

## 12. Other outcomes of activity

**【Appendix 1】** Minutes of meeting for the project implementation on February 2008

**【Appendix 2】** Minutes of meeting for the project implementation on November 2011

**【Appendix 3】** Materials of technical transfer training

**【Appendix 4】** Photos of technical transfer training

**【Appendix 5】** Materials for SVLK promotion workshop

**【Appendix 6】** Materials for final workshop

**【Appendix 7】** Activity report to BUK, Ministry of Forestry

**【Appendix 8】** Monthly report from local coordinator

**【Appendix 9】** Newsletter

**【Appendix 1】Minutes of meeting for the project implementation on February 2008**

**MINUTES OF MEETINGS  
BETWEEN  
THE JAPANESE PRELIMINARY STUDY TEAM AND  
AUTHORITIES CONCERNED OF  
THE GOVERNMENT OF THE REPUBLIC OF INDONESIA  
ON  
JAPANESE TECHNICAL COOPERATION FOR  
THE PROJECT FOR FACILITATING DEVELOPMENT OF  
WOOD INDUSTRY IN SMALL DIAMETER LOGS PROCESSING**


The Japanese Preliminary Study Team (hereinafter referred to as “the Team”), organized by Japan International Cooperation Agency (hereinafter referred to as “JICA”), headed by Mr. Hiroshi Nakata, was dispatched to the Republic of Indonesia (hereinafter referred to as “Indonesia”) from February 3 to 22, 2008 for the purpose of working out the details of framework of the Project for Facilitating Development of Wood Industry in Small Diameter Logs Processing (hereinafter referred to as “the Project”).

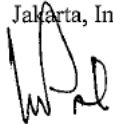
This Project is materialized in accordance with the Joint Statement at the signing of the Agreement between Japan and the Republic of Indonesia for an Economic Partnership signed by both leaders on August 20, 2007 in Jakarta. The framework of this Project was agreed as stipulated herewith, taking the discussion between the officials of the both sides involved in the EPA negotiation fully into consideration.

During its stay in Indonesia, the Team exchanged views with the authorities concerned of the Government of Indonesia (hereinafter referred to as “GOI”) through a series of discussions and field surveys on the Project.

As a result of the discussions and field surveys, the Team and the Indonesian authorities concerned agreed to the matters referred to in the document attached hereto.

Jakarta, Indonesia, February , 2008

  
\_\_\_\_\_  
Mr. Hiroshi Nakata  
Team Leader  
The Preliminary Study Team  
Japan International Cooperation Agency  
Japan

  
\_\_\_\_\_  
Dr. Ir. Hadi S. Pasaribu, M.Sc.  
Director General  
Directorate General of Forestry Production  
Management  
Ministry of Forestry  
Republic of Indonesia

## ATTACHMENT

### 1. Background of the Project

Developing wood based industries in a sustainable manner becomes the concern of both Indonesia and Japan. Indonesia possesses 109.9 million hectares of forestlands, 43.9 million hectares of which are allocated for restrictive and permanent production forests. Available data shows that the number of wood industries in Indonesia has been decreasing year after year due to difficulties in obtaining raw materials. For example, the number of plywood industry in 1999 was 107 units and this number dropped to 91 units in 2003.

In addition to around 8 million hectares of forestlands allocated for industrial plantation, Indonesia also plan to plant another 3 million hectare of land both in public and private lands in 5 years time through what so called 'Gerhan' program. The program has been initiated in 2003 involving millions of rural people in 15 provinces and 145 districts/cities. It is expected that in the near future the quantity of wood originated from plantation forest, mostly with small diameter, will be abundantly available and the rural people will enjoy additional income from harvesting the wood.

At the same time, other significant potential source of wood would be planted trees among agricultural land including agroforestry practices and community-based forest management area out of industrial plantation area (HTI). Such situation provides a great opportunity to alleviate poverty in rural area through community forestry and forest industry.

The present condition of plantation practices by farmers, however, is mostly suffering from insufficient benefit from log production due to lack of knowledge on wood market among farmers. Saw mills situated in such area are operated by individuals and equipped with inefficient machineries. Generally significant share of profit goes to middlemen who connect every step of wood flow from stands to end products. To ameliorate such constraints, a successful model of small scale wood industry operated by farmers' group may have a great impact, through vital dissemination activities to other sub-district district and provinces in view to respective local condition, and contributes to reducing wood supply from natural forests which Indonesia heavily rely on, and releases those natural forests from pressure of illegal logging by rural people.

It is stated in the PBIS that "Japan's support in establishing a model of wood processing system for small diameter logs will be of a great contribution to dissemination of a successful model of such industry and generating better income for millions of rural people surrounding the forest."

### 2. Framework of the Project

#### 2.1 Project Title

The Project title is "the Project for Facilitating Development of Wood Industry in

X/1

Small Diameter Logs Processing”.

**2.2 Objective**

**A local model of integrated community-based SDL processing established.**

**2.3 Period of Cooperation**

The period of cooperation will be two (2) years from August 01, 2008

**2.4 Project Areas**

The Project areas will be Lampung and Central Java.

**2.5 Matrix and Tentative Work Plan**

The Logical Framework Matrix (hereinafter referred to as “the Matrix”) shown in Annex 1 will be applied to the Project to manage and implement the Project efficiently and effectively with the following understanding:

- a) The Matrix is logically designed to define the initial understanding of the framework of the Project and to indicate the logical steps towards the achievement of the Project Purpose.
- b) The Matrix is to be reviewed and, if necessary, revised flexibly upon discussion between Indonesian side and Japanese side, according to the progress and achievement of the Project.

A tentative Work Plan is shown in Annex 2, subject to further finalization by both sides.

**3. Administration of the Project**

**3.1 Project Director**

Director of Forest Products Processing and Marketing Management, Directorate General of Forestry Production Management, as the Project Director, will bear overall responsibility for the administration and implementation of the Project.

**3.2 Project Manager**

Deputy Director for the Industry Performance Assessment and Forest Product, Directorate of Forest Products Processing and Marketing Management, as the Project Manager, will be responsible for the managerial and technical matters of the Project.

**A site manager will be appointed in Lampung by the local authority concerned.**



**4. Measures to be taken by JICA**

**4.1 Dispatch of Japanese Expert(s)**

JICA will provide the services of the Japanese expert(s) in the field of Small Diameter Logs Processing.

**4.2 Provision of Machinery and Equipment**

JICA will provide such machinery, equipment and other materials (hereinafter referred to as "the Equipment") necessary for the implementation of the Project. The Equipment will become the property of the Government of Indonesia upon being delivered C.I.F. (cost, insurance and freight) to the Indonesian authorities concerned at the ports and/or airports of disembarkation.

**4.3 Training of the Indonesian Counterparts in Japan**

JICA will provide opportunities of training in Japan for the Indonesian counterparts of the Project.

**5. Measures to be taken by the Government of Indonesia**

**5.1** The Government of Indonesia will take necessary measures to ensure that the self-reliant operation of the Project will be managed sustainably during and after the period of Japanese technical cooperation, through full and active involvement of all stakeholders, including related authorities, beneficiaries and institutions, in the Project.

**5.2** The Government of Indonesia will grant privileges, exemptions and benefits to the Japanese experts and their families referred to in 4.1 above, which are no less favorable than those accorded to experts of third countries working in Indonesia under the Colombo Plan Technical Cooperation Scheme.

**5.3** The Government of Indonesia will ensure that the Equipment referred to in 4.2 above will be utilized effectively for the implementation of the Project in consultation with the Japanese experts.

- 5.4 The Government of Indonesia will take necessary measures to ensure that the knowledge and experience acquired by the Indonesian personnel from technical training in Japan will be utilized effectively in the implementation of the Project.
- 5.5 In accordance with the laws and regulations in force in Indonesia, the Government of Indonesia, at its own expense, will take necessary measures to:
- (1) appoint and attach the counterparts from relevant authorities, including central and local governments/entities through the project period;
  - (2) accommodate sufficient administrative services needed for smooth implementation of the Project;
  - (3) provide land, buildings and facilities;
  - (4) supply and maintain machinery, equipment, instruments, vehicles, tools, and their spare parts as well as any materials necessary for smooth implementation of the Project other than the Equipment provided by JICA;
  - (5) provide means of transport and travel allowances for the Indonesian counterparts and Japanese experts for official travel within Indonesia; and
  - (6) provide suitably furnished accommodation for the Japanese experts and their families.
- 5.6 In accordance with the laws and regulations in force in Indonesia, the Government of Indonesia will take necessary measures to meet :
- (1) Expenses necessary for transportation within Indonesia of the Equipment referred to in 4.2 above as well as for the installation, operation and maintenance thereof ;
  - (2) Customs duties, internal taxes and any other charges, imposed in Indonesia on the Equipment referred to in 4.2 above ; and
  - (3) Running expenses necessary for the implementation of the Project.
- 5.7 The Government of Indonesia disseminate the outcome of the Project to the other areas of Indonesia, including through duplication of the model developed, in order to maximize the impact of the Project; and.
- 5.8 For the purpose of promoting support for the Project among the people of Indonesia, the Government of Indonesia will take appropriate measures to make the Project

widely known to the people of Indonesia.

**6. Mutual Consultation**

There will be mutual consultation between JICA and Indonesian Government on any major issues arising from, or in connection with this Attached Document.

**7. Miscellaneous**

The contents, specification and quantity of the Equipment referred to in 4.2 will be determined after the commencement of the Project, within the framework stipulated in Annex 1.

Annex 1	Logical Framework Matrix
Annex 2	Tentative Work Plan



Logical Framework Matrix for the Project for Facilitating Development of Wood Industry in Small Diameter Logs Processing

Project elements	Indicators	Means of verifications	Important assumptions
<b>Development objective</b> Small Diameter Log (SDL) industry contributes to local economies and alleviate pressure for illegal logging in natural forest in Indonesia	<ul style="list-style-type: none"> <li>Production value of SDL by areas</li> <li>Declining tendency of illegal logging</li> </ul>	Report of MoF Report of local gov.s Report of operating bodies	Central Government disseminates the outputs in other areas
<b>Specific objective</b> A local model of integrated community-based SDL processing established.	<ul style="list-style-type: none"> <li>Sales value of the integrated models</li> <li>Number of employment in the model area</li> </ul>	Report of the body Field observation	Local communities are positive. Local governments are positive. Local communities are positive. Local governments are positive.
<b>Output</b> 1. Diagnosis of industry and market in the model area	<ul style="list-style-type: none"> <li>Compilation of relevant information</li> <li>Availability of analysis</li> <li>Availability of strategy</li> </ul>	Project report	Local communities extend their knowledge. Local budget for extension is available.
2. A strategy model for SDL processing and marketing	<ul style="list-style-type: none"> <li>Percentage of relevant officials understood on strategy and technical aspect of the project both in the central and the local governments</li> <li>Existence of the body</li> </ul>	Interview	Local communities are positive.
3. Capable and responsible public sector for the implementation of the strategy	<ul style="list-style-type: none"> <li>Initial and operating cost</li> <li>Rate of operation</li> <li>Log consumption and recovery rate</li> <li>Volume and value of the products</li> </ul>	Written statement on establishment of the body Management report	Instruments delivered and installed timely. Labour are available.
4. Operating body for SDL production			
5. Model of integrated processing unit consisting a sawmill, sawwood drying kiln and a wood working unit with trained staff and villagers			
<b>Activities</b>			
1. Diagnosis			
1.1. Interview with local authorities, managers of sawmills, distributors/wholesalers, end users.	<ul style="list-style-type: none"> <li>Allocation of counterparts (CP)</li> <li>Travel cost for CP and EP</li> <li>Venues of workshops/meetings</li> <li>Administrative cost</li> </ul>		
2. Strategy identification			
2.1. Organizing participatory workshop with stakeholders and identifying SDL processing and marketing strategy	<ul style="list-style-type: none"> <li>Land for the units</li> <li>Infrastructure for the units</li> </ul>		
3. Public sector strengthening			
3.1. Having consultations with relevant officials			
3.2. Conducting training for key CP			
4. Establishing operating body (for Lampung)	<ul style="list-style-type: none"> <li>Dispatch of an expert (EP)</li> <li>Training course for CP</li> </ul>		
4.1. Internal discussion among potential members of the operating body			
4.2. Organizing workshop for stakeholders on the establishment of the operating body			
4.3. Establishing the operating body and determining the responsible public organization.			
5. A model of small scale integrated wood processing industry including sawmilling, sawwood drying, and woodworking with trained villagers (for Lampung)	<ul style="list-style-type: none"> <li>A saw mill, a drying kiln and a woodworking unit for Lampung</li> </ul>		
5.1. Identifying suitable equipment			
5.2. Determination of the specific location and installing the equipment			



5.3. On-site training for the villagers and CP using the machinery

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Tentative Work plan of the Project for Facilitating Development of Wood Industry in Small Diameter Logs Processing

Outputs and activities/month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Note
1. Diagnosis	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x		
1.1. Interview	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x		
2. Strategy identification	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x		
2.1. Organizing participatory workshop/identifying strategy	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x		
3. Public sector strengthening	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x		
3.1. Consultations with relevant officials	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x		
3.2. Training for key CP	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x		
4. Establishing operating body (for Lampung)	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x		Discuss the rule of cooperative management
4.1. Internal discussion	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x		
4.2. Organizing workshop for stakeholders	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x		
4.3. Establishing the operating body/determining the responsible public organization.	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x		
5. A model of small scale integrated wood processing industry (for Lampung)	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x		
5.1. Identifying suitable equipment	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x		
5.2. Determination of the specific location and installing the equipment	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x		
5.3. On-site training (Dispatch of Japanese expert)	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x		
(Monitoring by Dephut and DINAS)	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x		Considering participation of JICA Indonesia

**【Appendix 2】Minutes of meeting for the project implementation on November 2011**

MINUTES OF MEETINGS  
BETWEEN  
AUTHORITIES CONCERNED OF  
THE GOVERNMENT OF THE REPUBLIC OF INDONESIA.  
AND  
JAPAN INTERNATIONAL COOPERATION AGENCY  
ON  
JAPANESE TECHNICAL COOPERATION  
FOR  
THE PROJECT FOR FACILITATING DEVELOPMENT OF WOOD INDUSTRY IN  
SMALL DIAMETER LOGS PROCESSING

Japan International Cooperation Agency (hereinafter referred to as "JICA") and the Indonesian authorities concerned had mutual consultations on Project for Facilitating Development of Wood Industry in Small Diameter Logs Processing" (hereinafter referred to as "the Project").

As a result of the consultations, based on the Minutes of Meetings on the Project between the Indonesian authorities concerned and JICA, signed in Jakarta, February 2008, both sides agreed to the amendments referred to in document attached hereto.

Jakarta, 25 November, 2011



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Mr. Iman Santoso  
Director General of Forest Utilization  
Ministry of Forestry  
Republic of Indonesia



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Mr. Shigeki HATA  
Executive Technical Advisor to the  
Director General  
Global Environmental Department  
Japan International Cooperation Agency  
Japan

The Attached Document

1. The existing period of cooperation mentioned in "2.3 Period of Cooperation" of Minutes of the Meetings signed on February, 2008, expired at the end of July 2010. Both sides have discussions to deal with the circumstances and agreed to revise the clause for the period of cooperation, which will be one and a half (1.5) years from the first day of the dispatch of Japanese expert(s) to Indonesia.
  
2. Both sides confirm for the following personnel as the Project Director and Project Manager;
  - (1) Project Director  
Director of Forest Products Processing and Marketing, Directorate General of Forest Utilization, as the Project Director, will bear overall responsibility for the administration and implementation of the Project;
  
  - (2) Project Manager  
Deputy Director for Forest Products Processing and Design, Directorate General of Forest Utilization as the Project Manager, will be responsible for the managerial and technical matters of the Project.
  
3. Both sides confirm that components of the Project will be revised and improved as based of further discussions, in that component of introducing machinery will be decided later based on the suitability of the local situation. For this procedure, both sides should pay attention to the importance of improvement of income generation of rural people, and the activities are expected to contribute to sustainable forest management in Indonesia. *SHB ✓*

### **【Appendix 3】 Materials of technical transfer training**

#### **Materials of 1st technical transfer training**

- 3-1-1 Nursery techniques
- 3-1-2 Forestry techniques
- 3-1-3 Logging techniques
- 3-1-4 Wood production techniques

#### **Materials of 2nd technical transfer training**

- 3-2-1-1 Forest survey techniques
- 3-2-1-2 Forest survey note
- 3-2-1-3 Acacia mangium volume yield table
- 3-2-2 Forest register
- 3-2-3 GPS
- 3-2-4 Joint wood production techniques

#### **Materials of 3rd technical transfer training**

- 3-3-1 Forest survey techniques
- 3-3-2 GPS
- 3-3-3 Forest register
- 3-3-4-1 Forest fire prevention
- 3-3-4-2 Forest fire activity
- 3-3-4-3 Forest fire fighting training
- 3-3-4-4 How to make bamboo flapper
- 3-3-4-5 Iron net flapper
- 3-3-4-6 Forest fire danger level board
- 3-3-4-7 Patrol communication
- 3-3-5 Natural wood drying
- 3-3-6 Sawmill technic



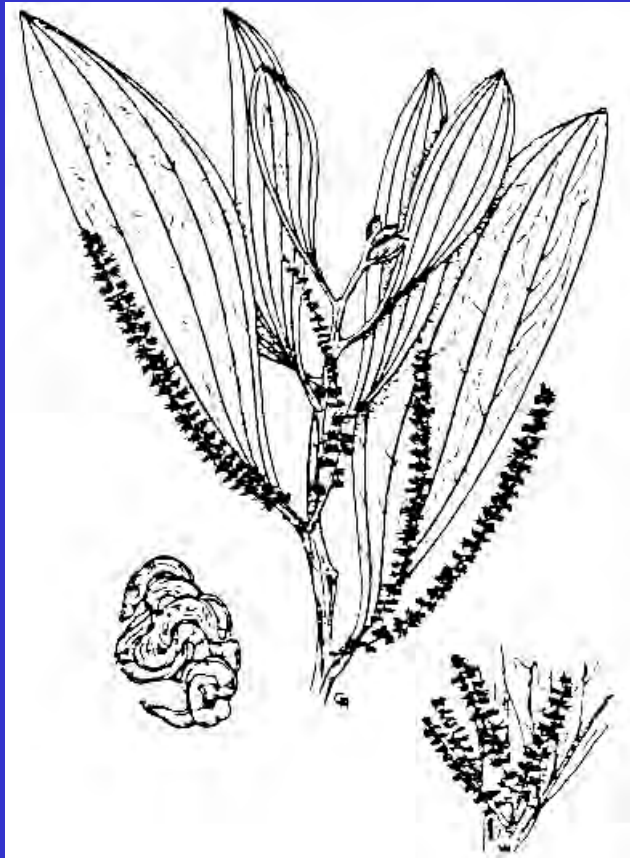
*Nursery techniques*

*Japan Overseas Forestry  
Consultants Association*

# Contents

1. Origin and other information
2. Seed correction and seeds
3. Nursery technique
4. Grafting technique

# Origin



- Australia and Oceania, including Papua New Guinea.



# Ecology

- **Annual rainfall:** 1000-4000mm.
- **Normal temp range:** 17.5-31° C
- **Altitude range:** 0-720m.
- **Seasonal adaptability:** poor drought tolerance.

# Morphological Characteristics



- *Acacia mangium* is large genus with over 1300 species widely distributed throughout the tropics and subtropics
- *Acacia mangium* is fast growing ,nitrogen fixing.

## Soils condition

pH from 4.5-8.0, grows well on red-yellow podsol, even if heavily eroded.

Can tolerate some waterlogging.

**Light requirement:** strong, as it is a pioneer species.

**Other site limitations:**

performs poorly with less than 1200 mm annual rainfall; does not tolerate strong wind.

**Height at maturity:** 25-30m.

**Diameter at breast height (1.3m) at maturity:**  
40-60cm.

**Form:** good, self pruning, straight bole without knots, especially when grown in plantation.

**Coppicing ability:** only in young stems, poor in old trees.

**Growth:** in a 13-year old plantation, can reach 23-25m height, 27-30cm diameter at breast height (1.3m).

**Other:** fixes nitrogen.

# Mother tree of Seeds orchard



- You can corrected seeds from seeds orchard of low height tree is better like correcting seed easily. .

# *Dry up seeds under sunshine*



- After correcting seeds, they are dry up seeds in the house

# Seeds production



- The tree flower annually, usually at end of the rainy season or the early part of dry season
- Acacia magnum plantation produced 1 kg of seed per year



# size of Seeds



1 m m



# *Main Selection point of seeding*

*1.suitable condition (climate condition, soil condition)*

*2.good growth*

*3.good wood quality*

*3.Protect Disease of resistance,*

*5.Meteorological*

*6.etc*

# Seed storage and viability

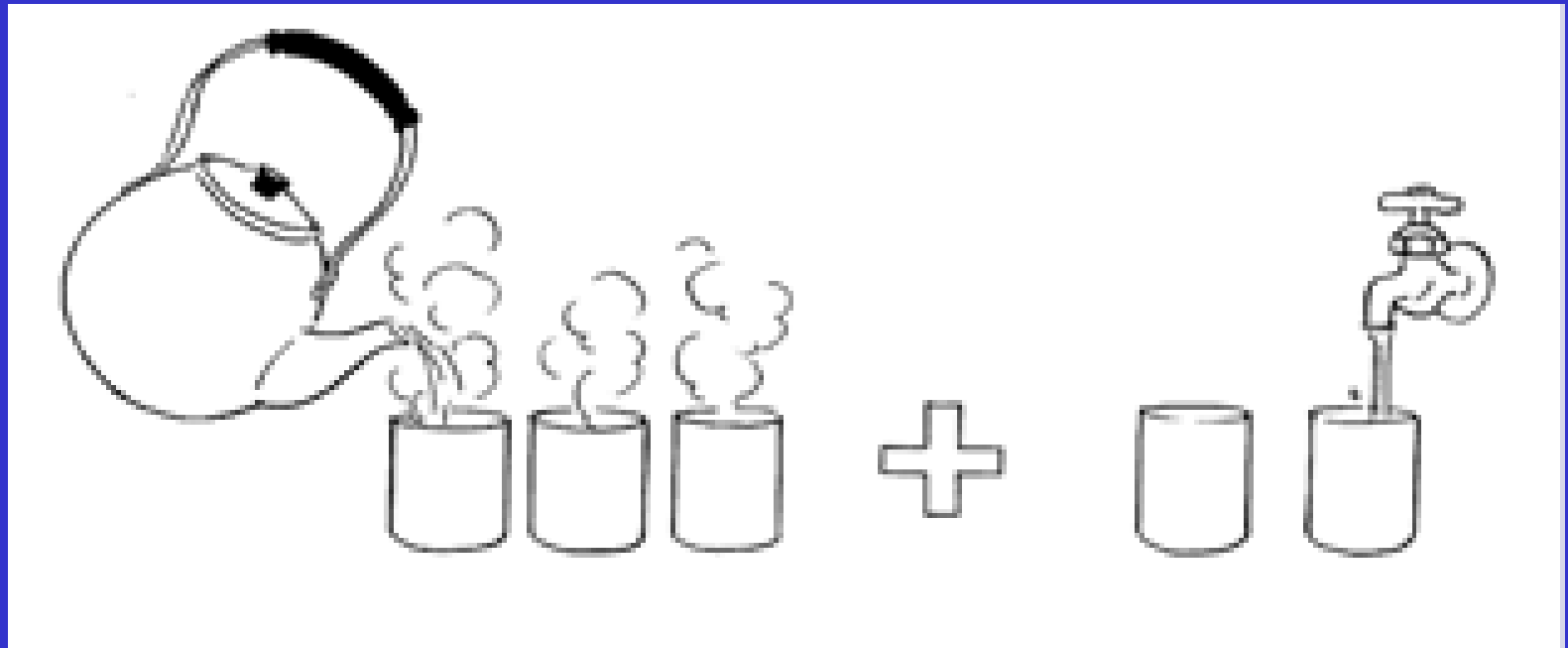
- The viability of Acacia Magnum seeds tends to increase over the course of the fruiting season.
- After air drying, small amounts of seed may be separated by hand
- Storage with moisture content of 4-12% at 3-5°C in sealed containers is recommended. Although seed started at ambient temperatures will retain its viability for up to 2 year.

# Seed treatment

**The seed coat is very hard when ripe . Therefore pre-germination treatments should be carried out to promote prompt.**

Pour hot boiling water over 30 seconds after that 2 hour put in cold water.

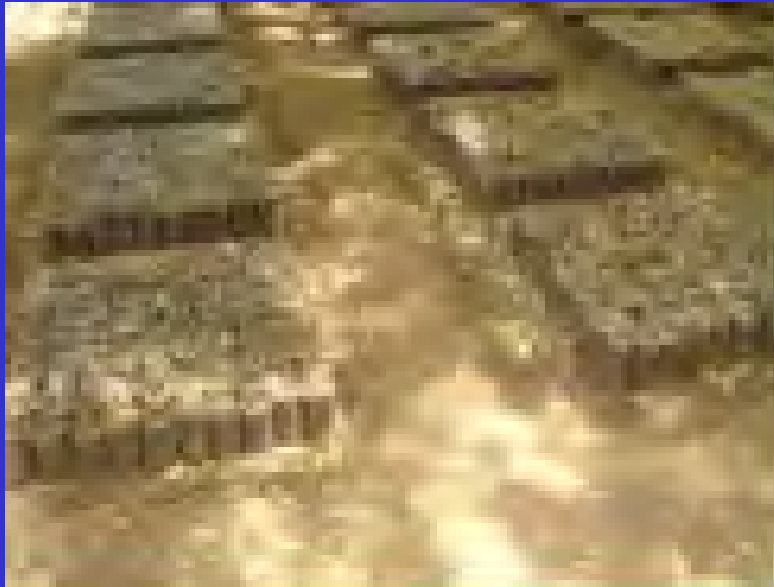
Portion of boiled and cool water for pre-treatment



# Nursery Establishment

- When establishing a nursery, we have to pay attention to following things: ① Choose a flat slope area in order to take care of seedlings conveniently. The nursery should be located in ventilated place Water is available throughout the duration of raising seedlings for the watering of seedlings .In addition, the water source has to be cleaned.

# Making frame for nursery



- We have to make a high frame. It is normally 10-20cm higher for tending seedling and watering daily.

# Time of start of nursery

Nursery establishment should be started in proper time considering duration of raising seedling in the nursery and time of transplanting the seedlings in the field

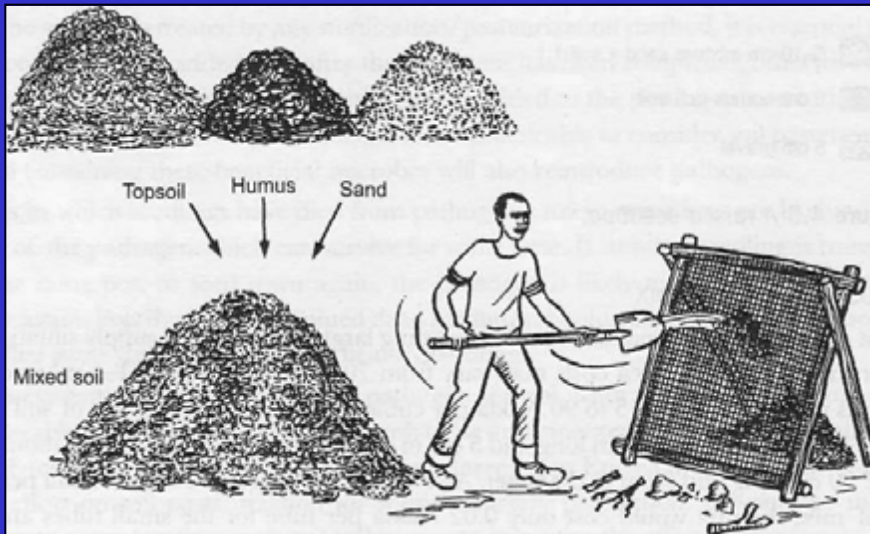


# Pre- treatment of seeds

- In natural condition, seeds of many tree species need a long period to germinate. Pre-treatment of seeds is then practiced to hasten the germination time and to get good germination percentage.

# Soil mixing

- Forest soil, manure and phosphate are usually mixed for potting as follows:



# Potting

- After mixing soil, plastic bags are filled with such mixed soil. Size of pot to be recommended 7 to 9 cm in width × 11 to 13 cm in length.



# Sowing of seeds

- Sow the seeds into plastic pots after finishing the pre-treatment. Make sure that seeds should not be sowed too deep because it will be difficult to germinate. Seeds should be 1 to 2 cm from the surface of soil pot. Sow two or three seeds in a pot.

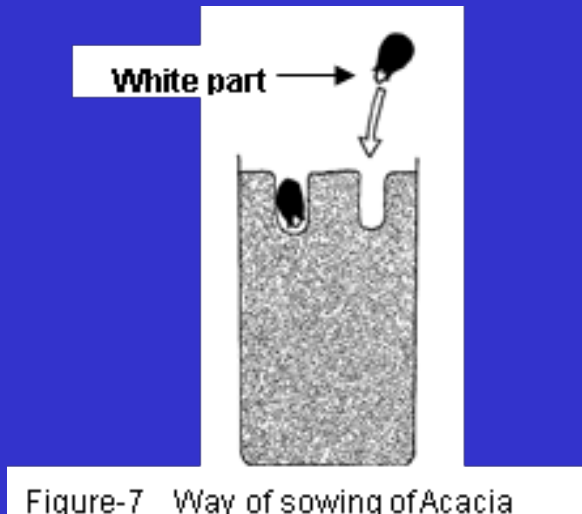
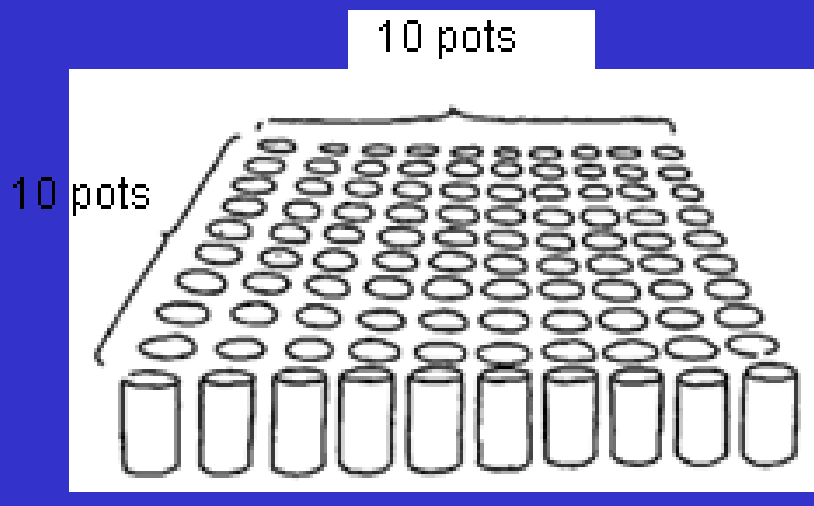


Figure-7 Way of sowing of Acacia

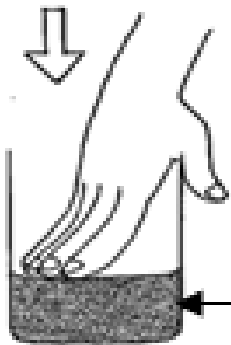
# Arrangement of pots



It is recommended to make fixed number pots a unit such as 100 pots ( $10 \times 10$ ) and 200 pots ( $10 \times 20$ ) to ease the management work and counting.

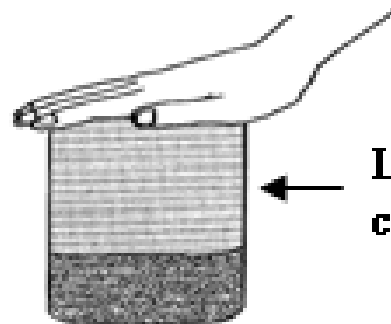
# Potting seeds

**First step**



**Hard  
compacted**

**Second step**



**Light  
compacted**

**Third step**

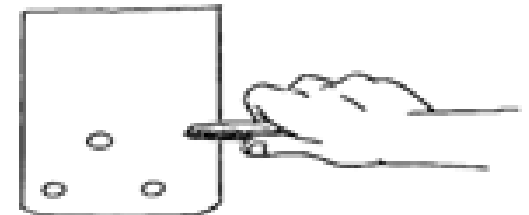


Figure-6 Process of potting

# Shadowing

- Time and rate of shadowing: in the first 20 days, seedling need covered 70-80 % then reduce shadowing to 30 % gradually by 30 to 45 days before the transplanting.



# watering



- Water seedling one time /day with 3 to 5 liters/m<sup>2</sup>. However, the volume of water depends on the weather condition.



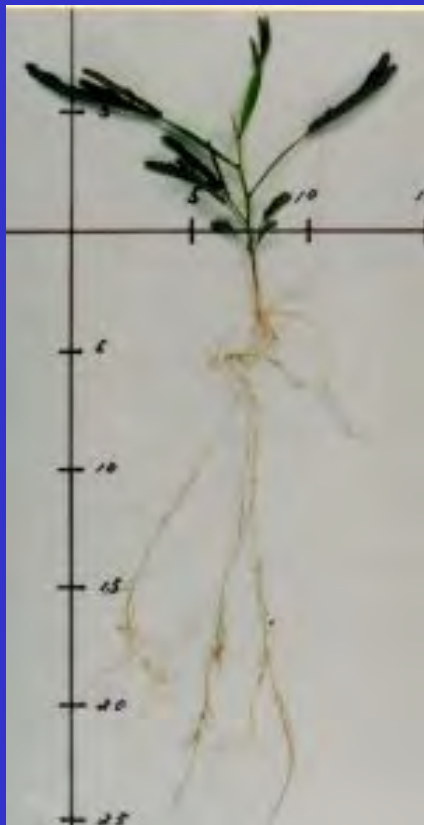
2 weeks after germination



month after germination



## 2.5 month after germination



Main root is not so long  
but blanch root grow well

# Thinning

- In case that more than two seeds in a pot are germinated, seedling which does not relatively grow well compared with another should be removed from the pot after one seedling reach 3 to 4 cm, so that only one good seedling remain in a pot.

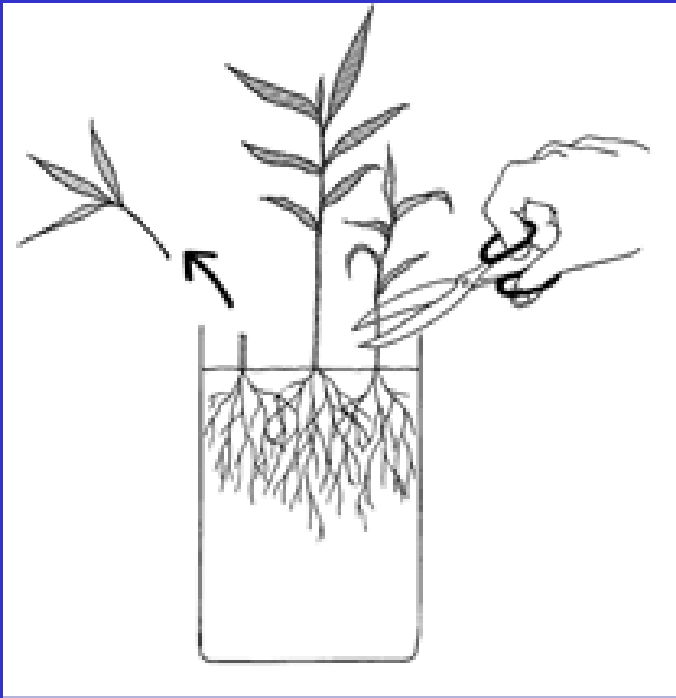


Figure-10 Way of thinning in too late timing

# weeding

Weeding in and around the pot, arranging the seedling and turn up the soil up to 0.5 cm depth with small stick.

# Hardening

**Hardening is to expose the seedlings to harsh conditions to make them strong so that we will be able to survive under natural climate condition in the field after planted out.**



# Basic standard of seedling



- Basic standard of seedling for transplanting is the field is 25 cm to 40cm ,seedling haight .

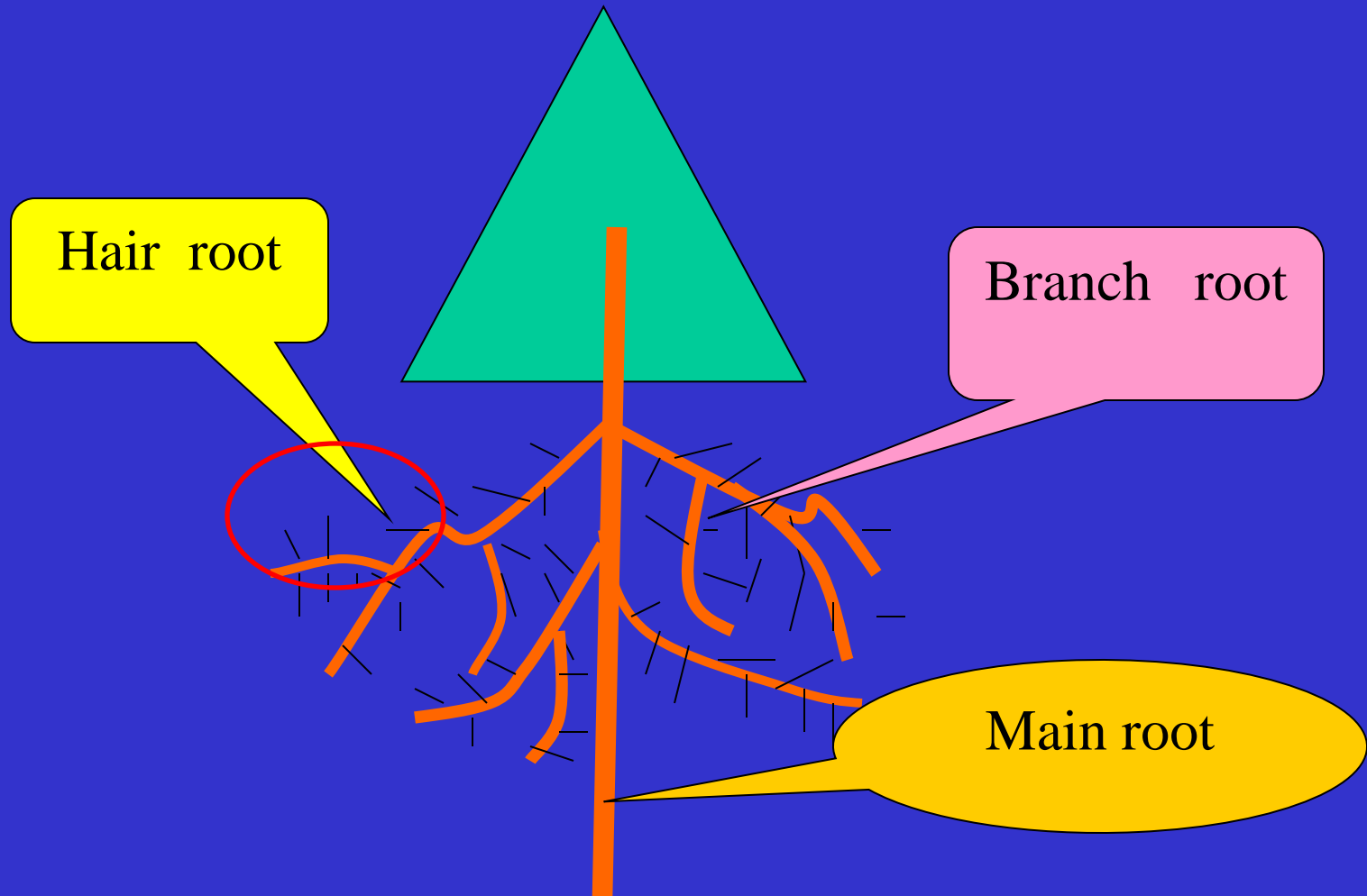
# Good Root system



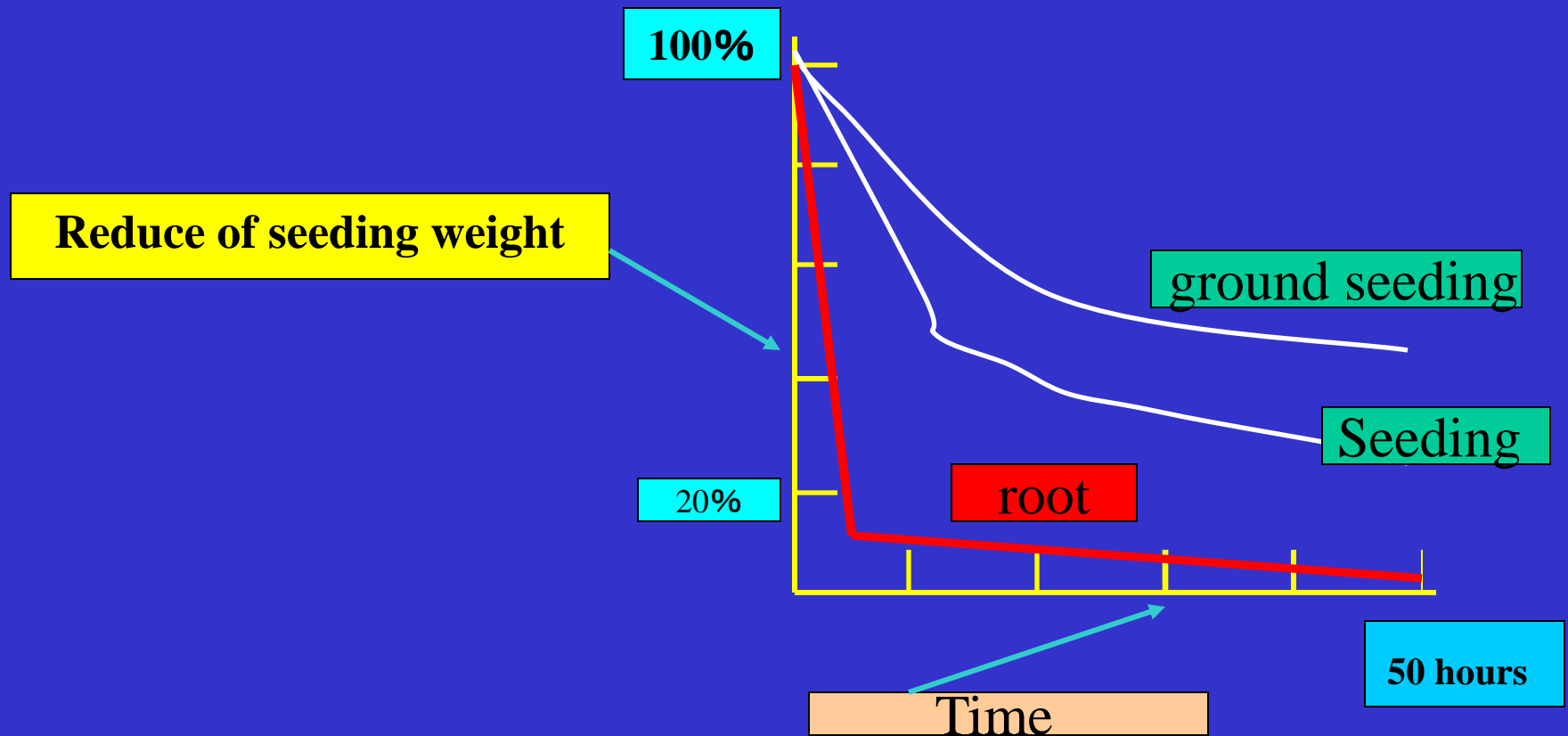
Good root system  
has many branch  
roots in the pot



# Seedling roots



# *Seedling dry up index*



# *Seeds orchard*

You make mother trees from a good gene

*Seed tree is from cutting .because take over gene .*



# Mother trees of Seeds orchard



- You can correct seeds from seeds orchard of low height tree is easy 1 correcting .

# Cutting method



- Using a scissors cut the appropriate length, to allow enough space at the base to be inserted into rooting medium.

# Scion cutting

- Place on a wooden surface and slice diagonally across the scion.



# Cut surface



# Fit section of scion



- Fit section carefully into the cut of the root stock such that the tip of the scion reaches the bottom of the cut, and also, the cambial surfaces of both scion and root stock should fit well, as callus formation takes place here. Vertical slice (flat) faces the inner surface of the cut root stock.



# Use a plastic band

- Use a plastic band to tie the graft union firmly, starting from the bottom to the top, enclosing the cut surfaces completely to avoid fungal attack and water entering into the graft union. If plastic band can not completely cover the cut surfaces, it can be further covered by wax.



# Plastic bag



- Alternatively, use a transparent plastic bag to cover the tied graft union with a few leaves of the root stock and tie the lower edge with a plastic band and place the plants in the shade.

# Cutting method



- After corrected scion from seeds orchard
- You make cutting seedling ,size is about 10 cm.

After cutting the scion , put  
in water



# Cutting seeds bed



# *Shade control*

Shade made  
by straw



*Before planting you  
should be remove  
shade some times  
depending  
sunshine.*

# Seedling size

- The appropriate height for transplanting is 25—40cm( 3-5 month after sowing )



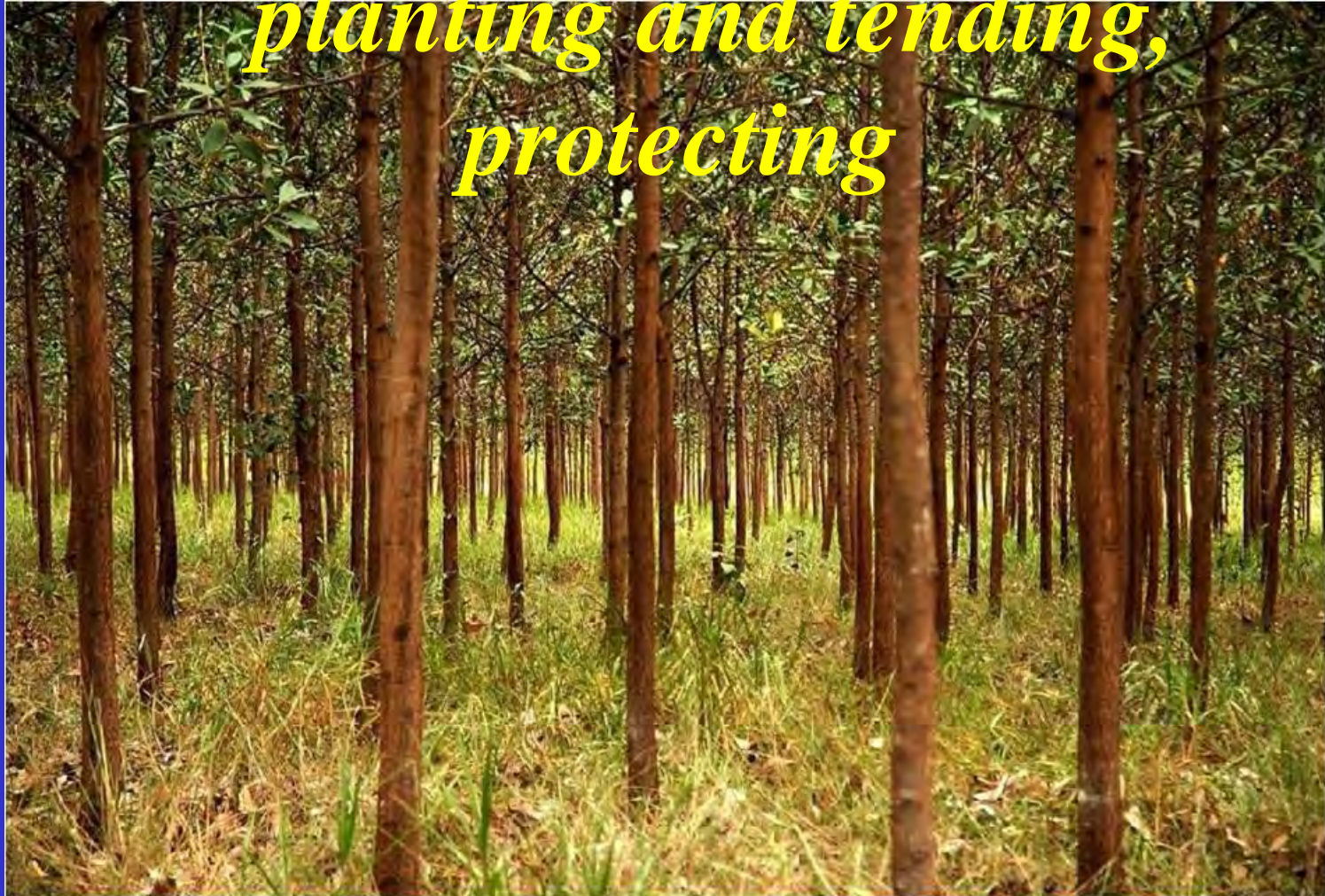
Thank you





# *Forestry techniques*

*planting and tending,  
protecting*



# Main Contents

1. Forestry Cycle Management
2. Cause of bad planted area in Japan
3. Natural condition survey
4. Social condition Survey
5. Long term Planting Plan
6. Normal Forest
7. Construct of Planted a board
8. Forest registration

9. Safety work

10. Planting work

11. Tending work

12. Thinning work

13. forest Fire of Protection

14. forest Protection of animal

15. protection of road condition

.

