov	6	8	48	6	70	560
Fertilization	8	2	Jun-Nov	6	8	48	6	70	560
Irrigation	62	2	Mar-Aug	6	6	36	6	70	420
Pruning	55	2	Feb-Mar	6	5	30	6	70	350
Weeding	38	2	May-Apr	6	10	60	6	70	700
Phytosanitary Control.		2	May-Apr	6	6	36	6	70	420
HARVEST	80	3	May-Apr	6	25	150	6	70	1750
								TOTAL=	5.460

CHART OF CONSUMABLES

GENERIC NAME	STAGE	DATE	AMOUNT/KG KG	SPECIFIC CONCEPT	PRICE	UNIT	PRESENTATION	AMOUNT
Fertilizer	2	Jun-Nov	5000	Compost	2000	Kg.	Sack	10.000
Fertilizer	2	Jun-Nov	400	17-17-24	180	Kg.	Sack	1440
Fertilizer	2	Jun-Nov	15	Micronut	60	Kg.	BAG	900
Insecticide	2	Oct-Jun	8	NES	50	Litro	Gallon	400
Fungicide	2	Oct-Jun	6	Varios	350	Kg/Lt.	BAG/Bottle	2100
							TOTAL=	14.840

Specialty fertilizers and agrochemicals (organic and biologic)

PRODUCTION AND DESTINATION

YIELD TON/HA	SALE PRICE/TON	GROSS INCOME	PRODUCTION COST	PROFIT
7	25.000	175.000	20.300	154.700

SUMMARY TECHNOLOGICAL PACKAGE FOR THE CROP OF THE CUCUMBER IN THE PAPALOAPAN RIVER BASIN AUTUMN-WINTER

Name: Cucumber (*Cucumis sativus L*).

1. **Introduction**: Original species of the tropical regions of the considered south of Asia and like a fruit vegetable, in Mexico is consumed like fresh fruit and in salads, in some other places it is preferred prepared in vinegar, it is a very important species because it has a stability of the cultivated surface, with an increase in the production and the export.
2. **Edaphoclimatic requirements:**

Edaphoclimatic factors	Abs. Min.	Min. Opt	Max. Opt	Max. Abs	Killing Temp.
Temp. ºC	18	20	30	38	1
Annual precipitation	300	500	1100	1300	
soil pH	5.5	5.5	6.8	7.5	

Environmental factors	Optimum	Range	Days to Harvest
Light requirement (hours)	12	12-14	80-90
Photoperiod	Neutral		
Soil texture	Loamy clay	Wide	
Soil Depth	More than 90 cm		
Soil Drainage	Well drained	Well drained	
Salinity	Less than 4	Less than 4	
Fertility	High in O.M.	Medium	
Altitude	0-1200 msnm.		

3. **Terrain preparation**: To make a Fallow to 40 cm of depth, 2 dray passages and elaboration of beds or furrows.
4. **Density and method of planting**: The distance to which it is due to seed is: 1.5 xs 0,4 m or 1,2 xs 0,5 m and the PLANTING can be made of direct form or be made seed plot soon to be transPlantdas.
5. **Irrigation**: It can be rolled or by dripping, and it is made according to the state of the Plantation, being more frequent at the beginning.
6. **Fertilization**: One is due to make in bys with approximately 150-200 kg/ha of Nitrogen, 300 kg/ha of Phosphorus and 110-220 kg/ha of Potassium.
7. **Control of weeds**: It is made of manual form or with earthed up LABORS of, it is very little used the applications of chemical agents, since they can u damage to the cultivated Plant.
8. **Plagues**: Flea bulging (*Epitrix cucumeris H.*), white Mosquita (*Bemisia tabaci*), Pulgón (*Aphis gossandpii*), False measurer (*Trichoplusia H*), Sapper of the leaf (*Liriomandza sativae*), Nemátodos (*Meloidogandne sp*).
9. **Diseases**: Dustand Cenicilla *(Erusihe cuchoracearum*), Antracnosis (*Cabbageletotrichum lagenarium*).
10. **Harvest**: It is made of manual form depending on the exigencies of the market, in general the fruit must be tender and the best index of it is the consistency of the seed.
11. **The methodology to define the potential of cultivation**: Was a screen of information with the following sequence.

First, the data of weather and around of the studied places were come into the data bank of the FAO named ECOCROP and the result was a preliminary list of 1710 species of potential cultivation. Second, this list was inter-related with the results of marketing studies, with the banks of information of the Institute of Forest Investigation, Agricultural and Livestock, (IFIAL) and the rural prices, published by (SAGARPA) in its page of Support and the Commercialization Agricultural Services (SCAS).

Furthemore, the information of previous experiences and the specific generated study that we are seeing, for exemple, the restrictive factors of agricultural production in each studied irrigation.

12. **Recommendations:** The cultivation of cucumber is recommended for module I and IV on the cicle autumn-winter (a-w) when in the Mexican high plateau is not produced because of cold and rain season has finished in the Papaloapan River Basin.

    Before sowing it is recommended to level the ground and the irrigation has to be with caution in order to control by this way fungus diseases such as cenicilla, the mildiu and the antracnosis of plants that affect cucurbitacea's family.

13. **Disadventages:** Nowadays there is no credit, agricultural insurance or technical assistance even though the last one can be solved by (INIFAP) the National Institute of Forest Agricultural and Livestock Investigation and the (SEDARPA) Secretariat of Agricultural, Rural, Forest and Feeding Developing, the last one is a state agency end its objective is the agricultural developing.

14. **Advantages:** Sure market of harvest sale in the Papaloapan River Basin in Veracruz, Xalapa, Coatzacoalcos and Acayucan.

    Some of the producers on modules IV have experience on this cultivation. The following diagram shows the productivity for the cucumber in the Papaloapan River Basin.

Productivity by hectare

YIELD TON / HA	SALE PRICE/TON	GROSS INCOME	PRODUCTION COST	PROFIT
18	U.S. Dollar $191.30	U.S. Dollar $3182.60	U.S. Dollar $890.80	U.S. Dollar $2552.70

Note: One dollar = $11.50 Mexican pesos.

PRODUCTION COSTS

YEAR 1	CYCLE	CROP	SURFACE/HA	PLANTING	HARVEST
2004-2005	O-I	CUCUMBER	1		

LABORS	CODE	STAGE	DATE	HOW IT WAS DONE	PERSONS EMPLOYED	FOR HOW LONG	WAGE/HR	UNITARY COST	AMOUNT
Fallow	15	1	Sep-Oct	6	1	6	6	600	600
Raking	60	1	Sep-Oct	6	1	6	6	600	600
Furrowing	76	1	Oct	6	1	6	6	500	500
Plantation	57	2	Oct-Nov	6	10	60	6	70	700
Fertilization	8	2	Nov	6	10	60	6	70	700
Aplic. Agroquim.	11	2	Nov-Dec	6	10	60	6	70	700
Irrigation	62	2	Oct-Jan	6	8	48	6	70	560
Harvest	80	3	Dec-Jan	6	15	90	6	70	1050
								TOTAL=	5.410

CHART OF CONSUMABLES

GENERIC NAME	STAGE	DATE	AMOUNT /KG KG	SPECIFIC CONCEPT	PRICE	UNIT	PRESENTATION	AMOUNT
Seed	1	Sep-Oct	1,5	Seed	1200	Libra	Bote	1.800
Fertilizer	2	Nov-Dec	250	Urea	154	Kg.	Sack	770
Fertilizer	2	Nov-Dec	100	DAP	172	Kg.	Sack	344
Fertilizer	2	Nov-Dec	100	20-10-20	160	Kg.	Sack	320
Agrochemical	2	Nov-Dec	2	Insecticide	200	Litro	Container	400
Agrochemical	2	Nov-Dec	2	Fungicide	300	Kg.	BAG	600
Fertilizer	2	Nov-Dec	10	microelements	60	Kg.	BAG	600
							TOTAL=	4.834

Specialty fertilizers and agrochemicals (organic and biologic)

PRODUCTION AND DESTINATION

YIELD TON/HA	SALE PRICE/TON	GROSS INCOME	PRODUCTION COST	PROFIT
18	2200	39600	10.244	29,356

SUMMARY TECHNOLOGICAL PACKAGE FOR THE CROP OF PAPAYA MARADOL IN THE PAPALOAPAN RIVER BASIN

Name: Papaya (*Carica papaya L.*).

1. **Introduction**: Original CROP of Mexico, of great importance because it occupies the third world-wide place in the production of this species and more in Veracruz individual than is the first producing state, is for this reason that it sets out to this fruit tree like one more an alternative of development for the agriculturists of the River basin of the Papaloapan since they tell on the necessary conditions for his operation commercial level.
2. **Edaphoclimatic factors:**

Edaphoclimatic factors	Abs. Min.	Min. Opt	Max. Opt	Max. Abs	Killing Temp.
Temp. ºC	10	18	24-26	28	- 1
Precipitation	500	1000	1700	2800	
soil pH	5.5	6	7	8	

Environmental factors	Optimum	Range	Days to Harvest
Light requirement (hours)	13	12-14 hrs.	230
Photoperiod	Neutral		
Soil texture	Loamy clay	Wide	
Soil Depth	More than 150 cm.	50-150cm	
Soil Drainage	Well drained	Well drained	
Salinity	Less than 4	Less than 4	
Fertility	High	Medium	

3. **Terrain preparation**: Two are made Fallows, 3 dray passages in crossed form, leveling of the land, formation of backs to drain the water and it does not cause problems to the Plantation, next the outline of the Plantation.
4. **Density and method of planting**: The Plantation is made to distances of 2 xs 2 ms for a total of 2500 Plants/ha, the PLANTING is made in seed plot so that when these have from 20 to 25 cm of height are transPlantdas to the definitive site.
5. **Irrigation**: The recommended Irrigation is the located Irrigation or by dripping, the applications are made according to the conditions of the Plantation, but they are very necessary throughout its development.
6. **Varieties**: Red variety maradol.
7. **Fertilization**: 200 are applied kg/ha of a Fertilizer that contains NPK mainly and this it is applied of 15 to 20 Days depending of the conditions of the Plantation at intervals.
8. **Control of weeds**: This work can be made of manual form with grub hoe or machete, mechanized with tractor or chemistries applying Herbicides taking care of that this not between in contact with the Plant, since it can affect it.
9. **Plagues**: Red spider (*Tetranandchus cinnabarinus*), harinoso louse (*Planococcus sp*), Fly of PAPAYA (*curvicauda Toxotrandpana*).
10. **Illnesses**: Antracnosis (*Cabbageletotrichum gloesporoides*), Pudriciones by the root and the base of the stem (*Phandtophthora sp, Pandthium sp* and

Sclerotium rolfsii), Nemátodos (incognito *Meloidogandne*), Virus of the annular spot of papaando (*Mandzus persicae*, *Aphands gossipii* and *Aphis nerii*).