- Forestry Cycle Management



## *Cause of bad planted area in Japan*

- *Used of bad Seed source*
- *Used of bad planting stock*
- *Miss take species*
- *Miss take planting method*
- *Miss take tending and protection method*

- *Before planting ,At fast start the survey*

- *You consider two kind of survey points* Two kinds of Survey

- *Natural condition Survey*

- *Social condition survey*

# *1. Natural condition Survey*

*(1). Topography*

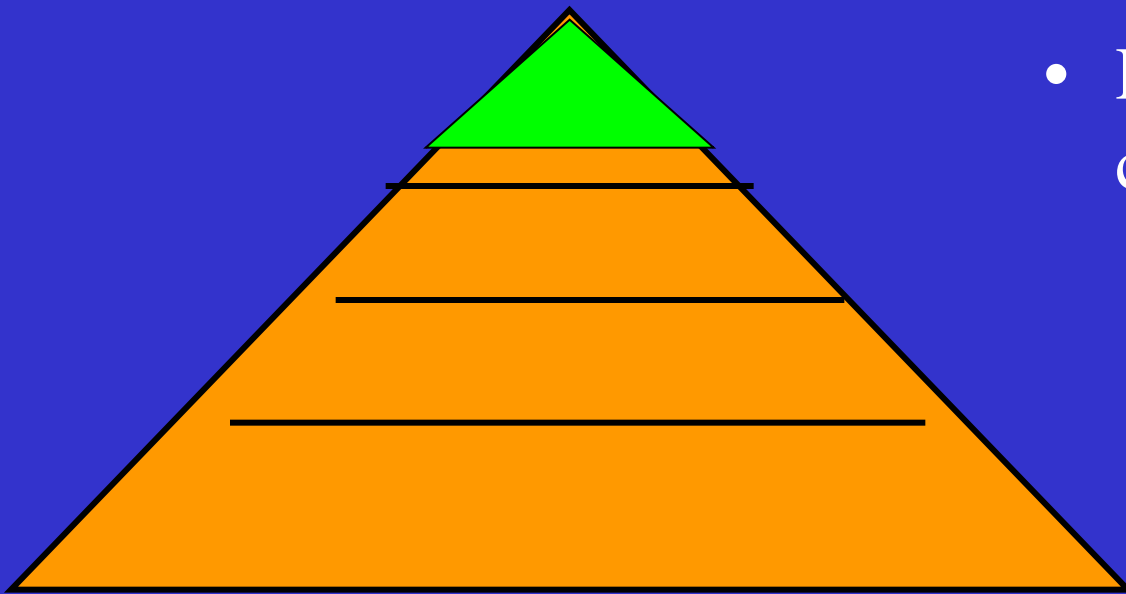
*( 2). Geology*

*( 3). Climate*

*(4). Ground grasses*

# (1) Topography

- Elevation
- Slope
- Direction(east,south,etc)

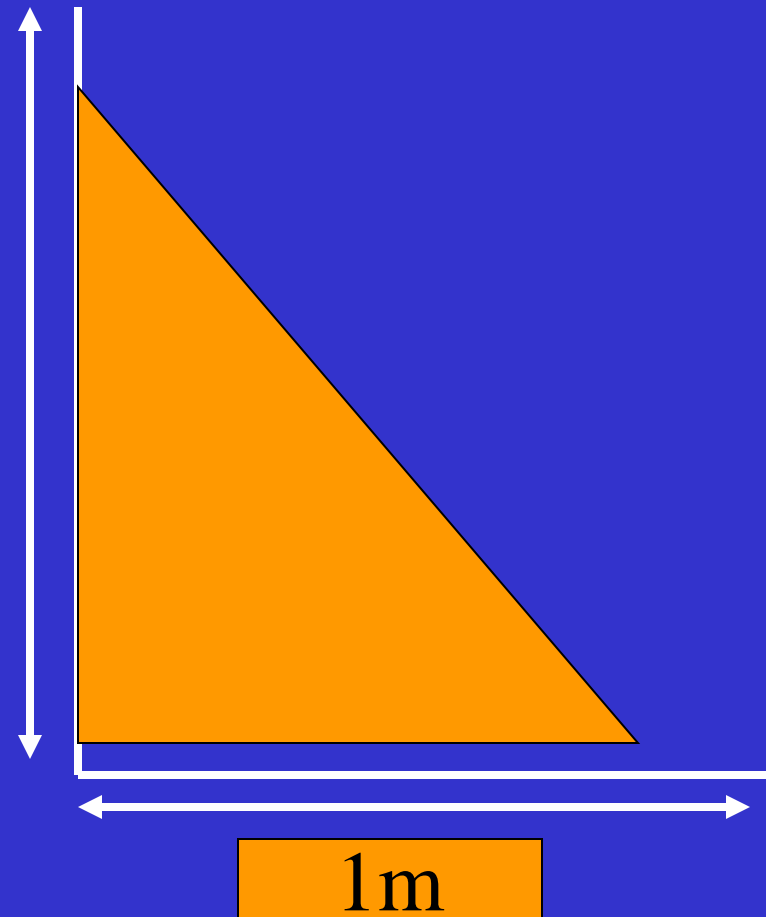




## (2)-1.geography(Soil type )

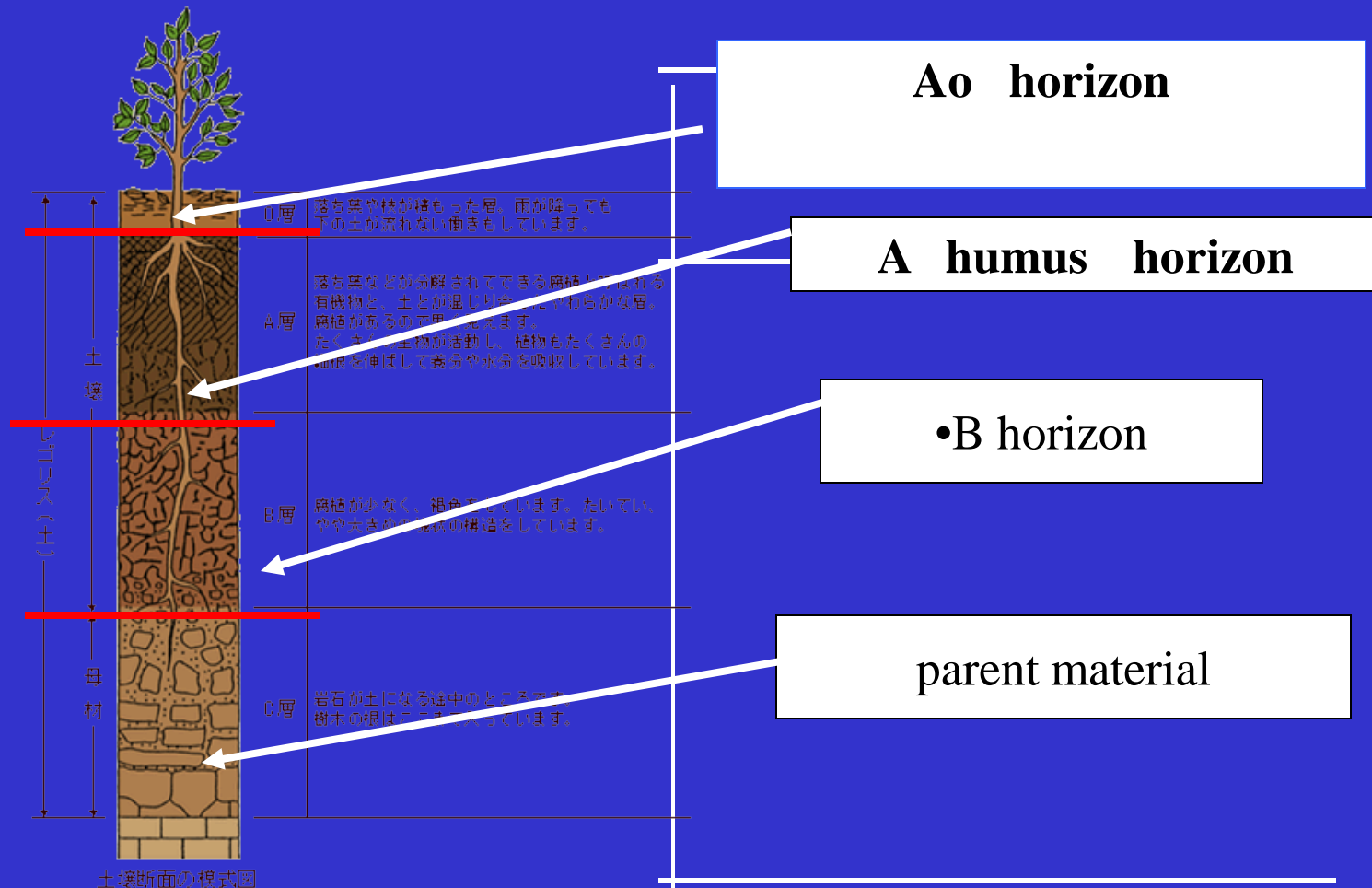


• 1m



1m

# (2)-2 Forest soil



## *(3)climate*

*1.temperature*

*2. wing*

*3.rainfall*

*4.etc*

## *(4)Ground grasses*

- Under tree grass is Indicator



- Light density



- Heavy density

# *Social condition survey*

- 1. Number of workers are available in the villages*
- 2. Low restriction*
- 3. Local needs*
- 4. etc*

- Discussion with local people



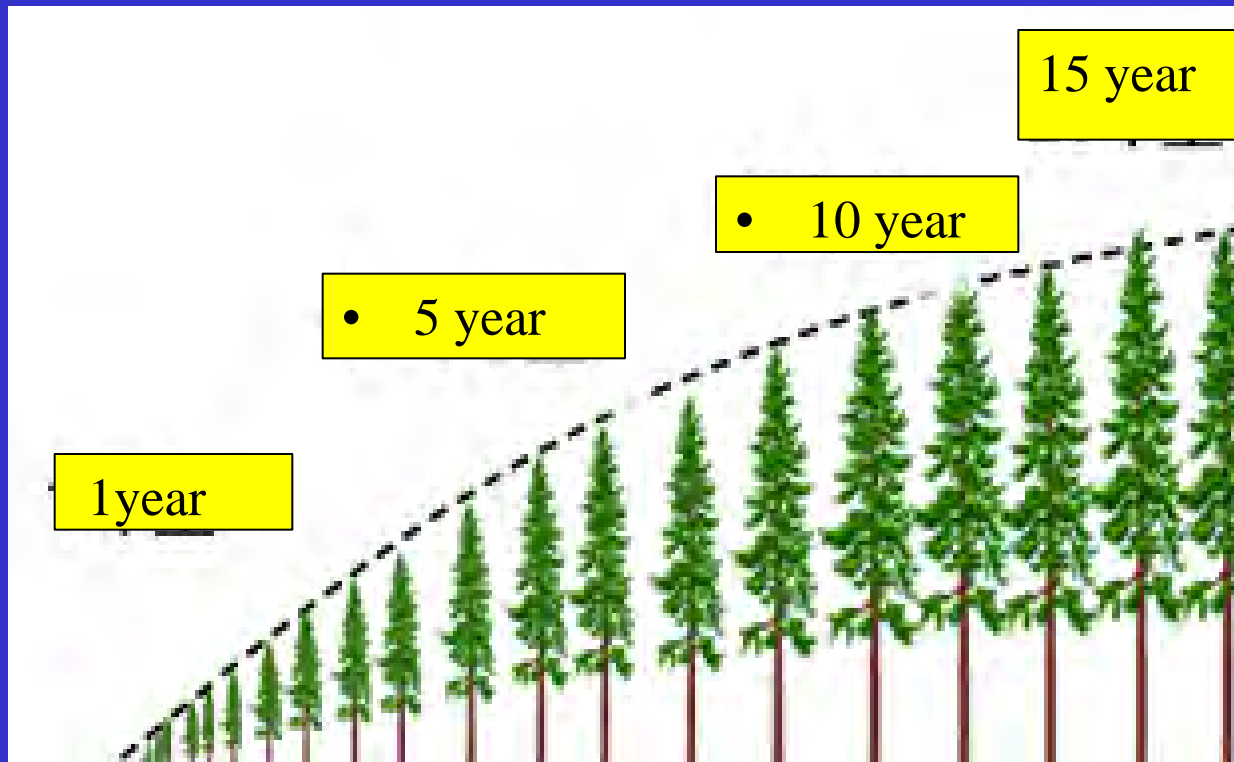
# *Long term Planting plan*

## Three Important Plan

- *1)planting plan*
- *2)Tending plan*
- *3)Protection plan*

# Normal Forest

- 





- Construct of Planted area borad



**ACACIA INDUSTRIES (KELANTAN) SDN BHD** (co. no. 567250-x)

**PROJEK LADANG HUTAN GETAH**  
**LUAS KAWASAN SIAP DITANAM (30/6/2010)**

No	Ladang	Kompartmen	Hektar	Umur Pokok (Bulan)	Jenis Klon
1	Acacia A	C 48	287	45	RRIM 2025 /RRIM 2001 /PB 350
2		C 47	218	43	RRIM 2025 /RRIM 2001 /PB 260
3		C 49	247	37	RRIM 2025 /RRIM 2001 /PB 350
4		C 18/19	343	34	RRIM 2001 /RRIM 2025 /PB 350
5		C 51	214	31	PB 350 /RRIM 2001 /RRIM 2025
6		C 38/44	337	12	RRIM 3001 /PB 350 /PB 260
7		C 56	61	1	PB 350
8	Acacia B	T0 2	320	18	RRIM 2001 /RRIM 2025 /PB350
9		T0 3	294	18	PB 350 /RRIM 2025 /RRIM 2001
10		T0 4	453	18	PB 350 /RRIM 2001 /RRIM 2025
11		T0 1	245	18	PB 350 /RRIM 2001 /RRIM 2025
12		T0 6	227	14	RRIM 2001 /RRIM 3001 /PB 350
13		T0 5	476	10	RRIM 2025 /RRIM 2001 /RRIM 3001
14		T0 8	393	7	RRIM 2001 /RRIM 2025
	<b>JUMLAH</b>		<b>4115</b>		

# Forestry registration

- Name of national forest and compartment  
Management type/
- Protection forest/
- Production forest etc.  
Management method of protection forest
- Management plan/
- Long-term raising Area  
Forest condition  
Land description

# *Planting Work*

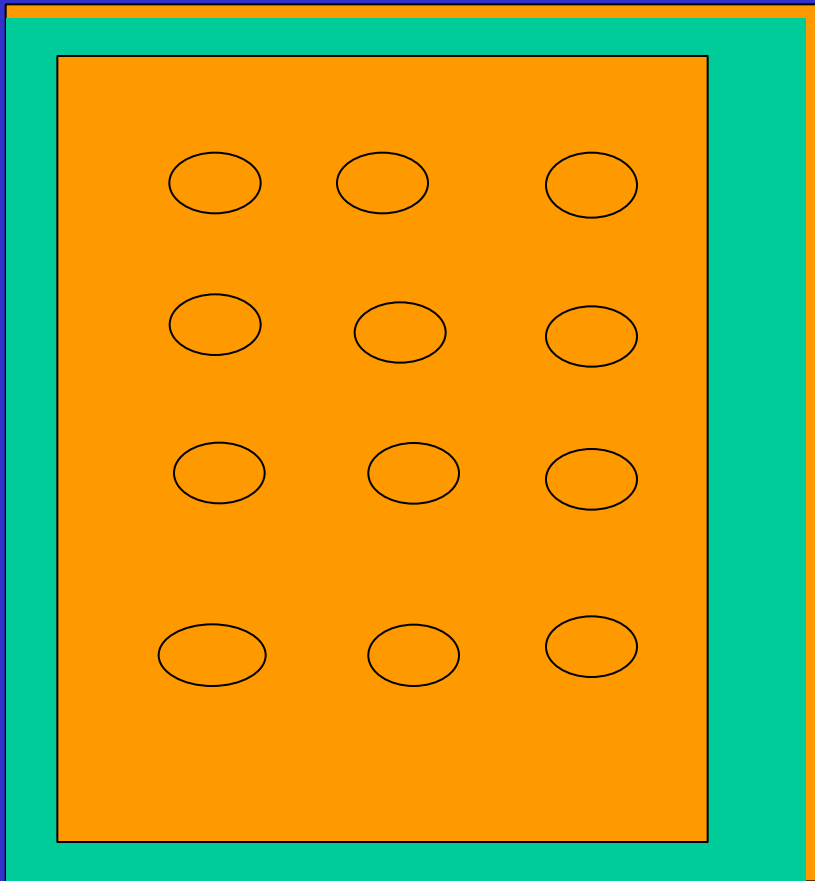
## **1.preparation type**

**clear ,line ,box**

## **2.planting type**

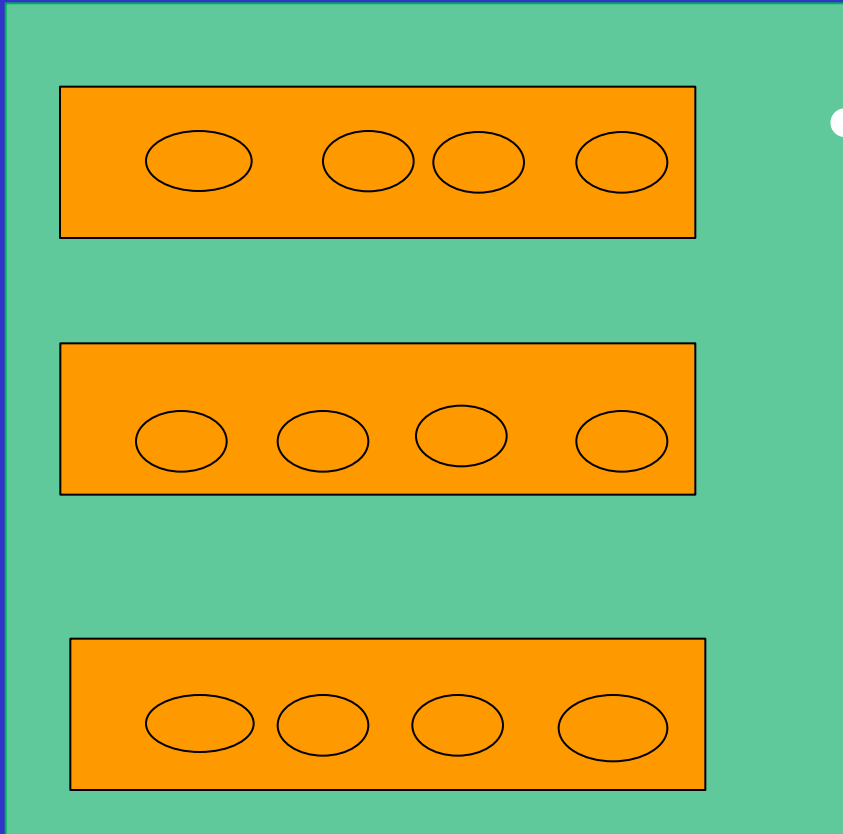
**species, seeding ,number of  
seedling ,planting distance, planting  
season**

# Type- Clear



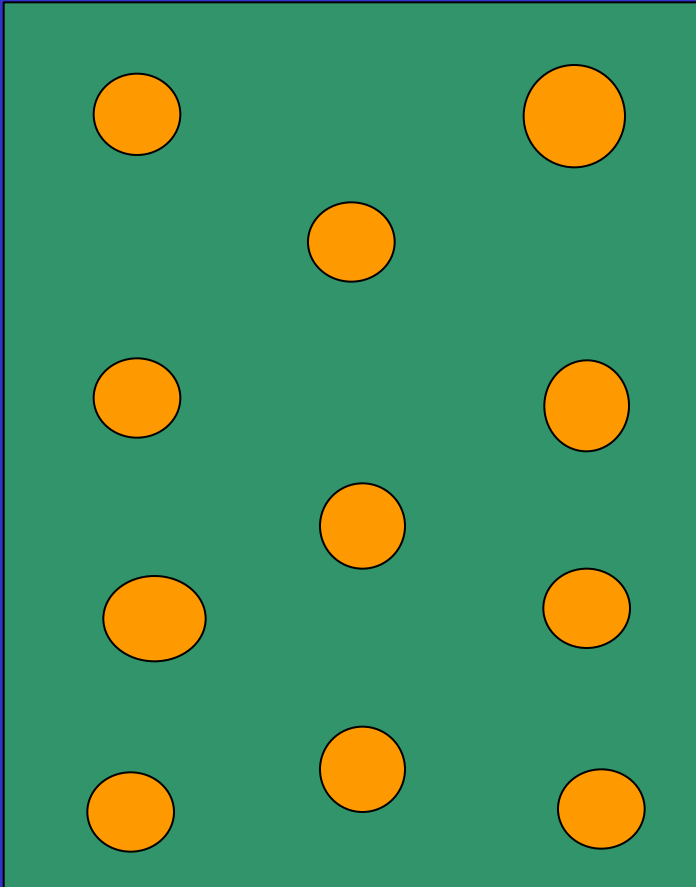
- 1. cost is expensive

# Type- Line



- 1. cost is cheap  
2 happen  
sometimes  
damage by  
animal and  
insect

# Type-Spot



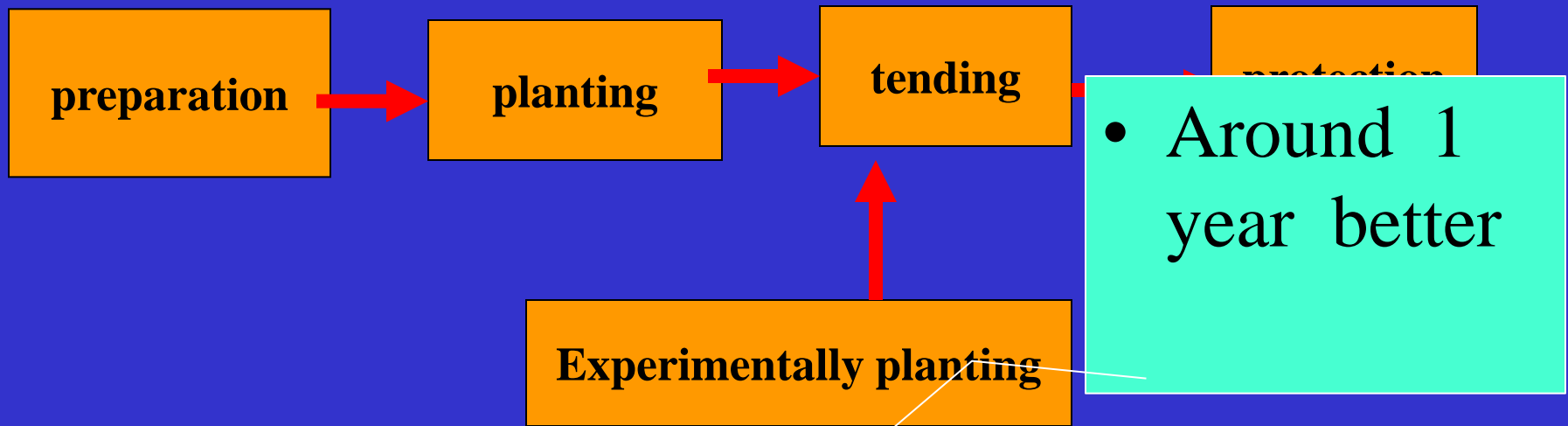
- 1. cost is cheap
- 2. happen sometimes damage by animal and insect

# Planting plan



- Planting hole dig about 1 month before
- Planting hole size is 30cm-30cm square ( $3 \times 3$ ).
- Spacing of the seedlings in the plantation is adjusted depending on the intended uses of the trees

# *Planting process*



- Around 1 year better

Experimentally planting

Consider Survival  
rate 85%



# *Tending plan*

1. Weeding (clear , line, box)
2. Climber cutting,
3. Pruning
4. Thinning( line, quantitative)

# *Protection plan*

1. Insect and animal attack - Control method

- chemical (repellent) ,
- electric (electric wire) ,
- fence (wire netting around planting area or each tree)

2. Forest fire (construct fire brake

width , planting trees (do not burn so early)

# *Artificial forest plantation*

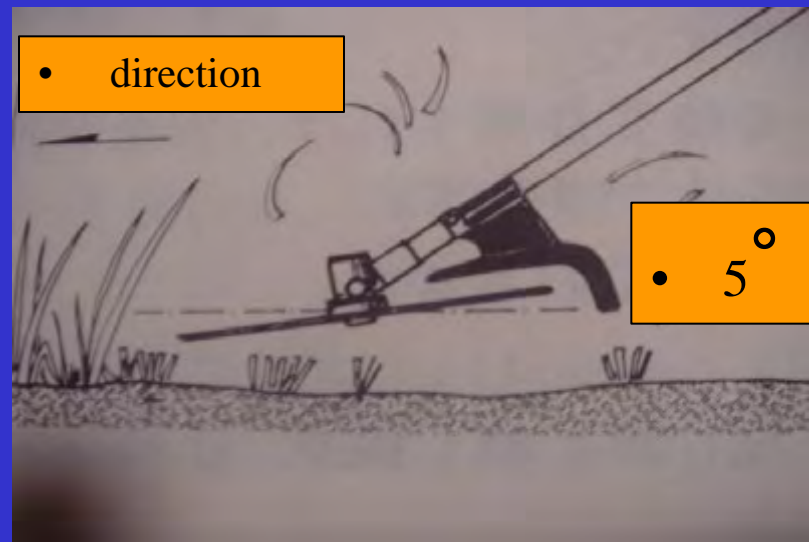
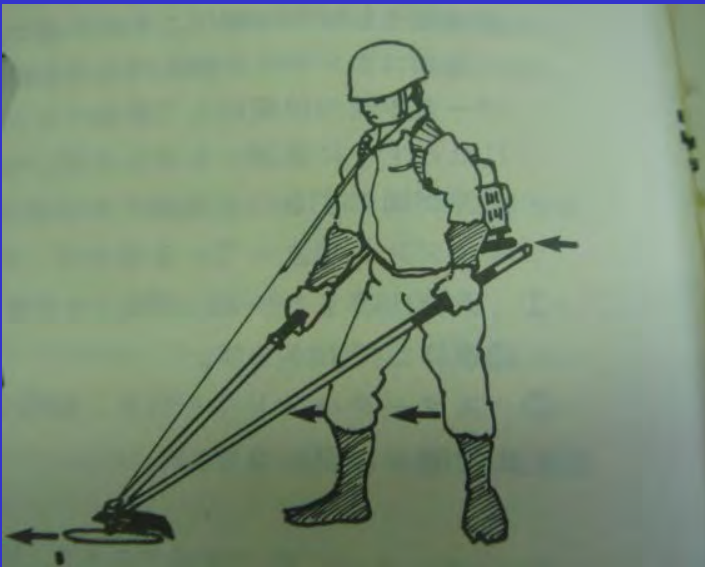


Dry brown forest soil

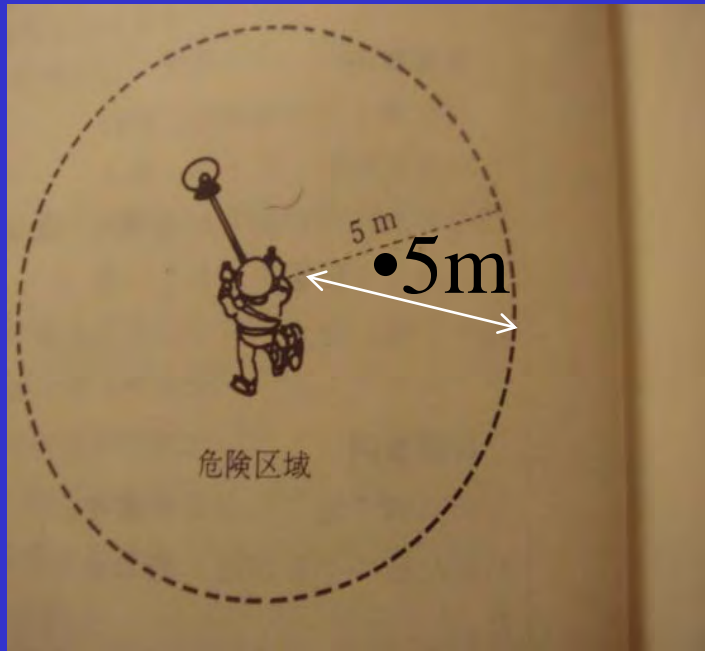
Suitable brown forest soil

Wet brown forestsoil

# Safety work



# Safety work



- When you cutting grass by bush cutter around small tree , you have to keep distance with other workers about 5m.

# Safety work

- When you use bush cutter , you have to move step from left leg and next move right leg.



# Safety work

- You have to distance each other with other worker .



# Safety work

- Don't smoke beside fuel.





# Safety work

- Be care full, There many obstacle in the field,



# Safety work



- Don't take a big swing ,when you cutting grass around tree.

# Safety work



- Don't use sickle beside other worker.
- You have to keep distance each other .

# Planting work

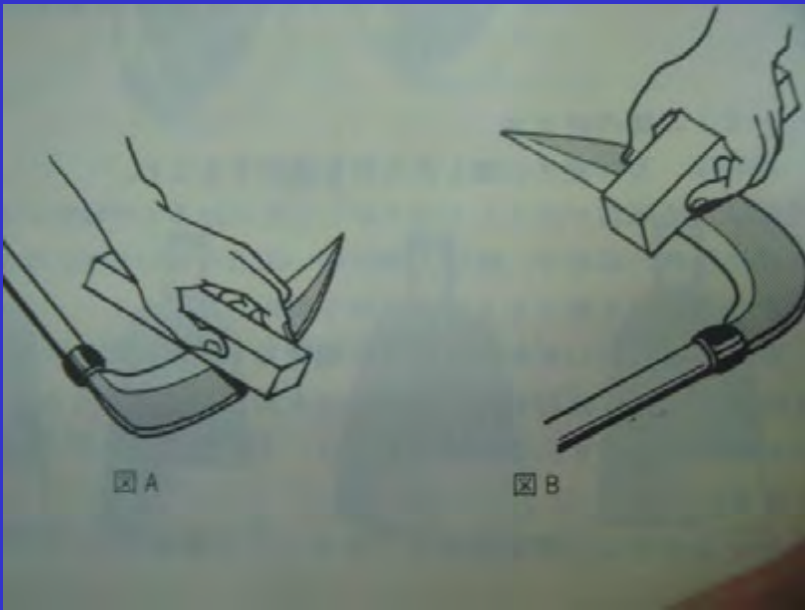
## *Planting of Important point*

1. Do not dry up seeding root
2. select Good seedling
3. Do not small dig hole
4. Push soil around ground
5. Maling around planted seedling
6. Hole size -depending rote size



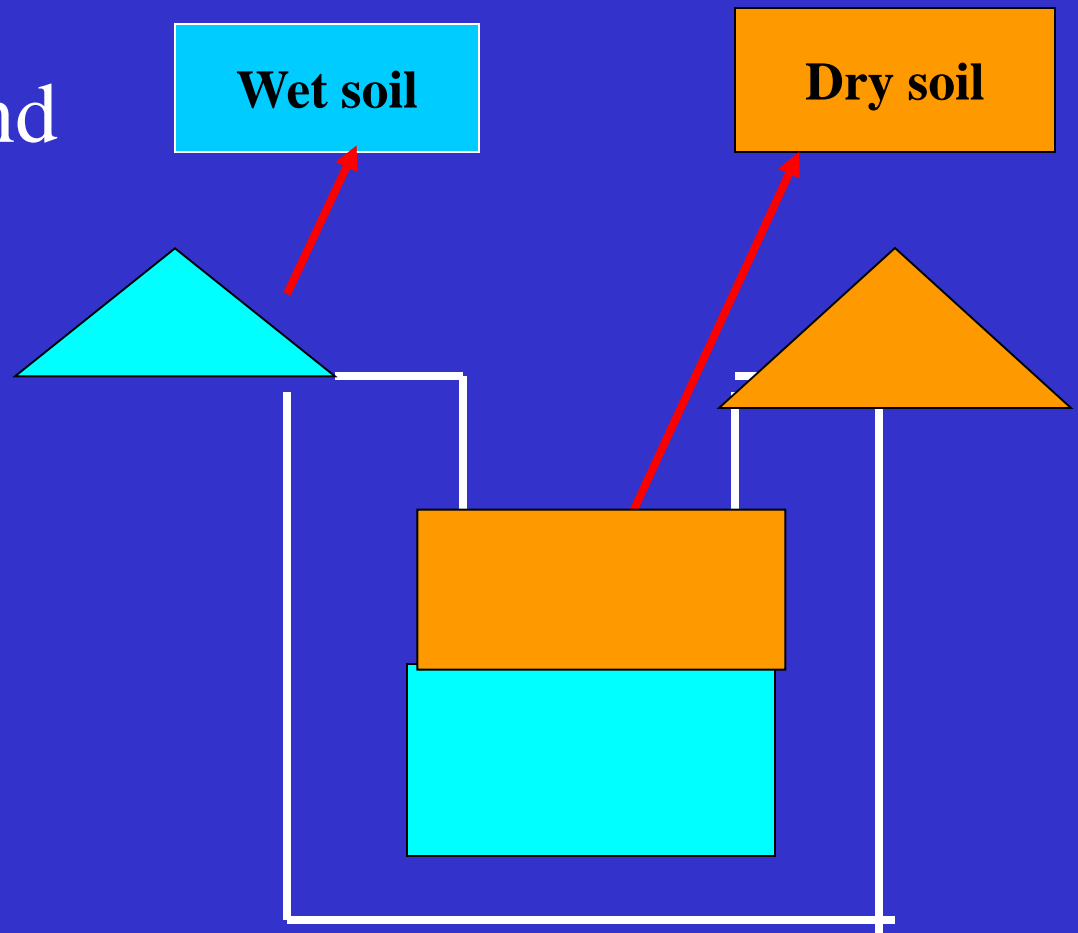
# Safety work

- Don't look other way ,when you grind a edge of sickle .



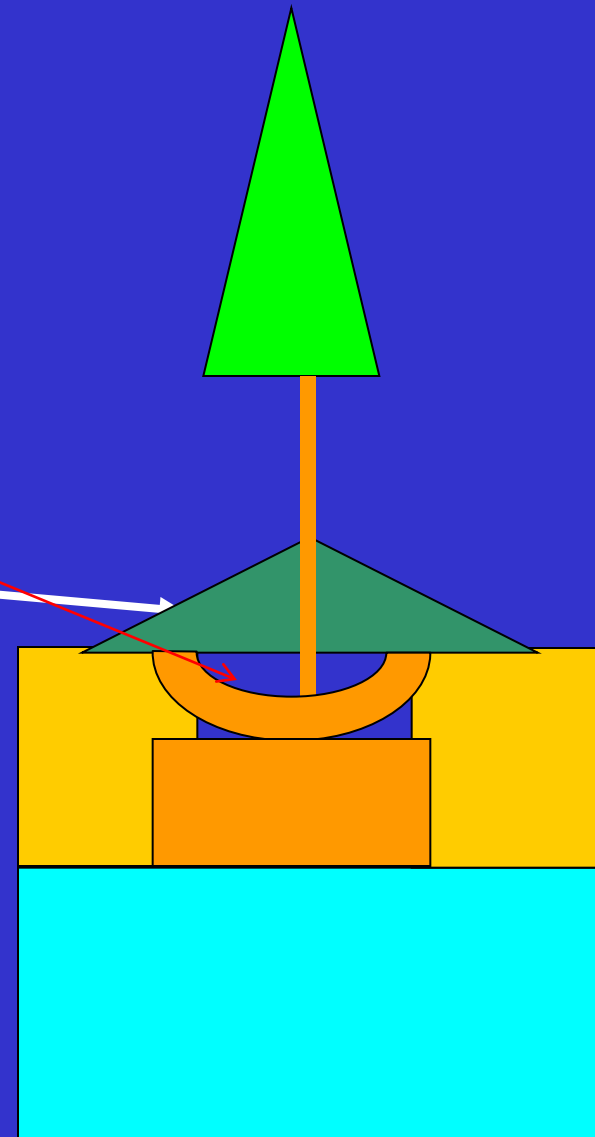
# *Planting process of soil*

Divide wet soil and  
Dry soil

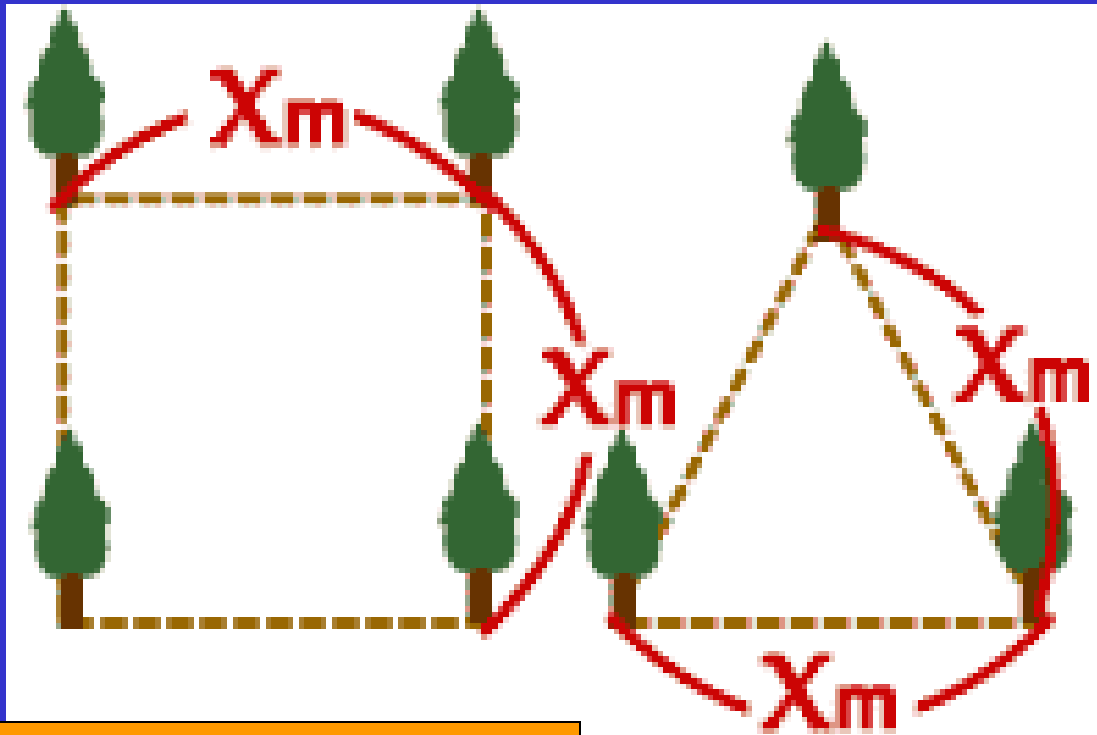


# *Planting method*

- 1. Moon type of soil surface
- (You can Save rain water)
- 2. Marching Cover grass  
Two purpose  
shade from sunshine  
effective fertilizer
- (Be careful about termite attack)



# Planting method (space)

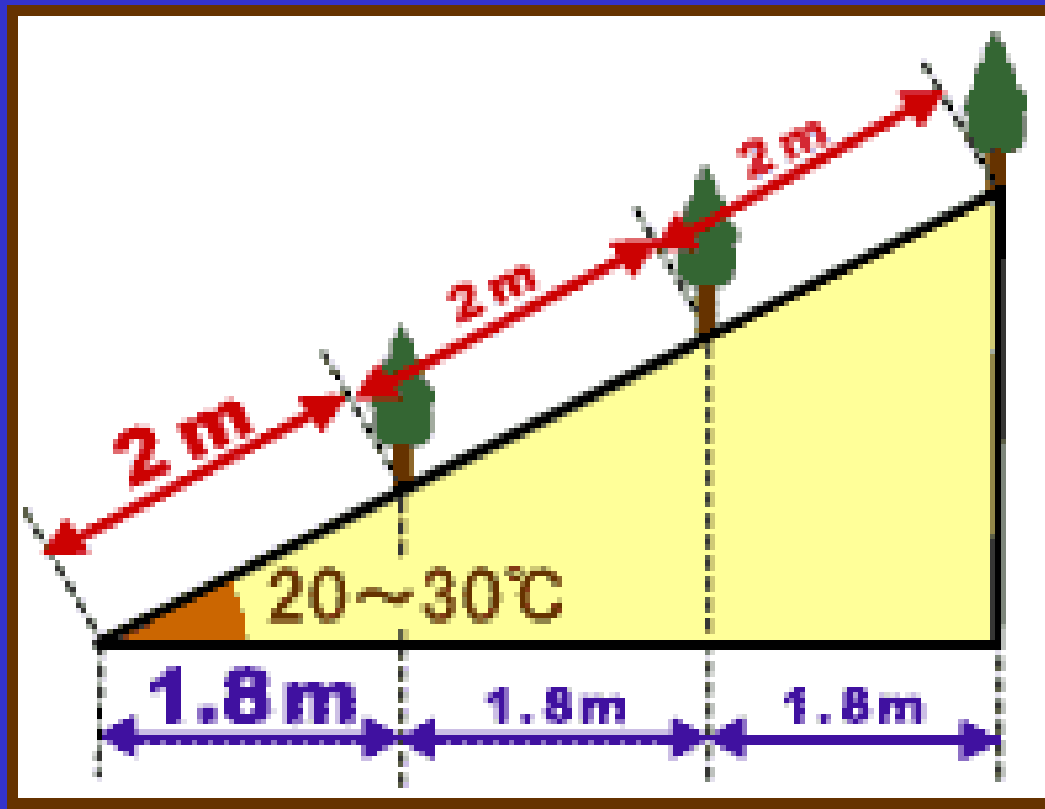


• Square planting

• Triangle planting



# *Distance in the slope land*



# •Weeding work

## Weeding work point



1.Season

2.Method

- Machine or man power

3.clear weeding,  
line weeding,  
pot weeding

•

# Pruning work



- Cut branch beside trunk

# Pruning track

- If you cut branch good timing , it is good well of quality timber .

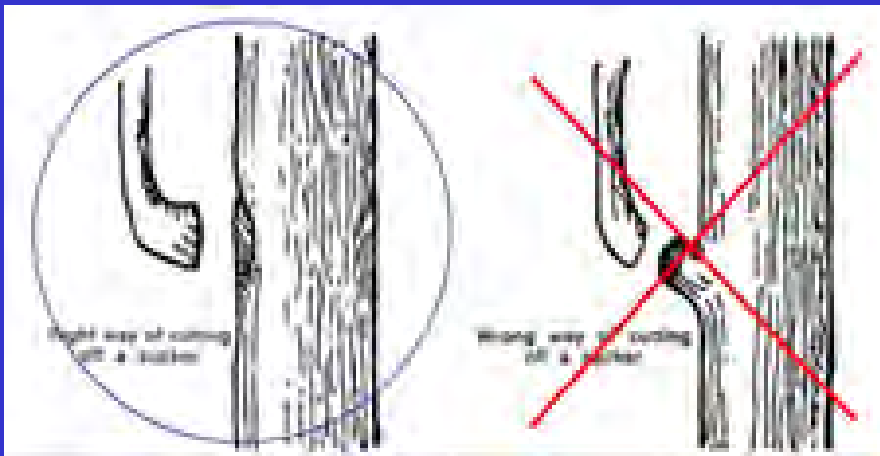


# Good pruning



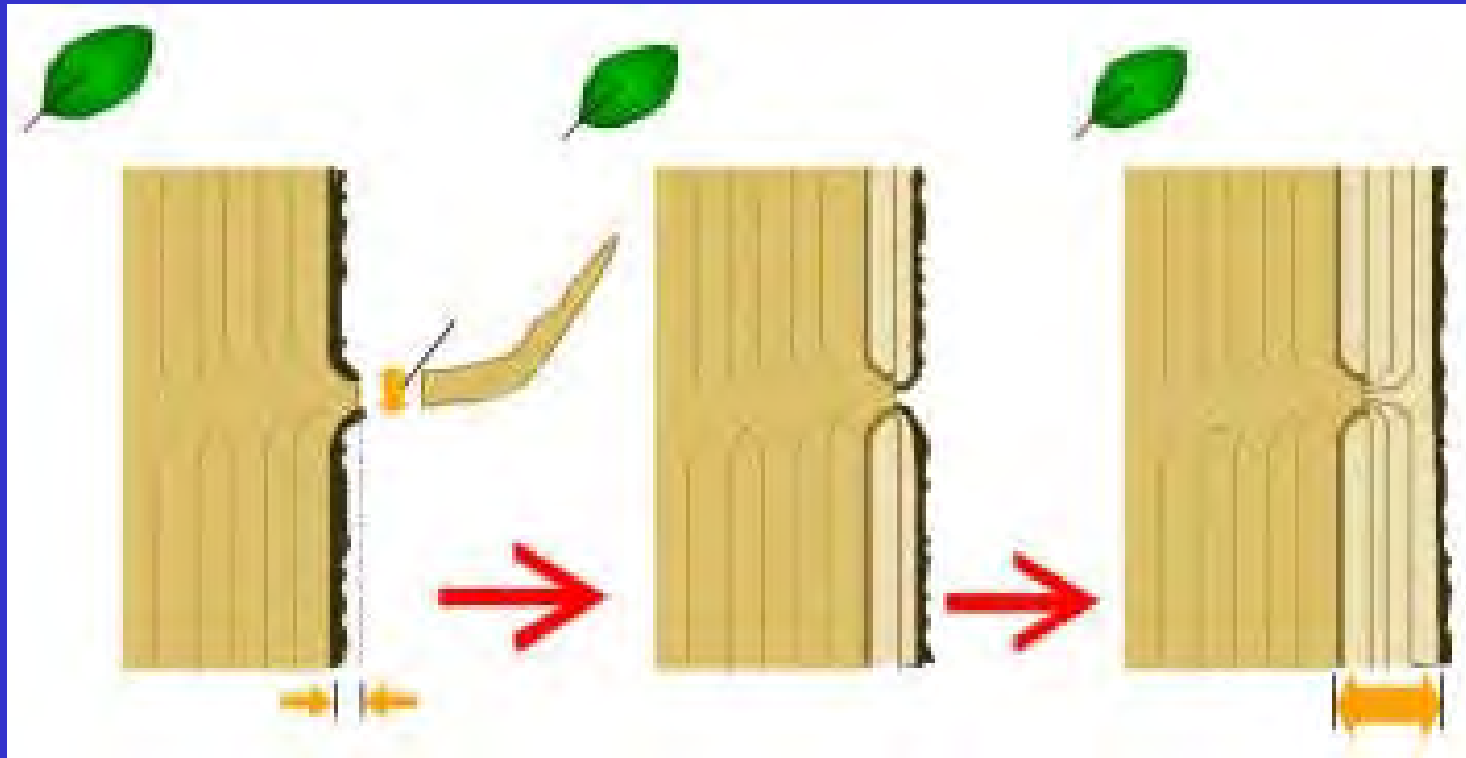
- 1.Branch track is inside of wood
- 2.wood quality is good

# Pruning method



- Suckers must be cut off close to the trunk

# •Pruning of point



# Dead Knot



- Dead knot

- When take wood is not so good of quality



# Thinning work



# *Forest which has not been thinned*



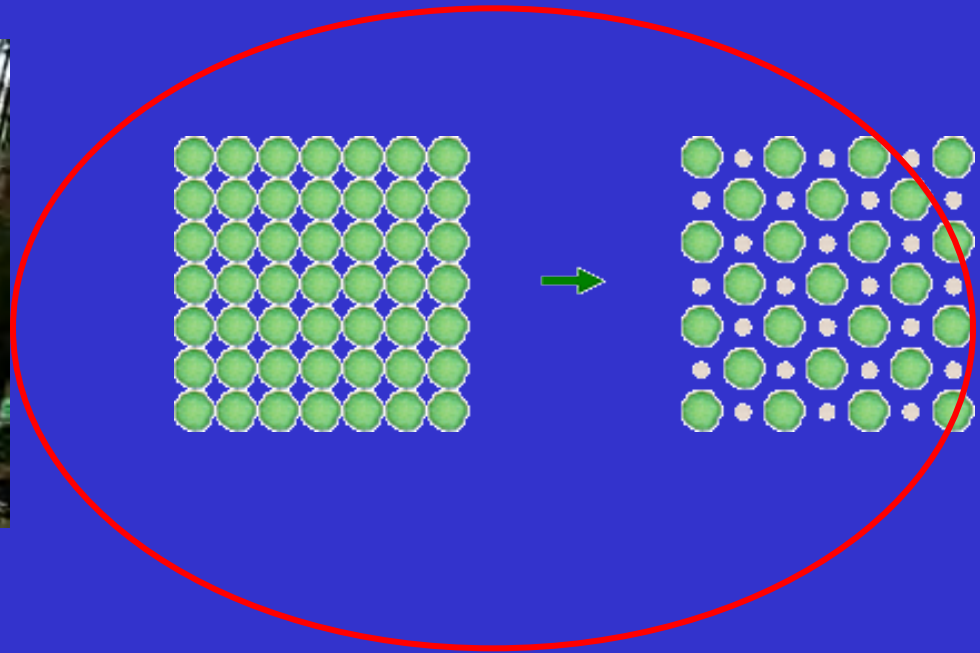
**Dark in forest**

**No grass**

**Weakly tree**

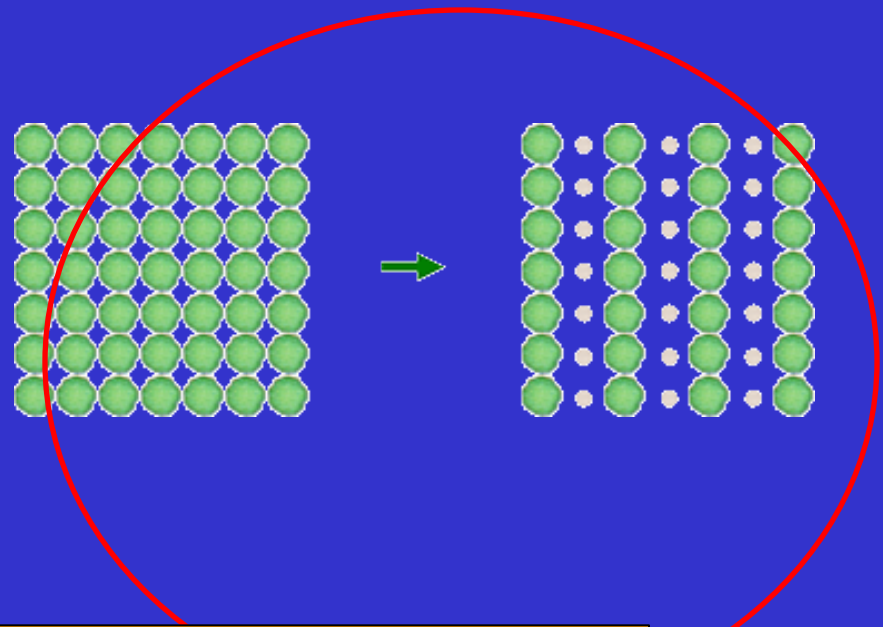
**Soil destroy**

# Thinning type- Qualitative thinning



- Select techniques high level

# Thinning type-Line thinning



Select techniques not so difficult

# Heart not

- Most serious of which is heart not about *Acacia Magnuim*

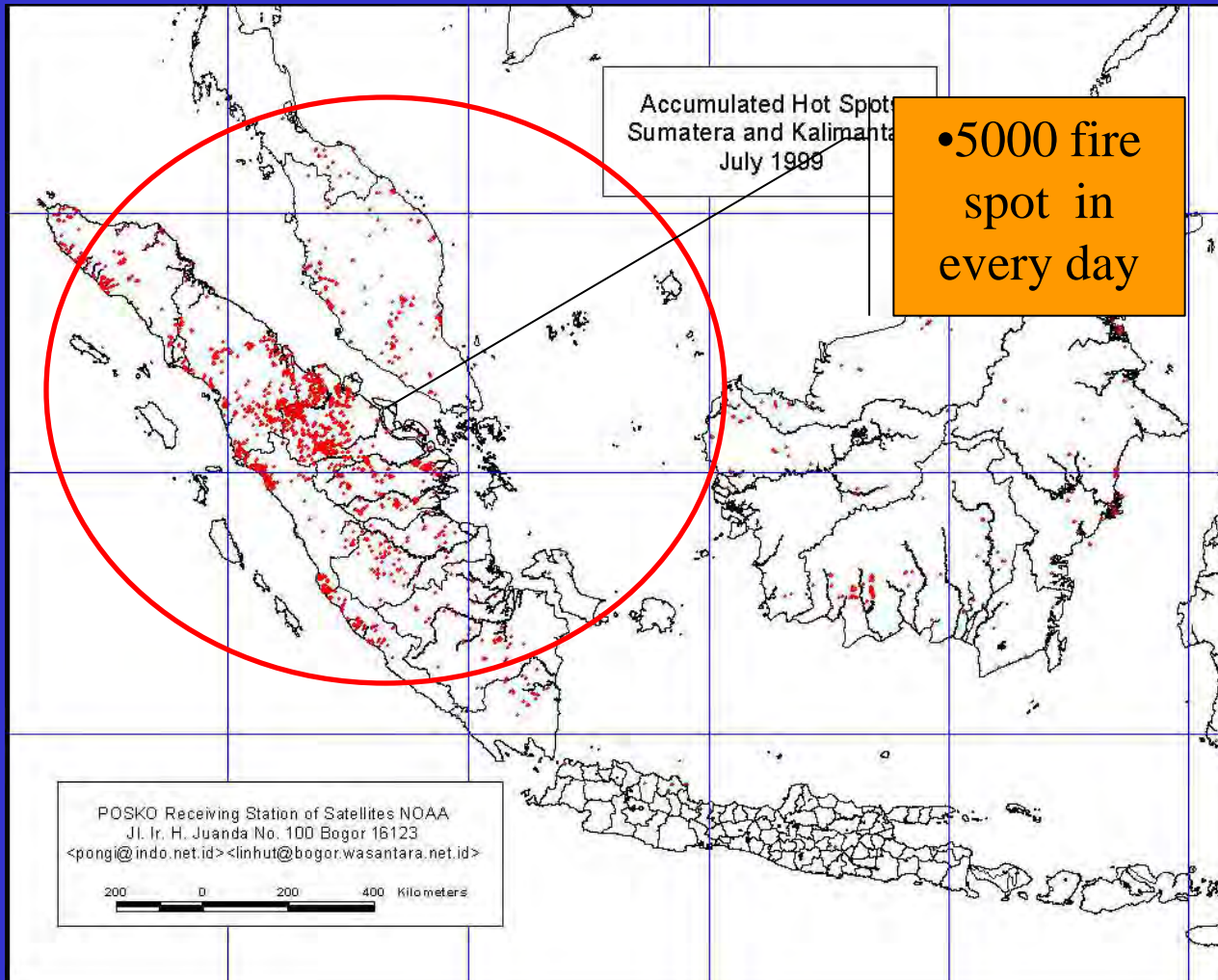


- Heart not

- Forest fire protection
- - Indonesia forest fire situation-



# *Hot spot in Indonesia*



# Forest fire from the farm in Indonesia



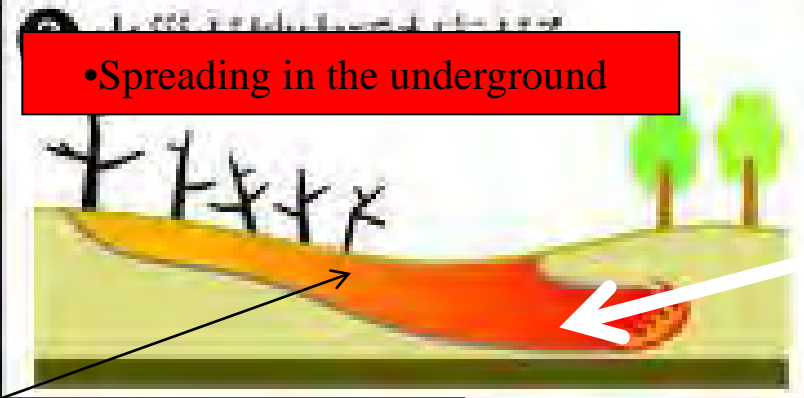


# Mechanism of peat fire

- Groundwater go down by development



- Spreading in the underground



- Slash and burn faming



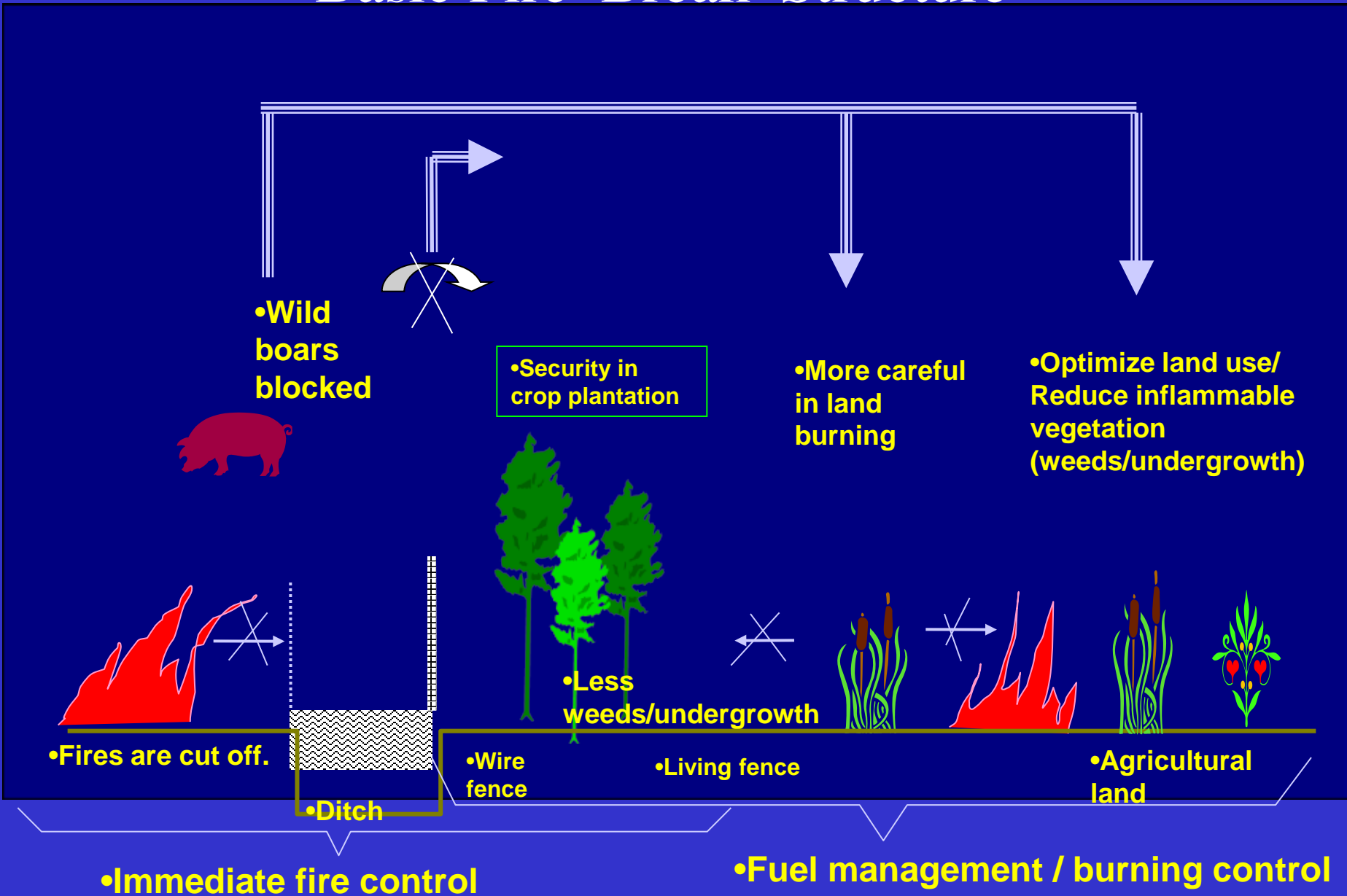
# *Forest fire from Sifting cultivation*



# *Forest fire prevention activity*

- 1. publicity by television and radio.
- 2. publicity and watching by helicopter.
- 3. Forest fire prevention parade.
- 4. Forest fire prevention patrol.
- 5. Forest fire prevention conference.
- 6. banner and signboard
- 7. poster contest and distribution of poster.

# • Basic Fire Break Structure



# Fire protection board is drawing by local people



It is drowned slogan by local people .

- This is very important. Because they are understand where place is danger place .



# Important of use of Local materials

- Very useful local material of **bamboo** and small diameter tree



# Bamboo flapper

- Bamboo flapper is completed



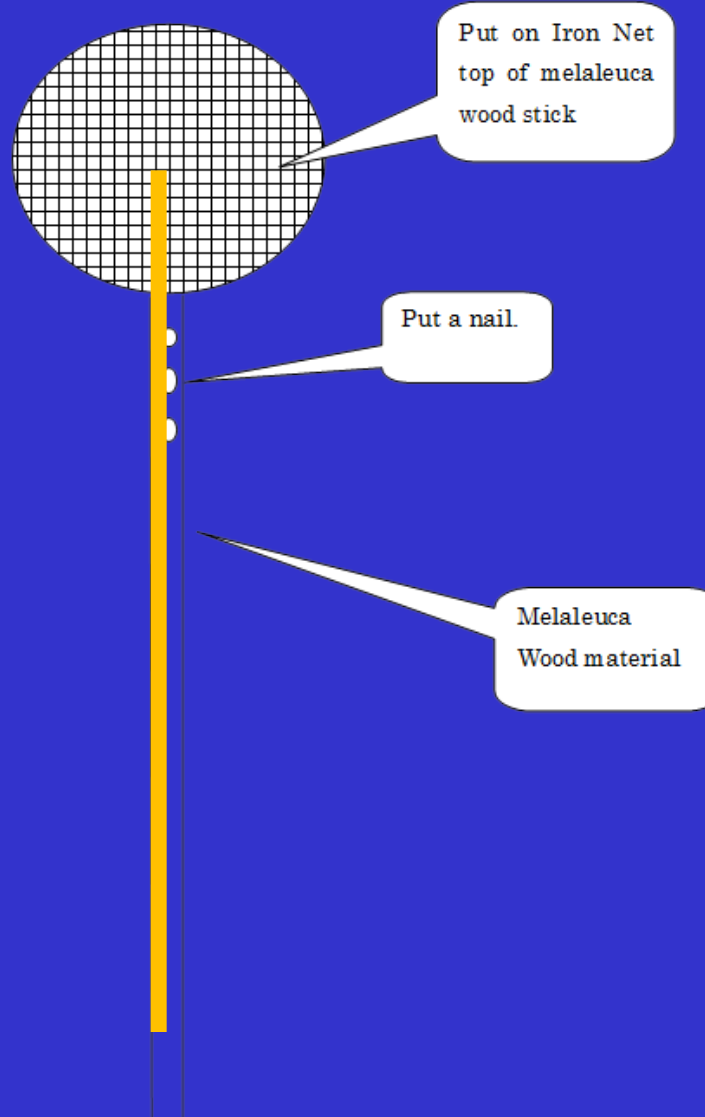


# Iron net flapper

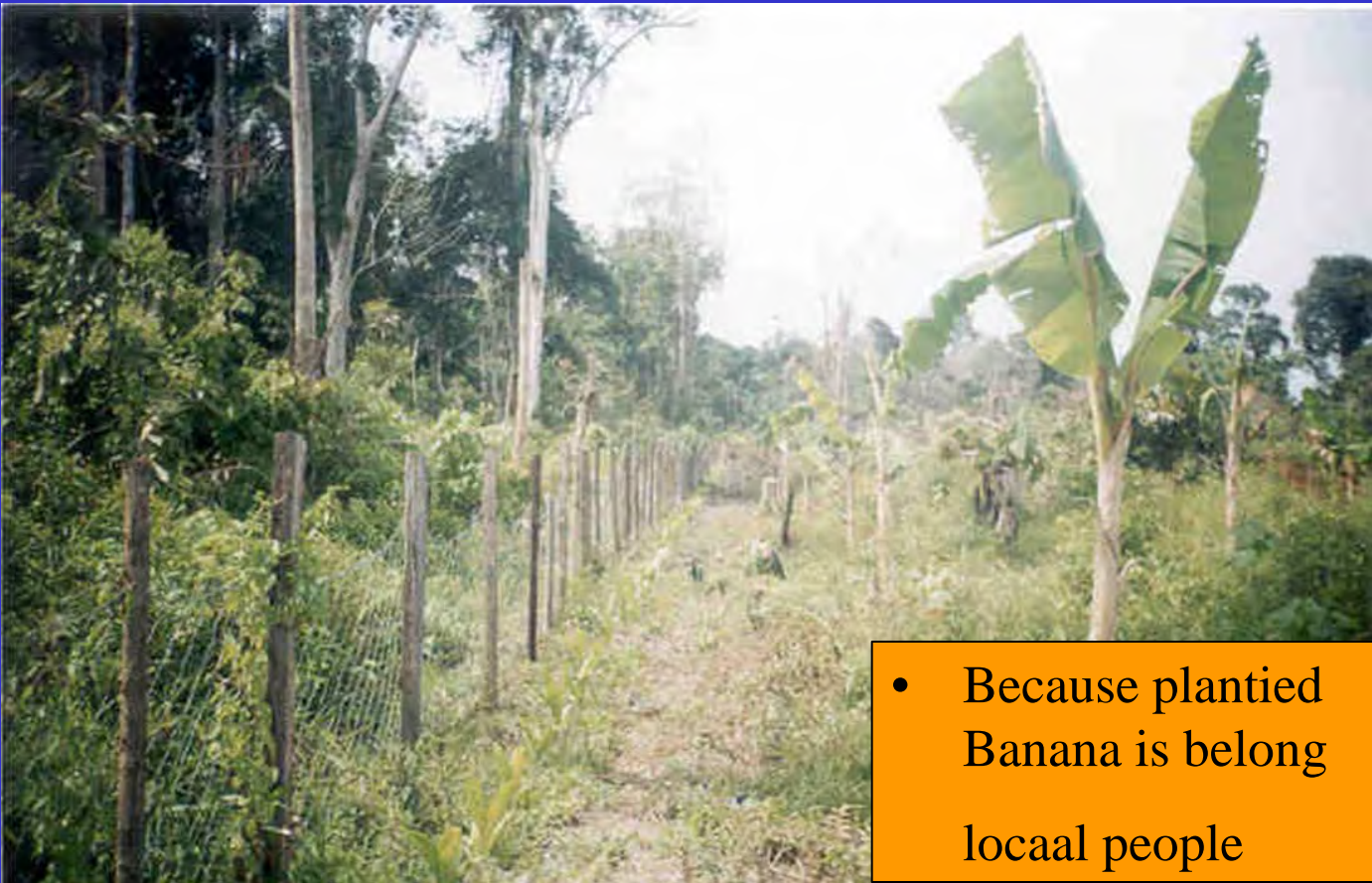
- Iron net flapper is completed



# Iron net flapper



- Fire Break of planting banana, If local people plant banana they don't put on fire so much



- Because planted Banana is belong local people

# Practice of fire protection



# How to carry the hand tool

Bad



• Good



# Forest Fire Material storage

- Put in order about material



# Construct of Fire brake by man power



# Fire brake



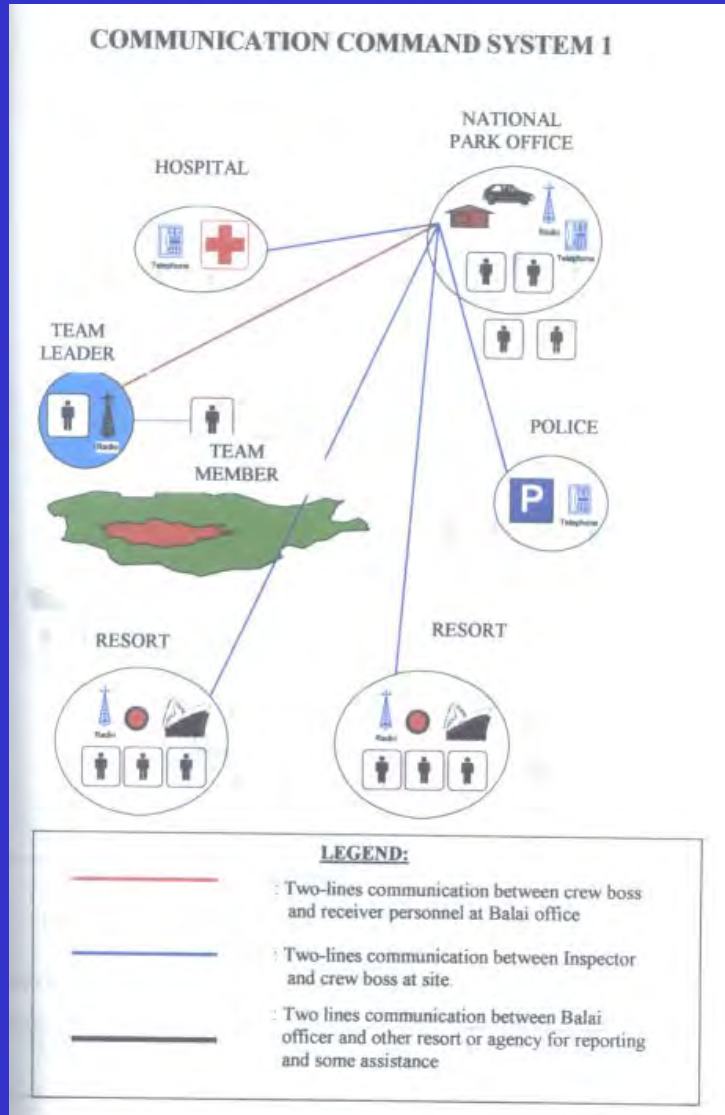
- In planted area ,you have to make the interval between each planted of compartments.



# Stand fire sign board



# Emergency system



- Hazard map and communication map on the wall

# Fire Danger Level



- In front of plantation ,you make a message to local people
- Today danger or not

# Forest protection of animal

## Protection by Ditch protection from Elephant



- Elephant can not pass to farm

- Protection by electric line from animal



# Protect fence to the deer enter in the forest of Japan

- Deer is eating bark of tree



# Protection road condition from rain



- This is very useful method .Old tire is used to protect of destroy of road condition from running water

# Thank you



- Acacia mangium forest is finished of pruning



# Logging techniques



Japan

Japan

Association

tion

# Main contents

1. Forest Resources Survey
2. Cutting tree
3. Cutting log
4. Timber yard
5. Safty standard

# Forest Resources Survey



Before harvesting trees ,you measure of inventory standing tree volume

# measure of tree diameter

Caliper



Diameter tape



# Measure of tree height

Clinometer



Digital clinometer

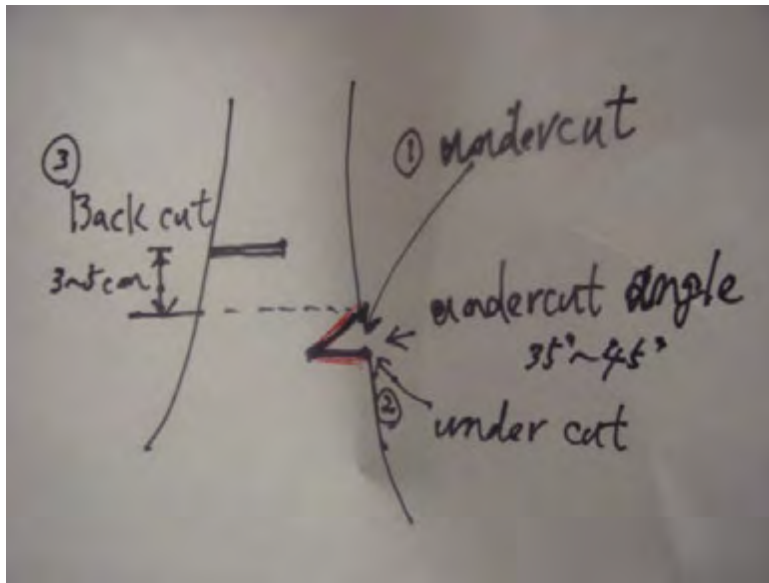


# Attention of Standing Tree is Cutting



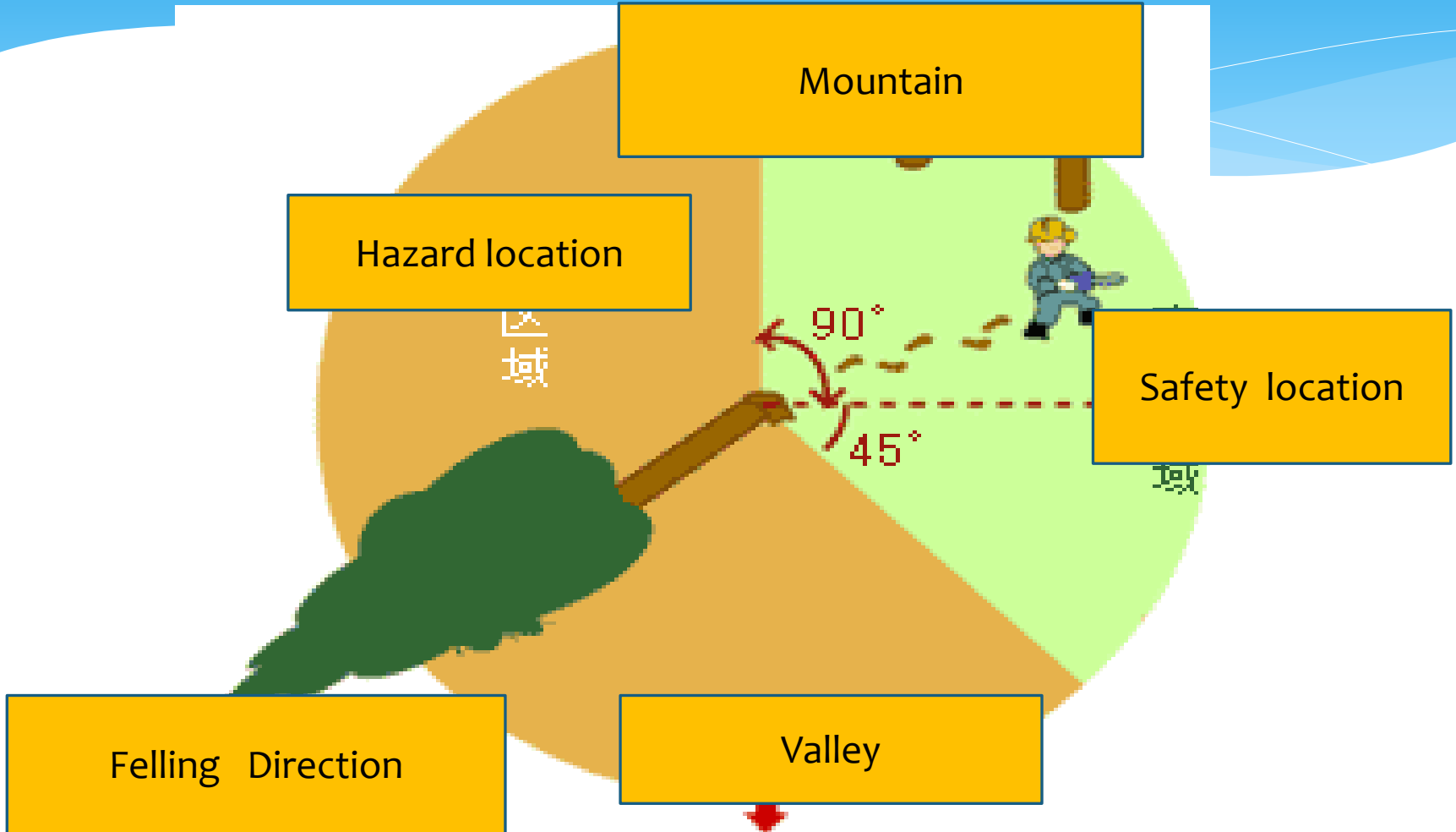
Before cutting tree ,you must check around cutting area .2.and also you must say loud voice.

# Fell down tree method



- \* 1. at fast under cut of upper portion
- \* 2. under cut of down portion
- \* 3. finally cut tree back cut from opposite site

# Safety direction of fell down tree

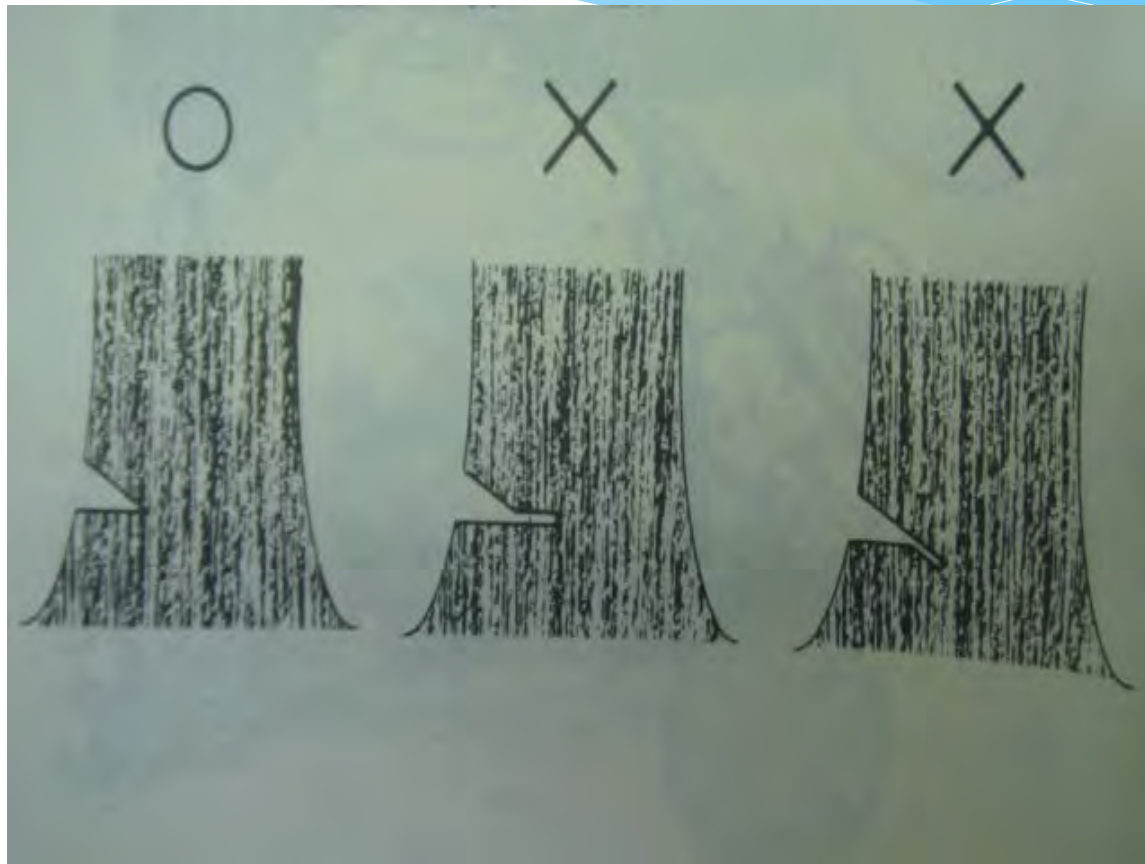




# Standing Tree is Cutting



# Under cut

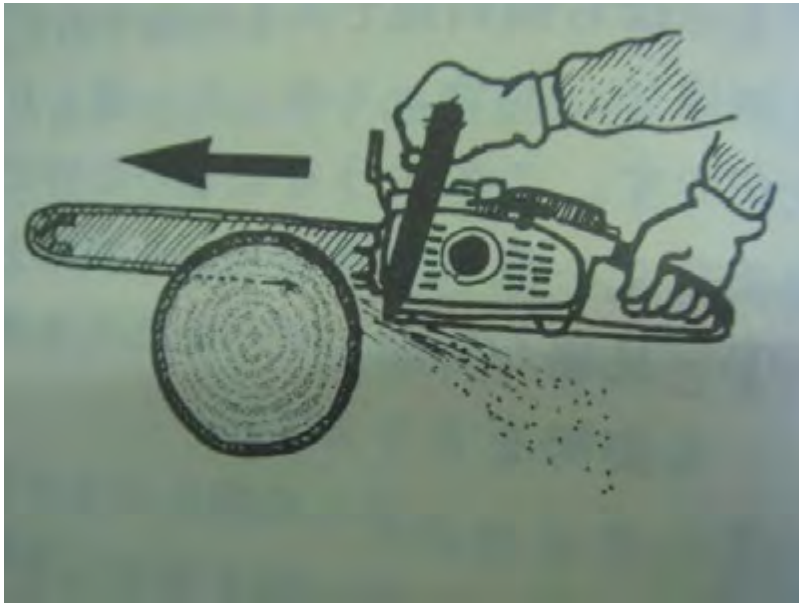


# Fell down tree



- \* Tree fell down desisted direction.

# Log cutting



- \* Cutting by under of bar of chain saw

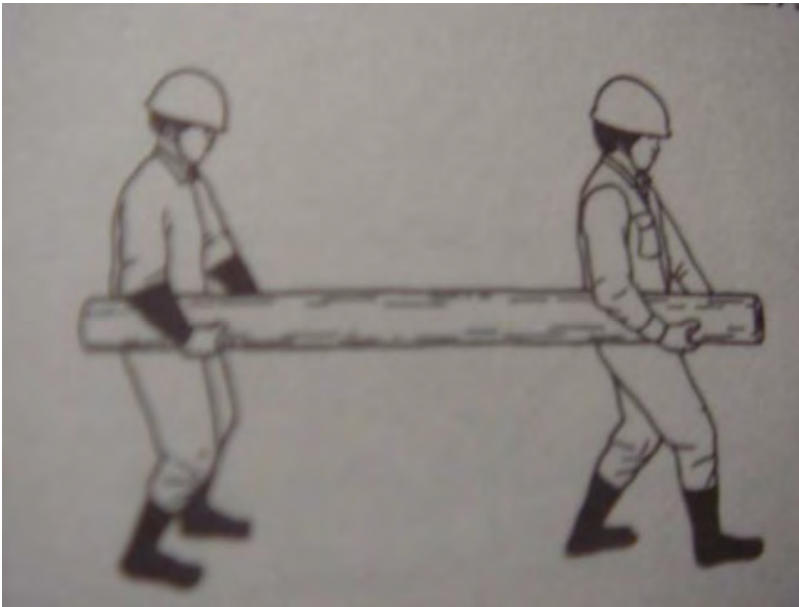
# Cutting log



- \* After fell down tree ,cut to log of size (2m,3m,etc)

# Carry log

- \* Hand carry by man power

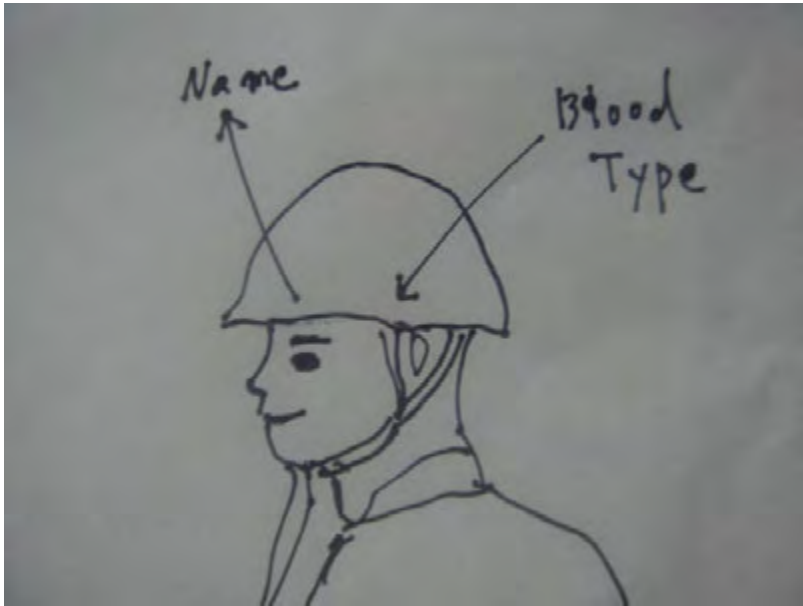


# Timber yard

- \* After cutting the log is
- \* Kept at timber yard



# How to wear a helmet



- \* 1. When you wear a helmet, you have to write your name and fasten tight on chin.
- \* 2. you write blood type on helmet, because if you injured at somewhere, you can get blood easily through hospital.



# Preparation exercise



- \* It works after it limbers up, and the body is untied enough.

# Prohibition of vertical work



- \* If you work at area with an inclination, sometime fell down stone and etc.

# Basic movement



- \* It walks by using the entire back of the foot as much as possible when going up on the slope.

# Basic movement



- \* The stone is not dropped under the slope.

# Physical condition work



- \* It does to work by the physical condition of thorough. It takes a rest when a lot of moisture and salinities are taken, and it becomes tired.

# Be careful of bee and some insect when enter the forest



# Accident



- \* It loudly informs them when the wounded go out.

# Thank you





# Wood Crafting Techniques of Acacia Manguim



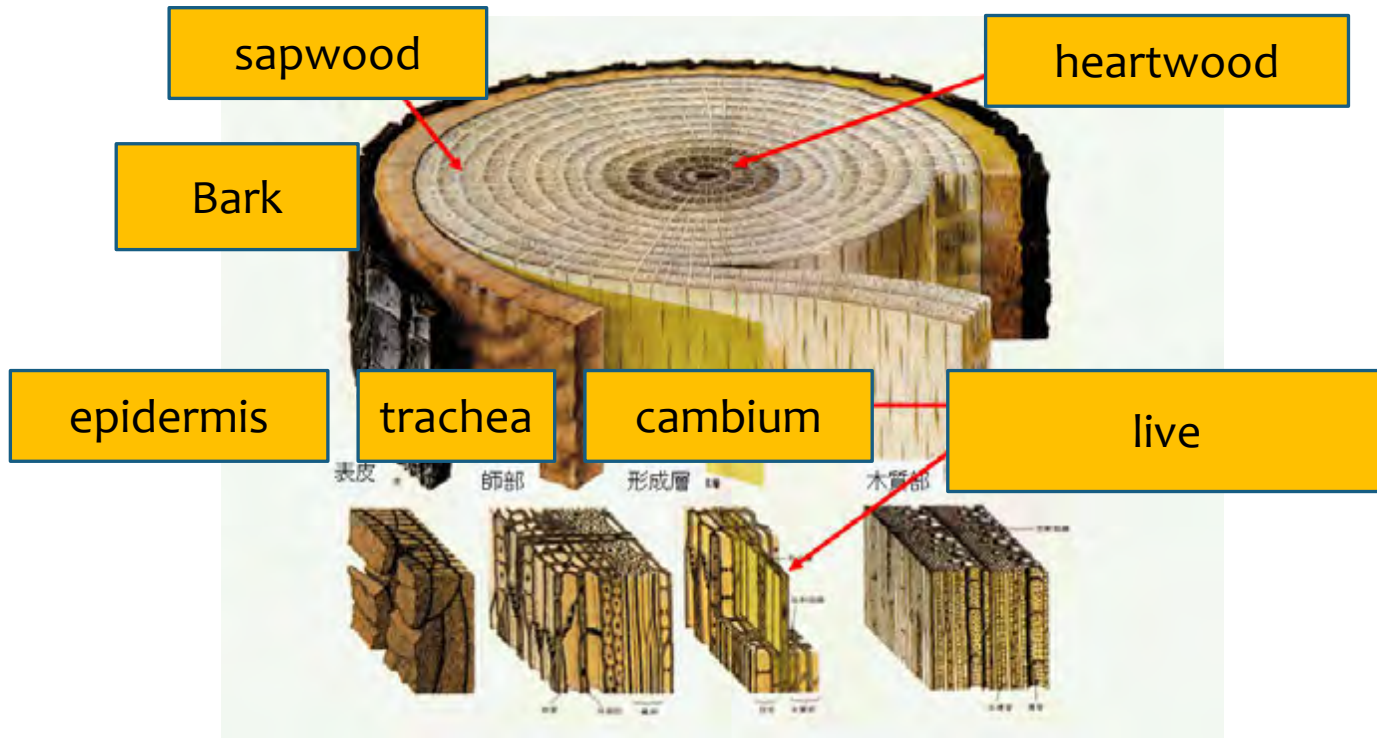
# Main Contents

1. Wood production
2. Wood composition
3. Transportation log from mountain log
4. Safty standard
5. System of Wage work for sawmill
6. Preparation to sawing
7. Natural drying of timber
8. Plane a board smooth
9. Wood conversion
10. Forest certification

# Wood products from *Acacia magnuim*

- \* Timber, pulp, plywood, particle board.
- \* **Fuel wood:** 4800-4900 kcal/kg, produces high
- \* quality charcoal.
- \* **Fodder:** generally considered a poor fodder tree.

# Wood Composition



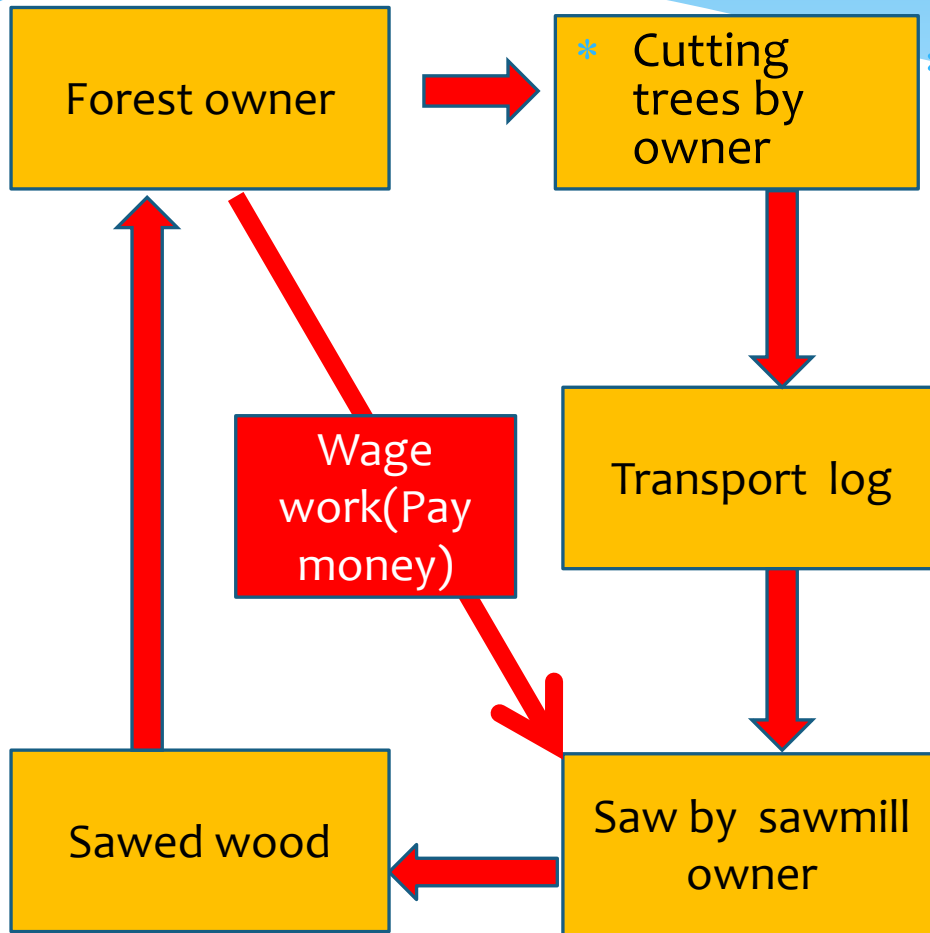
Transported from mountain side



# Safety standard

1. It is better Wearing of protection by glasses
- 2.The uniform is correctly wear gloves are not used as there is not rolling clothes.
- 3.The putting condition of saw edge is seen.
- 4.It tries with the moving slightly switch.
- 5.It is looked whether there is moving [ before and behind saw edge
- 6.It is confirmed whether there is abnormality (The sound unusual sound ).
- 7.It switches on the rotation begins to be steady completely.
- 8.The tip of a finger is noted.
- 9.Attention of Cutting log with knot .
- 10.Use prohibition at nighttime

# System of Wage work for sawmill



\* After cut trees by forest owner transport of timber in log form.

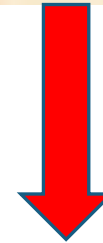
\* It is a system that orders the saw only in sawmill and pay wage work as for the material wood.