11. **Harvest:** It is made of manual form using gloves, and it is made when the crust of the fruit begins to change of green the dark green sure forming YELLOW lines of the end of the fruit towards pedúnculo.
12. **The methodology to define the potential of cultivation**: Was a screen of information with the following sequence.
    First, the data of weather and around of the studied places were come into the data bank of the FAO named ECOCROP and the result was a preliminary list of 1710 species of potential cultivation. Second, this list was inter-related with the results of marketing studies, with the banks of information of the Institute of Forest Investigation, Agricultural and Livestock, (IFIAL) and the rural prices, published by (SAGARPA) in its page of Support and the Commercialization Agricultural Services (SCAS).
    Furthemore, the information of previous experiences and the specific *generated study that we are seeing, for exemple, the restrictive factors of* agricultural production in each studied irrigation.
13. **Recommendations:** Cultivation of maradol papaya fruit is suggested for modules II, III and IV. Maradol papaya fruit is recommended as organic cultivation in order to have acces in México City market because it is well accepted. Whit irrigation in low water season, it is possible stagger the production in the orchard to obtain better sell prices.
    Before the plantation is made, it is recommended to level the ground and make furrows for the plantation stocks, this will let a good ventilation of roots of papaya fruit at the moment of transplanting. The specie is sensitive to fungus diseases like putrefaction of root and in the base of stem as well as antracnosis.
14. **Disadvantages:** Nowaday there is no credit, agricultural insurance or technical assistance eventhogth the last one can be solved by (INIFAP), the National Institute of Forest, Agricultural and Livestock Investigations and the (SEDARPA) Srecretarial of Agricultural, Rural, Forest and Feeding Developing, the last one is a estate agency and its objective is the Agricultural developing.
    Cultivation on papaya fruit can´t stand flood ground.
15. **Advantages:** Sure market for harvest sale as fresh fruit is in Veracruz, Xalapa, Coatzacoalcos, Acayucan and even Mexico City. Some producers of modules II, III and IV have already experience on this cultivation. The following diagram shows the productivity per hectare for cultivation of papaya fruit in the Papalopan river basin. Papaya fruit is a semiperennial cultivation.

Productivity by hectare

YIELD TON / HA	SALE PRICE/TON	GROSS INCOME	PRODUCTION COST	PROFIT
	U.S. Dollar	U.S. Dollar	U.S. Dollar	U.S. Dollar
50	$217.39	$10,869.56	$4,625.30	$6,244.26

Note: One dollar = $11.50 Mexican pesos.

PRODUCTION COSTS

YEAR	CYCLE	CROP	SURFACE/HA	PLANTING	HARVEST
2004-2005	O-I	PAPAYA	1	sep-04	jun-05

LABORS	CODE	STAGE	DATE	HOW IT WAS DONE	PERSONS EMPLOYED	FOR HOW LONG	WAGE/HR	UNITARY COST	AMOUNT
PLANTING	77	1	sep	6	16	96	6	70	1120
Fallow	15	1	sep	2	1	3	3	600	600
Raking	60	1	oct	2	1	3	3	500	500
Sloping		1	oct	2	1	3	3	400	400
Transplant	57	2	nov	6	22	132	6	70	1540
Irrigation	62	2	nov-May	6	40	240	6	70	2800
Replantation	61	2	May	6	2	12	6	70	140
Fertilization	8	2	nov-Apr	6	20	120	6	70	1400
Cultural practices		2	nov-Apr	6	64	384	6	70	4480
Agrochemicals	11	2	Apr-May	6	20	120	6	70	1400
HARVEST	80	3	jun05-nov06	6	216	1296	6	70	15120
								TOTAL=	29500

CHART OF CONSUMABLES

GENERIC NAME	STAGE	DATE	AMOUNT/KG KG	SPECIFIC CONCEPT	PRICE	UNIT	PRESENTATION	AMOUNT
SEED	1	SEP	0,1	SEED	1200	CAN	50 Gr.	2400
SUS. FUMIGATION	1	SEP	300	SUBSTRATE	4	SACK	25 Kg.	1200
BOL.P/VIV.	1	SEP	15	BAGS	14	PACKAGE	VARIABLE	210
PERIODECO	3	JUN04-NOV05	1000	PERIODECO	2,2	KILOGRAM	Kg.	2200
FERTILIZER	2	NOV.APR	3000	TRIPLE 17	150	SACK	50KG	9000
FERTILIZER	2	NOV.APR	200	18-46-00	171,5	SACK	50KG	686
FERTILIZER	2	NOV.APR	100	UREA	153,5	SACK	50KG	307
FERTILIZER	2	NOV.APR	1500	NUTRIENTS	125	SACK	50KG	3750
AGROCHEMICALS	2	APR-MAY	10	INSECTICIDE	200	LITRO	1 LT.	2000
AGROCHEMICALS	2	APR-MAY	6	FUNGICIDE	76	KILOGRAM	1 KG	456
AGROCHEMICALS	2	APR-MAY	3	FUNGICIDE	360	KILOGRAM	1 KG	1080
AGROCHEMICALS	2	APR-MAY	6	FUNGICIDE	67	KILOGRAM	1 KG	402
							TOTAL=	23691

PRODUCTION AND DESTINATION

YIELD TON /HA	SALE PRICE/TON	GROSS INCOME	PRODUCTION COST	PROFIT
50	2500	125000	53191	71809

SUMMARY TECHNOLOGICAL PACKAGE FOR THE CROP OF BLACK PEPPER IN THE PAPALOAPAN RIVER BASIN

Name: Black pepper (*Piper nigrum*).

1. **Introduction**: Species native of India, at the moment already has some plantations in state of Chiapas and Veracruz with very good results, is Plant that grows in form of rattan that it has not single applications culinary, but that also is used in medicine since it effectively fights the hemorrhages of the varices, of the liver and matrix, is had special interest in cultivating it, because EU is one of the main importers of this species.
2. **Edaphoclimatic requirements**:

Edaphoclimatic factors	Abs. Min.	Min. Opt	Max. Opt	Max. Abs	Killing Temp.
Temp. ºC	8	25	30	31	0
Precipitation	600	1000	1500	2500	
soil pH	5.0	5.5	7.0	8.0	

Environmental factors	Optimum	Range	Days to Harvest
Light requirement (hours)	12	13	80
Photoperiod	Short		
Soil texture	Sandy loam	Wide	
Soil Depth	20-50cm	50-150cm	
Soil Drainage	Well drained	Well drained	
Salinity	Less than 4	Less than 4	
Fertility	High	Medium	
Altitude	200-600 msnm	0-1000 msnm	