# System of Wage work for sawmill

Trance port log by forest owner or Lumberman



Arrived sawmill



Sawing by Lumberman



Same material arrived to forest owner





# Preparation to sawing of Acacia manguim Wood log



# Sawing process



# Contact prevention material



# More smaller cutting process



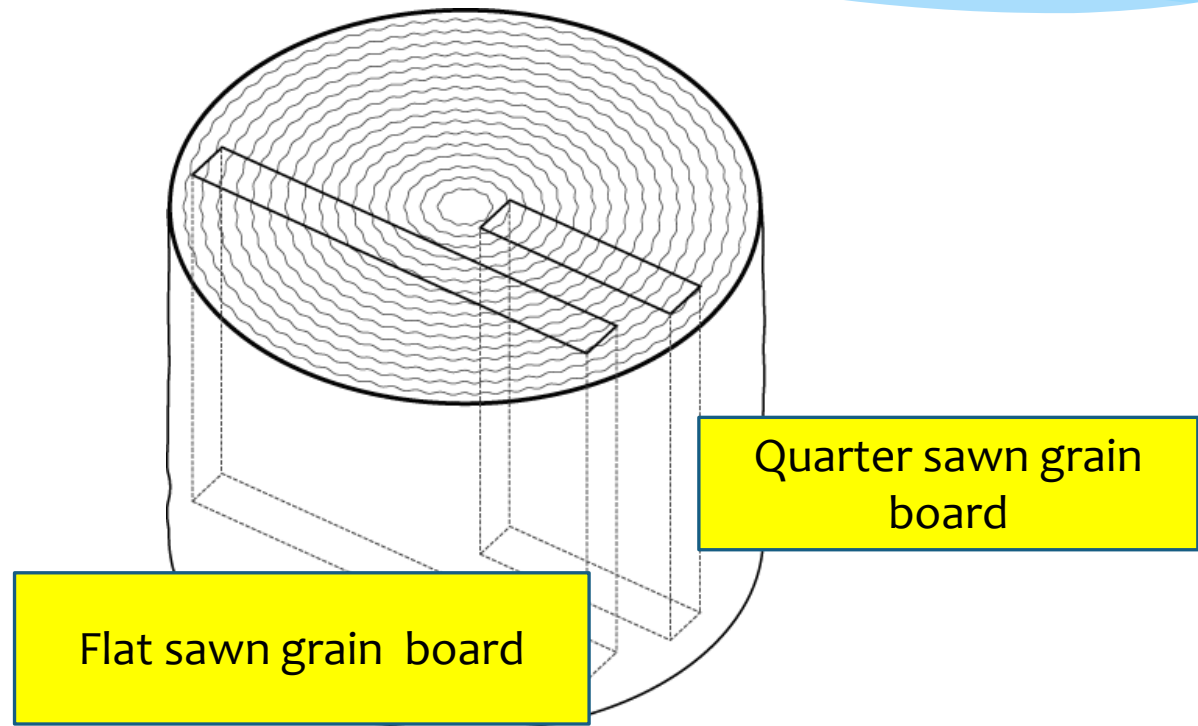
# Natural drying of timber



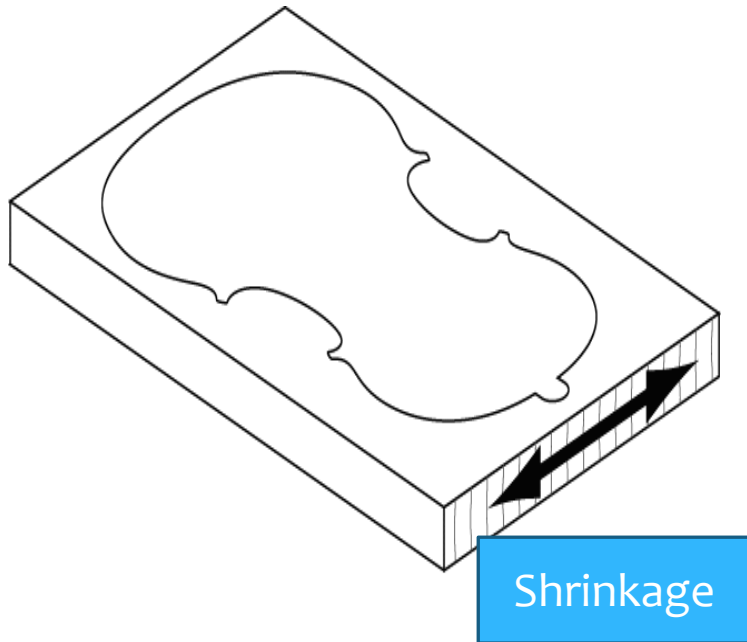
# Plane a board smooth



# Wood conversion

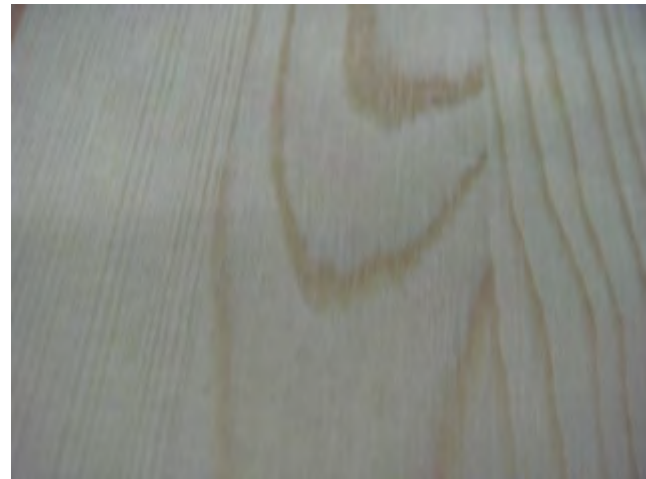
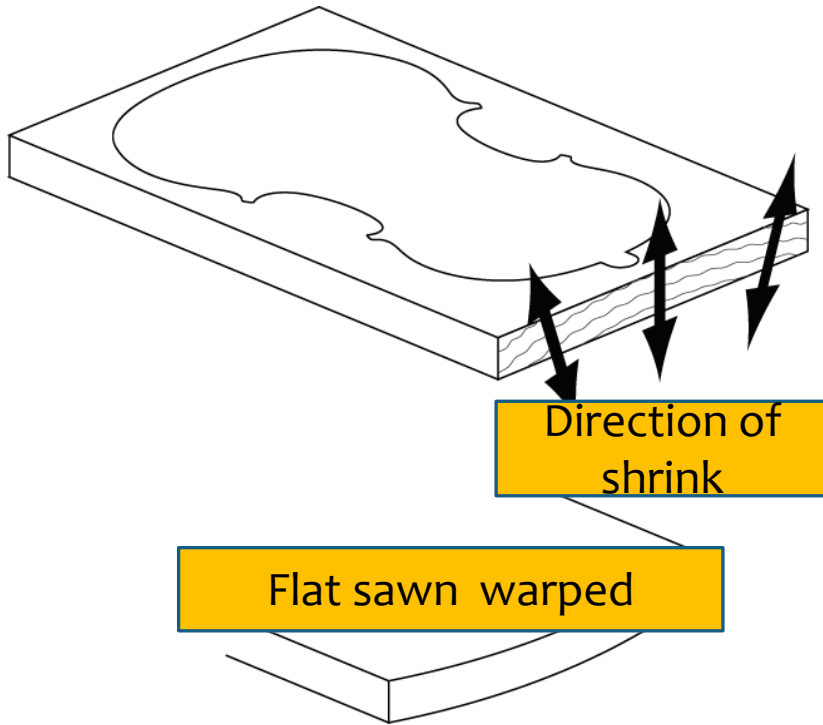


# Quarter sawn gain Board is Shrinkage





# Flat sawn grain board



# Desk



# Chair



# How to make about chair



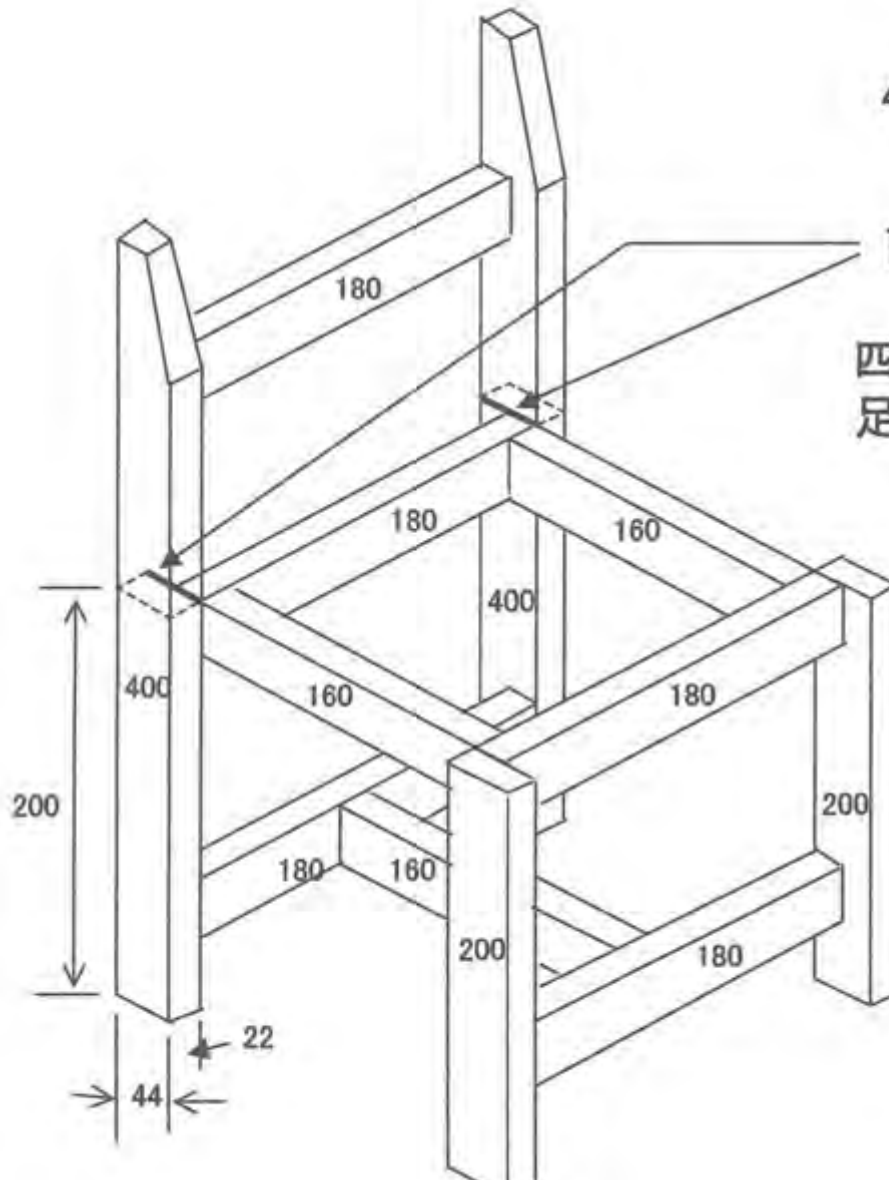
# Parts of chair



# School students are study



# Plans of chair



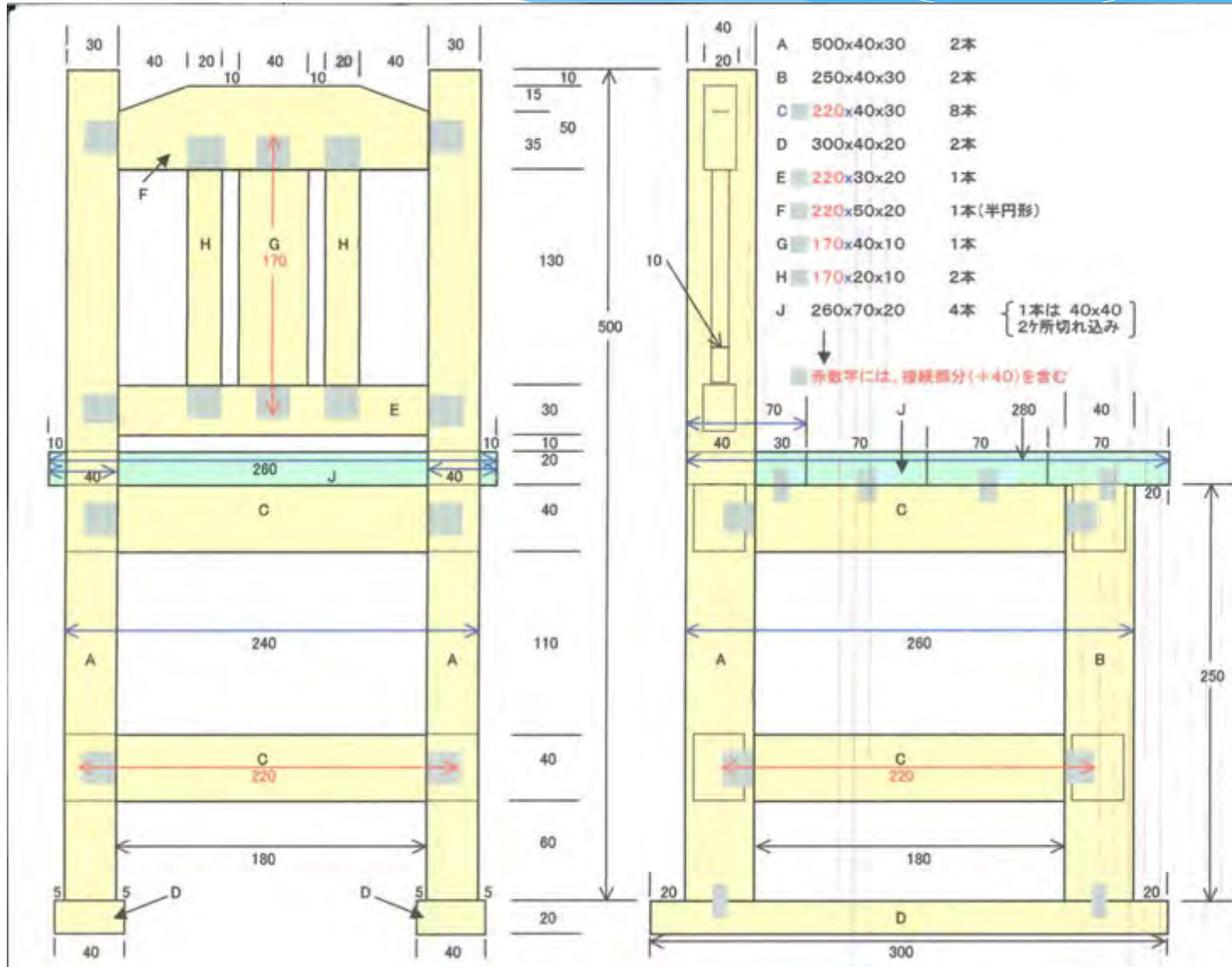
44X22X(長さ)の棒を使用

前足と同じ長さの線を引く

四角形とH形に前後4本の  
足を取り付ける

背板、床板を取り付ける

# Plans of chair



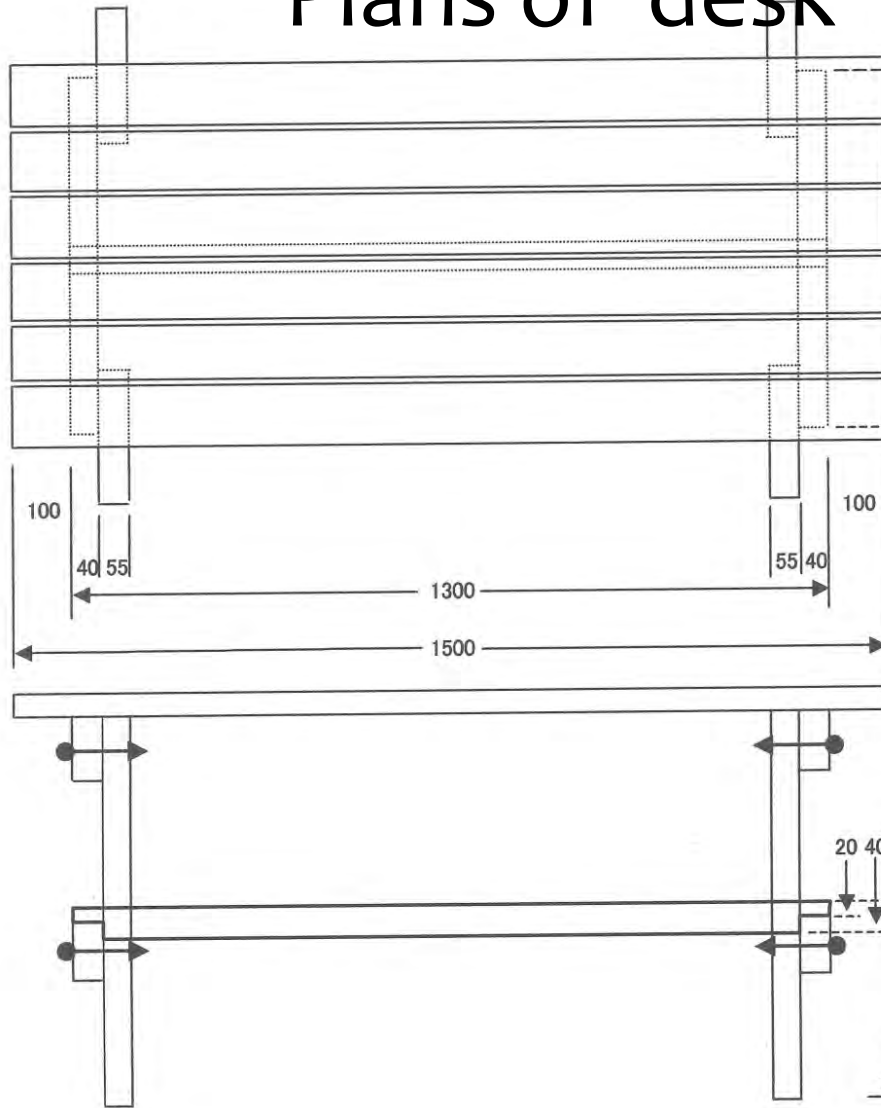


# Desk



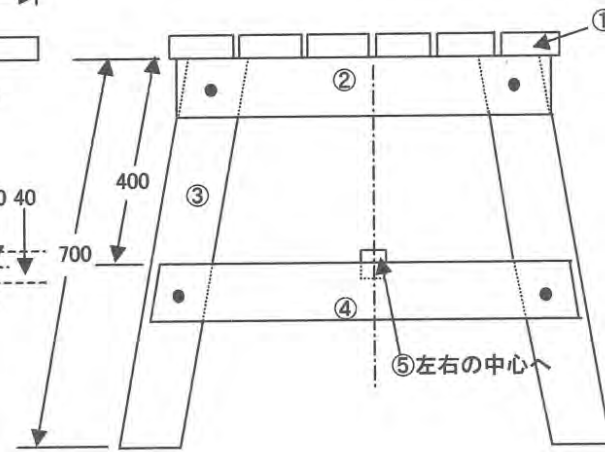


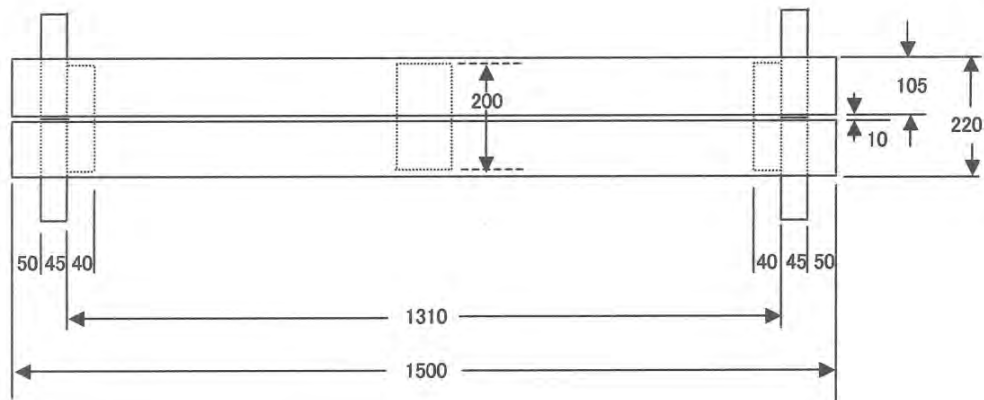
# Plans of desk



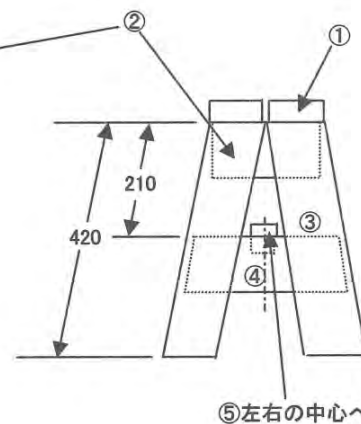
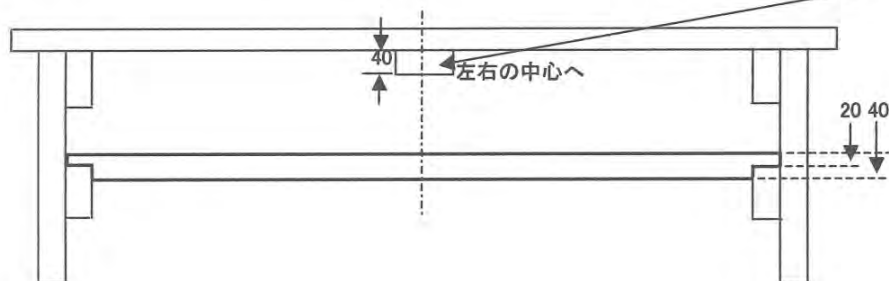
## ☆ セパレート型テーブル見取り図

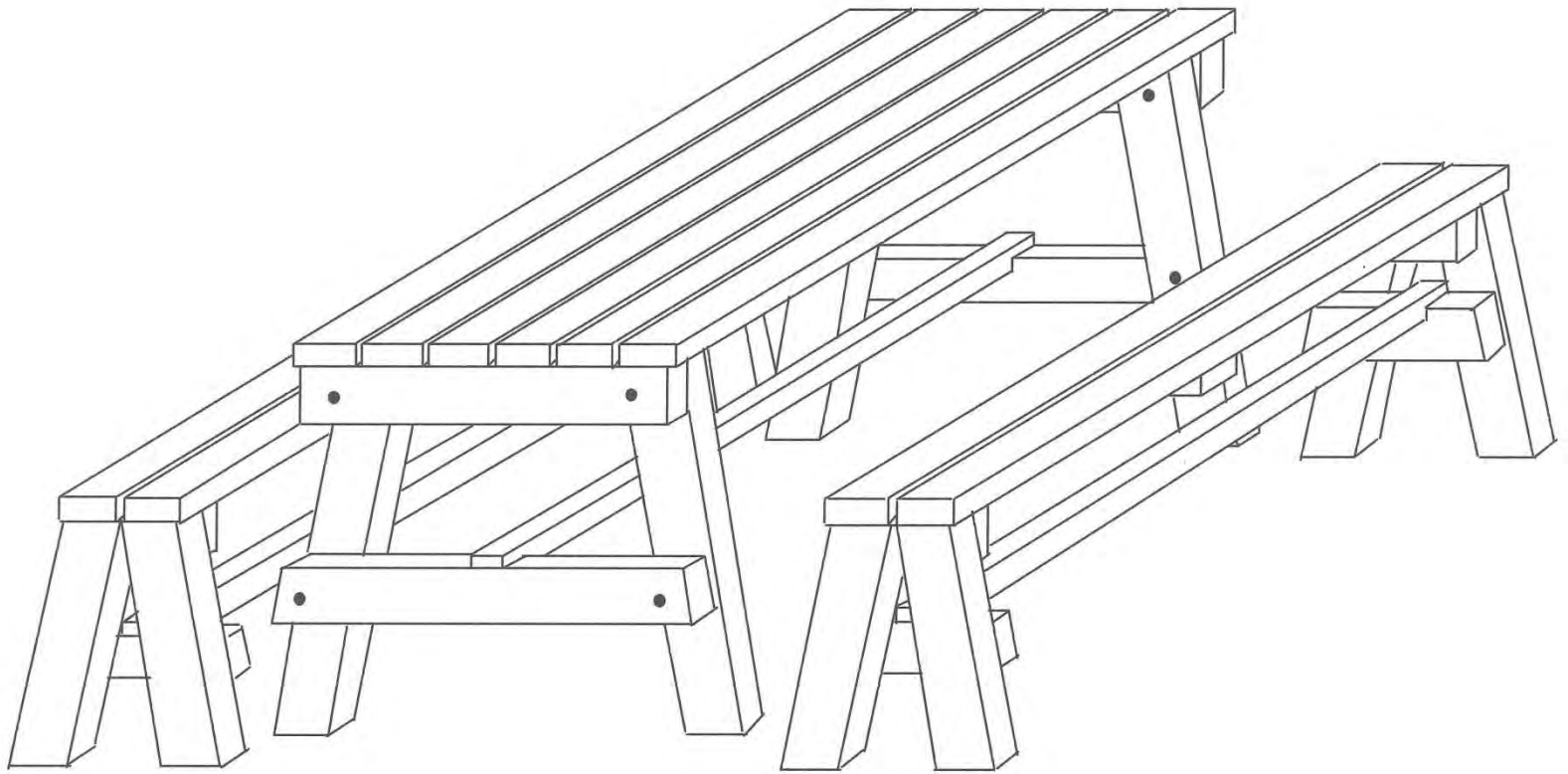
- ① 1500x105x40 = 6枚
- ② 630x105x40 = 2枚
- ③ 700x105x55(菱形) = 4枚(切角10°)
- ④ (750・720)x105x40(台形) = 2枚(切角10°)
- ⑤ 1300x40x40 = 1本(両端に40x20の切込み)
- ⑥ 125mm(46-1)ボルト・ナット = 8本





- ① 1500x105x40 = 2枚
- ② 200x105x40 = 3枚
- ③ 420x105x45(菱形) = 4枚(切角10°)
- ④ (260・240)x105x40(台形) = 2枚(切角10°)
- ⑤ 1310x40x40 = 1本(両端に40x20の切込み)





# Pencil stand



# Parquetry



## Parquetry of After glue board





## Joint board by Binder



Volunteer group are made woody material



# Forest certification log and timber



# Chair of forest certification



# Woody toys



# Thank you



## Forestry Register Note

Forest owner name :    date:

famer name	Compartme nt	Sub compartmen t	Total Area (ha)	Planted Spiecis	Planted Area(ha)	Planted year	TreeDiameter		Tree Hight		Tree Volume		Numbers of planted/h a	Forest certificatio n:Yes or No	Nursery :Yes or No	Tending (featilizer ,thining,bra nching)	Fire protectio n	Boundary :Yes or No	Remark s		
							av.diameter min.diameter- max.diameter		av.hight min.hight- max.hight		av.volume min.volume- max.volume										

# Forest Survey techniques



Japan

Jap

ciation

tion



## Main contents

1. Forest survey
2. Tree Diameter measurement
3. Tree Height measurement
4. Equipment measurement
5. Digital clinometer

# 1. Forest Survey

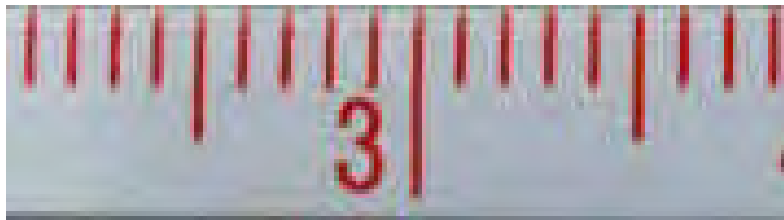
- \* It is essential to properly understand the current state of forest in order to formulate adequate management plans. Forest survey is conducted for this purpose. Based on practices of field survey and inspection regarding stand and site conditions, forest survey data books are prepared. These serve as archival data to be referred when various projects are carried out, including logging programs, regeneration of log-over land, and nurturing and managements of forests.

## 2.Tree Diameter measurement

The breast height diameter is to be measured from the upper side on sloping ground .On level ground, however, it may be measured at any direction. If use diameter tape, please check the twist.

- + It is measured at the height of 130 cm from ground level (when the tree is standing on the slope, however, it must be measured from the upper side of the sloping ground).
- + The diameter is recorded in centimeter and rounded off.
- + Calipers, diameter tapes or other tools are used for measurement.

# Tree diameter tape



### 3.Tree height measurement

The height of tree is determined by measuring the tree from the top to the end on the upper side on the slope.

Measuring digital clinometer is used.

# Digital Clinometer



## Digital Clinometer

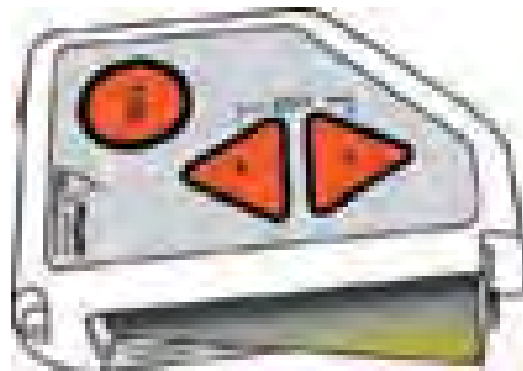
Digital Clinometer is an easy to use field instrument that offers accurate measuring results on inclination and heights of objects, usually trees. Heights are measured from any optional distance and placing in relation to the object's position in the field. The digital clinometer uses one AA battery that is removed by pushing open the battery lid . Battery consumption is low and a battery often lasts for several months.

# Digital clinometer instrument





# How to hold the instrument.



# Digital clinometer Function

\* **Function** Select function with a quick press on the 'ON' button one or several times. To turn off, press '+' and '-' buttons simultaneously. (Automatic turnoff after approx. 30 sec's of inactivity.)

**1 press: DIST** Distance setup, height measuring (m/ft)

**2 presses: HGT** Height Measuring (m/ft)

**3 presses: DEG** Inclination (%/°)

## Distance setup /measure height and inclination

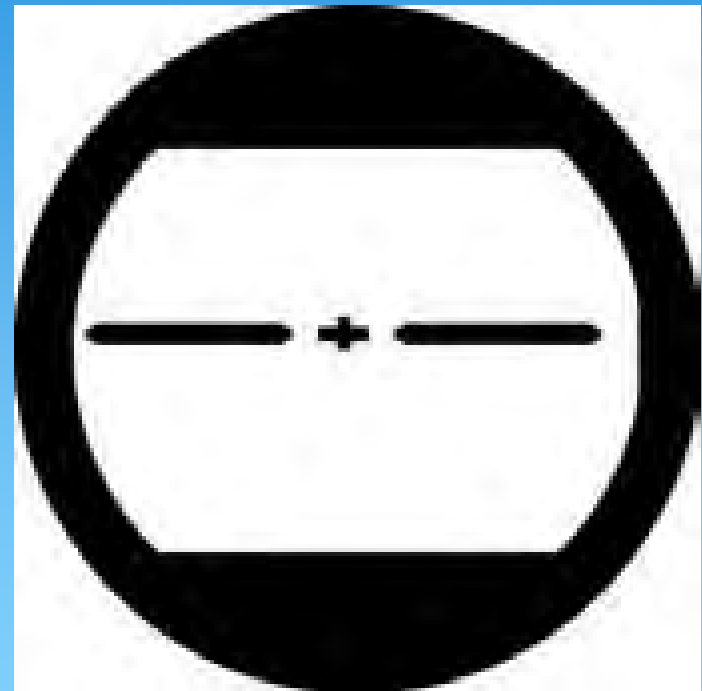
Input distance with the '+' and '-' buttons. The distance equals the distance from the eye to the Centre of the tree's (object's) diameter at the bottom (ground level). Step up (increase) with the '-' button. Optional distance from 0 to 999m/ft can be registered. A single press increases or decreases distance by 1. Hold the button '+' or '-' down to scroll distance by 5. Release the button when the required distance is reached.

\* Press the 'ON' button to register the distance. The digital clinometer will use the last input distance as default also if the instrument is turned off. NOTE! The digital clinometer will not measure distances. Use a measuring to determine the correct distance to the measuring object.

Measure the angle to the bottom of the tree by aiming with the horizontal lines in the instrument display and pressing 'ON' one time. NOTE! Use both eyes when aiming!

Measure height by aiming at the top (or other height) and press 'ON'. To measure more heights on the same tree simply aim and press the 'ON' button at your selected heights. Go straight to height measuring without registering a new distance at Height . Select Degrease to measure angles and inclination.

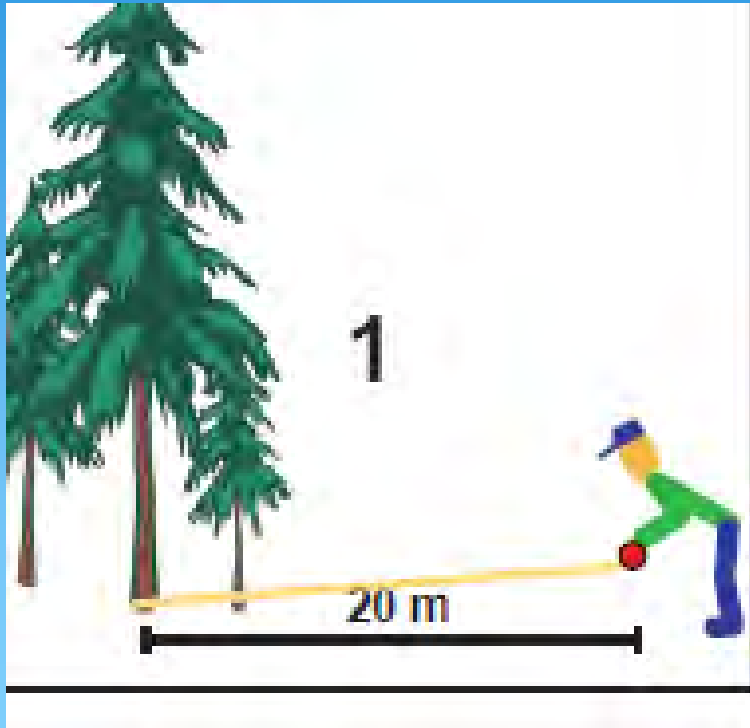
# How to measure tree height



# Distance tape



At fast measure distance by distance tape



Use a measuring to determine the correct distance to the measuring object.



# Measure Tree Height



# Measure degree

Degree 40.0



## 4. Equipment Management

Forest Survey Equipment' needs to be managed in the warehouse by the staff in charge. The management of the forest survey equipment is important. It is necessary to fix the specific stock position by each equipment though all equipment shall be kept in a warehouse properly. The forest survey equipment should be kept correctly in the warehouse. And also it is necessary to wash and clean the equipment after it is used for proper maintenance, The staff in charge should manage the forest survey equipment by safekeeping note on survey equipment. Sample pictures are as follows:

# Arrangement Equipment





## Acacia mangium volume yied table

DBH\H DBH(cm)	樹高(m)												
	5	6	7	8	9	10	11	12	13	14	15	16	
5	0.0062	0.0075	0.0089	0.0103	0.0117	0.0131	0.0145	0.0159					
6	0.0084	0.0103	0.0121	0.0140	0.0159	0.0178	0.0198	0.0217	0.0236				
7	0.0110	0.0133	0.0158	0.0182	0.0207	0.0232	0.0257	0.0282	0.0307	0.0333	0.0358		
8	0.0138	0.0167	0.0198	0.0228	0.0259	0.0290	0.0322	0.0354	0.0385	0.0417	0.0450	0.0482	
9	0.0168	0.0204	0.0241	0.0279	0.0317	0.0355	0.0393	0.0432	0.0471	0.0510	0.0549	0.0589	
10	0.0201	0.0245	0.0289	0.0333	0.0379	0.0424	0.0470	0.0516	0.0563	0.0610	0.0657	0.0704	
11	0.0236	0.0287	0.0339	0.0392	0.0445	0.0499	0.0553	0.0607	0.0662	0.0717	0.0772	0.0828	
12	0.0274	0.0333	0.0393	0.0454	0.0516	0.0578	0.0641	0.0704	0.0767	0.0831	0.0895	0.0959	
13		0.0382	0.0451	0.0521	0.0591	0.0662	0.0734	0.0806	0.0879	0.0952	0.1025	0.1099	
14		0.0433	0.0511	0.0590	0.0670	0.0751	0.0832	0.0914	0.0996	0.1079	0.1163	0.1246	
15			0.0575	0.0664	0.0754	0.0844	0.0936	0.1028	0.1120	0.1213	0.1307	0.1401	
16			0.0641	0.0741	0.0841	0.0942	0.1044	0.1147	0.1250	0.1354	0.1458	0.1563	
17				0.0821	0.0932	0.1044	0.1157	0.1271	0.1385	0.1501	0.1616	0.1733	
18				0.0904	0.1027	0.1150	0.1275	0.1400	0.1527	0.1653	0.1781	0.1910	
19				0.0991	0.1126	0.1261	0.1397	0.1535	0.1673	0.1812	0.1952	0.2093	
20					0.1228	0.1376	0.1525	0.1675	0.1825	0.1977	0.2130	0.2284	
21					0.1334	0.1495	0.1656	0.1819	0.1983	0.2148	0.2314	0.2481	
22					0.1444	0.1617	0.1792	0.1969	0.2146	0.2325	0.2504	0.2685	
23						0.1744	0.1933	0.2123	0.2314	0.2507	0.2700	0.2895	
24							0.2078	0.2282	0.2488	0.2695	0.2903	0.3112	
25							0.2227	0.2446	0.2666	0.2888	0.3111	0.3335	
26								0.2614	0.2850	0.3087	0.3325	0.3565	
27								0.2787	0.3038	0.3291	0.3545	0.3801	
28									0.3232	0.3500	0.3771	0.4043	
29									0.3430	0.3715	0.4002	0.4291	
30									0.3633	0.3935	0.4239	0.4545	
31										0.4161	0.4482	0.4805	
32										0.4391	0.4730	0.5071	
33										0.4627	0.4984	0.5343	
34											0.5243	0.5621	
35											0.5507	0.5904	
36											0.5777	0.6193	
37												0.6488	
38												0.6789	
39												0.7095	
40													
41													
42													
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60													



# Thank you



Forest survey note

owner name:

Place	Date	Sheet No.		/	
	Species	D.B.H.(cm)	Height(m)	Timber Volume	Remark
01					
02					
03					
04					
05					
06					
07					
08					
09					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					
25					
26					
27					
28					
29					
30					



## Acacia mangium timber volume yield table

DBH (cm)	5	6	7	8	9	10	11	12	13	14	15	16
5	0.0062	0.0075	0.0089	0.0103	0.0117	0.0131	0.0145	0.0159				
6	0.0084	0.0103	0.0121	0.0140	0.0159	0.0178	0.0198	0.0217	0.0236			
7	0.0110	0.0133	0.0158	0.0182	0.0207	0.0232	0.0257	0.0282	0.0307	0.0333	0.0358	
8	0.0138	0.0167	0.0198	0.0228	0.0259	0.0290	0.0322	0.0354	0.0385	0.0417	0.0450	0.0482
9	0.0168	0.0204	0.0241	0.0279	0.0317	0.0355	0.0393	0.0432	0.0471	0.0510	0.0549	0.0589
10	0.0201	0.0245	0.0289	0.0333	0.0379	0.0424	0.0470	0.0516	0.0563	0.0610	0.0657	0.0704
11	0.0236	0.0287	0.0339	0.0392	0.0445	0.0499	0.0553	0.0607	0.0662	0.0717	0.0772	0.0828
12	0.0274	0.0333	0.0393	0.0454	0.0516	0.0578	0.0641	0.0704	0.0767	0.0831	0.0895	0.0959
13		0.0382	0.0451	0.0521	0.0591	0.0662	0.0734	0.0806	0.0879	0.0952	0.1025	0.1099
14		0.0433	0.0511	0.0590	0.0670	0.0751	0.0832	0.0914	0.0996	0.1079	0.1163	0.1246
15			0.0575	0.0664	0.0754	0.0844	0.0936	0.1028	0.1120	0.1213	0.1307	0.1401
16			0.0641	0.0741	0.0841	0.0942	0.1044	0.1147	0.1250	0.1354	0.1458	0.1563
17				0.0821	0.0932	0.1044	0.1157	0.1271	0.1385	0.1501	0.1616	0.1733
18				0.0904	0.1027	0.1150	0.1275	0.1400	0.1527	0.1653	0.1781	0.1910
19				0.0991	0.1126	0.1261	0.1397	0.1535	0.1673	0.1812	0.1952	0.2093
20					0.1228	0.1376	0.1525	0.1675	0.1825	0.1977	0.2130	0.2284
21					0.1334	0.1495	0.1656	0.1819	0.1983	0.2148	0.2314	0.2481
22					0.1444	0.1617	0.1792	0.1969	0.2146	0.2325	0.2504	0.2685
23						0.1744	0.1933	0.2123	0.2314	0.2507	0.2700	0.2895
24							0.2078	0.2282	0.2488	0.2695	0.2903	0.3112
25							0.2227	0.2446	0.2666	0.2888	0.3111	0.3335
26								0.2614	0.2850	0.3087	0.3325	0.3565
27								0.2787	0.3038	0.3291	0.3545	0.3801
28									0.3232	0.3500	0.3771	0.4043
29									0.3430	0.3715	0.4002	0.4291
30									0.3633	0.3935	0.4239	0.4545
31										0.4161	0.4482	0.4805
32										0.4391	0.4730	0.5071
33										0.4627	0.4984	0.5343
34											0.5243	0.5621
35											0.5507	0.5904
36											0.5777	0.6193
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# How to use GPS

## GARMIN MAP62S



Portable handheld type, waterproof IPX7

2,000 point possible

Battery capacity :Up to 20 hours

Japan Overseas Forestry Consultants  
Association (JOFCA)

# what is GPS

## Global Positioning System

To use in field survey for positional control  
and movement trajectories recording

# Utilization of Artificial satellite

GPS  
satellite  
position



At least Catch the 4 artificial satellite  
from 24 artificial satellite

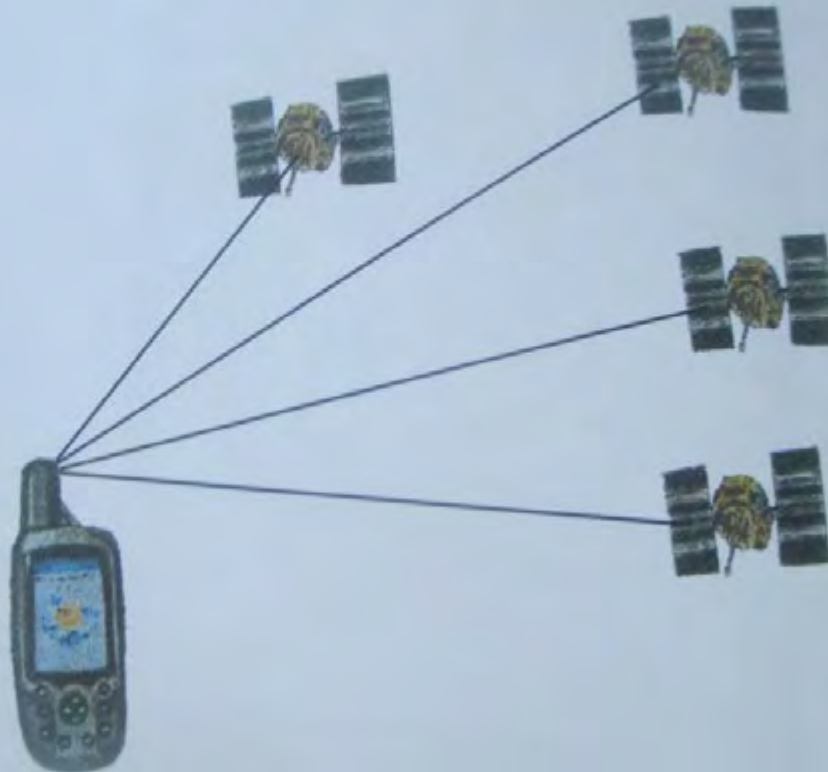
Good Distribution of satellite



Small Error Happen



Bad Distribution of satellite



Big Error Happen



Front



Back



Micro SD  
4GBS

2 Battery

10 hours

Cover

# Clip



# Set up clip



IN(magnification map)

Switch

OUT(reduction map)

FIND(look place)

PAGE(change indication)

MARK(record place)

MENU(set up)

QUIT(cancel)

ENTER(put and reserve)



## \* On / Off

### ■ On :

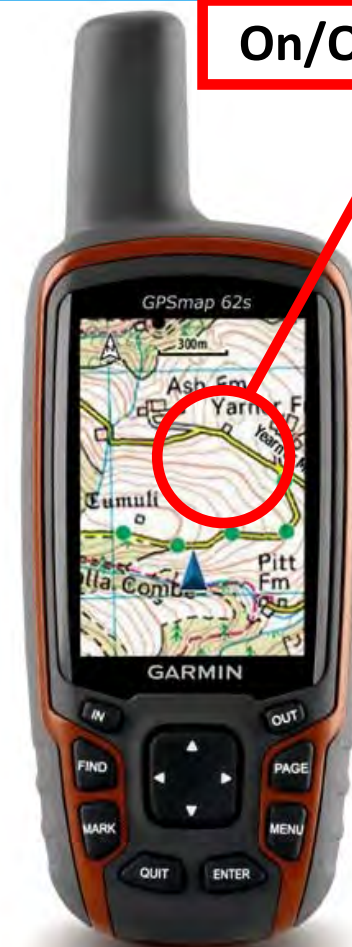
Press the On/ Off button a few seconds to start the GPSMAP 62s. Release the button after the logo "GARMIN" is displayed.

After turning on the device, position its antenna towards the sky a few minutes until the GPS signal stabilizes.

Before entering the forest, it is recommended to turn on the device in an open place to easily get the satellite signal.

### ■ Off :

The device stops if you hold the On / Off button a few seconds.



On/Off button

## \* Recording targeted positions

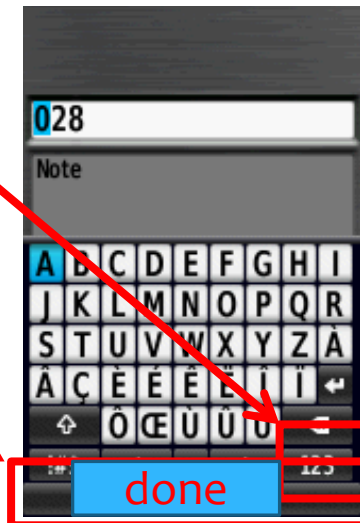
- Press "MARK". The recording screen of the point is displayed.
- Select the box " Point name " by using the cursor.



The box "Point name" becomes editable

- Change the plot identification number using the cursor and ENTER. Pressing "123" provides access to the number input screen.

After entering data, select "done".





## \* Recording targeted positions

- Select the box "Position" using the cursor. The coordinates input screen is displayed .
- Edit coordinates.
- Select "done" after entering data.
- After entering the identification number and the plot coordinates, select "done ".

20120317

Note

Position  
N 35°41'15.1"  
E 139°44'03.6"

Altitude -8<sub>m</sub> Profondeur \_\_\_\_\_<sub>m</sub>

N 0<sub>m</sub>

map done

20120317

Note

Position  
S 05°47'12.5"  
E 013°27'47.0"

Altitude -8<sub>m</sub> Profondeur \_\_\_\_\_<sub>m</sub>

0 13626.9<sub>k<sub>m</sub></sub>

map done

Position  
S 05°47'12.5"  
E 013°27'47.0"

Altitude -8<sub>m</sub> Profondeur \_\_\_\_\_<sub>m</sub>

1	2	3	
4	5	6	↑
7	8	9	↓
-	0	+	

done

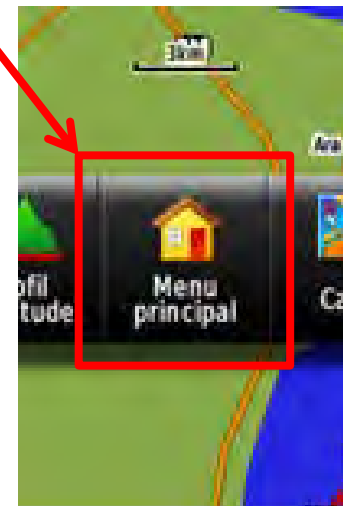
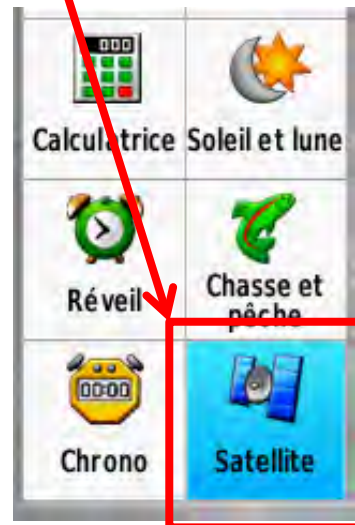
# How to use the GPS

## \* Checking the reception status of satellite signal

- Press "PAGE"
- Select "Menu principal".

The screen "Menu principal " is displayed.

- In " Menu principal ", search "Satellite" using the cursor , and press "ENTER ".



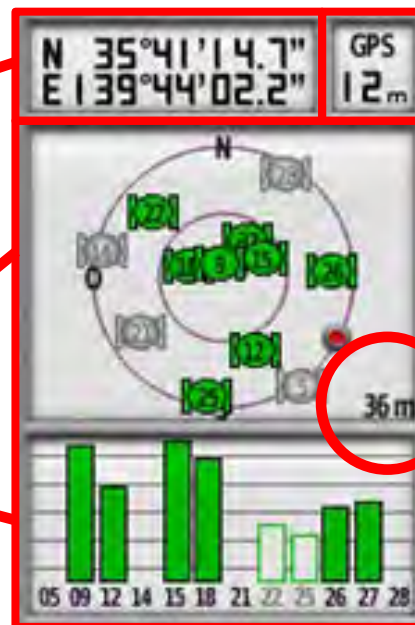
## \* Checking the reception status of satellite signal

The screen "Recherche satellites" is displayed.

- Check the reception status of satellite signal.  
You can check the latitude and longitude of the current position, GPS accuracy, satellite map, satellite signal quality and the GPS altitude.