3. **Terrain preparation**: Cleaning of the land with I plate later and with Herbicide, 1 Fallow, 2 Rakings, Plantation tracing, establishment of tutors (alive or died) and Opening of furrowss.
4. **Density and method of planting:** are recommended densities of 1600 and 2500 Plants/ha with distances of 2 xs 2 ms and 2,5 xs 2 ms. The PLANTING is made in stocks made in the terrain preparation. The propagation of the species is carried out more commonland by laander.
5. **Irrigation**: It is recommended to establish a system of Irrigation by dripping, since he is more effective, or to water manualland mateado depending on the necessities of the Plantation and the conditions of ground and climate.
6. **Fertilization**: CROP that responds well to the fertilizations with organic matter recommends 5 kg of compost/Plant/YEAR and to stimulate the flowering foliar/ha with the formula is recommended to apply to 4 times to the YEAR 1 kg of installment 10-40-10.
7. **Control of weeds**: It is recommended to make it of manual form with grub hoe or machete, the application of Herbicides is not very recomendadaza because their roots are very superficial.
8. **Plagues**: Tuzas (*Orthogeomands cherriej*).
9. **Diseases**: Ascending Marchitamiento (*palmivora Phandtophthora*), dried of branches (*Fusarium solana*), soft Pudrición (*carotovora Erwinia*) and Nemátodos (*Meloidogandne*).

10. **Harvest:** It is made of manual form with the help of stairs when the fruit presents/displays a YELLOWish green color.
11. **The methodology to define the potential of cultivation:** was a screen of information with the following sequence.
    First, the data of weather and around of the studied places were come into the data bank of the FAO named ECOCROP and the result was a preliminary list of 1710 species of potential cultivation. Second, this list was inter-related with the results of marketing studies, with the banks of information of the Institute of Forest Investigation, Agricultural and Livestock, (IFIAL) and the rural prices, published by (SAGARPA) in its page of Support and the Commercialization Agricultural Services (SCAS).
    Furthemore, the information of previous experiences and the specific generated study that we are seeing, for exemple, the restrictive factors of agricultural production in each studied irrigation.
12. **Recommendations:** The cultivation of black pepper is suggested for modules I, III and IV; there al ready exist some plantation of this specie in the state of Veracruz, in the region of Tezonapa, Ver.
    Before sowing it is recommended to level the ground and furrows has to made on which stock of plantation will be, this will let a good ventilation of black pepper roots at the moment of transplantation. Black pepper is sensitive to fungus deseases like ascending withering, drying of banches and soft putrefaction.
13. **Disadvantages:** Nowadays there is no credit, Agricultural insurance or technical assistance eventhough the last one con be solved by (INIFAO), the National Institute of Forest Agricultural and livestoke Investigations, and the (SEDARPA), Secretarial of Agricultural, Rural, Forest and Feeding developing, the last one is a estate agency and its objective is the agricultural developing.
    Producers on studied modules don´t have previous experiences on cultivations.
14. **Advantages:** Sure market for harvest sale to industries in Puebla, Guadalajara and even in Mexico City.
    The following diagram shows the productivity per hectare for cultivation of black pepper in the Papaloapan basin; black pepper is a perennial cultivation.

Productivity by hectare

YIELD TON / HA	SALE PRICE/TON	GROSS INCOME	PRODUCTION COST	PROFIT
12	U.S. Dollar $1,043.47	U.S. Dollar $12,521.74	U.S. Dollar $2,338.95	U.S. Dollar $10,182.78

Note: One dollar = $11.50 Mexican pesos.

PRODUCTION COSTS

YEAR 1	CYCLE	CROP	SURFACE/HA	PLANTING	HARVEST
2004-2005	1	Black Pepper	1	sep-04	aug -05

LABORS	CODE	STAGE	DATE	HOW IT WAS DONE	PERSONS EMPLOYED	FOR HOW LONG	WAGE /HR	UNITARY COST	AMOUNT
Fallow	15	1	SEP	6	1	3	3	600	600
Raking	60	1	SEP	6	1	3	3	600	600
Plantation tracing	69	1	SEP	6	2	12	6	70	1400
Tutoring	70	1	SEP	6	20	120	6	70	1400
Opening of furrowss	6	1	OCT	6	10	60	6	70	700
Disinfection	81	1	OCT	6	4	24	6	70	280
Plantation	57	2	OCT	6	6	36	6	70	420
Tying	5	2	OCT	6	10	60	6	70	700
Clumping	13	2	NOV-AUG	6	6	36	6	70	420
Fertilization	8	2	NOV.	6	8	48	6	70	560
Weeding	38	2	NOV-AUG	6	10	60	6	70	700
Pruning	55	2	DEC.-AUG	6	6	36	6	70	420
								TOTAL=	8200

CHART OF CONSUMABLES

GENERIC NAME	STAGE	DATE	AMOUNT/ KG KG	SPECIFIC CONCEPT	PRICE	UNIT	PRESENTATION	AMOUNT
Plant	1	OCT.	2500 Plants	Plant	5	Piece	Piece	12.500
Tutors	1	SEP	2500 sticks	Tutor	3	Piece	Piece	7500
Fertilizer	2	NOV.	2500 Kg.	Compost	2000 Ton.	50 Kg.	50 Kg.	5000
Fertilizer	2	NOV.	10 Kg.	12-45-12	20	1 Kg.	1 Kg.	200
Agrochemicals	2	OCT.	2 Lt.	Vidate	200	1Lt.	1 Lt.	400
Agrochemicals	2	OCT.	2 Lt.	Previcur and Derosal	355	1 Lt.	1 Lt.	710
Agrochemicals	2	OCT.	1 Kg.	Captan	70	Kg.	1 Kg.	70
Fertilizer	2	SEP-AUG	100 Kg.	Urea	154	Kg.	50 Kg.	308
Fertilizer	2	SEP-AUG	150 Kg	Potassium sulphate	160	Kg.	50 Kg.	480
Fertilizer	2	SEP-AUG	250 Kg.	Super fosfato triple	165	Kg.	50 Kg.	825
							TOTAL=	27.993

PRODUCTION AND DESTINATION

YIELD TON/HA	SALE PRICE/TON	GROSS INCOME	PRODUCTION COST	PROFIT
0		0	34.223	0

PRODUCTION COSTS

YEAR 2	CYCLE	CROP	SURFACE/HA	PLANTING	HARVEST
2005-2006	O-I	Black Pepper	1 Ha.	sep-04	aug -05

LABORS	CODE	STAGE	DATE	HOW IT WAS DONE	PERSONS EMPLOYED	FOR HOW LONG	WAGE/HR	UNITARY COST	AMOUNT
Clumping	13	2	Sep-Aug	6	10	60	6	70	700
Fertilization	8	2	Nov.	6	10	60	6	70	700
Weeding	38	2	Sep-Aug	6	15	90	6	70	1050
Pruning	55	2	Sep-Aug	6	10	60	6	70	700
HARVEST	80	3	Jun-Dec.	6	20	120	6	70	1400
Tying	5	2	Sep-Aug	6	10	60	6	70	400
								TOTAL=	4950

CHART OF CONSUMABLES

GENERIC NAME	STAGE	DATE	AMOUNT/KG KG	SPECIFIC CONCEPT	PRICE	UNIT	PRESENTATION	AMOUNT
Fertilizer	2	Nov	2500	Compost	2000	Kg	50 Kg.	5.000
Fertilizer	2	Sep-Aug	250	Urea	154	Kg	50 Kg.	770
Fertilizer	2	Sep-Aug	200	Potassium sulphate	160	Kg	50 Kg.	640
Fertilizer	2	Sep-Aug	300	Triple super phosphate	165	Kg	50 Kg.	990
Agrochemical	2	Sep-Aug	2	Herbicides	70	Lt.	1 Lt.	140
Agrochemical	2	Sep-Aug	3	Fungicides	260	Kg/L	1Kg.	780
Agrochemical	2	Sep-Aug	2	Insecticides	150	Kg/L	1 Lt.	300
							TOTAL=	8.620

PRODUCTION AND DESTINATION

YIELD TON/HA	SALE PRICE/TON	GROSS INCOME	PRODUCTION COST	PROFIT
5	12000	60000	48.093	11907

PRODUCTION COSTS

YEAR 3	CYCLE	CROP	SURFACE/HA	PLANTING	HARVEST
2007-2008	O-I	BLACK PEPPER	1 Ha.	sep-04	aug -05

LABORS	CODE	STAGE	DATE	HOW IT WAS DONE	PERSONS EMPLOYED	FOR HOW LONG	WAGE /HR	UNITARY COST	AMOUNT
Clumping	13	2	Sep-Aug	6	10	60	6	70	700
Fertilization	8	2	Sep-Aug	6	10	60	6	70	700
Weeding	38	2	Sep-Aug	6	10	60	6	70	700
Pruning	55	2	Sep-Aug	6	15	90	6	70	1050
Tying	5	2	Sep-Aug	6	10	60	6	70	700
HARVEST	80	3	Jun-Dec	6	24	144	6	70	1680
								TOTAL=	5530

CHART OF CONSUMABLES

GENERIC NAME	STAGE	DATE	AMOUNT/KG KG	SPECIFIC CONCEPT	PRICE	UNIT	PRESENTATION	AMOUNT
Fertilizer	2	Sep-Aug	300	Urea	154	Kg	50 Kg.	924
Fertilizer	2	Sep-Aug	250	Potassium sulphate	160	Kg	50 Kg.	800
Fertilizer	2	Sep-Aug	300	Triple super phosphate	165	Kg	50 Kg.	990
Fertilizer	2	Sep-Aug	35	Nutrients	35	Kg	1 Kg.	1225
Agrochemical	2	Sep-Aug	4	Herbicides	70	Lt.	1 lt.	280
Agrochemical	2	Sep-Aug	6	Fungicides	400	Kg./L	1 Kg/L:	2400
Agrochemical	2	Sep-Aug	3	Insecticides	350	Kg./L	1 Kg/L:	1050
							TOTAL=	7.669

PRODUCTION AND DESTINATION

YIELD TON/HA	SALE PRICE/TON	GROSS INCOME	PRODUCTION COST	PROFIT
8	12000	96000	23.199	72801

PRODUCTION COSTS

YEAR 4	CYCLE	CROP	SURFACE/HA	PLANTING	HARVEST
2008-2009	O-I	BLACK PEPPER	1 Ha.	sep-04	aug -05

LABORS	CODE	STAGE	DATE	HOW IT WAS DONE	PERSONS EMPLOYED	FOR HOW LONG	WAGE /HR	UNITARY COST	AMOUNT
Clumping	13	2	Sep-Aug	6	10	60	6	70	700
Fertilization	8	2	Sep-Aug	6	10	60	6	70	700
Weeding	38	2	Sep-Aug	6	10	60	6	70	700
Pruning	55	2	Sep-Aug	6	25	150	6	70	1750
Tying	5	2	Sep-Aug	6	25	150	6	70	1750
HARVEST	80	3	Jun-Dec.	6	40	240	6	70	2800
								TOTAL=	8400

CHART OF CONSUMABLES

GENERIC NAME	STAGE	DATE	AMOUNT/KG KG	SPECIFIC CONCEPT	PRICE	UNIT	PRESENTATION	AMOUNT
Fertilizer	2	Sep-Aug	350	Urea	154	Kg	50 Kg.	1.078
Fertilizer	2	Sep-Aug	300	Potassium sulphate	160	Kg	50 Kg.	960
Fertilizer	2	Sep-Aug	350	Triple super phosphate	165	Kg	50 Kg.	1155
Fertilizer	2	Sep-Aug	35	Nutrients	35	Kg	1 Kg.	1225
Agrochemicals	2	Sep-Aug	4	Herbicides	70	Lt.	1 Lt.	280
Agrochemicals	2	Sep-Aug	6	Fungicides	400	Kg./L	1 Kg./L	2400
Agrochemicals	2	Sep-Aug	4	Insecticides	350	Kg./L	1 Kg./L:	1400
Fertilizer	2	Nov	5000	Compost	2000	Kg.	50 Kg.	10000
							TOTAL=	18.498