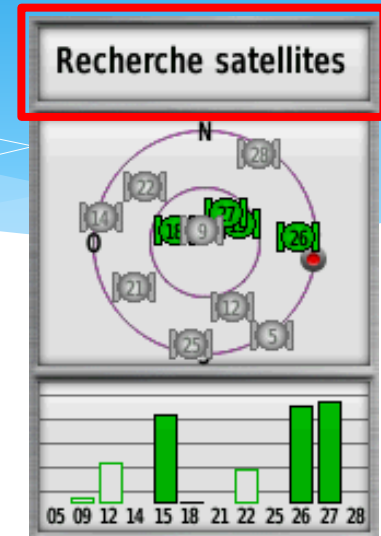
latitude and longitude of the current position

Satellite being searched by GPS and signal quality



GPS Accuracy (margin of error)

GPS altitude



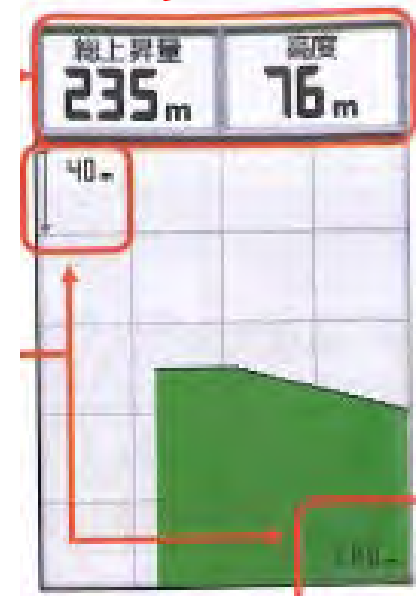
# How to use the GPS

## \* Elevation Plot

- Press "PAGE"
- Select "Elevation Plot".
- You can see the elevation .
- Press "MENU"
- There are some option as below



- ✓ Change Plot Type
- ✓ Adjust Zoom Ranges
- ✓ Change Data Fields
- ✓ Reset
- ✓ Calibrate Altimeter
- ✓ Restore Defaults

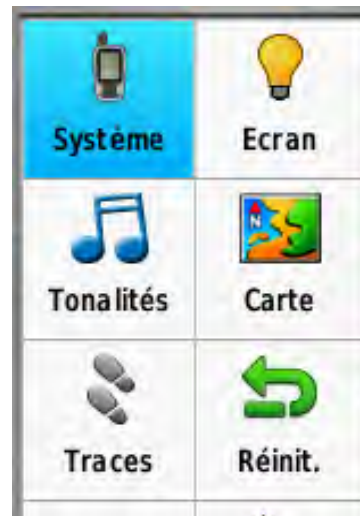
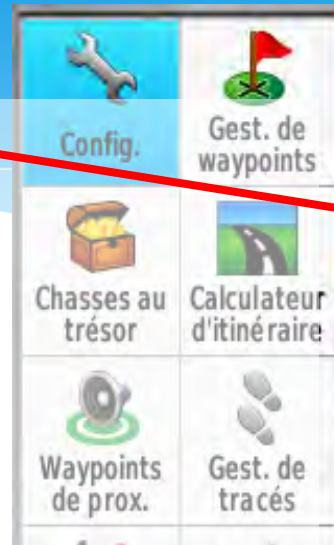


# How to use the GPS

## MENU ICON

Press the button "MENU"  
There are 21 icons as below

- ✓ Set up
- ✓ Waypoint Manager
- ✓ Geocaches
- ✓ Route Planner
- ✓ Proximity Alarms
- ✓ Track Manager
- ✓ Share Wire lessly
- ✓ Active Route
- ✓ Waypoint Averaging
- ✓ Sight 'N Go
- ✓ Profile Change
- ✓ Area Calculation
- ✓ Photo Viewer
- ✓ Calendar
- ✓ Calculator
- ✓ Sun and Moon
- ✓ Alarm Clock
- ✓ Hunt and Fish
- ✓ Stopwatch
- ✓ Satellite
- ✓ Adventures



# How to use the GPS

## Set up ICON

- Press the button "MENU"
- Press the button "Set up"

There are 18 icons as below

- ✓ System
- ✓ Display
- ✓ Tones
- ✓ Map
- ✓ Tracks
- ✓ Reset
- ✓ Page Sequence
- ✓ Units
- ✓ Time
- ✓ Position Format
- ✓ Heading
- ✓ Altimeter
- ✓ Geocaches
- ✓ Routing
- ✓ Marine
- ✓ Fitness
- ✓ Profiles
- ✓ About



# How to use the GPS

## \* Navigation

- Press the button "FIND"

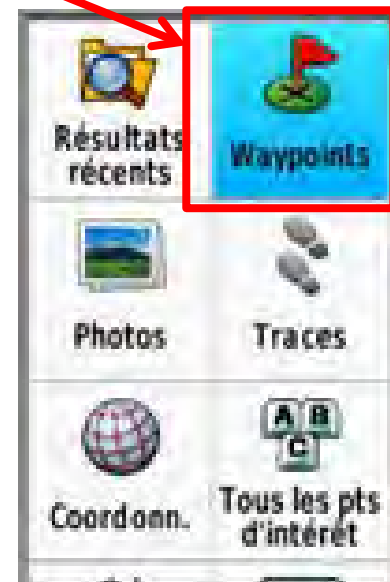
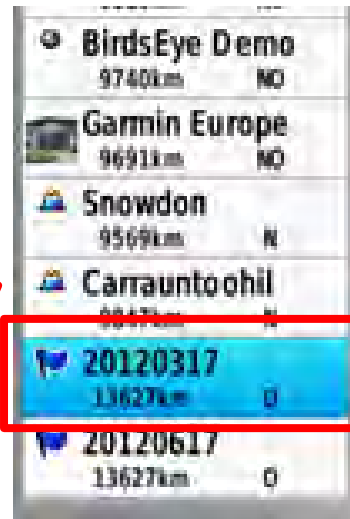
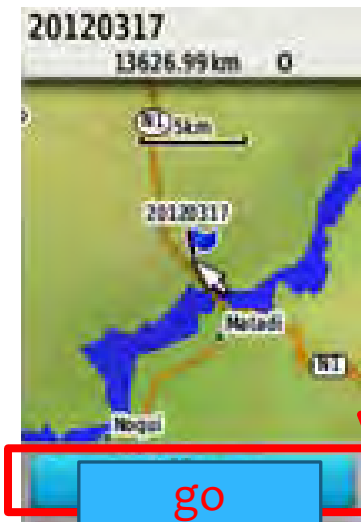
The screen "Recherche" is displayed.

- Select the box "Waypoints".

The list of Waypoints is displayed

- Search and select coordinates.

- Select "go".



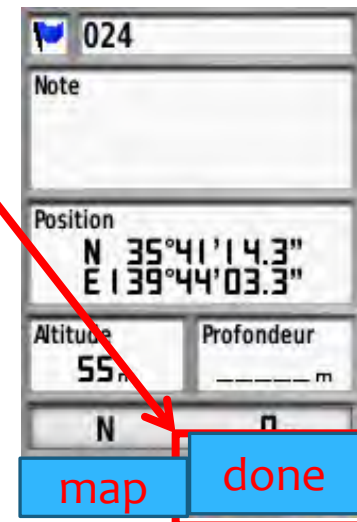
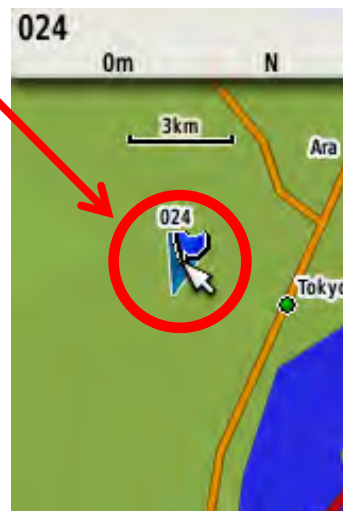
## \* Recording current position

- Press the button “MARK”

The recording screen of the point is displayed.

- Check content to record.
- Select “done” and press “ENTER”.

A flag (Way point) is displayed on the map.

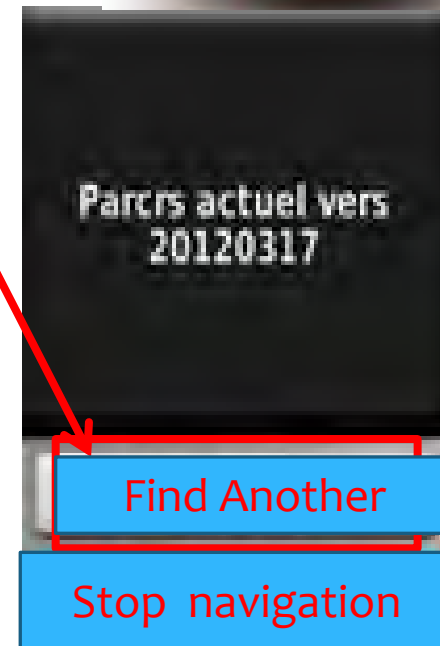




# How to use the GPS

## \* Navigation

- To stop navigating press “FIND” during the navigation.
- Select “stop navigation”.
- Press “ENTER”.



# How to use the GPS

## 1. In order to delete all data

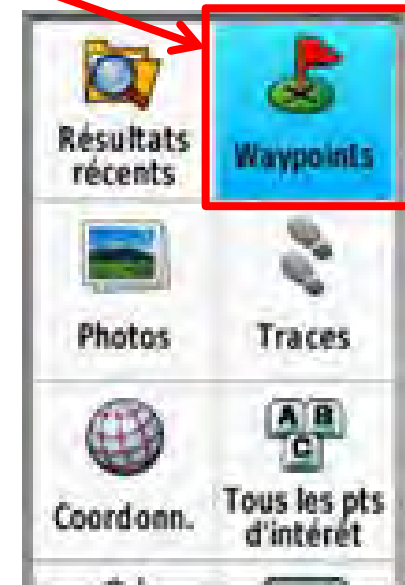
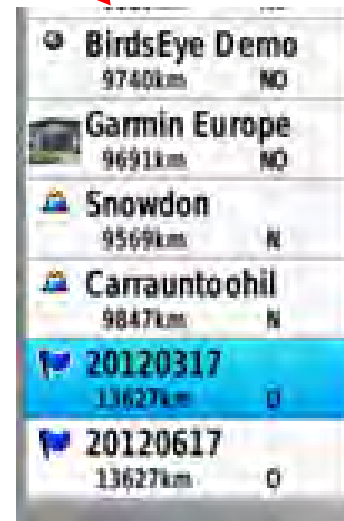
- Press the button “FIND”

The screen “Recherche” is displayed.

- Select the box “Waypoints”.

The list of Waypoints is displayed and

Press the button “MENU” and Select “Delete all”



## 2. In order to delete one data

- Press the button “FIND”

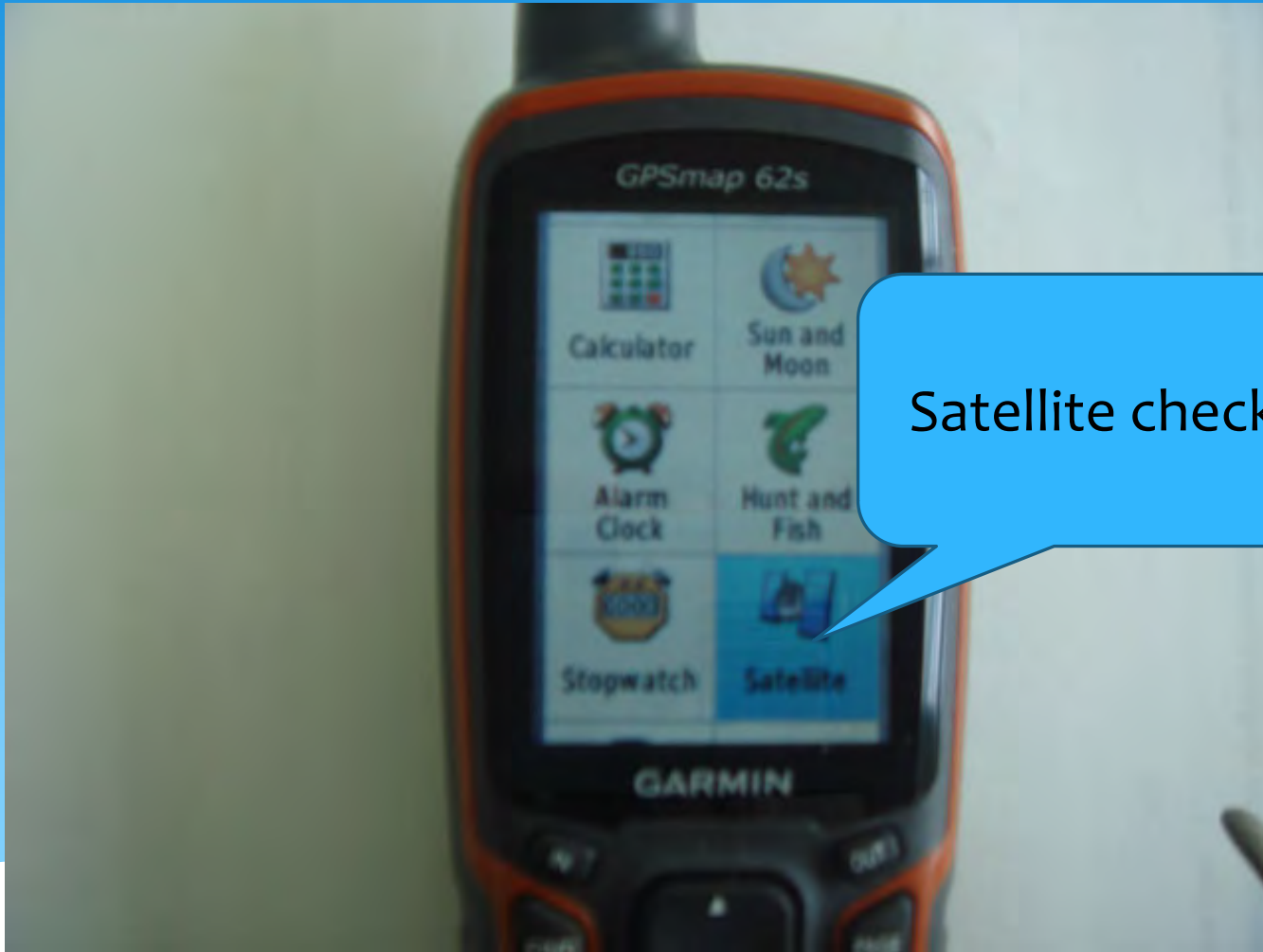
The screen “Recherche” is displayed.

- Select the box “Waypoints”.

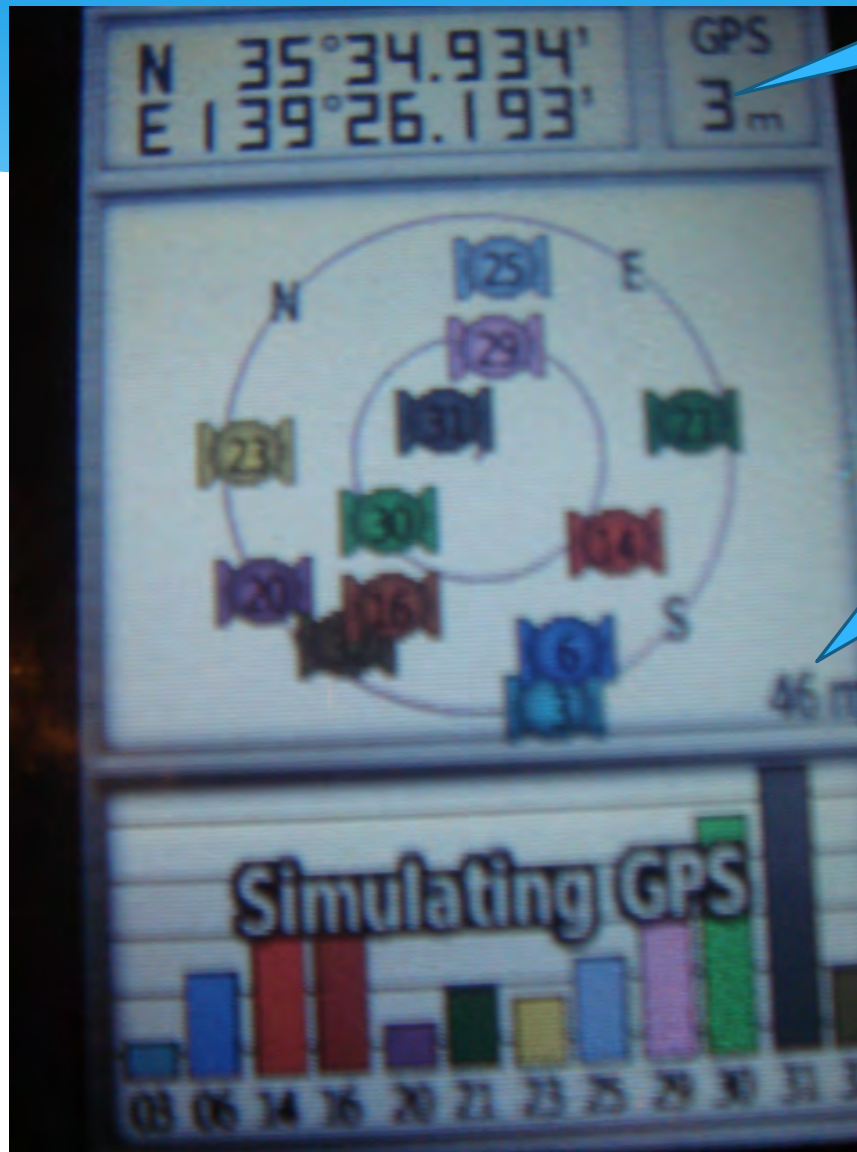
The list of Waypoints is displayed

- Search and select coordinates.

- Press the button “MENU” and Select “Delete ”



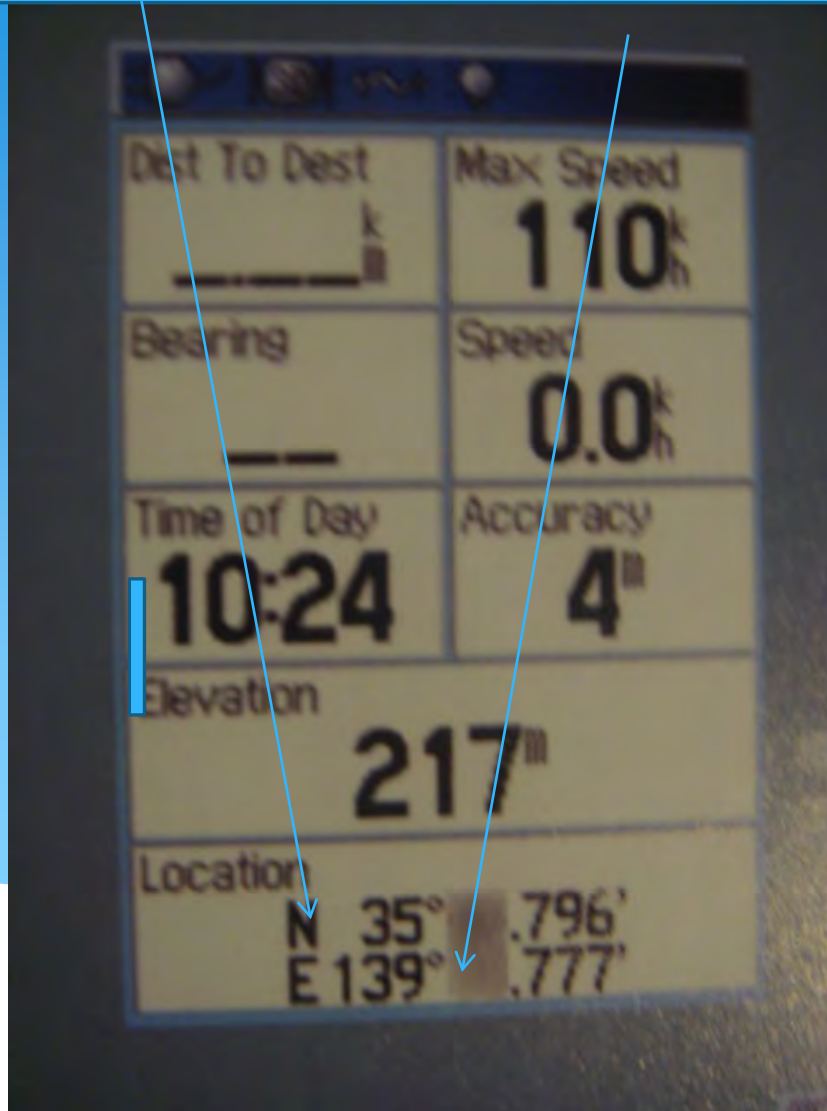
Satellite check



Error

Elevation

# latitude and longitude

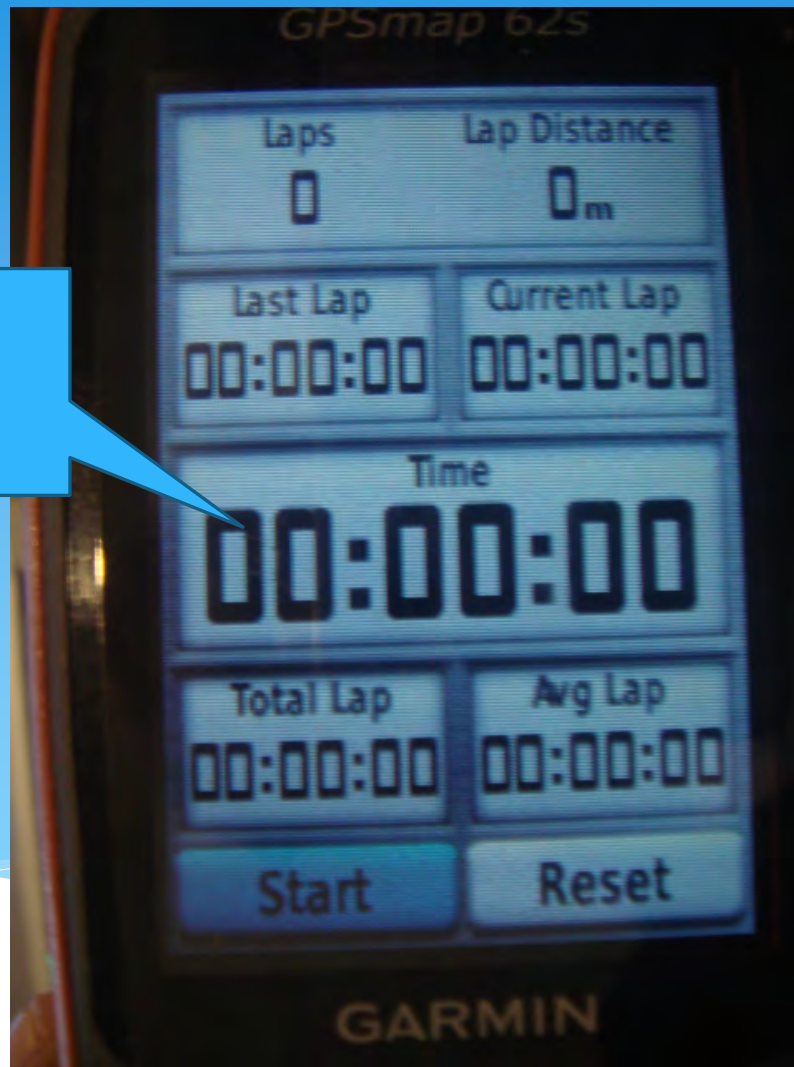


# Stop watch

Stop watch



Time check




# GPS Sets up at the car






# Way points



 280 (17:27)


0m

N

 281 (17:27)


0m

N

 282 (17:29)


0m

N

 283 (17:29)


0m

N

 284 (17:29)

0m

N

 285 (17:30)

0m

N

# Navigation



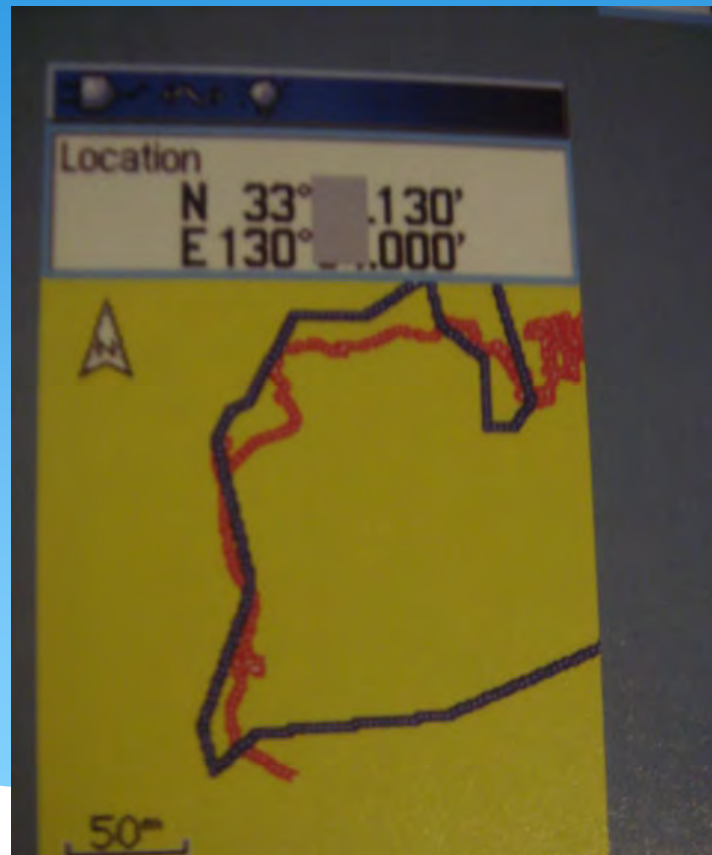
It is show to



# Location of survey points



# locus

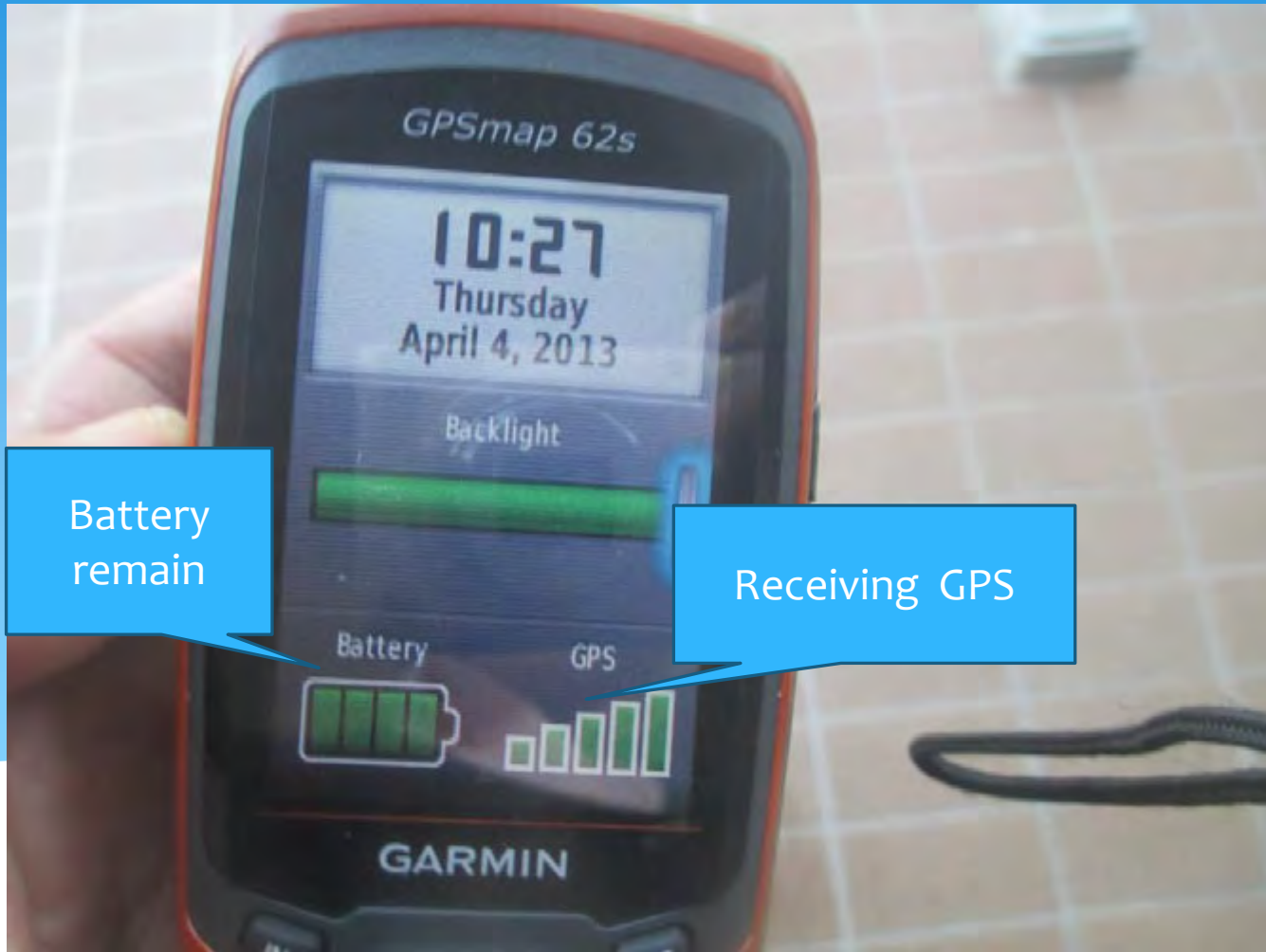


Moving along boundary

# Direction



# Battery remain and receiving GPS Check



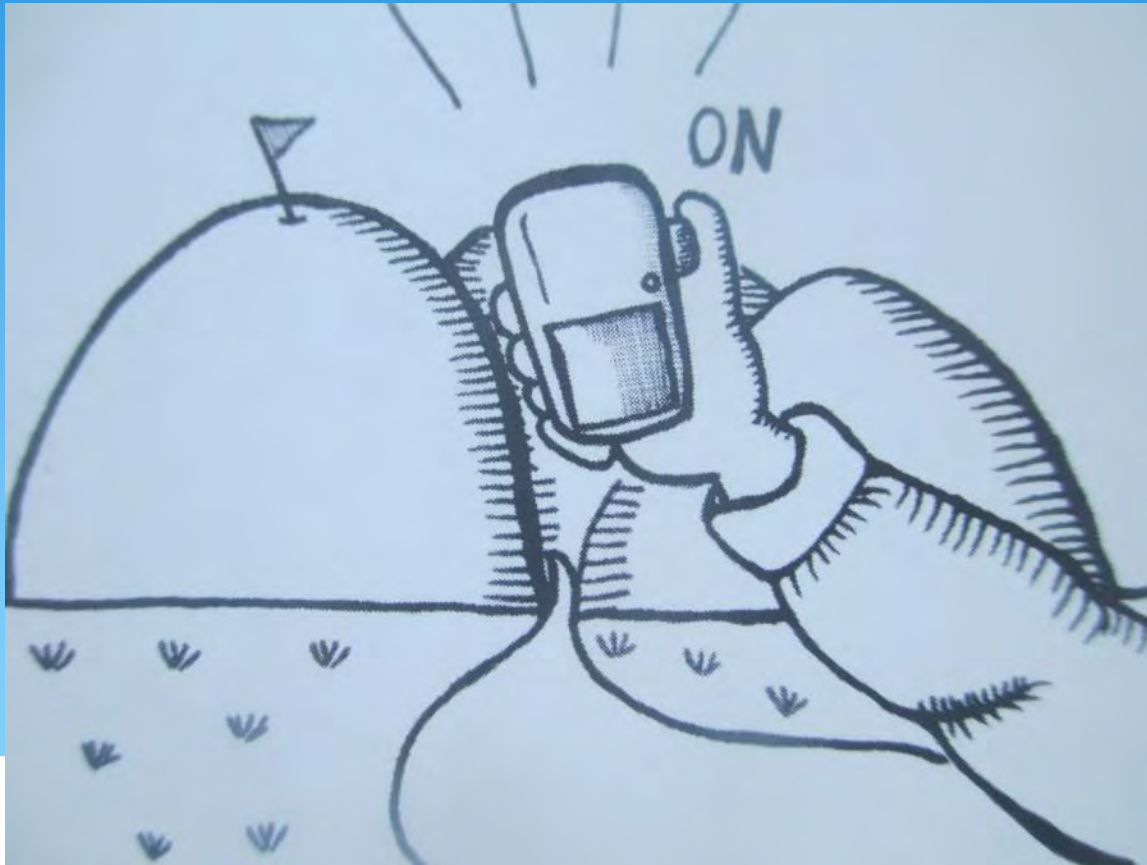


Don't carry from neck

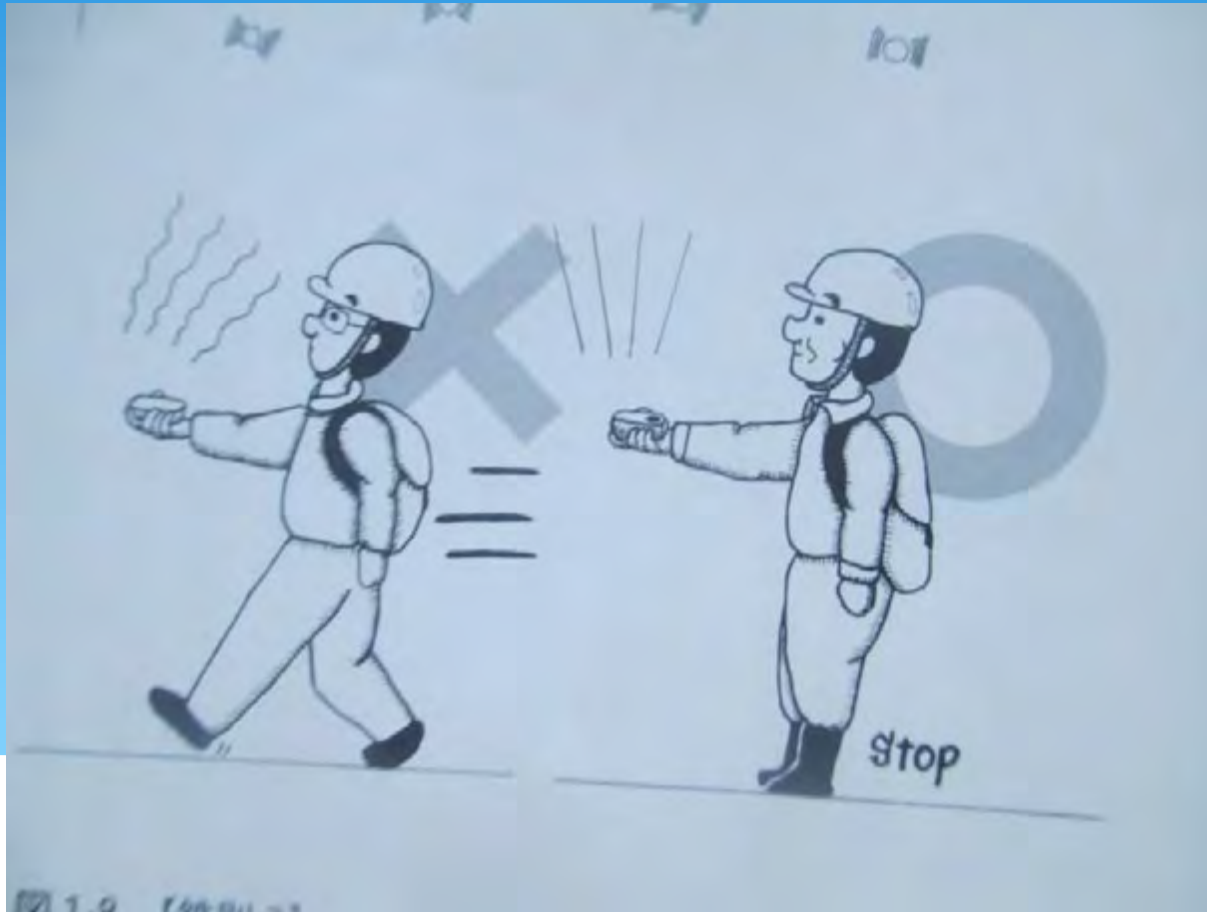


Please keep level

Don't switch on GPS after enter the mountain ,  
switch on GPS before enter the mountain



When you take the date ,you must stop in several seconds



You much better separate from your body



Your body also effect from satellite

If rain is coming , Please keep GPS in the plastic bag



図1-43 GPSは突然の雨で濡れないようにビニール袋に入れて使用

# Field work preparation

- \* **Planning team work (you must contact other survey members)**

- \* **GPS**

**Other Equipment's (caliper , Hypsometer and etc)**

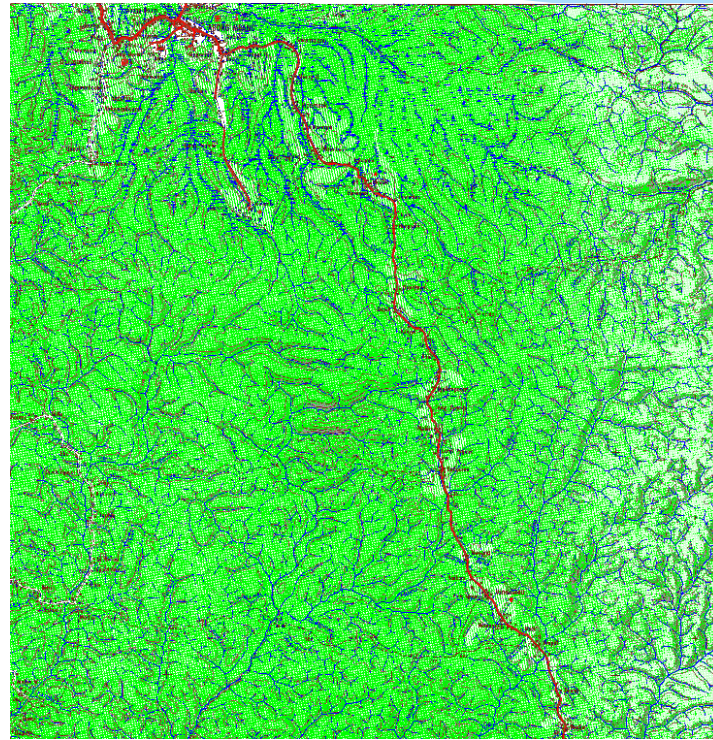
**Preparation of topographical maps**

# Preparation of topographical maps

- \* Topographic maps covering the survey sites are prepared to move into the field and indicate the location of the sampling unit .
- \* They will be magnified at the appropriate level (if possible scale 1: 50,000) and photocopied.
- \* For each sampling unit, the unit boundaries are drawn on maps.
- \* The central points of each plot in the sampling unit are shown on maps.
- \* Before going to the field, each team must identify and draw the easiest and fastest access to the first plot.

# Preparation topographical maps

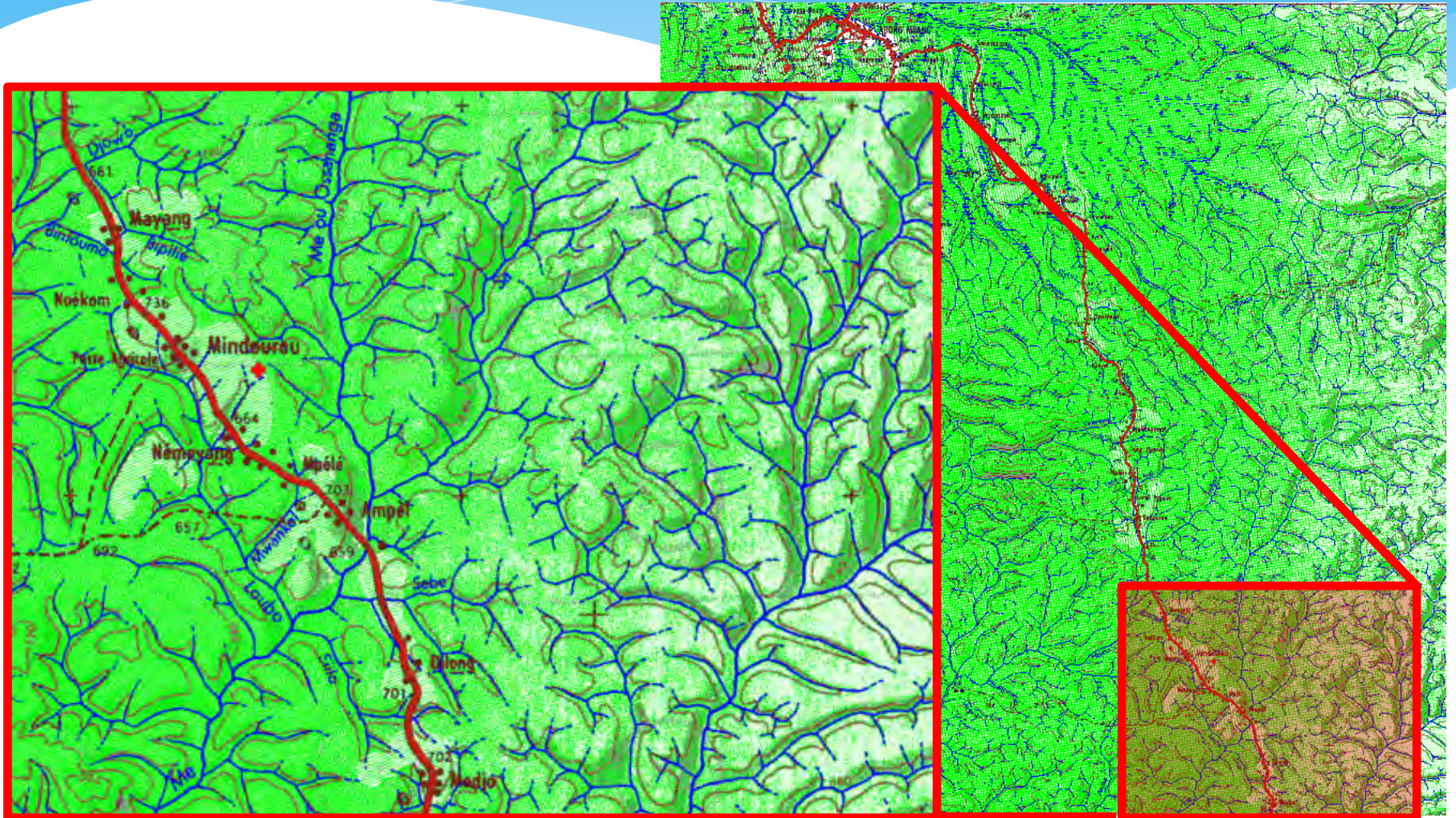
- \* Topographic maps covering the survey sites are prepared to move into the field and indicate the location of the sampling unit .





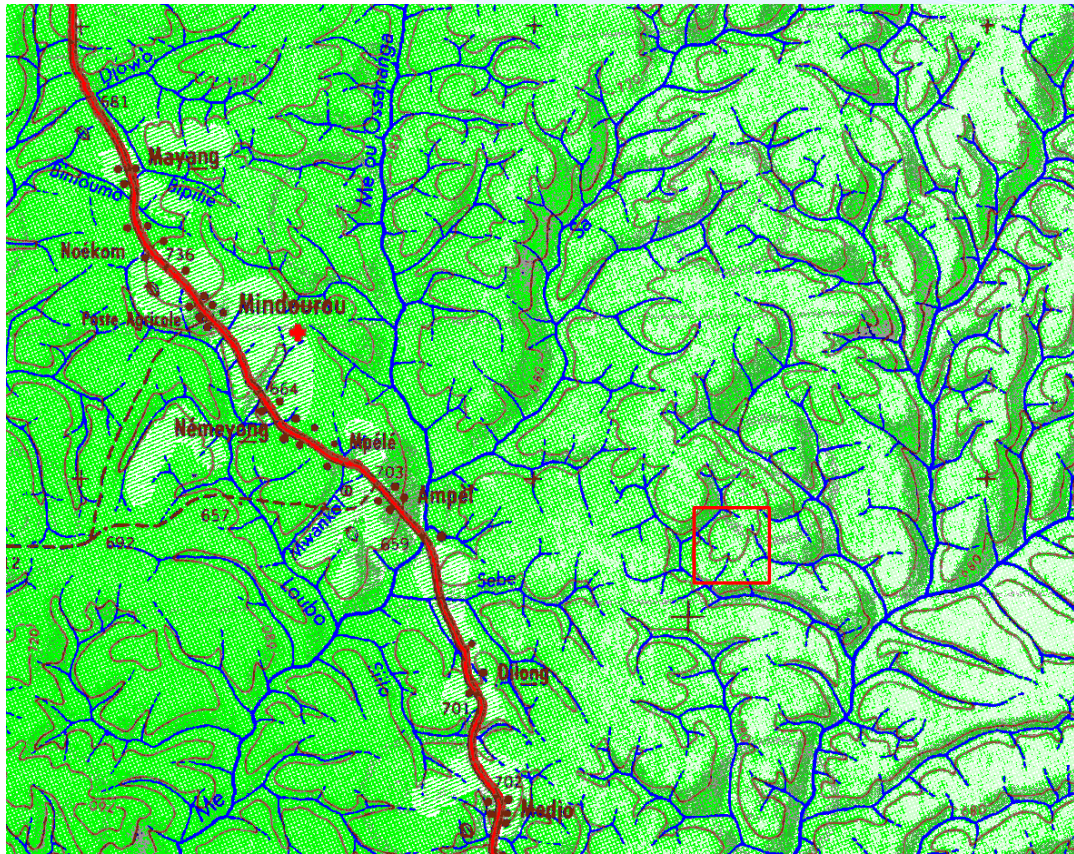
# Preparation topographiques

- \* They will be magnified at the appropriate level (if possible scale 1: 50,000) and photocopied.

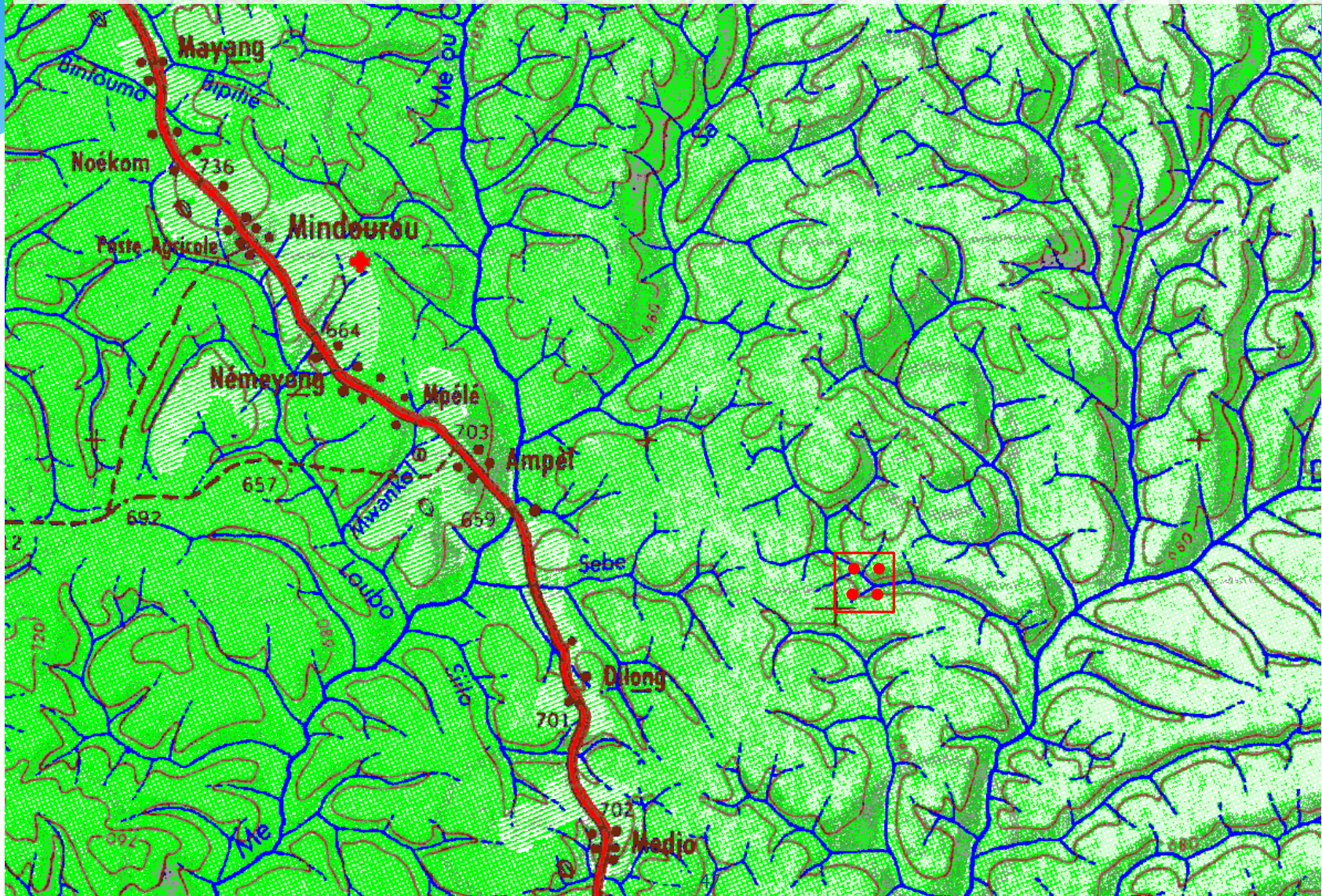


# Preparation des cartes topographiques

- \* For each sample unit , the unit boundary are drawn on maps.

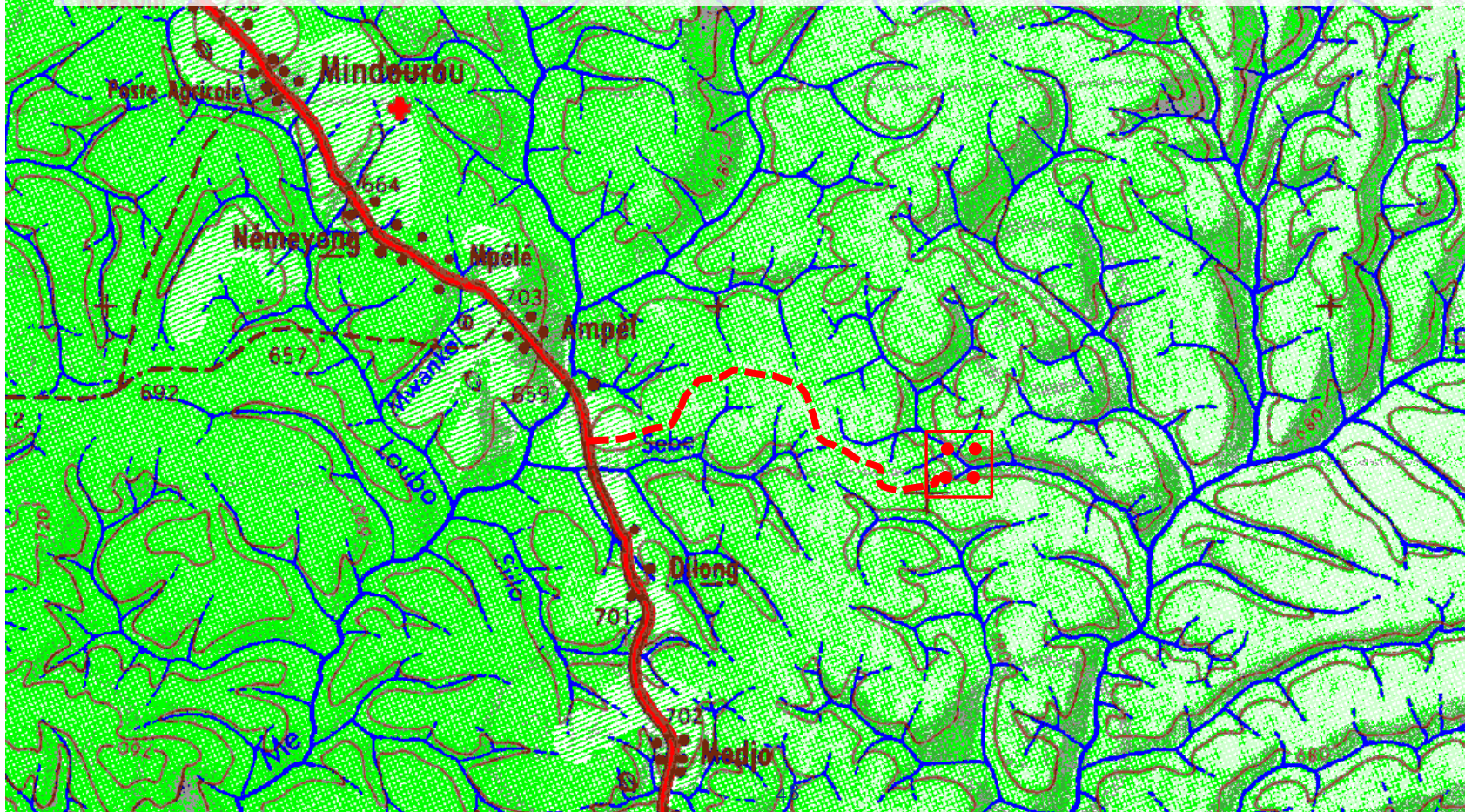


\* The central points of each plot in the SU are shown on maps.