PRODUCTION AND DESTINATION

YIELD TON/HA	SALE PRICE/TON	GROSS INCOME	PRODUCTION COST	PROFIT *
12	12000	144000	26.898	117102

PRODUCTION COSTS

YEAR 4	CYCLE	CROP	SURFACE/HA	PLANTING	HARVEST
2008-2009	O-I	BLACK PEPPER	1 Ha.	sep-04	aug 05

LABORS	CODE	STAGE	DATE	HOW IT WAS DONE	PERSONS EMPLOYED	FOR HOW LONG	WAGE /HR	UNITARY COST	AMOUNT
Clumping	13	2	Sep-Aug	6	10	60	6	70	700
Fertilization	8	2	Sep-Aug	6	10	60	6	70	700
Weeding	38	2	Sep-Aug	6	10	60	6	70	700
Pruning	55	2	Sep-Aug	6	25	150	6	70	1750
Tying	5	2	Sep-Aug	6	25	150	6	70	1750
HARVEST	80	3	Jun-Dec.	6	40	240	6	70	2800
								TOTAL=	8400

CHART OF CONSUMABLES

GENERIC NAME	STAGE	DATE	AMOUNT /KG KG	SPECIFIC CONCEPT	PRICE	UNIT	PRESENTATION	AMOUNT
Fertilizer	2	Sep-Aug	350	Urea	154	Kg	50 Kg.	1.078
Fertilizer	2	Sep-Aug	300	Potassium sulphate	160	Kg	50 Kg.	960
Fertilizer	2	Sep-Aug	350	Triple super phosphate	165	Kg	50 Kg.	1155
Fertilizer	2	Sep-Aug	35	Nutrients	35	Kg	1 Kg.	1225
Agrochemicals	2	Sep-Aug	4	Herbicides	70	Lt.	1 Lt.	280
Agrochemicals	2	Sep-Aug	6	Fungicides	400	Kg./L	1 Kg./L	2400
Agrochemicals	2	Sep-Aug	4	Insecticides	350	Kg./L	1 Kg./L:	1400
Fertilizer	2	Nov	5000	Compost	2000	Kg.	50 Kg.	10000
							TOTAL=	18.498

PRODUCTION AND DESTINATION

YIELD TON/HA	SALE PRICE/TON	GROSS INCOME	PRODUCTION COST	PROFIT **
12	12000	144000	26.898	117102

SUMMARY TECHNOLOGICAL PACKAGE FOR THE CROP OF VANILLA PLANIFOLIA IN THE PAPALOAPAN RIVER BASIN.

Name: Vanilla (*Vanilla planifolia*)

1. Introduction: Crop of enough antiquitand in Veracruz, main in the zone North of the state, where have cultivate already by several YEARs, be a CROP very profitable and of the one that obtain the extract of vanilla, which have a endless number of use, have use in the elaboration of essence, in the elaboration of wine and liquors, like saborizante, etc., be by these reason that propose like a very good alternative for the agriculturist of the River basin of the Papaloapan.
2. Edaphoclimatic requirements:

Edaphoclimatic factors	Abs. Min.	Min. Opt	Max. Opt	Max. Abs	Killing Temp.
Temp. ºC	10	21	30	33	0
Precipitation annual	1500	2000	2500	3000	
soil pH	4.3	5.5	7	8	

Environmental factors	Optimum	Range	Days to Harvest
Light requirement (hours)	12	12-14	270
Photoperiod		- de 12 hrs.	
Soil texture	areno arcilloso	Wide	
Soil Depth	20-50	20-50cm	
Soil Drainage	Well drained	Well drained	
Salinity	Less than 4	Less than 4	
Fertility	High	Moderate	
Altitude	200-400 msnm.	0-600 msnm	

3. Terrain preparation: limPiece of the land of manual form with I plate, establishment of alive tutors to give shade to the Plantation, if the land allows it to make a Fallow and a Raking, next is made the Opening of furrows.
4. Density and method of planting: the distance of PLANTING of 2 to 2,5 ms between Plants with a Density of 2000 Plants/ha, the Plant is obtained through sticks of mother Plants, soon are taken root to be transplanted in the final land.
5. Irrigation: It is made according to the climatologic conditions of the place and the state of the Plantation, the most recommended is the Irrigation by dripping.
6. Fertilization: one takes to I dig in his Maria with organic installments, since as its root is very superficial him it can affect the chemical Fertilization his system to radicular.
7. Control of weeds: this it must be taken of manual form with I plate with machete and Herbicide for the reason previously mentioned is not due to apply.
8. Plagues: Louse (*Spinas floridulos*), Bugs (*Danddarcus conncinus*), Catarina emerald (*Nezara emaragdula*), I inform hairand (*auriferous Prusia*), Caterpillar (*vainillana Conchilanda*).
9. Diseases: Antracnosis (*Calospora vanillae*), Marchitamiento (*Fussarium sp.*), (*Cabbageletotrichum hemstitches*), (*Puccinia cinnamoni*).

10. **Harvest:** it is made of manual form when the cases reach a length of 15-25 cm and are ready for harvest The mills have monopolized the market and the commercialization of the sugar cane, at the present time the subject mills are agroindustries of private capital to the movements of the market of the sweetners, although with governmental control. The rice, maize and mango are commercialized by buyers of other states. When the aspect is firm, heavy, has greenish yellow color, as well as a tenuous aroma.
11. **The methodology to define the potential of cultivation:** Was a screen of information with the following sequence.
    First, the data of weather and around of the studied places were come into the data bank of the FAO named ECOCROP and the result was a preliminary list of 1710 species of potential cultivation. Second, this list was inter-related with the results of marketing studies, with the banks of information of the Institute of Forest Investigation, Agricultural and Livestock, (IFIAL) and the rural prices, published by (SAGARPA) in its page of Support and the Commercialization Agricultural Services (SCAS).
    Furthemore, the information of previous experiences and the specific generated study that we are seeing, for exemple, the restrictive factors of agricultural production in each studied irrigation.
12. **Recommendations:** Cultivation of vainilla is suggested for modules III and IV. There are plantation of this specie in the state of Veracruz, in the region of Gutierrez Zamora and Papantla, Veracruz.
    Before sowing it is recommended to level the ground and make furrows for plantation stock from tutors alive, this will permit a good ventilation of tutor is a root at moment of transplanting.
13. **Disadvantages:** Nowadays there is no credit, Agricultural insurance or technical assistance eventhough the last one con be solved by (INIFAP), the National Institute of Forest Agricultural and livestoke Investigations, and the (SEDARPA), Secretarial of Agricultural, Rural, Forest and Feeding developing, the last one is a estate agency and its objective is the agricultural developing.The producers of studied modules don´t have previous experiences on cultivations and benefit of vainailla.
14. **Advantages:** Sure market for harvest sale previous benefit to industries in Puebla, Guadalajara and even in Mexico City.
    The following diagram shows the productivity per hectare for cultivation of vainilla in the Papaloapan basin from the third year of cultivation; vainilla is a perennial cultivation.

Productivity by hectare

YIELD TON / HA	SALE PRICE/TON	GROSS INCOME	PRODUCTION COST	PROFIT
3.5	U.S. Dollar $3478.30	U.S. Dollar $12173.90	U.S. Dollar $2080	U.S. Dollar $10093.90

Note: One dollar = $11.50 Mexican pesos.

PRODUCTION COSTS

YEAR 1	CYCLE	CROP	SURFACE/HA	PLANTING	HARVEST
2004-2005		VANILLA	1 Ha.		

LABORS	CODE	STAGE	DATE	HOW IT WAS DONE	PERSONS EMPLOYED	FOR HOW LONG	WAGE/HR	UNITARY COST	AMOUNT
Mowing	38	1	Jan	6	10	60	6	70	700
Fallow	15	1	Feb	6	1	3	6	600	600
Raking	60	1	Feb	6	1	3	6	600	600
Hole for Tutor	6	1	Feb	6	10	60	6	70	700
Plant. Tutor	57	1	Mar	6	15	90	6	70	1050
Pruning Tutor	55	2	Dec	6	8	48	6	70	560
Tracing	69	1	Mar	6	4	24	6	70	280
Disinf. Hole	84	2	Mar-April	6	5	30	6	70	350
Tying	5	2	Apr-Jun	6	8	48	6		560
Weeding	38	2	Jun-Dec	6	15	90	6	70	1050
								TOTAL=	6450

CHART OF CONSUMABLES

GENERIC NAME	STAGE	DATE	AMOUNT/ KG KG	SPECIFIC CONCEPT	PRICE	UNIT	PRESENTATION	AMOUNT
Fertilizer	2	May-Sep	2500	Compost	2	Kg	50 Kg.	5.000
Plant	2	Apr-May	2000	Rod	15	Piece	Piece	30000
Tutors	2	February	2000	Tutor	4	Piece	Piece	8000
Agrochemical	2	Apr-May	2	Fungicide	400	Kg	1 Kg.	800
Agrochemical	2	Apr-Dec	2	Insecticida	350	Lt.	1 Lt.	700
Fertilizer	2	May-Apr	4	Ac. Hum and Amino Ac.	200	Lt.	1 Lt.	800
							TOTAL=	45.300

Specialty fertilizers and agrochemicals (organic and biologic)

PRODUCTION AND DESTINATION

YIELD TON/HA	SALE PRICE/TON	GROSS INCOME	PRODUCTION COST	PROFIT
8	0	0	51.750	0

PRODUCTION COSTS

YEAR 2	CYCLE	CROP	SURFACE/HA	PLANTING	HARVEST
2005-2006		VANILLA	1 Ha.		

LABORS	CODE	STAGE	DATE	HOW IT WAS DONE	PERSONS EMPLOYED	FOR HOW LONG	WAGE /HR	UNITARY COST	AMOUNT
Weeding	38	2	Feb.	6	10	60	6	70	700
Pruning Tutor	55	2	Dec	6	10	60	6	70	700
Tying	5	2	Dec	6	10	60	6	70	700
Applic. A.D.	73	22	May-Sep	6	20	120	6	70	1400
Weeding	38	2	Nov	6	10	60	6	70	700
Phytosan. Cont.	83	2	Apr-Dec	6	8	48	6	70	560
								TOTAL=	4760

CHART OF CONSUMABLES

GENERIC NAME	STAGE	DATE	AMOUNT/ KG KG	SPECIFIC CONCEPT	PRICE	UNIT	PRESENTATION	AMOUNT
Fertilizer	2	May-Sep	5000	Compost	2000	Kg	Sack	10.000
Control	2	Apr-Dec	2	Fungicide	400	Kg	BAG	800
Phytosanitary	2	Apr-Dec	2	Insecticide	350	Lt.	Container	700
Fertilizer	2	May-Sep	4	Ac. Hum and Amino Ac.	200	Lt.	Container	800
Fertilizer	2	Jan-Dec	10	Micronutrient s	60	Kg	Container	600
							TOTAL=	12.900

Specialty fertilizers and agrochemicals (organic and biologic)

PRODUCTION AND DESTINATION

YIELD TON/HA	SALE PRICE/TON	GROSS INCOME	PRODUCTION COST	PROFIT
0	0	0	17.660	0

PRODUCTION COSTS

YEAR 3	CYCLE	CROP	SURFACE/HA	PLANTING	HARVEST
2006-2007		VANILLA	1 Ha.		