# Preparation topographiques

- \* Before going to the field, each team must identify and draw the easiest and fastest access to the first plot.



# GPS Setting

- \* The coordinates of the SU (Southwest corner) and the central point of each plot will be entered into the GPS receiver.
- \* The identification code is determined as follows:
  - Name of the SU southwest corner to enter into the GPS: "ID number of the SU (three digits)" + "C". Example: for the sampling unit 13: "013C"
  - Name of the central point of each starting plot to enter into the GPS: "ID number of the SU (three digits)" + "P" + "plot ID number (from 01 to 12)" + "D". Example: sampling unit number 13, plot number 4 "013P04D"

Measuring of tree diameter and GPS point on same time



# Tree Survey note book

Plot No	Latitude	Longitude	Elevation	Direction	Time	GPS No	Diameter	height	Timber Volume



**Thank you!**



# Joint Wood Production Techniques

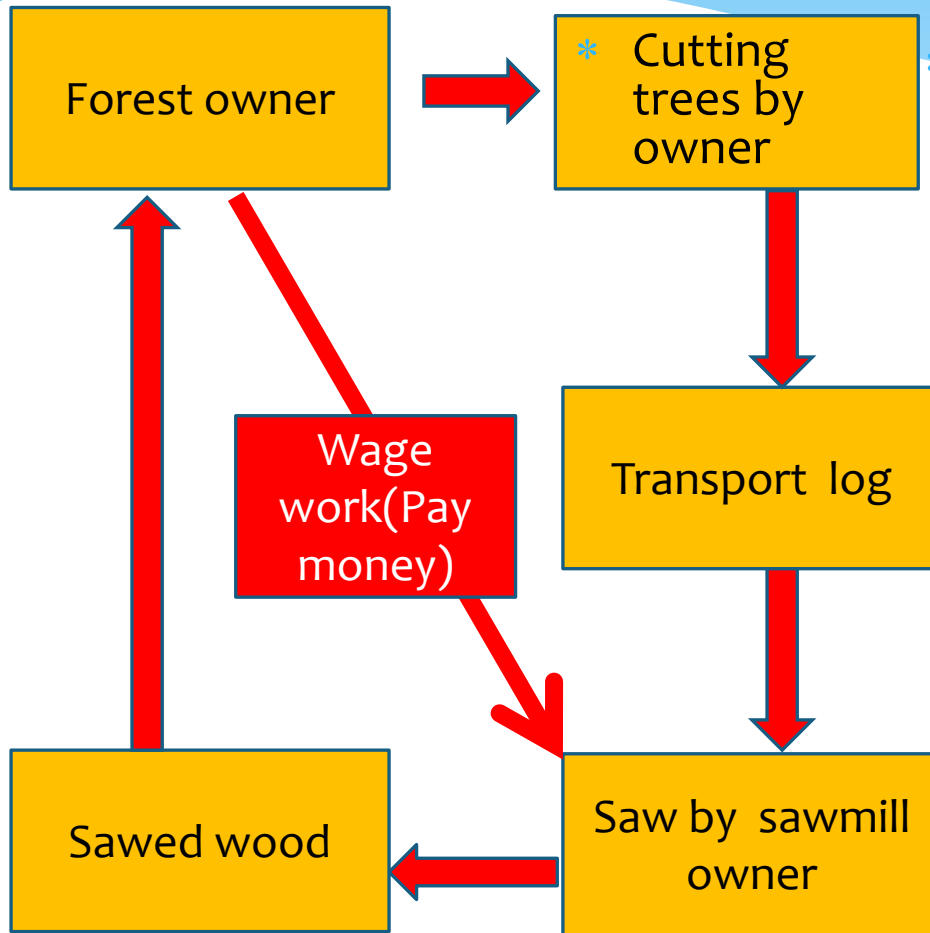


# Contents

1. System of Wage work for sawmill
2. Joint wood by Joint cutter

- 1) Wood conversion
- 2) Right angle wood
- 3) Uniform of wood
- 4) Joint with wood
- 5) Completion

# System of Wage work for sawmill



\* After cut trees by forest owner transport of timber in log form.

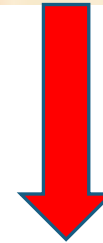
\* It is a system that orders the saw only in sawmill and pay wage work as for the material wood.

# System of Wage work for sawmill

Trance port log by forest owner or Lumberman



Arrived sawmill



Same material arrived to forest owner



Sawing by Lumberman



# Joint Wood Method by joint cutter

1. Dry up wood
2. Conversion Wood
3. Right Angle Wood
4. Same Uniform Wood
5. Joint Wood
6. Completion Wood

# 1. Dry up wood



## 2. Conversion Wood

- \* It cuts it more greatly than the size of the work.



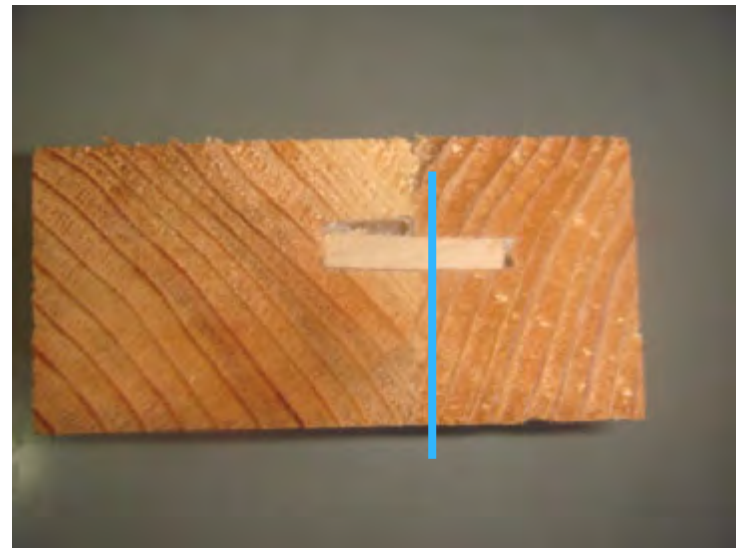
# Joint Cutter





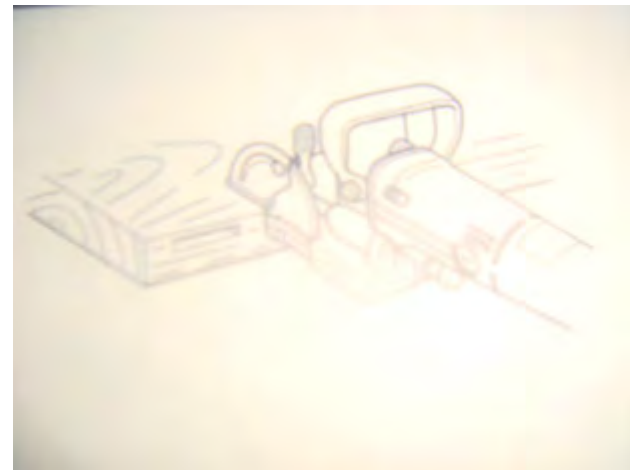
### 3. Wood Right angle

It is the right angle in joining woods by the plane (canna)



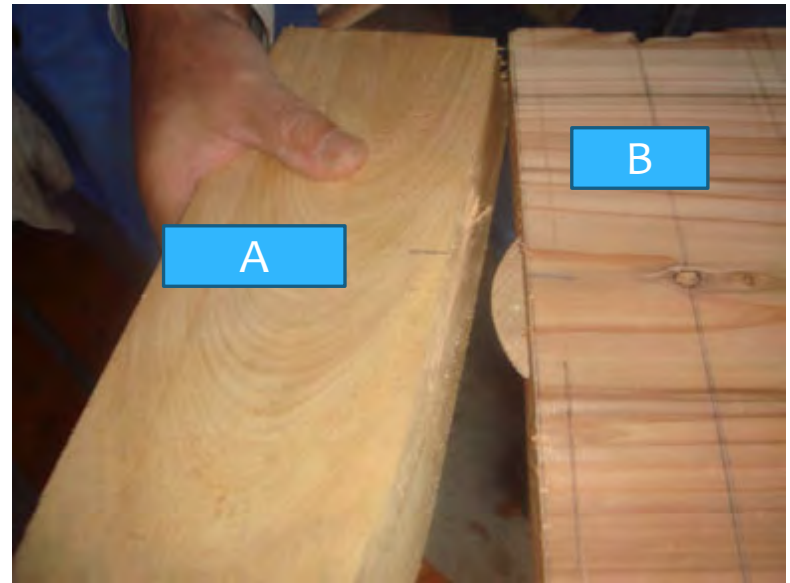
## 4. Same uniform Wood

Wood surface is  
same uniform  
with the sander  
( Japanese canna)

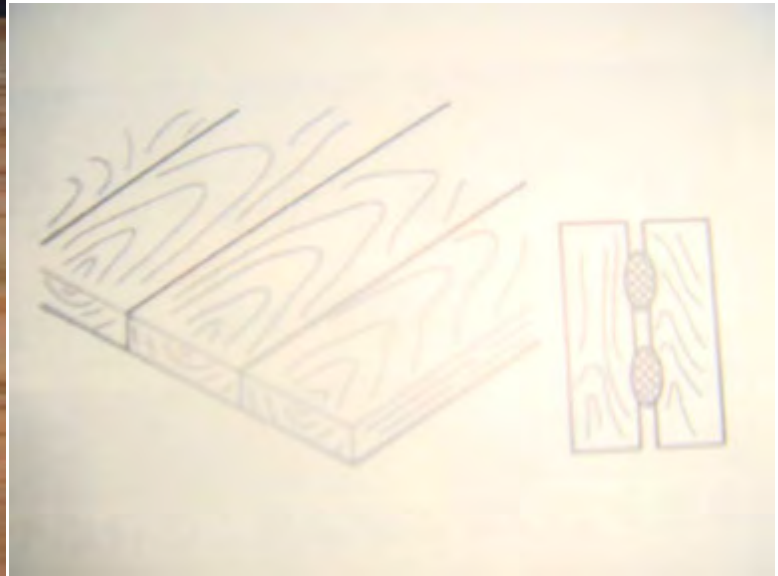


# 5. Joint Wood (1)

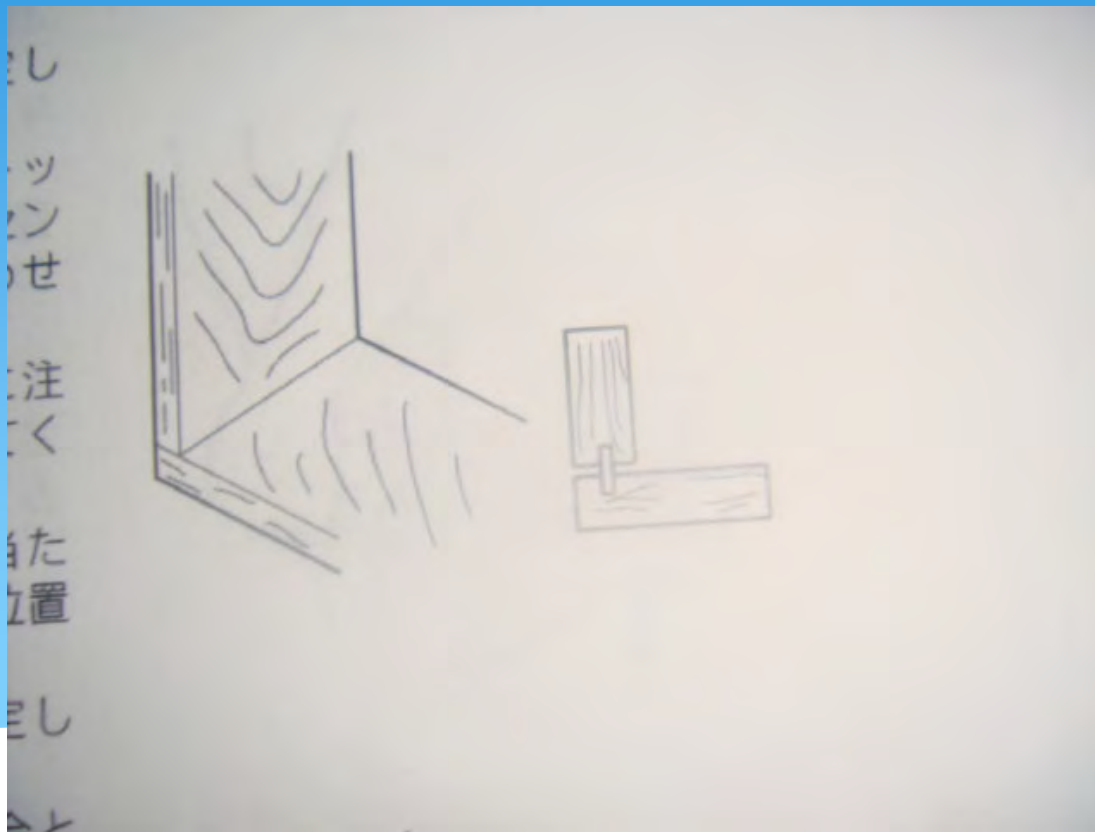
1. At first, put on the mark about A wood and B wood.
2. Make the hole about A wood and B wood.
3. Put in the biscuit in the hole with water glue.
4. Firm fixation by clamping or string.
5. After drying, plane the wood by sander or plane (canna).



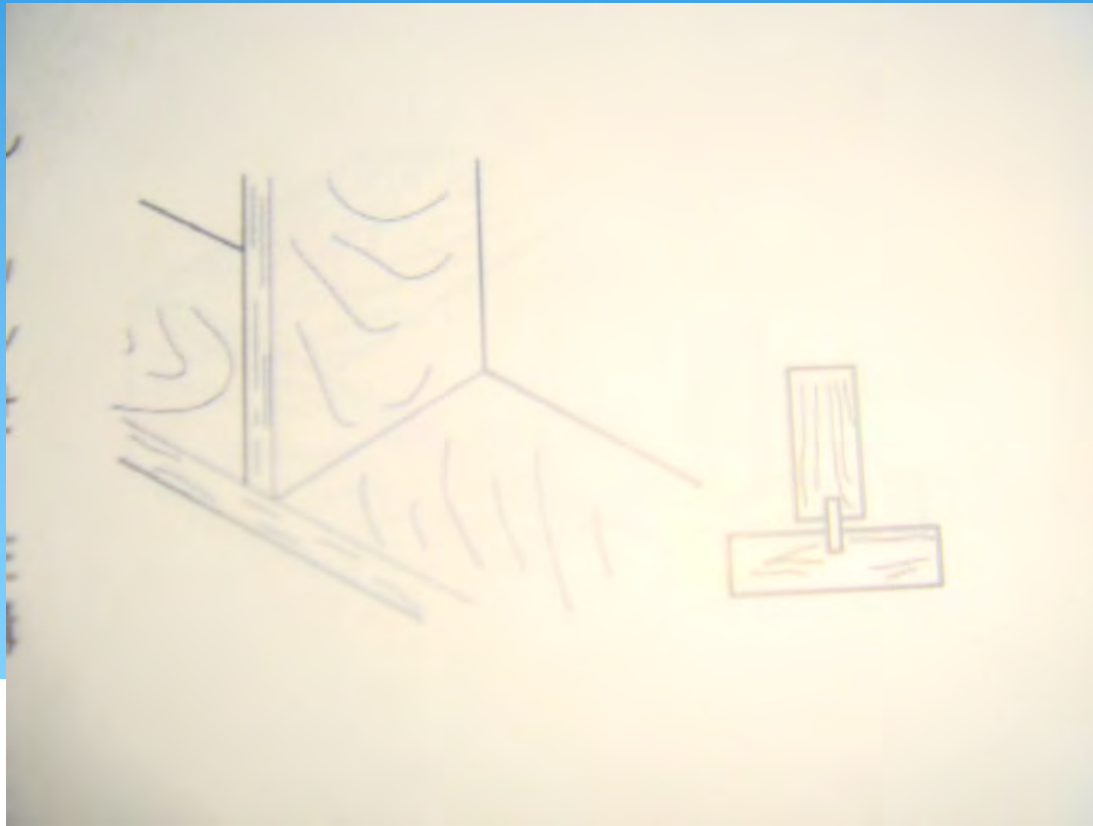
# Attaching wood



# Conner joint



# T pattern joint



# Biscuit



# Water Glue





# Joint wood by Binder



## 6. Completion wood





# Thank you



# Forest Survey techniques



Japan

Jap

ciation

tion

## Main contents

1. Forest survey
2. Tree Diameter measurement
3. Tree Height measurement
4. Equipment measurement
5. Digital clinometer

# 1. Forest Survey

- \* It is essential to properly understand the current state of forest in order to formulate adequate management plans. Forest survey is conducted for this purpose. Based on practices of field survey and inspection regarding stand and site conditions, forest survey data books are prepared. These serve as archival data to be referred when various projects are carried out, including logging programs, regeneration of log-over land, and nurturing and managements of forests.

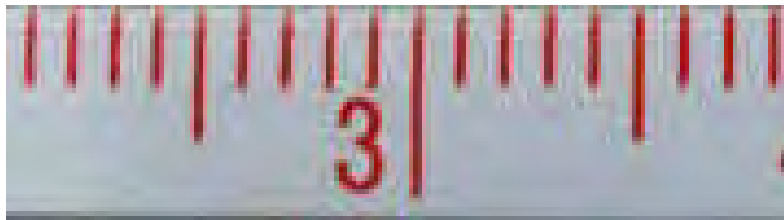
## 2.Tree Diameter measurement

The breast height diameter is to be measured from the upper side on sloping ground .On level ground, however, it may be measured at any direction. If use diameter tape, please check the twist.

- + It is measured at the height of 130 cm from ground level (when the tree is standing on the slope, however, it must be measured from the upper side of the sloping ground).
- + The diameter is recorded in centimeter and rounded off.
- + Calipers, diameter tapes or other tools are used for measurement.



# Tree diameter tape



### 3. Tree height measurement

The height of tree is determined by measuring the tree from the top to the end on the upper side on the slope.

Measuring digital clinometer is used.

# Digital Clinometer



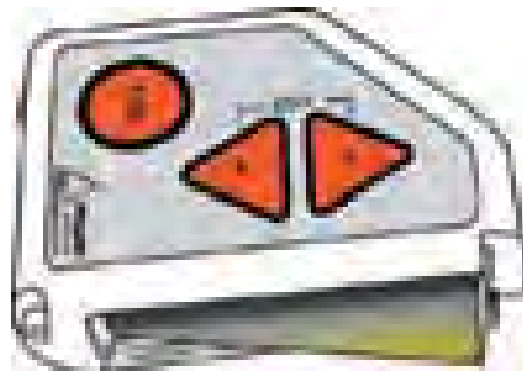
## Digital Clinometer

Digital Clinometer is an easy to use field instrument that offers accurate measuring results on inclination and heights of objects, usually trees. Heights are measured from any optional distance and placing in relation to the object's position in the field. The digital clinometer uses one AA battery that is removed by pushing open the battery lid . Battery consumption is low and a battery often lasts for several months.

# Digital clinometer instrument



# How to hold the instrument.



# Digital clinometer Function

\* **Function** Select function with a quick press on the 'ON' button one or several times. To turn off, press '+' and '-' buttons simultaneously. (Automatic turnoff after approx. 30 sec's of inactivity.)

**1 press: DIST** Distance setup, height measuring (m/ft)

**2 presses: HGT** Height Measuring (m/ft)

**3 presses: DEG** Inclination (%/°)

## Distance setup /measure height and inclination

Input distance with the '+' and '-' buttons. The distance equals the distance from the eye to the Centre of the tree's (object's) diameter at the bottom (ground level). Step up (increase) with the '-' button. Optional distance from 0 to 999m/ft can be registered. A single press increases or decreases distance by 1. Hold the button '+' or '-' down to scroll distance by 5. Release the button when the required distance is reached.

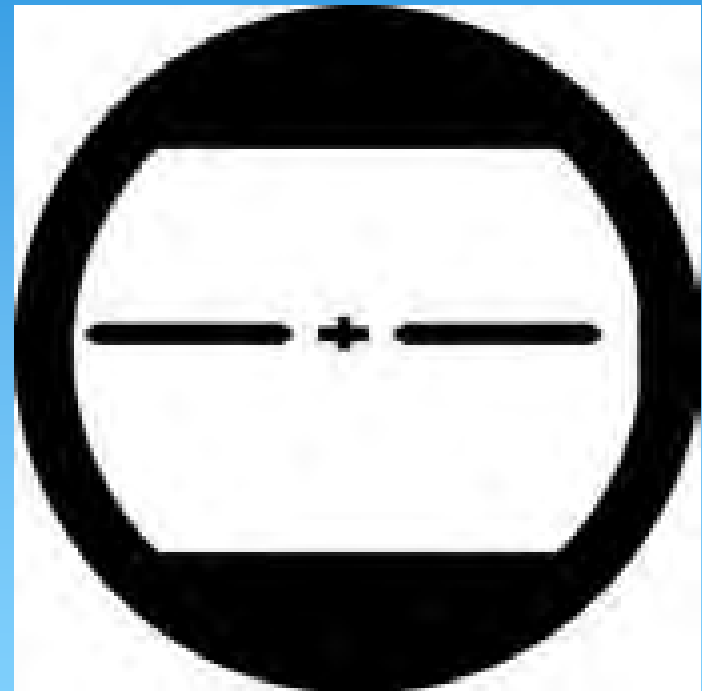


\* Press the 'ON' button to register the distance. The digital clinometer will use the last input distance as default also if the instrument is turned off. NOTE! The digital clinometer will not measure distances. Use a measuring to determine the correct distance to the measuring object.

Measure the angle to the bottom of the tree by aiming with the horizontal lines in the instrument display and pressing 'ON' one time. NOTE! Use both eyes when aiming!

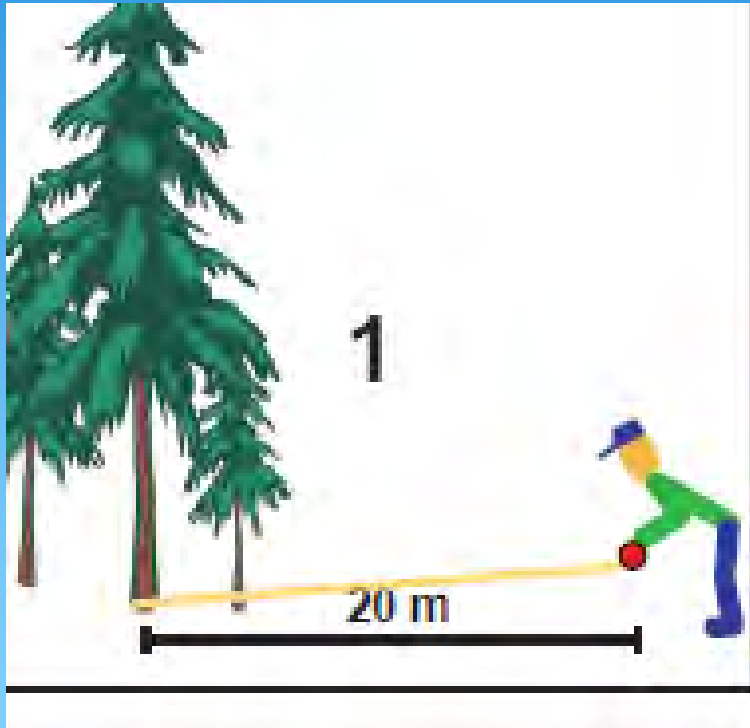
Measure height by aiming at the top (or other height) and press 'ON'. To measure more heights on the same tree simply aim and press the 'ON' button at your selected heights. Go straight to height measuring without registering a new distance at Height . Select Degrease to measure angles and inclination.

# How to measure tree height

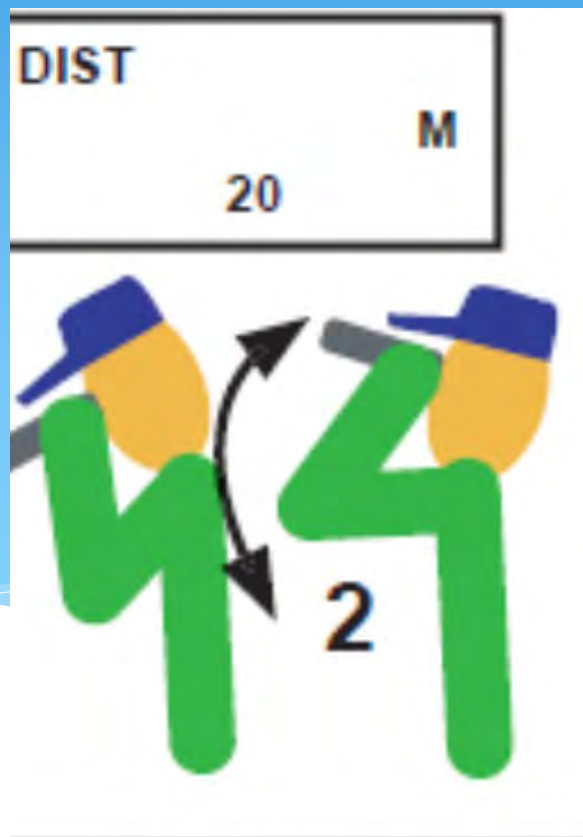


# Distance tape

At fast measure distance by distance tape



Use a measuring to determine the correct distance to the measuring object.



# Measure Tree Height





# Measure degree

Degree 40.0



## 4. Equipment Management

Forest Survey Equipment' needs to be managed in the warehouse by the staff in charge. The management of the forest survey equipment is important. It is necessary to fix the specific stock position by each equipment though all equipment shall be kept in a warehouse properly. The forest survey equipment should be kept correctly in the warehouse. And also it is necessary to wash and clean the equipment after it is used for proper maintenance, The staff in charge should manage the forest survey equipment by safekeeping note on survey equipment. Sample pictures are as follows:

# Arrangement Equipment





## Acacia mangium volume yied table

DBH\H DBH(cm)	樹高(m)												
	5	6	7	8	9	10	11	12	13	14	15	16	
5	0.0062	0.0075	0.0089	0.0103	0.0117	0.0131	0.0145	0.0159					
6	0.0084	0.0103	0.0121	0.0140	0.0159	0.0178	0.0198	0.0217	0.0236				
7	0.0110	0.0133	0.0158	0.0182	0.0207	0.0232	0.0257	0.0282	0.0307	0.0333	0.0358		
8	0.0138	0.0167	0.0198	0.0228	0.0259	0.0290	0.0322	0.0354	0.0385	0.0417	0.0450	0.0482	
9	0.0168	0.0204	0.0241	0.0279	0.0317	0.0355	0.0393	0.0432	0.0471	0.0510	0.0549	0.0589	
10	0.0201	0.0245	0.0289	0.0333	0.0379	0.0424	0.0470	0.0516	0.0563	0.0610	0.0657	0.0704	
11	0.0236	0.0287	0.0339	0.0392	0.0445	0.0499	0.0553	0.0607	0.0662	0.0717	0.0772	0.0828	
12	0.0274	0.0333	0.0393	0.0454	0.0516	0.0578	0.0641	0.0704	0.0767	0.0831	0.0895	0.0959	
13		0.0382	0.0451	0.0521	0.0591	0.0662	0.0734	0.0806	0.0879	0.0952	0.1025	0.1099	
14		0.0433	0.0511	0.0590	0.0670	0.0751	0.0832	0.0914	0.0996	0.1079	0.1163	0.1246	
15			0.0575	0.0664	0.0754	0.0844	0.0936	0.1028	0.1120	0.1213	0.1307	0.1401	
16			0.0641	0.0741	0.0841	0.0942	0.1044	0.1147	0.1250	0.1354	0.1458	0.1563	
17				0.0821	0.0932	0.1044	0.1157	0.1271	0.1385	0.1501	0.1616	0.1733	
18				0.0904	0.1027	0.1150	0.1275	0.1400	0.1527	0.1653	0.1781	0.1910	
19				0.0991	0.1126	0.1261	0.1397	0.1535	0.1673	0.1812	0.1952	0.2093	
20					0.1228	0.1376	0.1525	0.1675	0.1825	0.1977	0.2130	0.2284	
21					0.1334	0.1495	0.1656	0.1819	0.1983	0.2148	0.2314	0.2481	
22					0.1444	0.1617	0.1792	0.1969	0.2146	0.2325	0.2504	0.2685	
23						0.1744	0.1933	0.2123	0.2314	0.2507	0.2700	0.2895	
24							0.2078	0.2282	0.2488	0.2695	0.2903	0.3112	
25							0.2227	0.2446	0.2666	0.2888	0.3111	0.3335	
26								0.2614	0.2850	0.3087	0.3325	0.3565	
27								0.2787	0.3038	0.3291	0.3545	0.3801	
28									0.3232	0.3500	0.3771	0.4043	
29									0.3430	0.3715	0.4002	0.4291	
30									0.3633	0.3935	0.4239	0.4545	
31										0.4161	0.4482	0.4805	
32										0.4391	0.4730	0.5071	
33										0.4627	0.4984	0.5343	
34											0.5243	0.5621	
35											0.5507	0.5904	
36											0.5777	0.6193	
37												0.6488	
38												0.6789	
39												0.7095	
40													
41													
42													
43													
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59													
60													

# Thank you



# How to use GPS

## GARMIN MAP62S



Portable handheld type, waterproof IPX7

2,000 point possible

Battery capacity :Up to 20 hours

Japan Overseas Forestry Consultants  
Association (JOFCA)

# what is GPS

## Global Positioning System

To use in field survey for positional control  
and movement trajectories recording



# Utilization of Artificial satellite

GPS  
satellite  
position



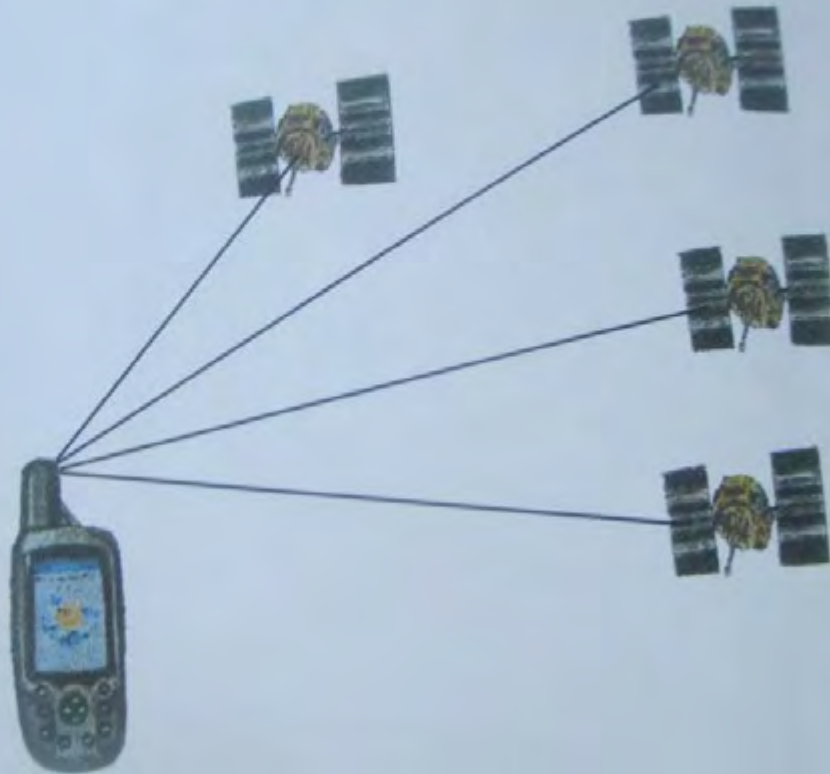
At least Catch the 4 artificial satellite  
from 24 artificial satellite

Good Distribution of satellite



Small Error Happen

Bad Distribution of satellite



Big Error Happen



Front



Back



Micro SD  
4GBS

2 Battery

10 hours

Cover

# Clip



# Set up clip



IN(magnification map)

Switch

OUT(reduction map)

FIND(look place)

PAGE(change indication)

MARK(record place)

MENU(set up)

QUIT(cancel)

ENTER(put and reserve)





## \* On / Off

### ■ On :

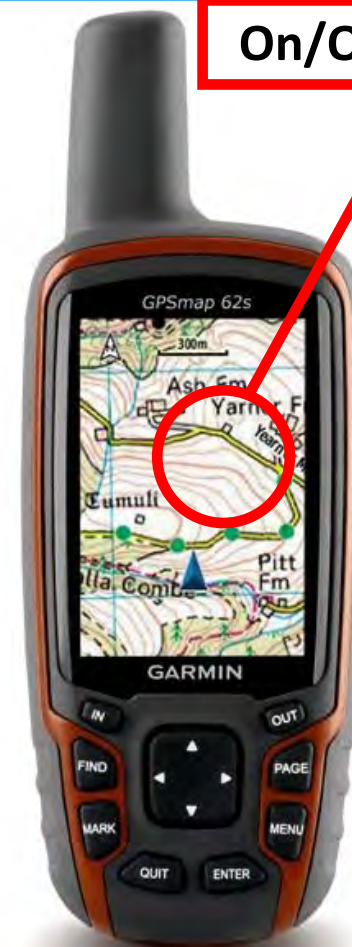
Press the On/ Off button a few seconds to start the GPSMAP 62s. Release the button after the logo "GARMIN" is displayed.

After turning on the device, position its antenna towards the sky a few minutes until the GPS signal stabilizes.

Before entering the forest, it is recommended to turn on the device in an open place to easily get the satellite signal.

### ■ Off :

The device stops if you hold the On / Off button a few seconds.



On/Off button

## \* Recording targeted positions

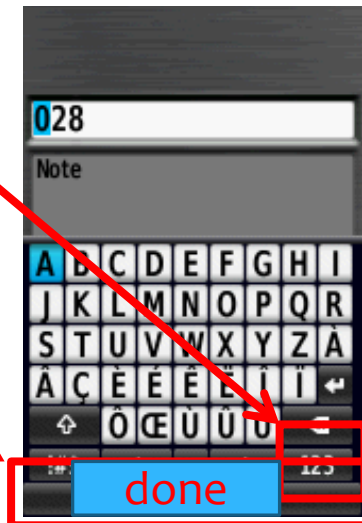
- Press "MARK". The recording screen of the point is displayed.
- Select the box " Point name " by using the cursor.



The box "Point name" becomes editable

- Change the plot identification number using the cursor and ENTER. Pressing "123" provides access to the number input screen.

After entering data, select "done".



## \* Recording targeted positions

- Select the box "Position" using the cursor. The coordinates input screen is displayed .
- Edit coordinates.
- Select "done" after entering data.
- After entering the identification number and the plot coordinates, select "done ".

20120317

Note

Position  
N 35°41'15.1"  
E 139°44'03.6"

Altitude -8<sub>m</sub> Profondeur \_\_\_\_\_<sub>m</sub>

N 0<sub>m</sub>

map done

20120317

Note

Position  
S 05°47'12.5"  
E 013°27'47.0"

Altitude -8<sub>m</sub> Profondeur \_\_\_\_\_<sub>m</sub>

0 13626.9<sub>k<sub>m</sub></sub>

map done

Position  
S 05°47'12.5"  
E 013°27'47.0"

Altitude -8<sub>m</sub> Profondeur \_\_\_\_\_<sub>m</sub>

1	2	3	↕
4	5	6	↕
7	8	9	↕
-	0	+	↕

done

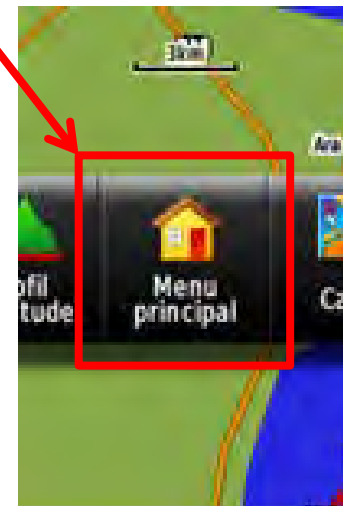
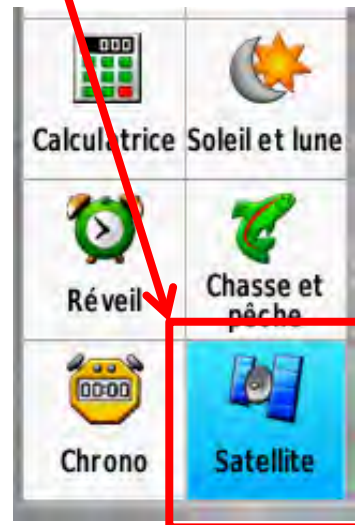
# How to use the GPS

## \* Checking the reception status of satellite signal

- Press "PAGE"
- Select "Menu principal".

The screen "Menu principal " is displayed.

- In " Menu principal ", search "Satellite" using the cursor , and press "ENTER ".



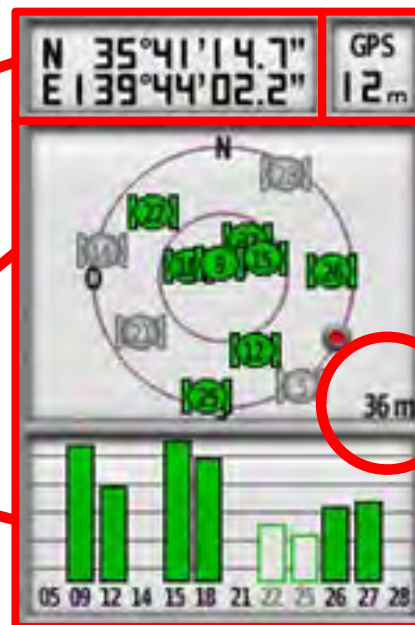
## \* Checking the reception status of satellite signal

The screen "Recherche satellites" is displayed.

- Check the reception status of satellite signal.  
You can check the latitude and longitude of the current position, GPS accuracy, satellite map, satellite signal quality and the GPS altitude.

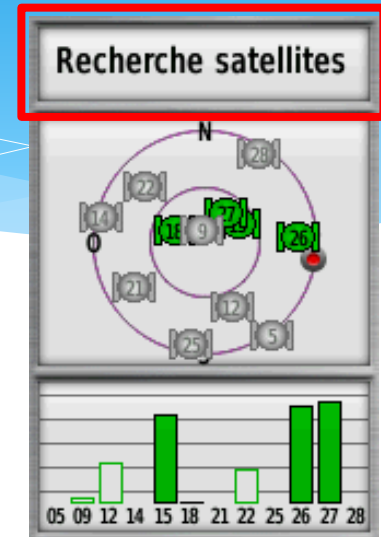
latitude and longitude of the current position

Satellite being searched by GPS and signal quality



GPS Accuracy (margin of error)

GPS altitude



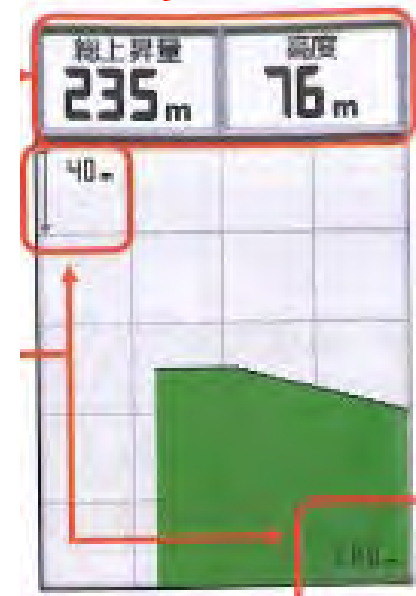
# How to use the GPS

## \* Elevation Plot

- Press "PAGE"
- Select "Elevation Plot".
- You can see the elevation .
- Press "MENU"
- There are some option as below



- ✓ Change Plot Type
- ✓ Adjust Zoom Ranges
- ✓ Change Data Fields
- ✓ Reset
- ✓ Calibrate Altimeter
- ✓ Restore Defaults



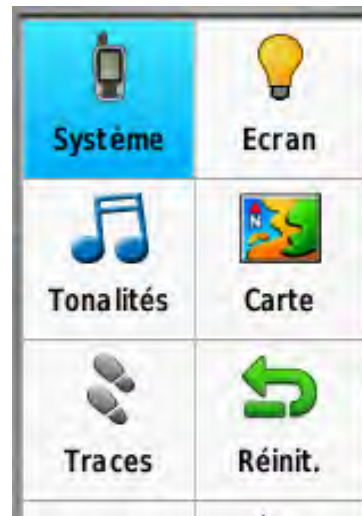
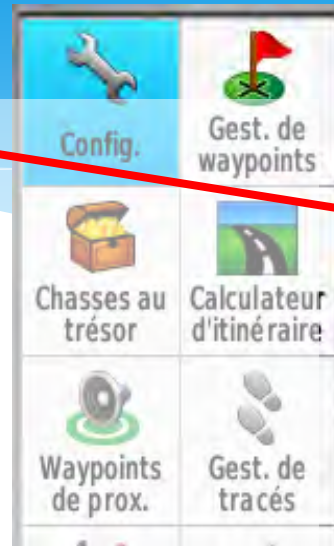
# How to use the GPS

## MENU ICON

Press the button "MENU"

There are 21 icons as below

- ✓ Set up
- ✓ Waypoint Manager
- ✓ Geocaches
- ✓ Route Planner
- ✓ Proximity Alarms
- ✓ Track Manager
- ✓ Share Wire lessly
- ✓ Active Route
- ✓ Waypoint Averaging
- ✓ Sight 'N Go
- ✓ Profile Change
- ✓ Area Calculation
- ✓ Photo Viewer
- ✓ Calendar
- ✓ Calculator
- ✓ Sun and Moon
- ✓ Alarm Clock
- ✓ Hunt and Fish
- ✓ Stopwatch
- ✓ Satellite
- ✓ Adventures



# How to use the GPS

## Set up ICON

- Press the button "MENU"
- Press the button "Set up"

There are 18 icons as below

- ✓ System
- ✓ Display
- ✓ Tones
- ✓ Map
- ✓ Tracks
- ✓ Reset
- ✓ Page Sequence
- ✓ Units
- ✓ Time
- ✓ Position Format
- ✓ Heading
- ✓ Altimeter
- ✓ Geocaches
- ✓ Routing
- ✓ Marine
- ✓ Fitness
- ✓ Profiles
- ✓ About





# How to use the GPS

## \* Navigation

- Press the button "FIND"

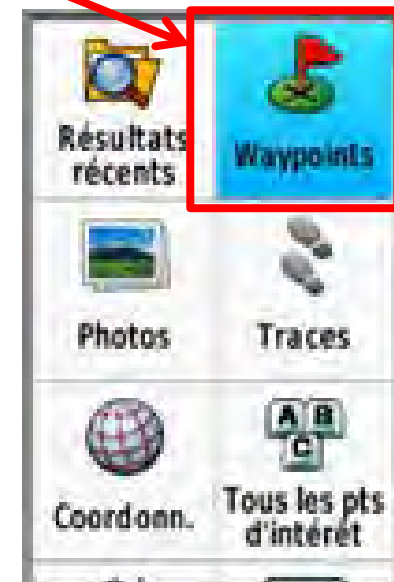
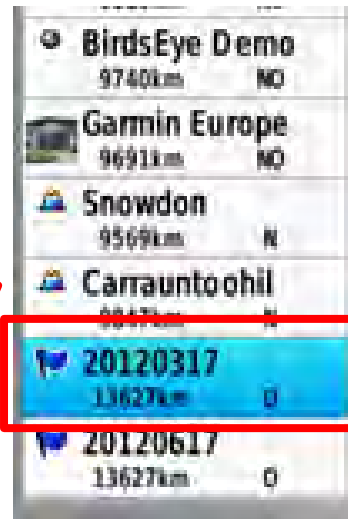
The screen "Recherche" is displayed.

- Select the box "Waypoints".

The list of Waypoints is displayed

- Search and select coordinates.

- Select "go".



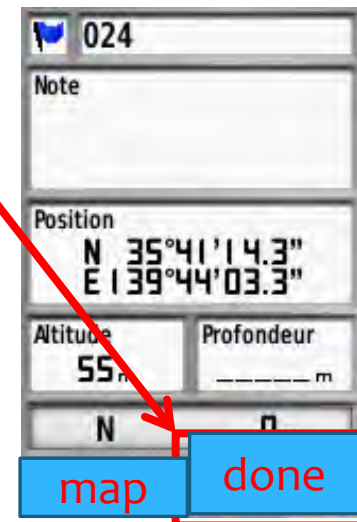
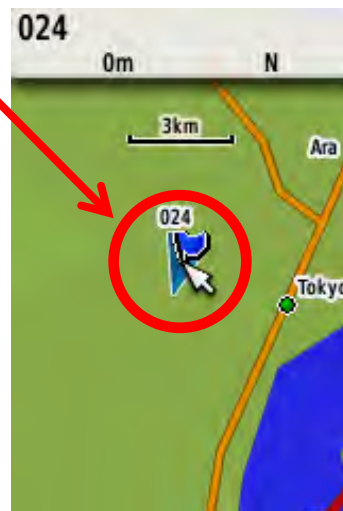
## \* Recording current position

- Press the button “MARK”

The recording screen of the point is displayed.

- Check content to record.
- Select “done” and press “ENTER”.

A flag (Way point) is displayed on the map.



# How to use the GPS

## \* Navigation

- To stop navigating press “FIND” during the navigation.
- Select “stop navigation”.
- Press “ENTER”.



# How to use the GPS

## 1. In order to delete all data

- Press the button “FIND”

The screen “Recherche” is displayed.

- Select the box “Waypoints”.

The list of Waypoints is displayed and Press the button “MENU” and Select “Delete all”



## 2. In order to delete one data

- Press the button “FIND”

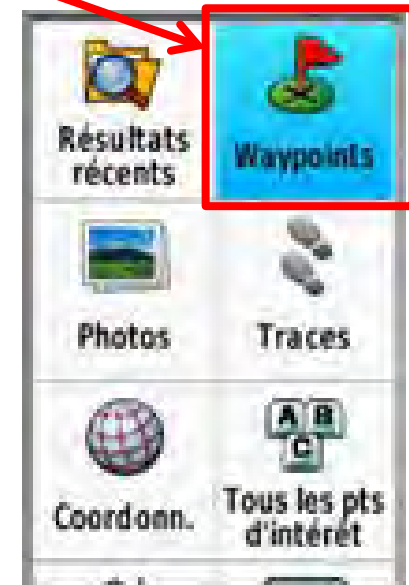
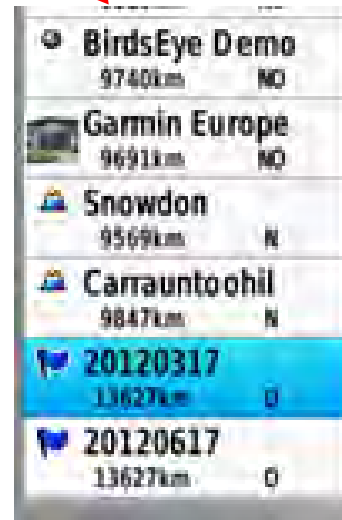
The screen “Recherche” is displayed.