LABORS	CODE	STAGE	DATE	HOW IT WAS DONE	PERSONS EMPLOYED	FOR HOW LONG	WAGE/ HR	UNITARY COST	AMOUNT
Weeding	38	2	Jul-Nov	6	20	120	6	70	1400
Clumping	13	2	May-Sep	6	10	60	6	70	700
Pruning Tutor	55	2	Dec	6	10	60	6	70	700
Tying	5	2	Dec	6	10	60	6	70	700
Phytosan. cont.	83	2	Apr-Dec	6	9	54	6	70	630
Pollination	82	2	Mar-Apr-May	6	50	300	6	100	5000
Aplic. M.O.	73	2	May-Sep	6	20	120	6	70	1400
HARVEST	80	3	Nov-Apr	6	5	30	6	70	350
								TOTAL=	10880

CHART OF CONSUMABLES

GENERIC NAME	STAGE	DATE	AMOUNT/ KG KG	SPECIFIC CONCEPT	PRICE	UNIT	PRESENTATION	AMOUNT
Fertilizer	2	May-Sep	5000	Compost	2000	Kg	Sack	10.000
Control	2	Apr-Aug	3	Fungicide	400	Kg	BAG	1200
Fitosanitario	2	Sep-Dec	3	Insecticide	350	Lt.	Container	1050
Nutrition	2	May-Sep	4	Ac. Hum and Amino Ac.	200	Lt.	Container	800
Nutrition	2	Jan-Dec	15	Micronutrient s	60	Kg	BAG	900
							TOTAL=	13.950

Specialty fertilizers and agrochemicals (organic and biologic)

PRODUCTION AND DESTINATION

YIELD TON/HA	SALE PRICE/TON	GROSS INCOME	PRODUCTION COST	PROFIT
1,5	40000	60000	94.240	34240

PRODUCTION COSTS

YEAR 4	CYCLE	CROP	SURFACE/HA	PLANTING	HARVEST
2007-2008		VANILLA	1 Ha.		

LABORS	CODE	STAGE	DATE	HOW IT WAS DONE	PERSONS EMPLOYED	FOR HOW LONG	WAGE/ HR	UNITARY COST	AMOUNT
Weeding	38	2	Jul-Nov	6	20	120	6	70	1400
Phytosan. cont.	83	2	Apr-Dec	6	9	54	6	70	630
Pollination	82	2	Mar-Apr-May	6	50	300	6	100	5000
Aplic. M.O.	73	2	May-Sep	6	20	120	6	70	1400
HARVEST	80	2	Nov-Apr	6	5	30	6	70	350
Pruning Tutors	55	2	Dec	6	8	48	6	70	560
Tying	5	2	Dec	6	8	48	6	70	560
								TOTAL=	9900

CHART OF CONSUMABLES

GENERIC NAME	STAGE	DATE	AMOUNT /KG KG	SPECIFIC CONCEPT	PRICE	UNIT	PRESENTATION	AMOUNT
Fertilizer	2	May-Sep	5000	Compost	2000	Kg	Sack	10.000
Control	2	Apr-Aug	3	Fungicide	400	Kg/Lt.	BAG/Bottle	1200
Phytosanitary	2	Sep-Dec	3	Insecticide	350	Kg./Lt.	BAG/Bottle	1050
Nutrition	2	May-Sep	4	Aminoacids	200	Lt.	Bottle	800
Nutrition	2	Jan-Dec	15	Micronutrients	60	Kg	BAG	900
							TOTAL=	13.950

Specialty fertilizers and agrochemicals (organic and biologic)

PRODUCTION AND DESTINATION

YIELD TON/HA	SALE PRICE/TON	GROSS INCOME	PRODUCTION COST	PROFIT
2,5	40000	100000	58.090	41910

PRODUCTION COSTS

YEAR 5	CYCLE	CROP	SURFACE/HA	PLANTING	HARVEST
2008-2009		VANILLA	1 Ha.		

LABORS	CODE	STAGE	DATE	HOW IT WAS DONE	PERSONS EMPLOYED	FOR HOW LONG	WAGE/ HR	UNITARY COST	AMOUNT
Weeding	38	2	Jul-Nov	6	20	120	6	70	1400
Phytosan. cont.	83	2	Apr-Dec	6	9	54	6	70	630
Pollination	82	2	Mar-Apr-May	6	50	300	6	100	5000
Aplic. M.O.	73	2	May-Sep	6	20	120	6	70	1400
HARVEST	80	3	Nov-Apr	6	6	36	6	70	420
Pruning Tutors	55	2	Dec	6	8	48	6	70	560
Tying	5	2	Dec	6	8	48	6	70	560
								TOTAL=	9970

CHART OF CONSUMABLES

GENERIC NAME	STAGE	DATE	AMOUNT /KG KG	SPECIFIC CONCEPT	PRICE	UNIT	PRESENTATION	AMOUNT
Fertilizer	2	May-Sep	5000	Compost	2000	Kg	Sack	10.000
Control	2	Apr-Aug	3	Fungicide	400	Kg/Lt.	BAG/Bottle	1200
Phytosanitary	2	Sep-Dec	3	Insecticide	350	Kg./Lt.	BAG/Bottle	1050
Nutrition	2	May-Sep	4	Aminoacidos	200	Lt.	Bottle	800
Nutrition	2	Jan-Dec	15	Micronutrients	60	Kg	BAG	900
							TOTAL=	13.950

Specialty fertilizers and agrochemicals (organic and biologic)

PRODUCTION AND DESTINATION

YIELD TON/HA	SALE PRICE/TON	GROSS INCOME	PRODUCTION COST	PROFIT
3,5	40000	140000	23.920	116080