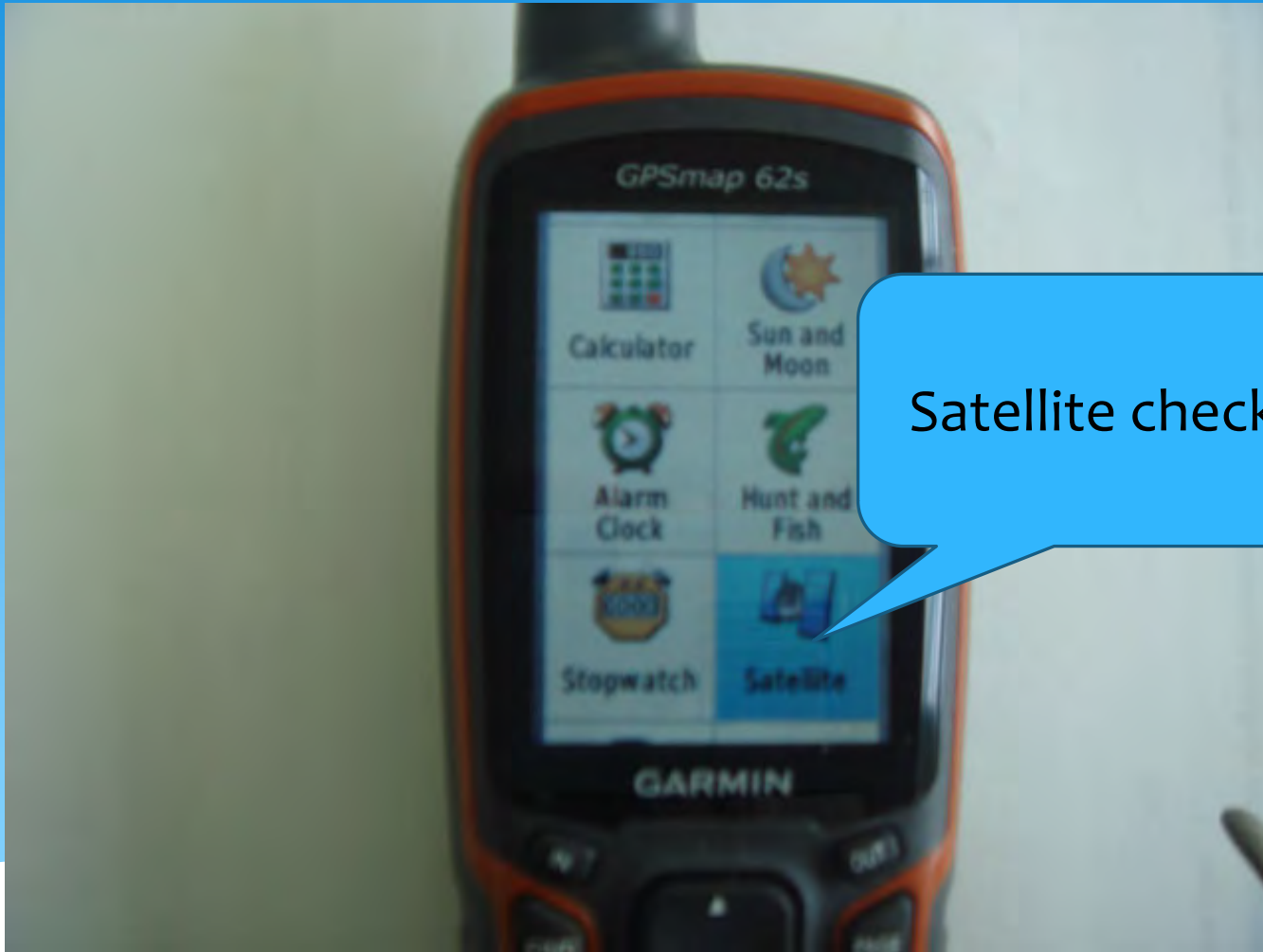
- Select the box “Waypoints”.

The list of Waypoints is displayed

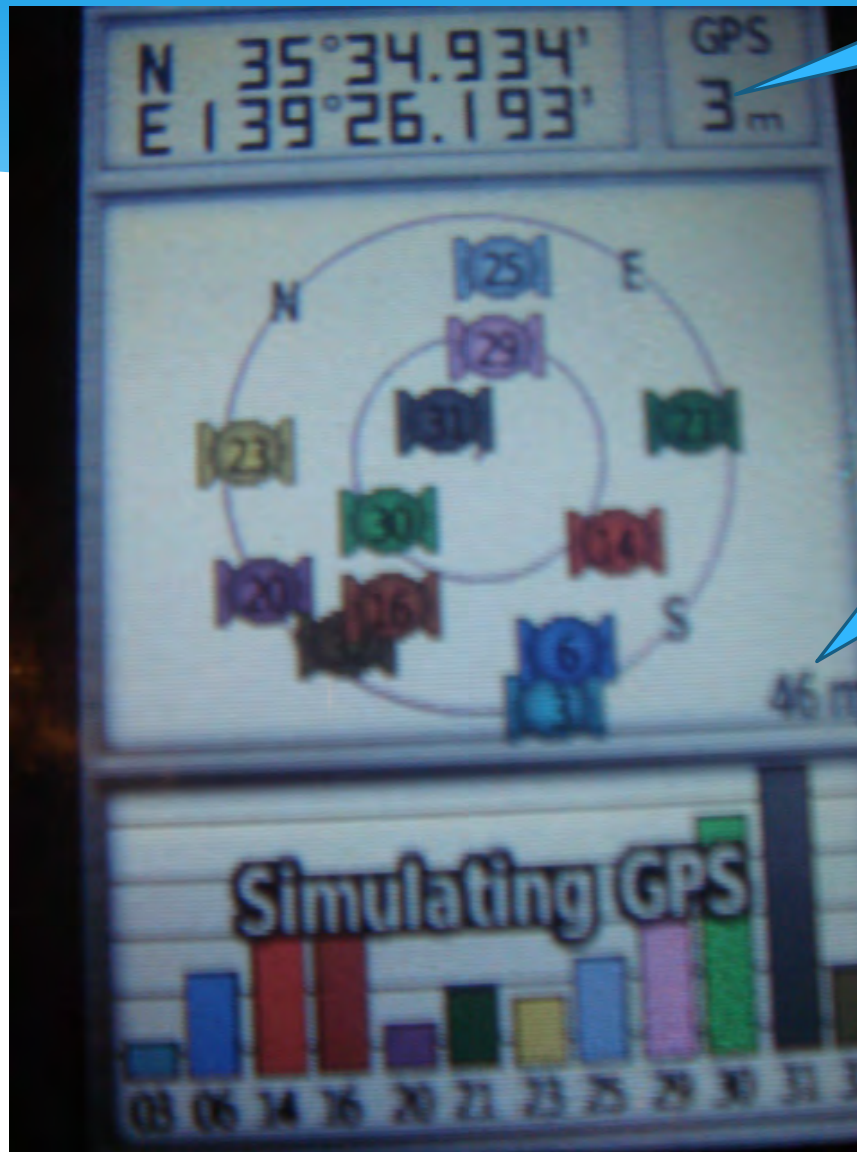
- Search and select coordinates.

- Press the button “MENU” and Select “Delete ”





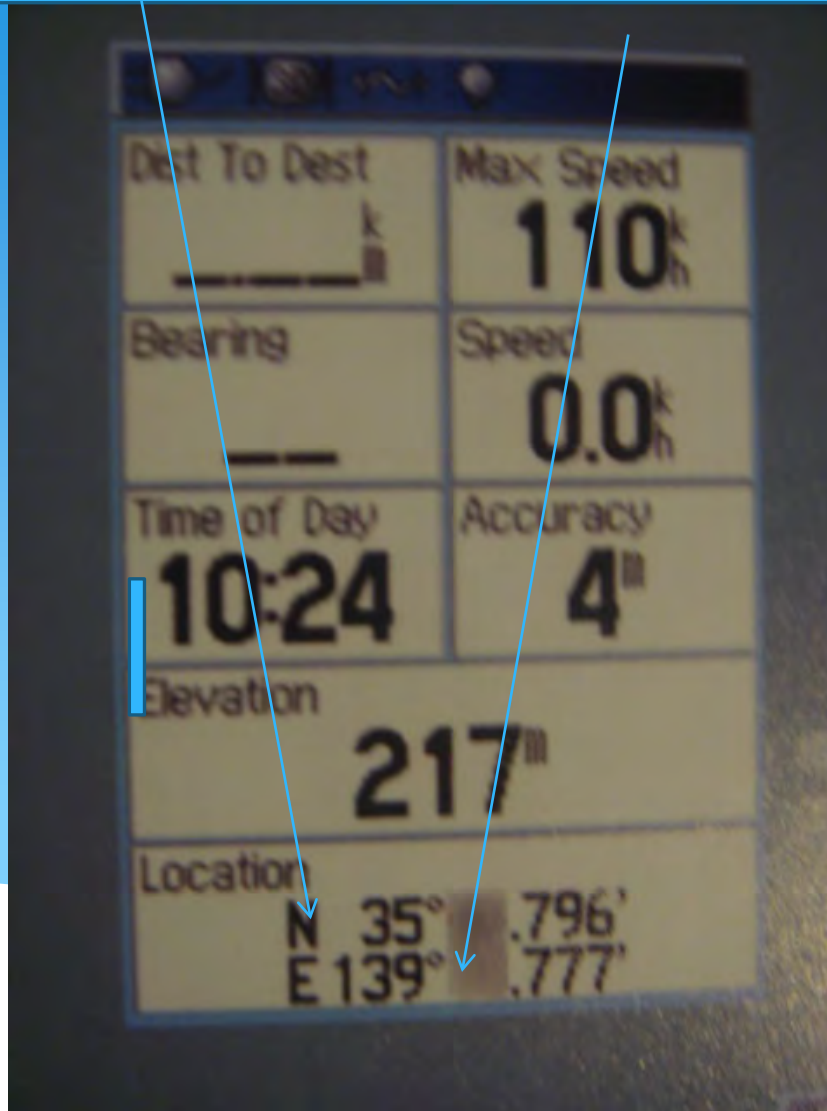
Satellite check



Error

Elevation

# latitude and longitude



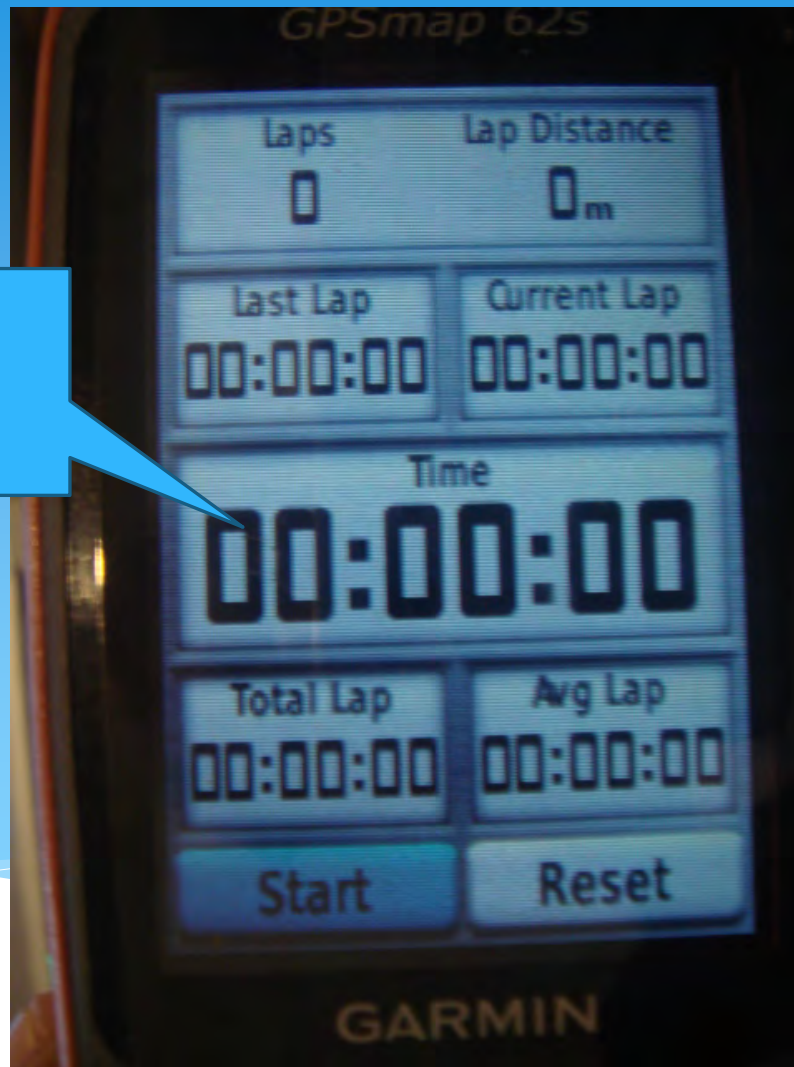
# Stop watch

Stop watch





Time check




# GPS Sets up at the car




# Way points



 280 (17:27)


0m

N

 281 (17:27)


0m

N

 282 (17:29)


0m

N

 283 (17:29)


0m

N

 284 (17:29)

0m

N

 285 (17:30)

0m

N

# Navigation



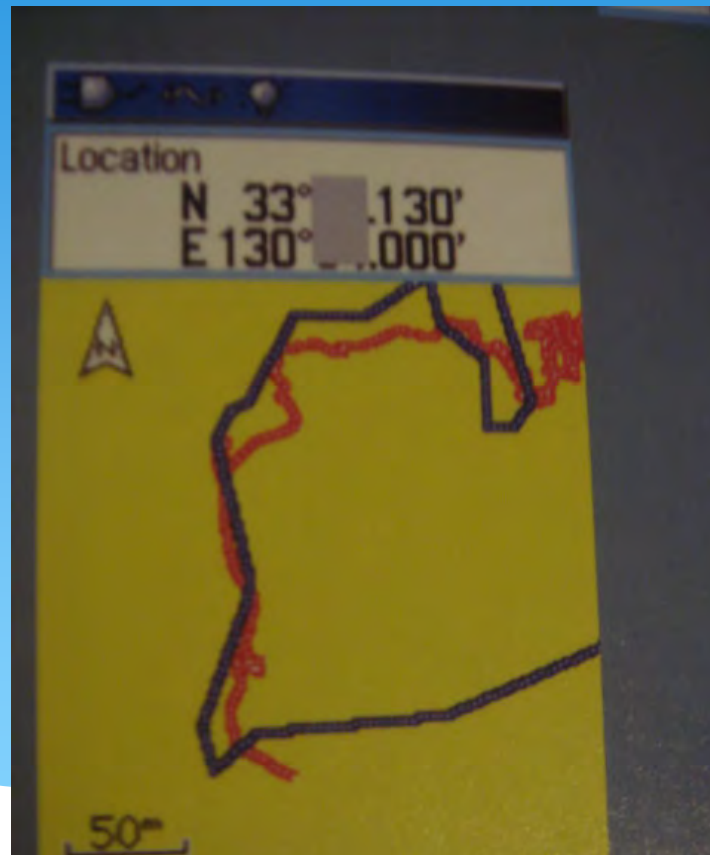
It is show to



# Location of survey points



# locus



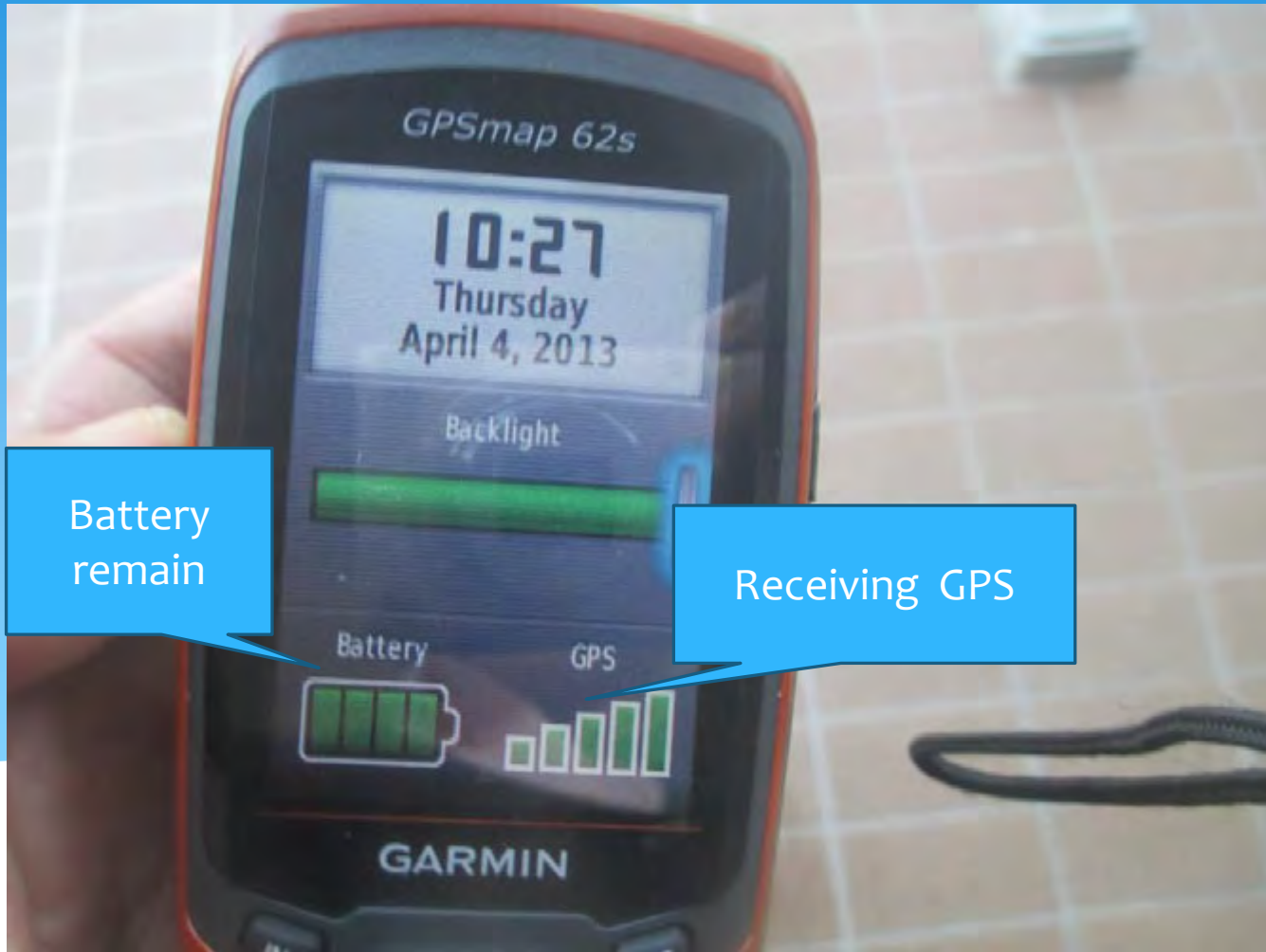
Moving along boundary



# Direction



# Battery remain and receiving GPS Check



Battery  
remain

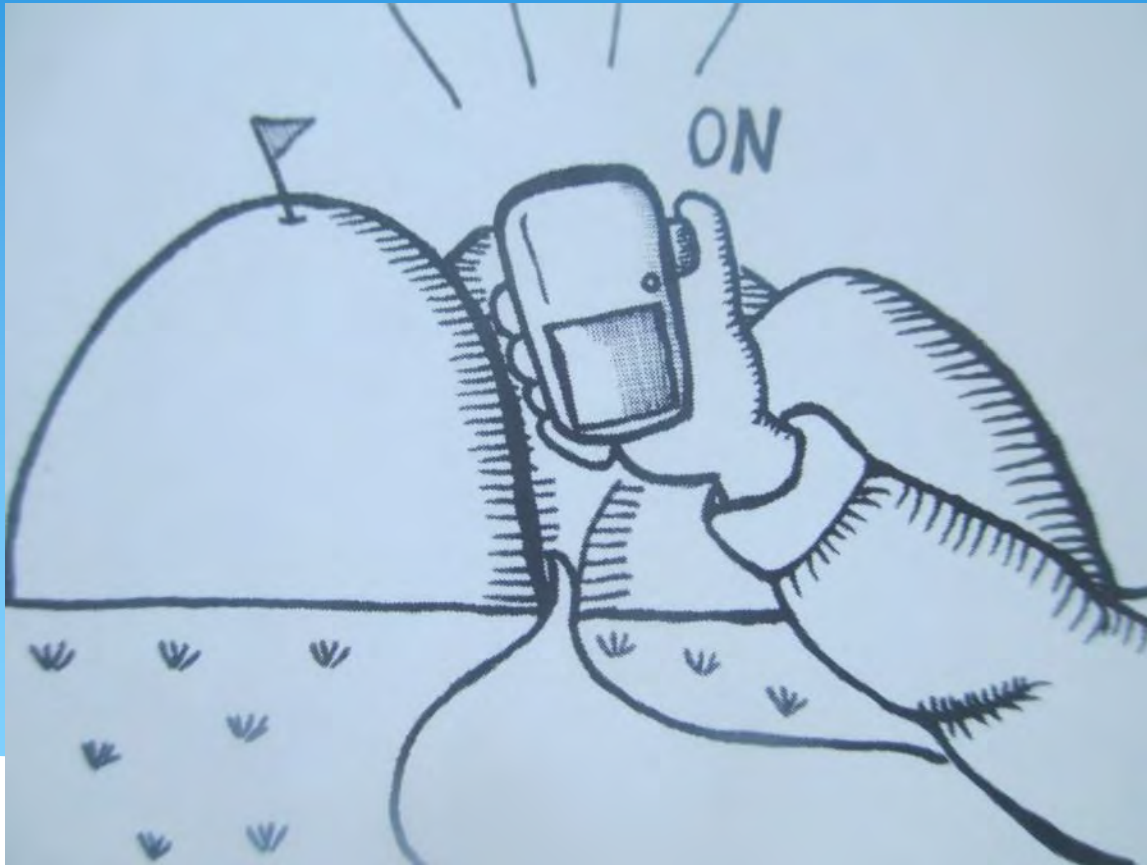
Receiving GPS

Don't carry from neck

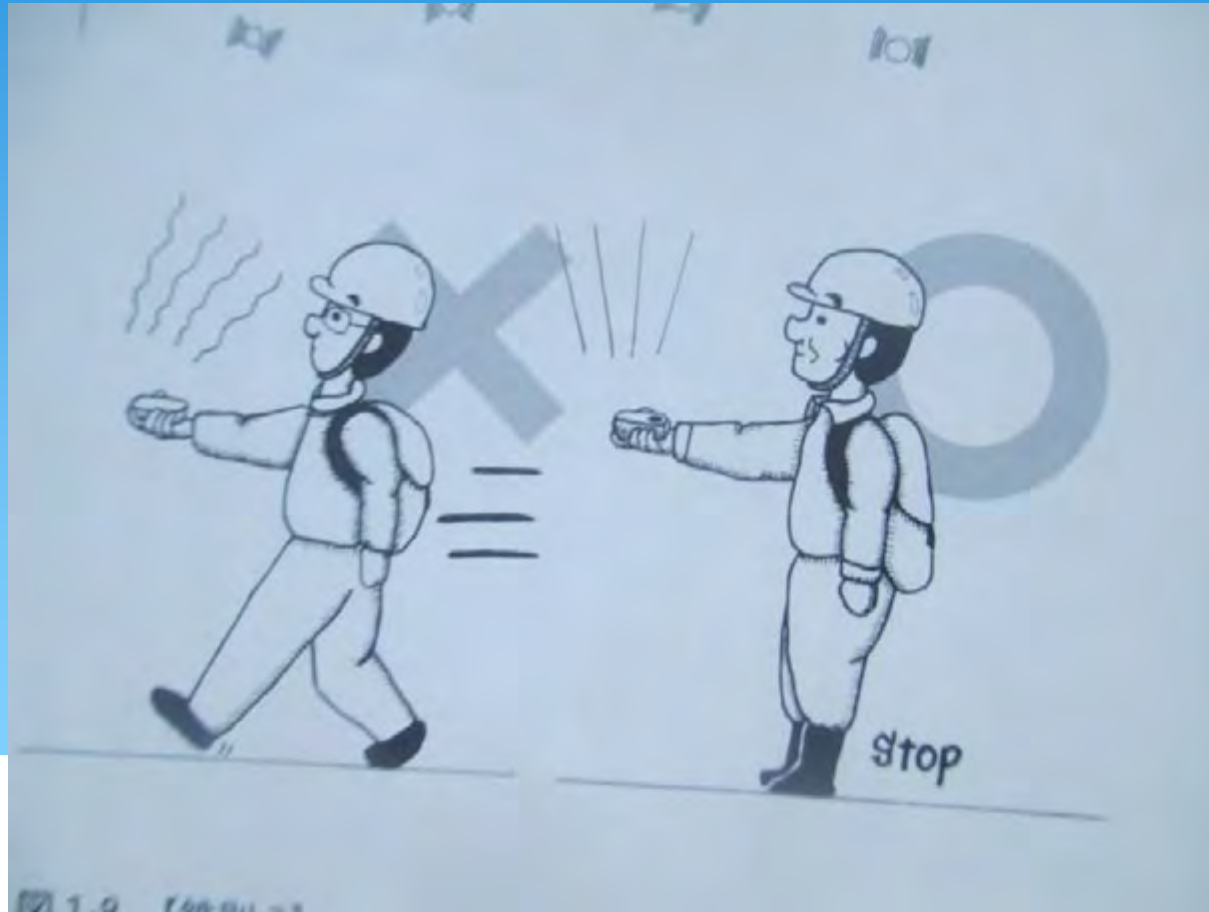


Please keep level

Don't switch on GPS after enter the mountain ,  
switch on GPS before enter the mountain



When you take the date ,you must stop in several seconds



You much better separate from your body



Your body also effect from satellite

If rain is coming , Please keep GPS in the plastic bag



図1-43 GPSは突然の雨で濡れないようにビニール袋に入れて使用

# Field work preparation

- \* **Planning team work (you must contact other survey members)**

- \* **GPS**

- Other Equipment's (caliper , Hypsometer and etc)**

- Preparation of topographical maps**

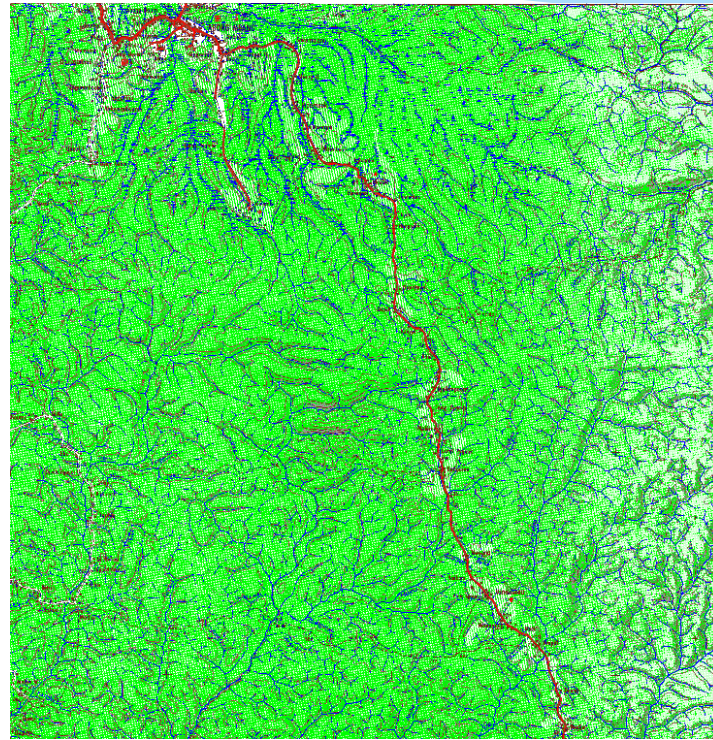


# Preparation of topographical maps

- \* Topographic maps covering the survey sites are prepared to move into the field and indicate the location of the sampling unit .
- \* They will be magnified at the appropriate level (if possible scale 1: 50,000) and photocopied.
- \* For each sampling unit, the unit boundaries are drawn on maps.
- \* The central points of each plot in the sampling unit are shown on maps.
- \* Before going to the field, each team must identify and draw the easiest and fastest access to the first plot.

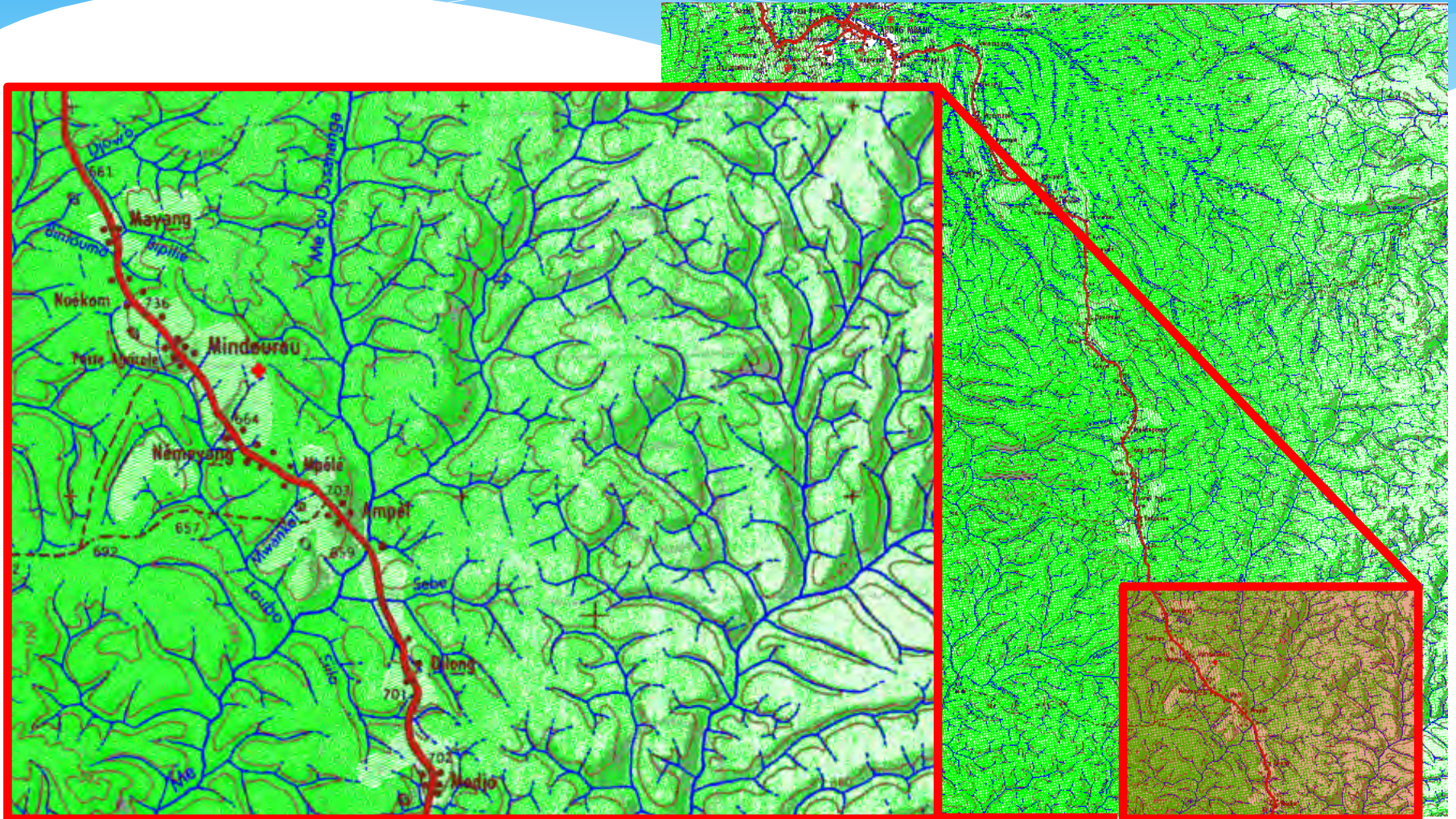
# Preparation topographical maps

- \* Topographic maps covering the survey sites are prepared to move into the field and indicate the location of the sampling unit .



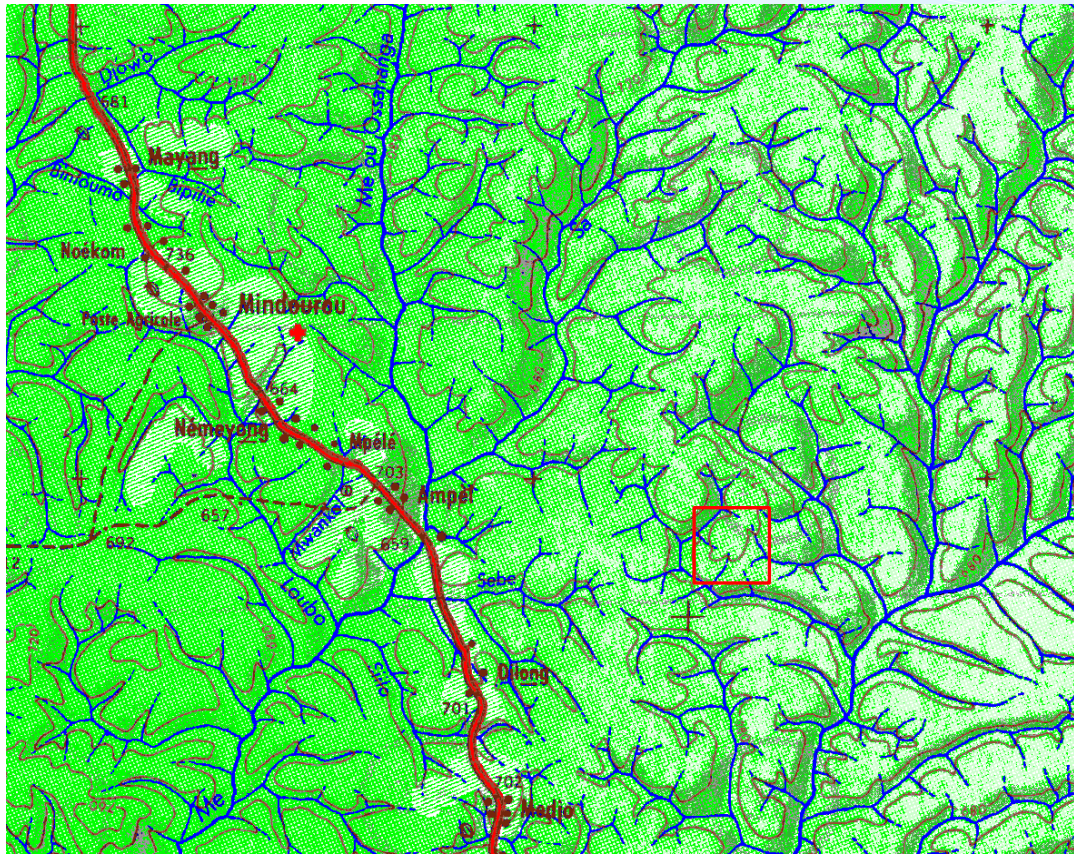
# Preparation topographiques

- \* They will be magnified at the appropriate level (if possible scale 1: 50,000) and photocopied.

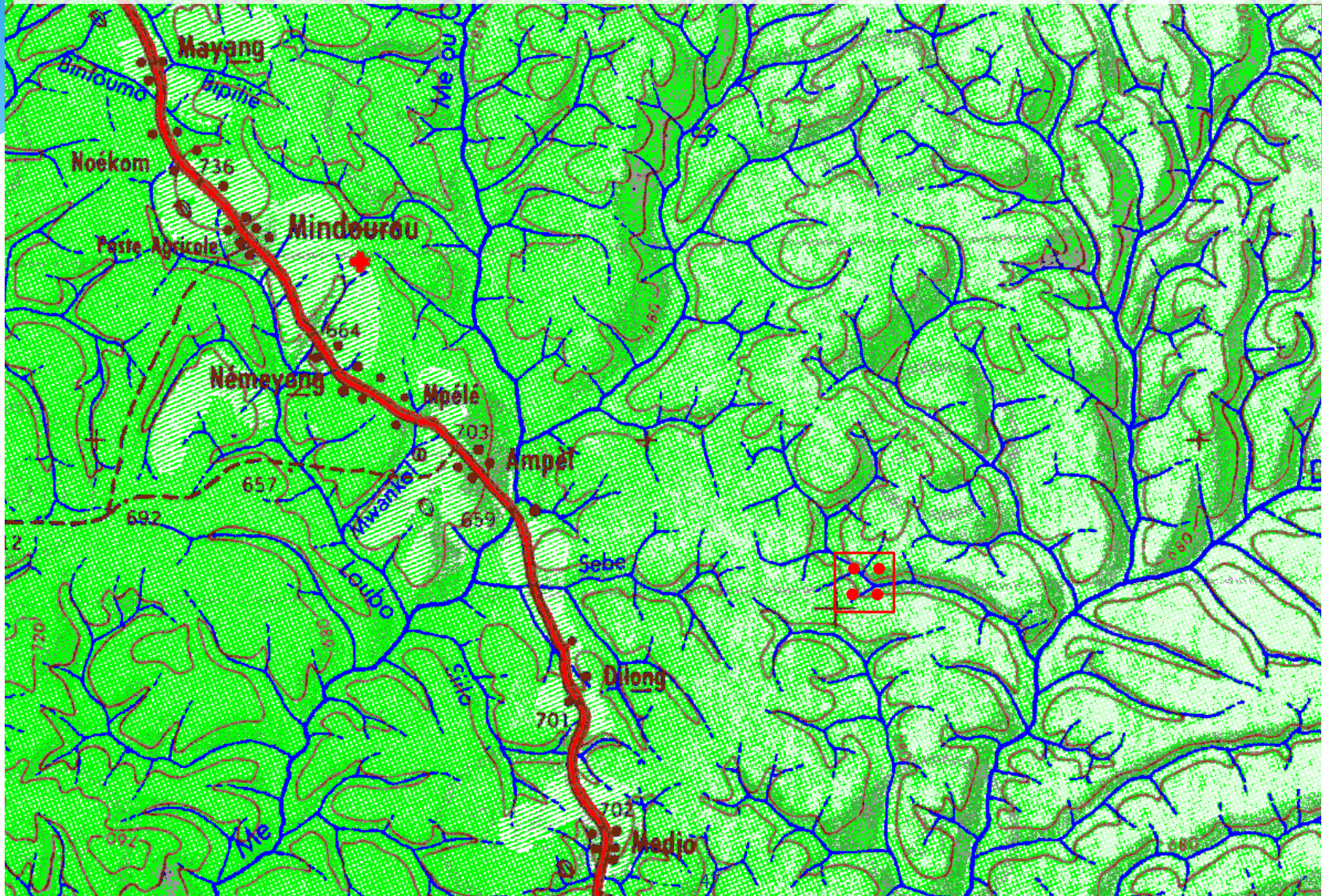


# Preparation des cartes topographiques

- \* For each sample unit , the unit boundary are drawn on maps.

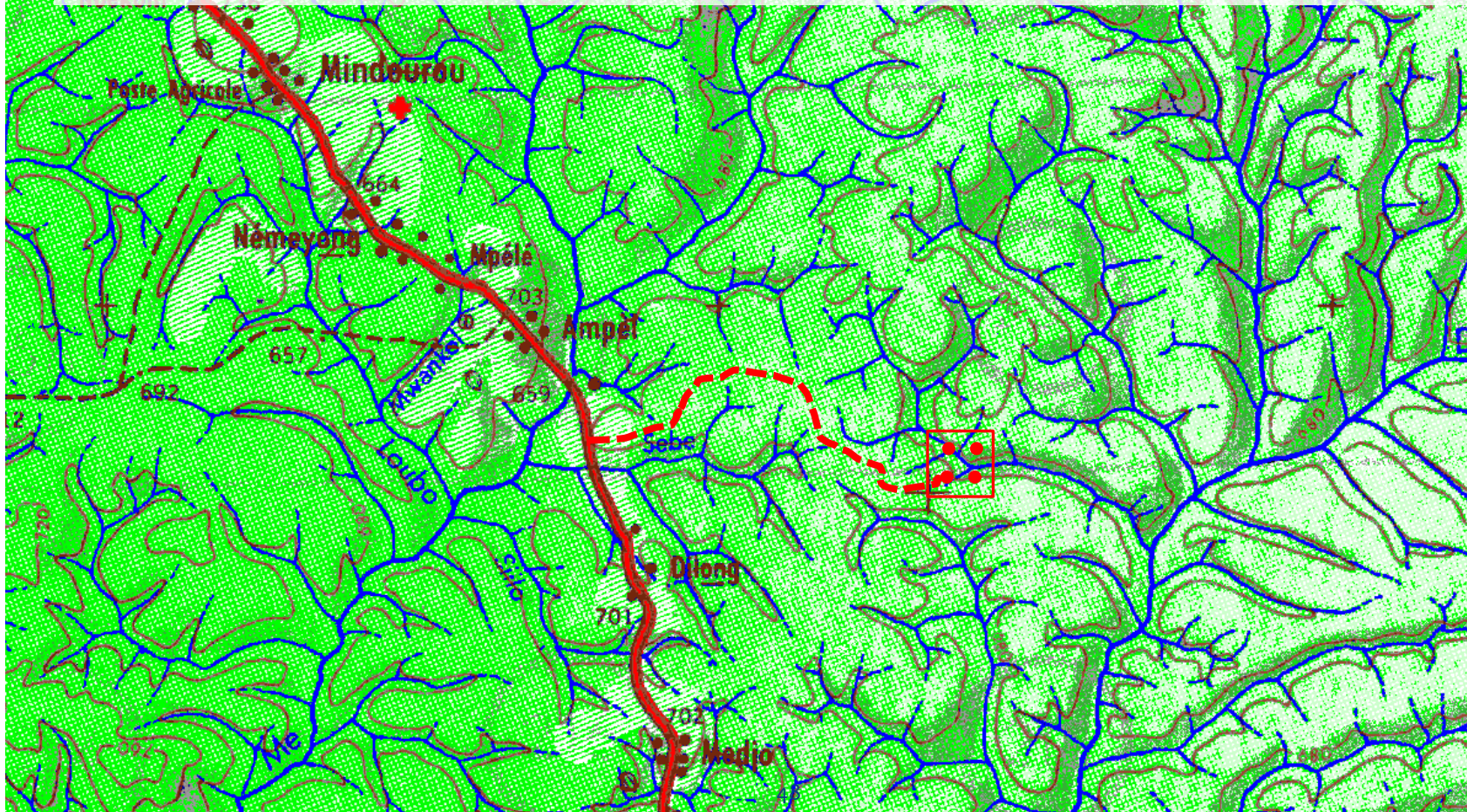


\* The central points of each plot in the SU are shown on maps.



# Preparation topographiques

- \* Before going to the field, each team must identify and draw the easiest and fastest access to the first plot.



# GPS Setting

- \* The coordinates of the SU (Southwest corner) and the central point of each plot will be entered into the GPS receiver.
- \* The identification code is determined as follows:
  - Name of the SU southwest corner to enter into the GPS: "ID number of the SU (three digits)" + "C". Example: for the sampling unit 13: "013C"
  - Name of the central point of each starting plot to enter into the GPS: "ID number of the SU (three digits)" + "P" + "plot ID number (from 01 to 12)" + "D". Example: sampling unit number 13, plot number 4 "013P04D"

Measuring of tree diameter and GPS point on same time





# Tree Survey note book

Plot No	Latitude	Longitude	Elevation	Direction	Time	GPS No	Diameter	height	Timber Volume



**Thank you!**



# *Forest Fire prevention Training for Villagers*



## *Important point*

1. Use for Local resources (material)

bamboo ,wood

2. Expect from local people idea

slogan

3.Expect from young student idea

picture

# *How to make bamboo flapper*

- *Local bamboo species is available in local area*



- Bamboo (5cm\*2,5m) is chopped down to make flapper



- Cutting bamboo into 2.5 m to make handle and another 2.5m is used to make a bamboo net





- Cutting bamboo into two equal parts (each part is 2.5m long)



- Preparing to make bamboo flapper



- Opening the bamboo about 1 m from top and cut the bamboo into 8 or 10 pieces (each piece is about 1 or 1,5 cm)



- Permanently  
Indicating the key  
bamboo bar on the  
flapper before  
netting it



- Netting the flapper



- The end of the head should be folded into two sides of the frame before netting



- Bamboo flapper is being netted



tied on bamboo  
stick





# *Local material Bamboo flapper*

- Bamboo flapper is finished



## *How to make iron net flapper*

- Melaleuca is easy available in local area to make a flapper stick.



- Melaleuca was chopped down to prepare for iron net flapper.



- Melaleuca stick (5cm\*2.5m) are prepared to make iron net flapper.



- Cleaning and uncovering melaleuca bark before joining the iron net into the handle.



- This man is joining the iron net into melaleuca stick.



- Hitting the nails into melaleuca stick.



- Examining whether the flapper is strong or not.





## *Local material Iron net flapper*

- Iron net flapper with malaluca stick is finished.



# *Thinking by local people*



# Making slogan



# Some slogan made by people



# Picture contest



# Primary school' student to draw promotional pictures for forest fire prevention



# Drawing



# Drawled picture





# *Team leader instruction*















JABATAN PERHUTANAN

## PETUNJUK API FIRE INDICATOR



-  LOW RISK (RISIKO RENDAH)
-  MEDIUM RISK (RISIKO SEDERHANA)
-  HIGH RISK (RISIKO TINGGI)
-  EXTREME RISK (RISIKO BERBAHAYA)

*Thank you*

## Forest Fire Fighting Activity for farmers

There are two main activities we can do to manage forest fires as follows:

- 1) Learn the ways to prevent forest fires,
- 2) Learn the ways to control and fight fires during a forest fire.

### 1. Types of Forest fires

Based on the material burned, forest fires are categorized into:

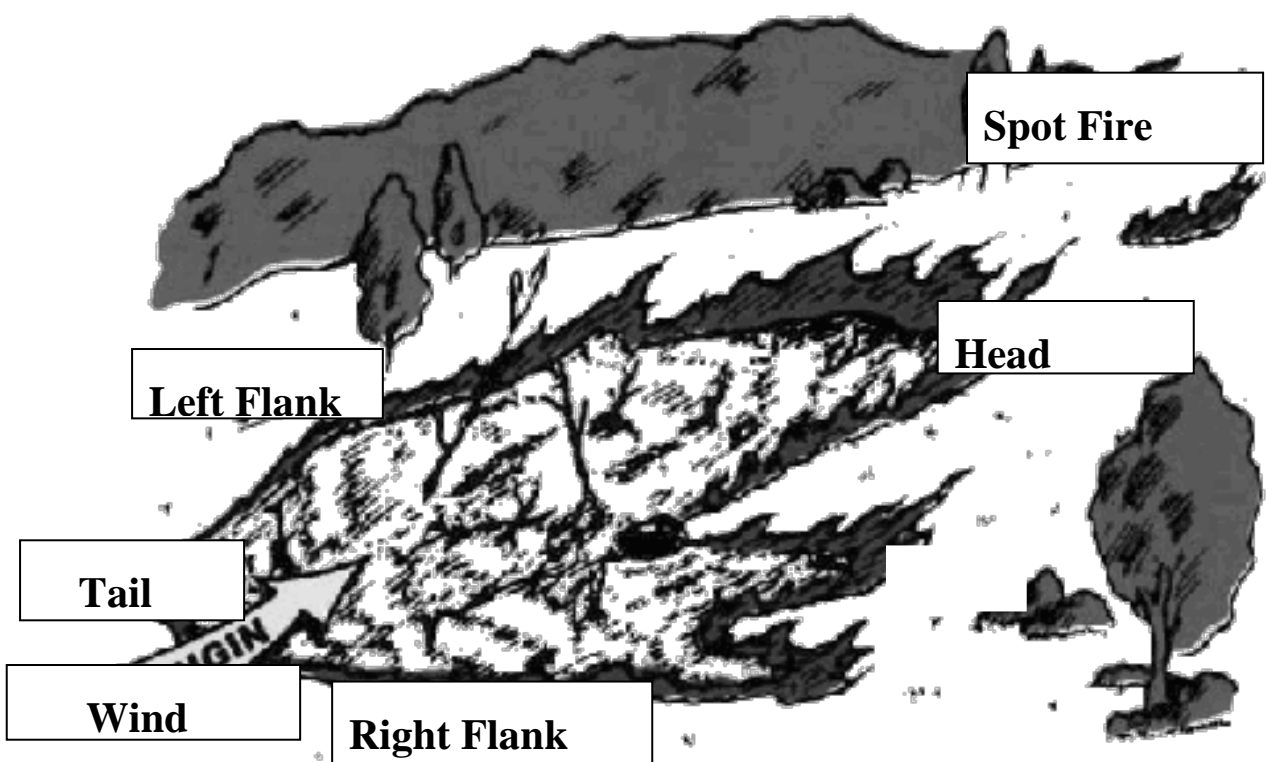
1. Ground fire: Fire burns all organic material such as debris and brush on the ground. The spread of the fire is not influenced by wind velocity.
2. Surface Fire: Fire burns the vegetation on the ground surface such as leaves and bushes. The first stage of this fire is the circle fire in which several factors influence the shape of the fire to become egg-shaped. In this condition, the spread of the fire is in line with the wind direction and velocity. If the fire is in line with the wind direction, spreading will be faster. If the fire is in the opposite direction of the wind, the fire will decelerate and easily fade out.
3. Crown fire: Fire burns the middle and top parts of the trees and bushes. This fire spread is always in line with the wind direction. The velocity of fire spread is described in miles or Km/ hours and width (ha)/hours.

### 2. Factors that influence fire size:

Forest fire size is influenced by:

1. Character and amount of burned materials: Bushes are easily burned compared to trees. Therefore, in bush areas or savannahs, the fire is easily spread to a wider area.
2. Water level: During dry season, fire will easily spread to wider area through dry plants due to lack of water.

3. Wind condition: Wind has the power to make leaves or other light materials fly to other areas. It can form new hotspots and widen the fire area. The wind direction determines the direction of the spreading fire. During fire fighting this condition should be considered, because fires burning opposite to the wind direction will decelerate the spread of the fire.

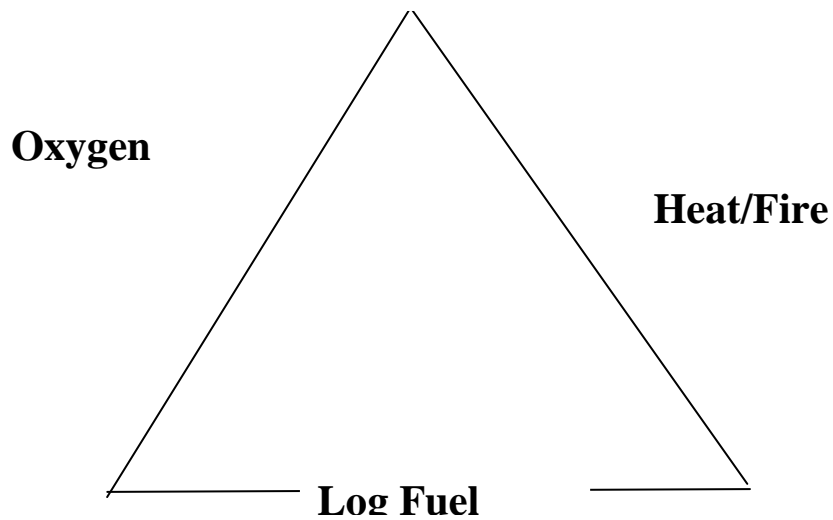


Prevention is the best way to stop a forest fire. This effort can be done by forming groups of volunteers that recognize the causes of forest fires and can extend this information effectively to the community. The core of this activity is community participation and involvement in forest fire prevention.

Other important thing is to prepare fire equipment to conduct fire fighting. This equipment includes jet shooters and other safety equipment for the fire-fighting personnel.



## Triangle concept of fire



### 4. Forest fire control

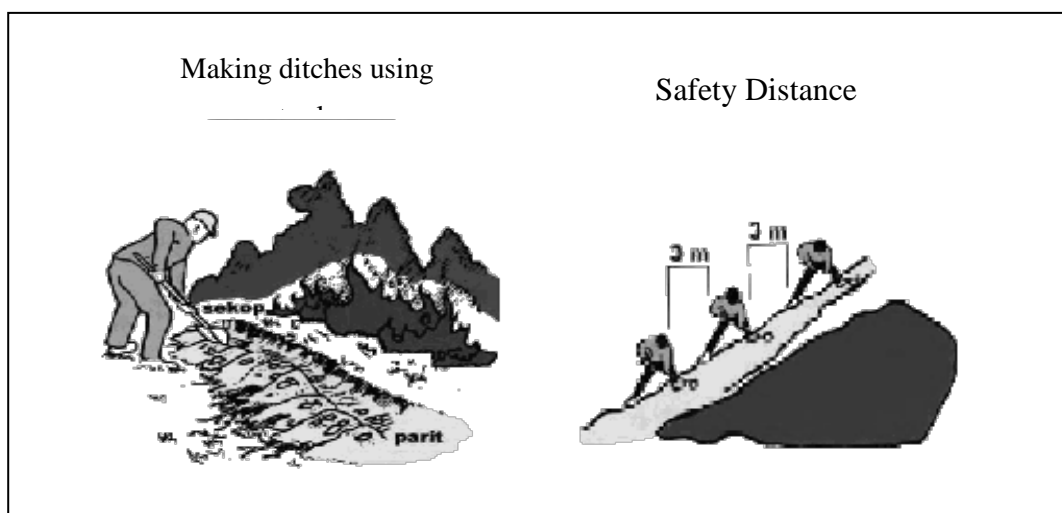
During a forest fire, we can suppress the fire or eliminate the spread of the fire by:

#### a. Making ditches:

Objectives: To prevent the fire from spreading to a wider area, and to provide a safe distance from which the fire fighters can fight the fire..

Method: Dig ditches around the burning area.

To prevent the spreading of fire, we can also clean up the flammable materials that easily burn (such as wood and leaves).



#### Making ditches and a safety distance

#### a. Forest fire fighting

This action should be done early, before fire spreads to other areas. We can cover the burning area with soil or water using a bucket, fire flapper, or fire pumps.

Suppressing a fire can be done through;

#### Direct and Indirect Attacks

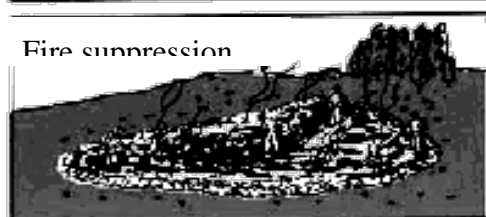
Fire are controlled in one of two way .Either a fire line is dug around the fire, or the edges are sprayed with water until they are extinguished. Once the fire is stopped (or checked) the next task is to prevent its escape beyond its control lines. Firefighters follow rules to ensure that they do their job safely and effectively. Fires can either be fought close in – direct attack –or from a distance- an indirect attack.

Direct attack involves spraying the edge of a fire with a hose or backpack pump, swatting the flames with shovels or fire swatters, pulling flaming material into the burning area, or by cutting a fire line right along the fire edge. A direct attack is almost always safer than an indirect attack, several people should regularly check the line (patrolling) behind the crew to make sure the fire has not crossed line.

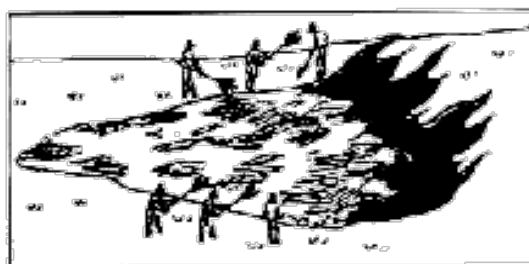
Indirect attack is carried out by back firing from a control line that can be a natural barrier, one constructed at the time,e.g a fire line ,or one that has been pre-built.e.g. a road of fire break. The object is to clear-burn an area approximately 30m,wide ahead of the fire but to sacrifice as little extra area to the fire as possible . Ideally ,the clear area should be between two control lines., with the back fire extinguished before the main fire arrives. The turbulence that occurs when two fires meet is thus avoided.

Different techniques are used to set a back line –strip fires or flanking fires- to ensure the area is burned completely before the main fire arrives. The operation requires skill and experience as well as adequate resources. Backing should only be carried out in area of light, uniform fuels and in winds below 15kin.hr-1.

Nether indirect nor direct fire lines are safe until the fire has burned all the way to the line and is no longer flaming .Thus as a crew builds an indirect line, it regularly burns out the fuel between fuel line and the fire.



Direct Attack



Indirect Attack



# Forest Fire Fighting Training

## Types of Forest fire

### 1. Ground fire:

Fire burns all organic material such as debris and brush on the ground.

### 2. Surface Fire:

Fire burns the vegetation on the ground surface such as logs and bushes.

### 3. Crown fire:

Fire burns the middle and top parts of the trees and bushes. This fire spread is always in line with the wind direction.

## Factors that influence fire size:

1. Character and amount of burned materials

2. Water level Wind condition



## Forest fire prevention

1. Forming volunteer group
2. Not conducting activity that triggering forest fire
3. Preparing instrument that can be used for forest fire fighting
4. Making planning program to prevent forest fire

## Fire Fighting

1. Making ditches
2. Suppressing fire :

## Suppressing Fire :

1. Direct Attack: Directly suppressing the fire using flappers, soil, and water pumped directly from the fire pump or tank.
2. Indirect attack: Making ditches around the fire areas in order to prevent fire spread out to larger area and suppress the fire.

## How to make Bamboo Fire Flapper

Preventing is more important, but we also need to prepare to suppress fire. If you have a bamboo on your backyard, you can get this material easy and you can make it easy by yourself .let's make a fire flapper. Fire flapper is a traditional fire-suppressing device made from plaited bamboo.

### 1.Tool and Marerial

a.1 (one) bamboo stick with 5 m length and  $\pm$  5 cm diameter.

b.1 (one) big knife/machete.

### 2. How to Make a Fire Platter

(1)Cut the bamboo using the machete into two parts, which are:

a. First part 2,5 m long of the tip for the platter, and

b. Second part 2,5 m long of the end for the plait.

(2)Clean the bamboo using the machete.

(3)Prepare the fire platter's head by cracking the 1-meter part of the bamboo's tip for the platter into 1,5 m – 2 cm wide. Pay attention on how the cracking advised.

(4)Tie the tip of the cracks so the crack won't continue. Set supporting devices in forms of bamboo sticks on the tip of platter's head so the bamboo can extend evenly.

(5)Prepare the bamboo for plaiting by cracking into 1 – 1,5 cm wide and crack with a knife to take the skin.

(6)Start to plait by slipping the bamboo in turns forward and backward into the platter's frame. The sides of the platter's head are plait-folded around the frame. While for the plaited connections, try to make it in the middle of the plait by slipping the bamboo to-be-plait into the bamboo plaited.

(7)When half part of it were plaited, first finish plaiting the end of the head by plaiting  $\pm$  4 rows until  $\pm$  10 cm before the end of the head, and crack the end of frame into 2 parts. Fold the end of frame to two sides to hook the last plait and slip the end of the frame into the plait before.

(8)Continue plaiting until it covers all the whole head. Platter is ready to use.

## How make bamboo flapper



*Local bamboo species is available in local area*



Bamboo (5cm\*2,5m) is chopped down to make flapper



Cutting bamboo into 2.5 m to make handle and another 2.5m is used to make a bamboo net



Cutting bamboo into two equal parts (each part is 2.5m long)



Preparing to make bamboo flapper



Opening the bamboo about 1 m from top and cut the bamboo into 8 or 10 pieces (each piece is about 1 or 1.5 cm)



Permanently  
Indicating the key  
bamboo bar on the  
flapper before netting  
it



Netting the flapper



The end of the head  
should be folded into two  
sides of the frame before  
netting





Bamboo flapper is being netted

Isolating the flapper and the handle by a bamboo lace tied tightly on bamboo stick



Bamboo flapper is finished



## How to make Iron Net Flapper

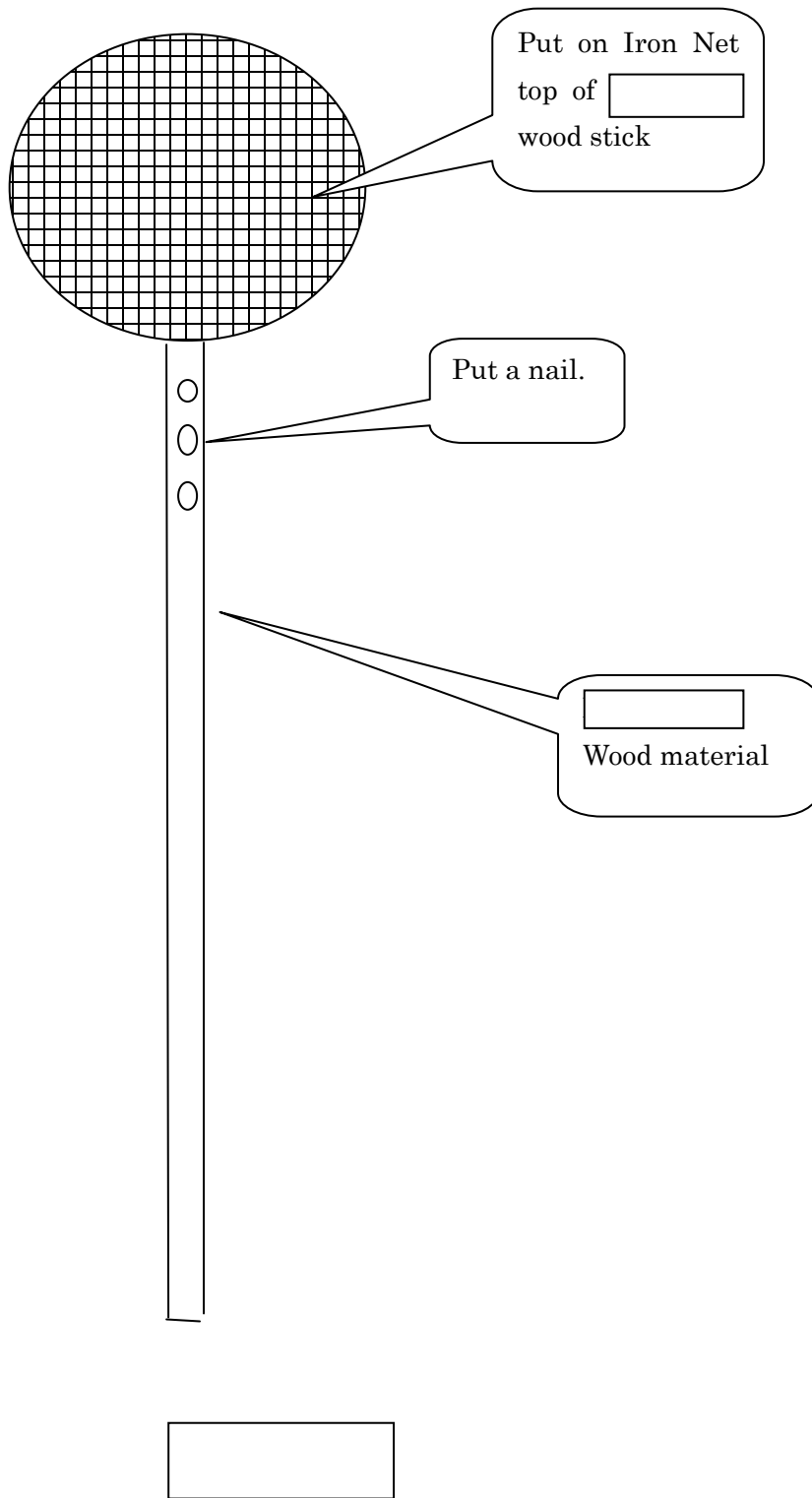
Preventing is more important, but we also need to prepare to suppress fire by other material. If you have a wood on your backyard, let's make a iron net flapper. Iron net flapper is a fire-suppressing device made from wood material and iron net.

### 1. Tools and Materials

- (1) (one) wood stick with 2.5m length and  $\pm 5$  cm diameter.
- (2) 1(one) square iron net
- (3) nail or bolt and nut

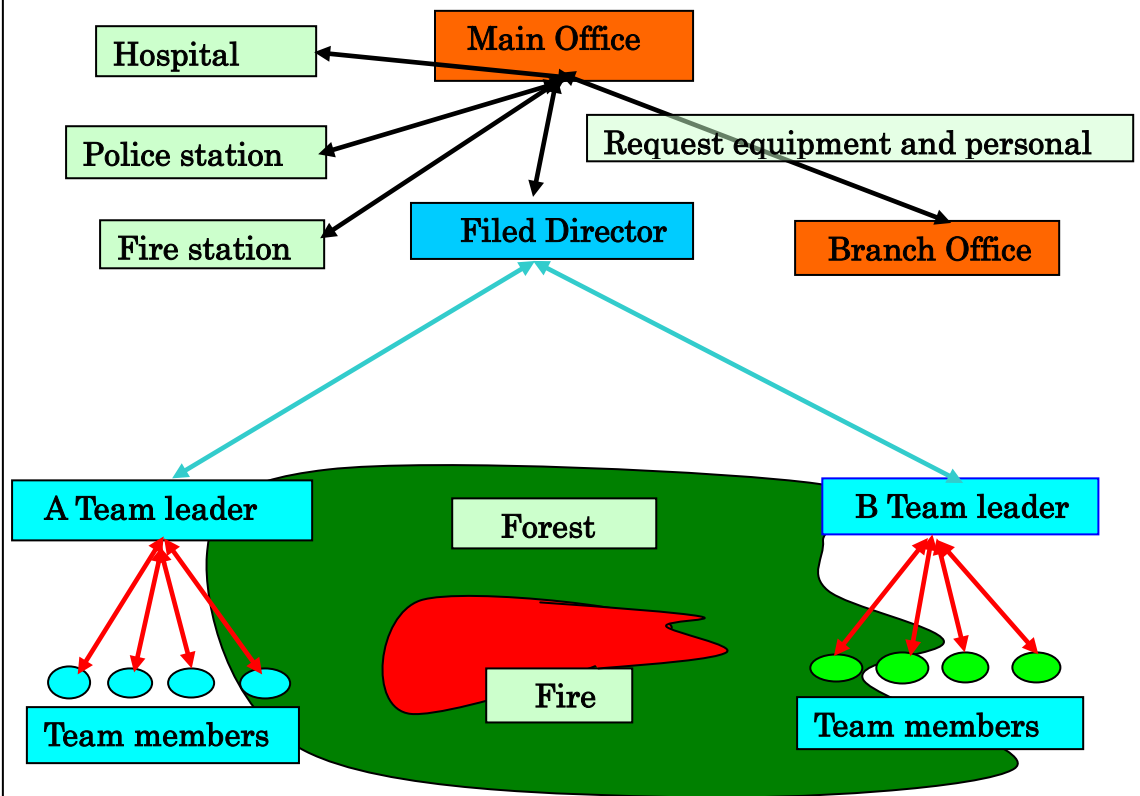
### 2. How to Make a Fire net flapper

- (1) Cut the wood using the machete into one part.
- (2) Clean the wood using the machete.
- (3) Iron net put of the top of wood stick by the nail or bolt and nut
- (4) flapper is ready to useful



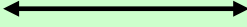




# Communication Command System



Main office coordinates and supervise among the offices.  
 A team consists of one team leader and four members.  
 Communication between A team and B team are carried out through Field Director except emergency.

-  communication between team leader and team members
-  communication between Filed Inspector
-  communication between main office and other office for reporting and assistance

# Natural Wood Drying



# Method of wood Drying

1. Natural wood Drying

2. Artificial wood Drying



# Compare of Natural wood drying Artificial wood drying

Natural wood Drying	Artificial wood Drying
The color and the gloss of wood remain.	It blackens.
The smell of wood remains.	The smell decreases.
The surface is caused. There are some shrinkage.	Going mad doesn't happen easily.
The average water cut doesn't become 20 percent or less.	It makes it to an arbitrary water cut.
Because the sun and the wind are used, the impact on environment is a little.	There is a negative environmental impact. The heavy consumption of the fossil fuel and the exhaust of CO <sub>2</sub> .

\*



Dark Luster

\* N



Good Luster

# Reason for necessity of Wood Drying

1. Going mad and the crack are caused in the product made in the unseasoned wood while it is using it because wood shrinks along with dryness.

2. It is easy for the unseasoned wood to be violated by the corrosion bacterium and the discoloration bacterium.

3.Strength improves by dry processing.

4.Enough adhesive power is not obtained with moist of undry wood.

5.The painting of the unseasoned wood are bad.

6.It becomes light when drying, and it becomes easy the handling of freight and to transport.

# Feature of natural wood Drying

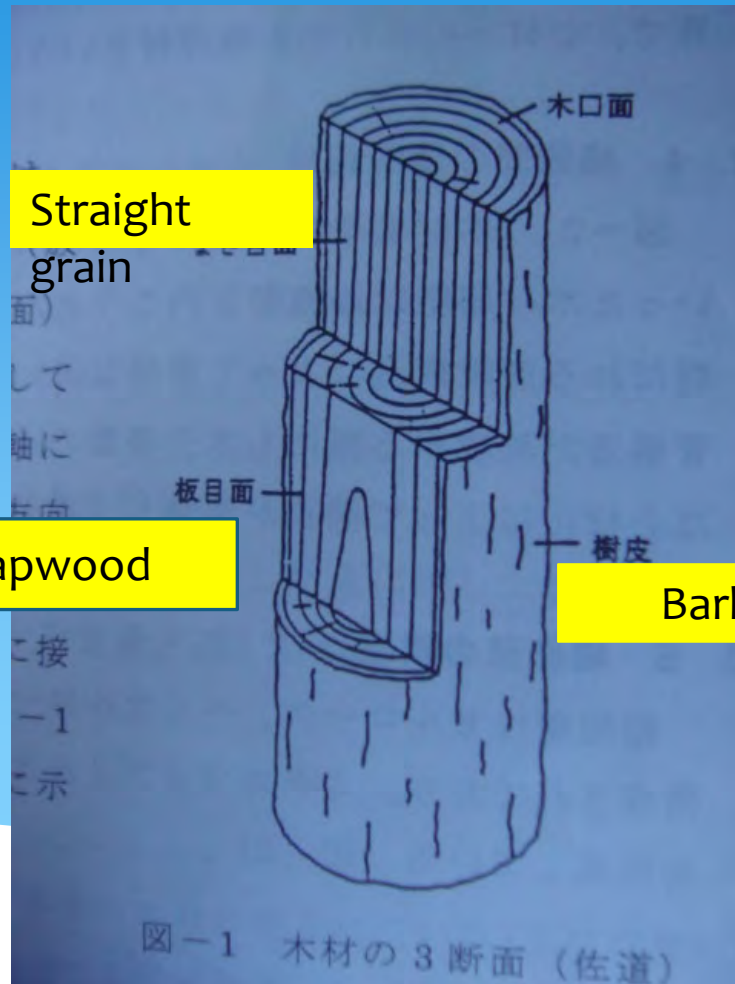
1. Luster of the tree improves from the slow dryness to natural wood Drying.

2. Because the artificial wood Drying doesn't use the fossil fuel, the environment can be considered. The exhaust of  $\text{CO}_2$  is 0.

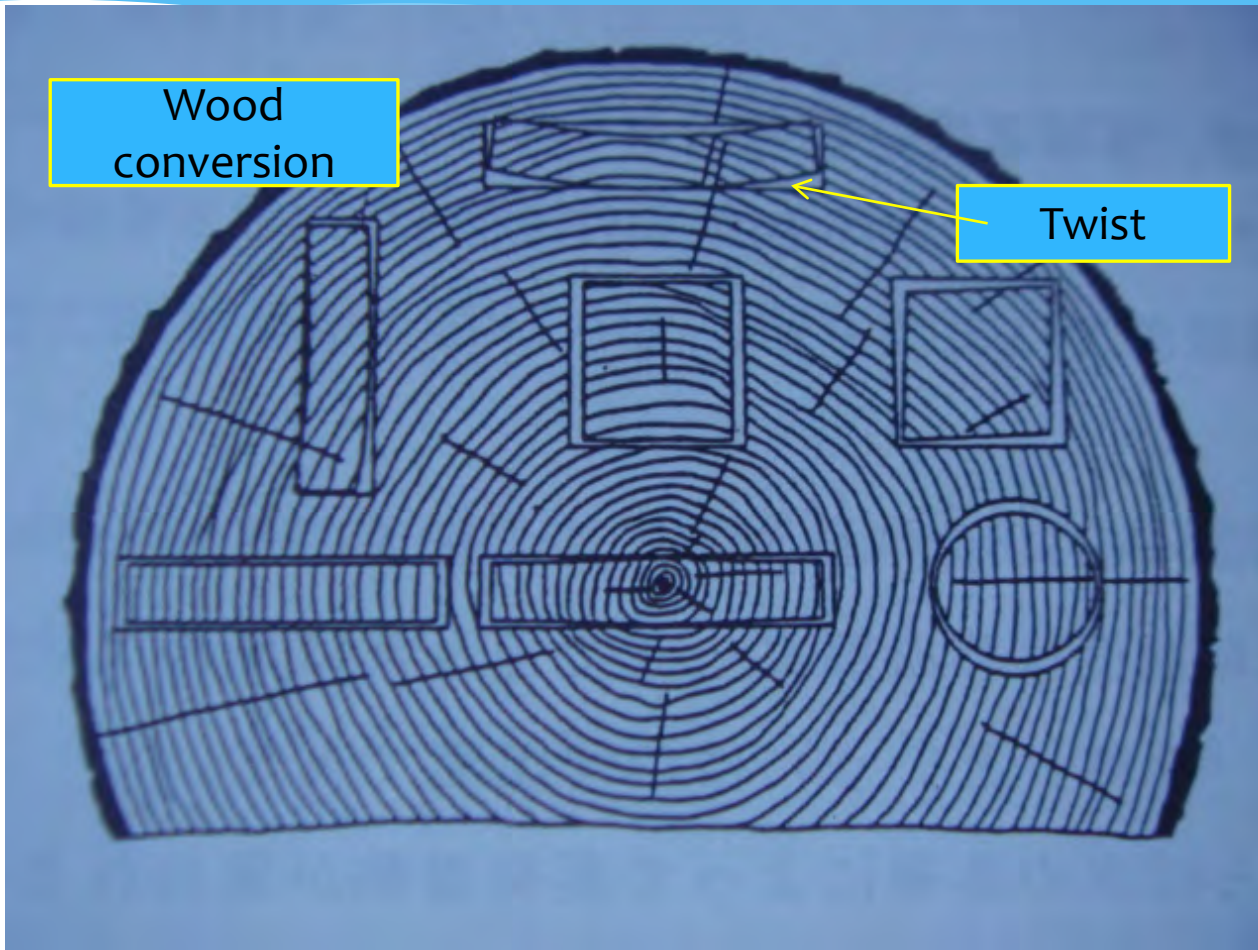
# Wood drying process



# Wood Conversion



# Wood conversion and Twist





# Kind of Twist

ある。しかし  
はある程度の効果があるが、曲がりに対しては効果がな  
る。

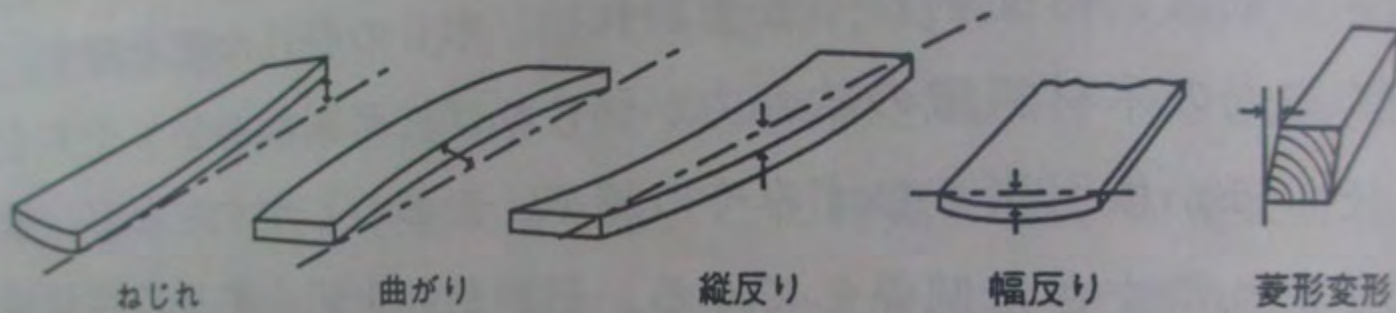


図-14 狂いの種類

## Method and check point of natural wood drying

1. The soil place of natural dryness does the arrangement order and always improves the drainage and ventilation.

2.

It arranges it so that wood may squarely come to leave space extent that the person can at least pass in the front, back, left and right of the crosspiece volume for the eternal style.

3. The stiffener of the appropriate heat is put at correct intervals.

4. It arranges it with the same wood species, and one crosspiece volume arranges and piles up an initial water cut and thickness as much as possible.

5. It makes to at least 30cm-60cm or more, and dryness under the crosspiece volume is prevented being delayed in the height of foundation.

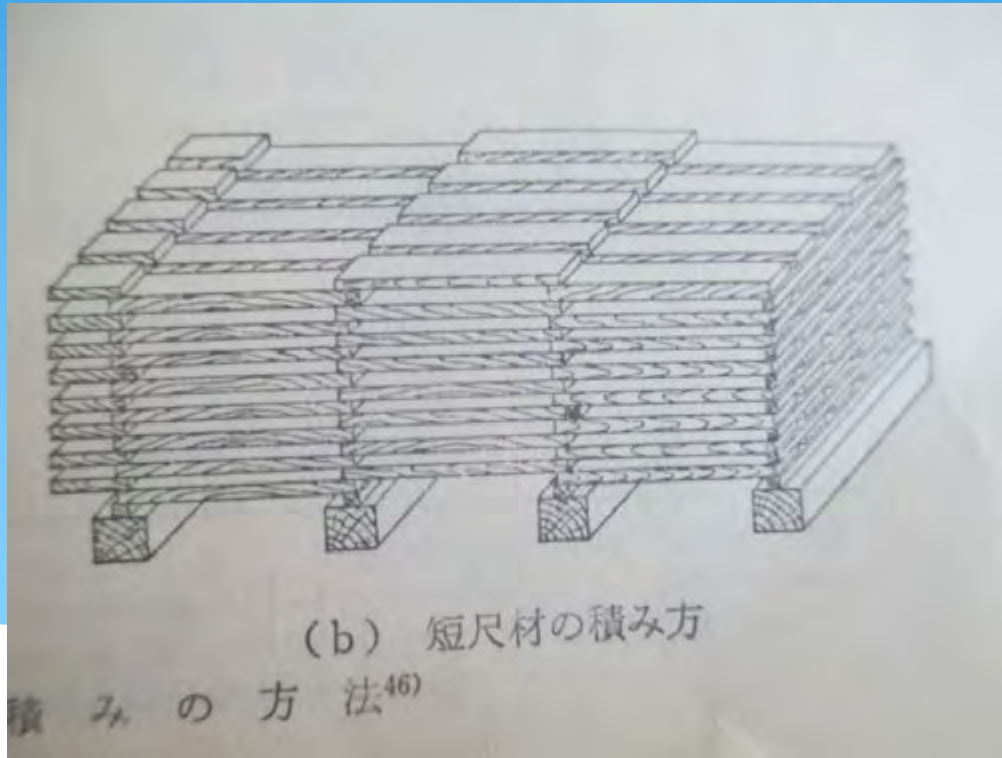
6. To prevent a big surface crack and the split, the quality of timber used is coated with the crack stop medicine etc.

7. Uppermost part of the crosspiece volume and wood on the side put the roof because it causes the warp and discoloration easily because it is exposed to a very severe because of the day of firing directly and wind and rain environmental condition.

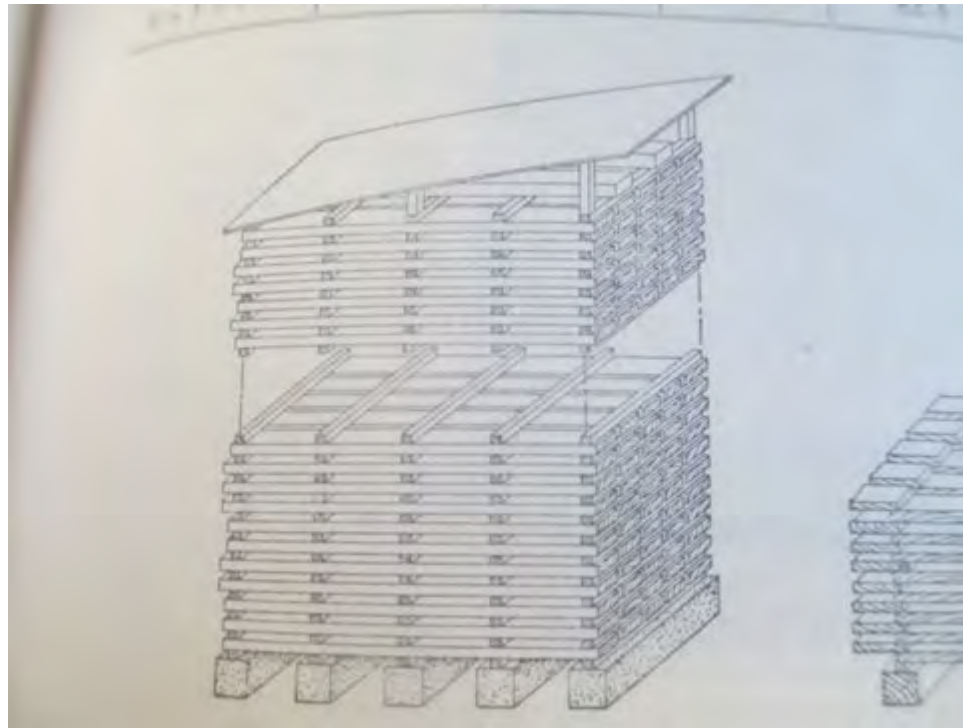
## Water Content by Natural wood Drying

Spices	Thickness(cm)	Numbers of days	before natural wood Drying		After natural Wood Drying	
			Water content (%)	Average of deviation	Water content(%)	Average of deviation
ramin	4.0	213	55.6	5.6	15.8	1.2
Querus crispula	2.7	150	72.1	9.7	16.6	1.1
Lauan	2.1	60	82.4	17.2	27.7	4.4

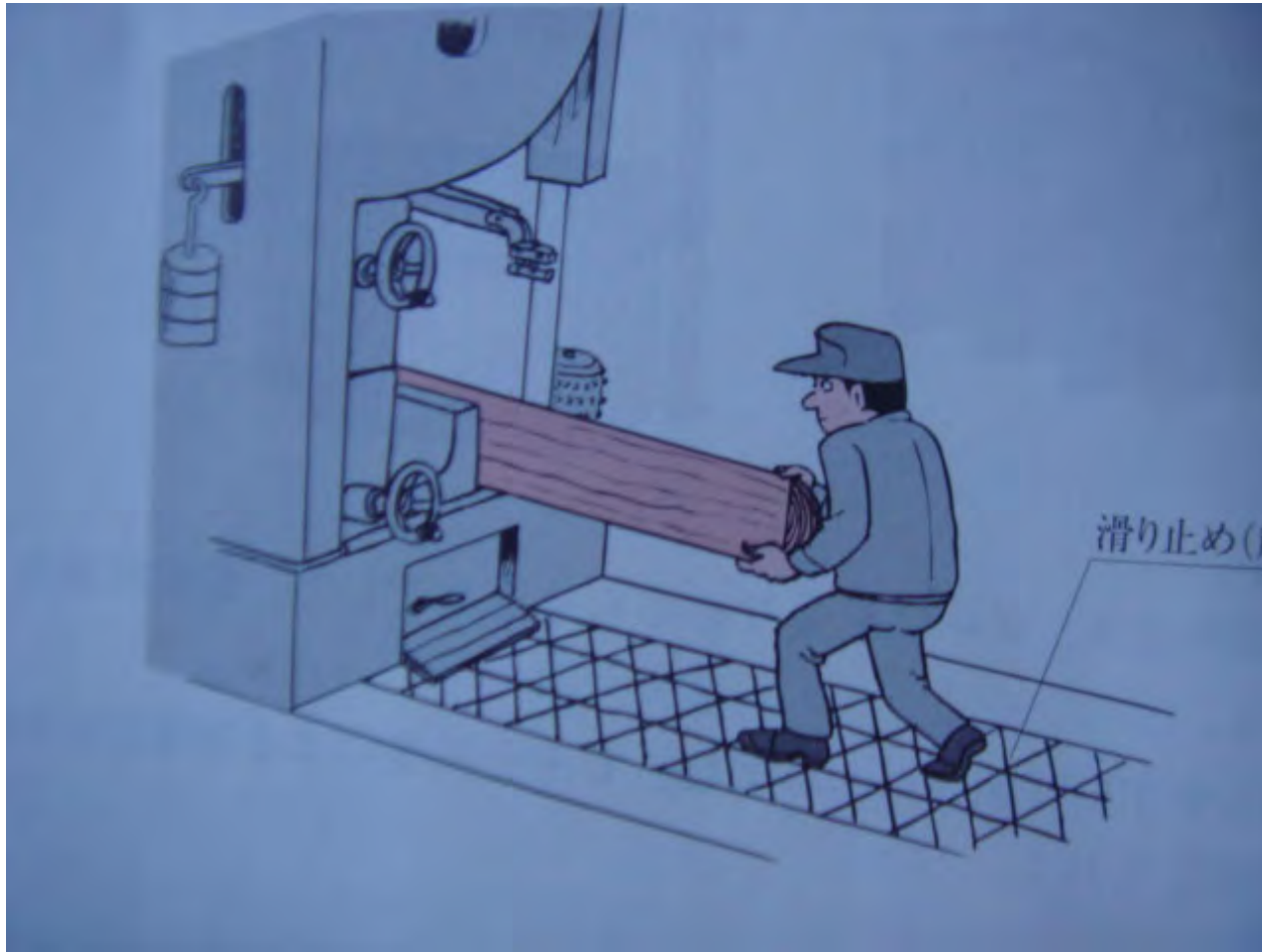
# Method of Wood Drying



# Method of Drying

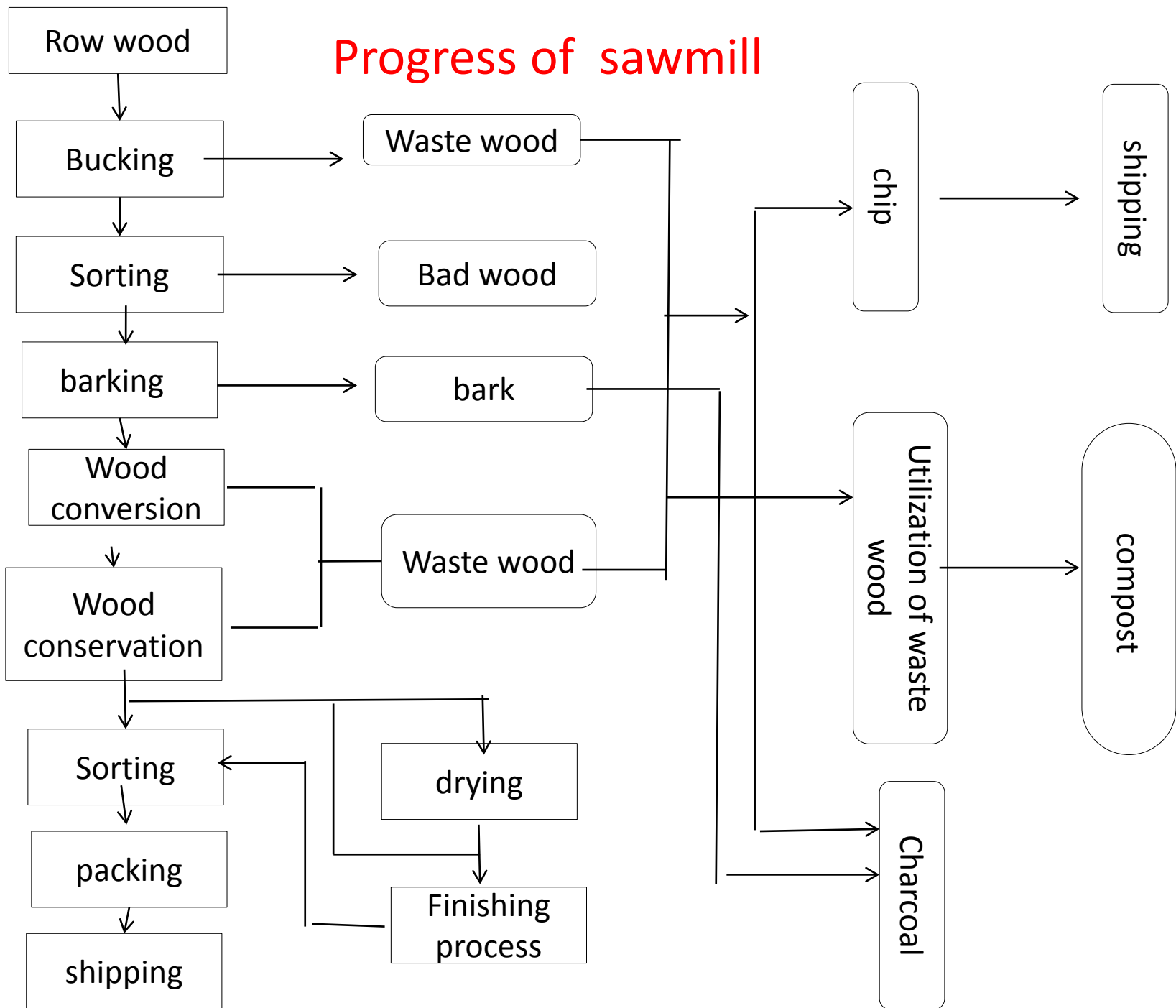


# Sawmill technic





# Progress of sawmill



## Check point

1. Assign of Operation chief
2. Safety Supervisor
3. Safety Regulation
4. Safety Education
5. Safety Indication
6. wood conversion

# Duty as operation chief of machine for log processing

1. Command work to handle the machine for the log processing directly.
2. Check the machine for the log processing and the safety device.
3. Take necessary at once measures when you admit abnormality in the machine for the log processing and the safety device.
4. Observe the usage condition such as tools while working.

# Don't Not Enter



# Safety Education



# Health check



# Finger Confirmation

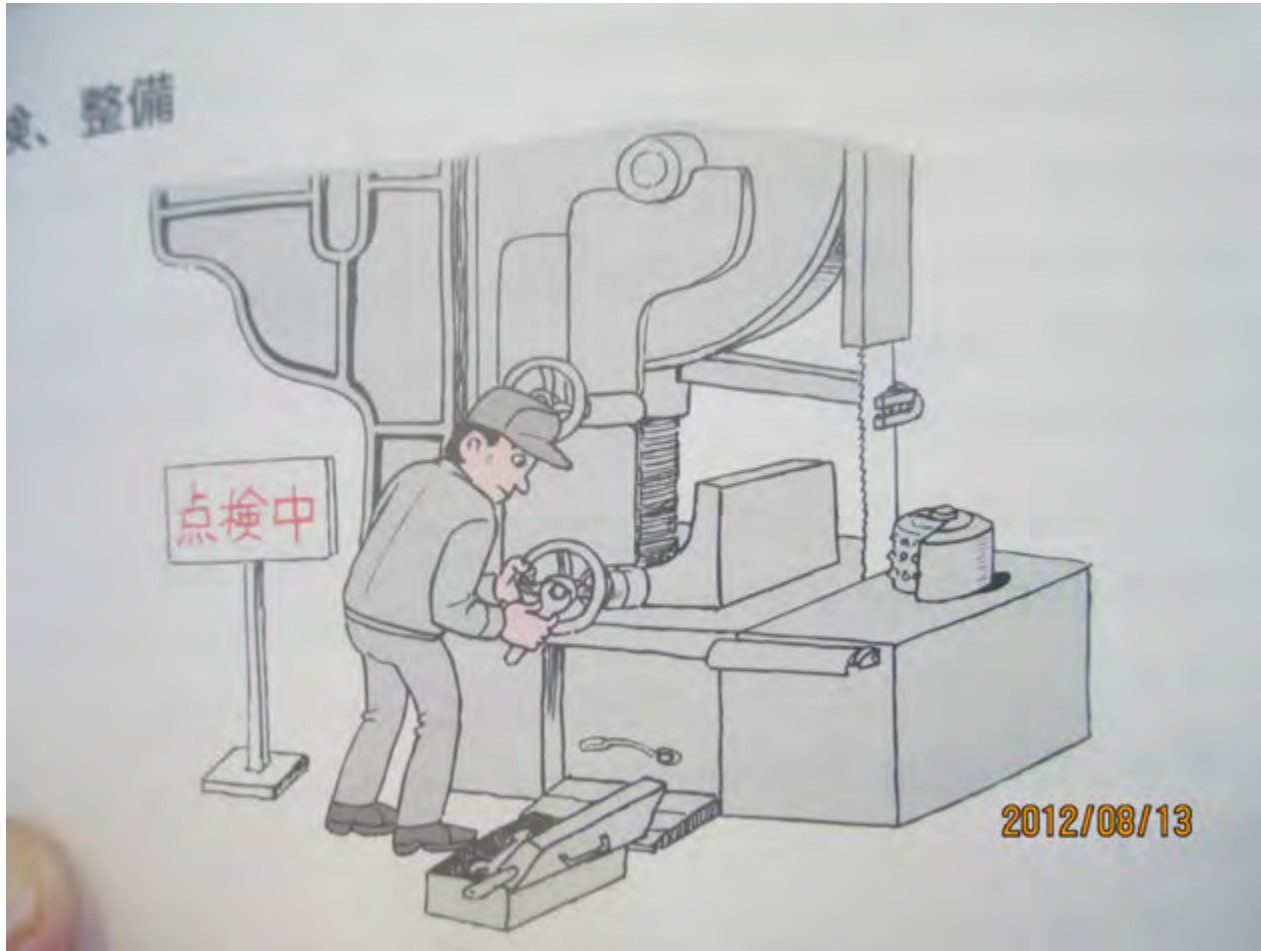


# Meeting





# Inspection a machine



# No Smoking

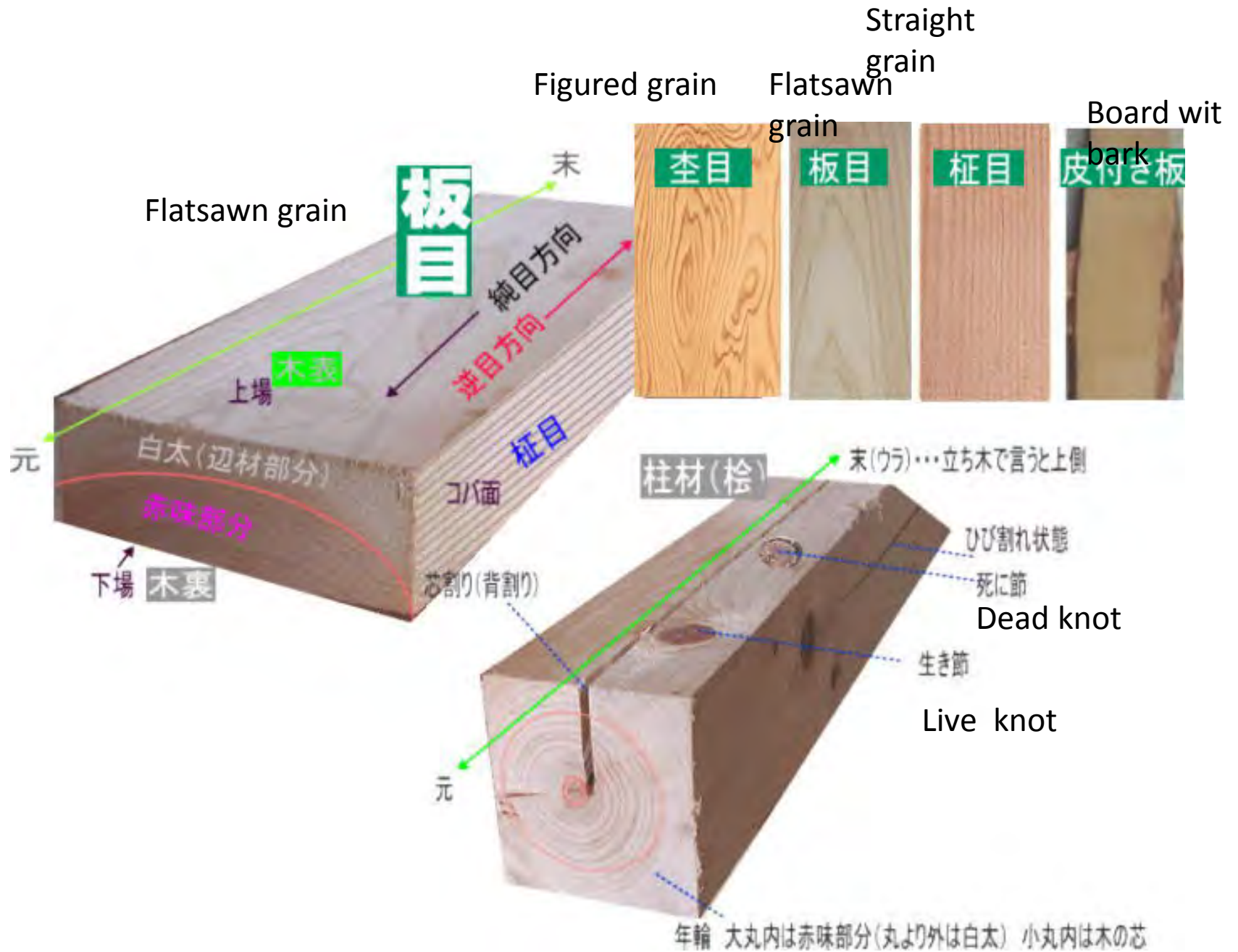


# Safety closes

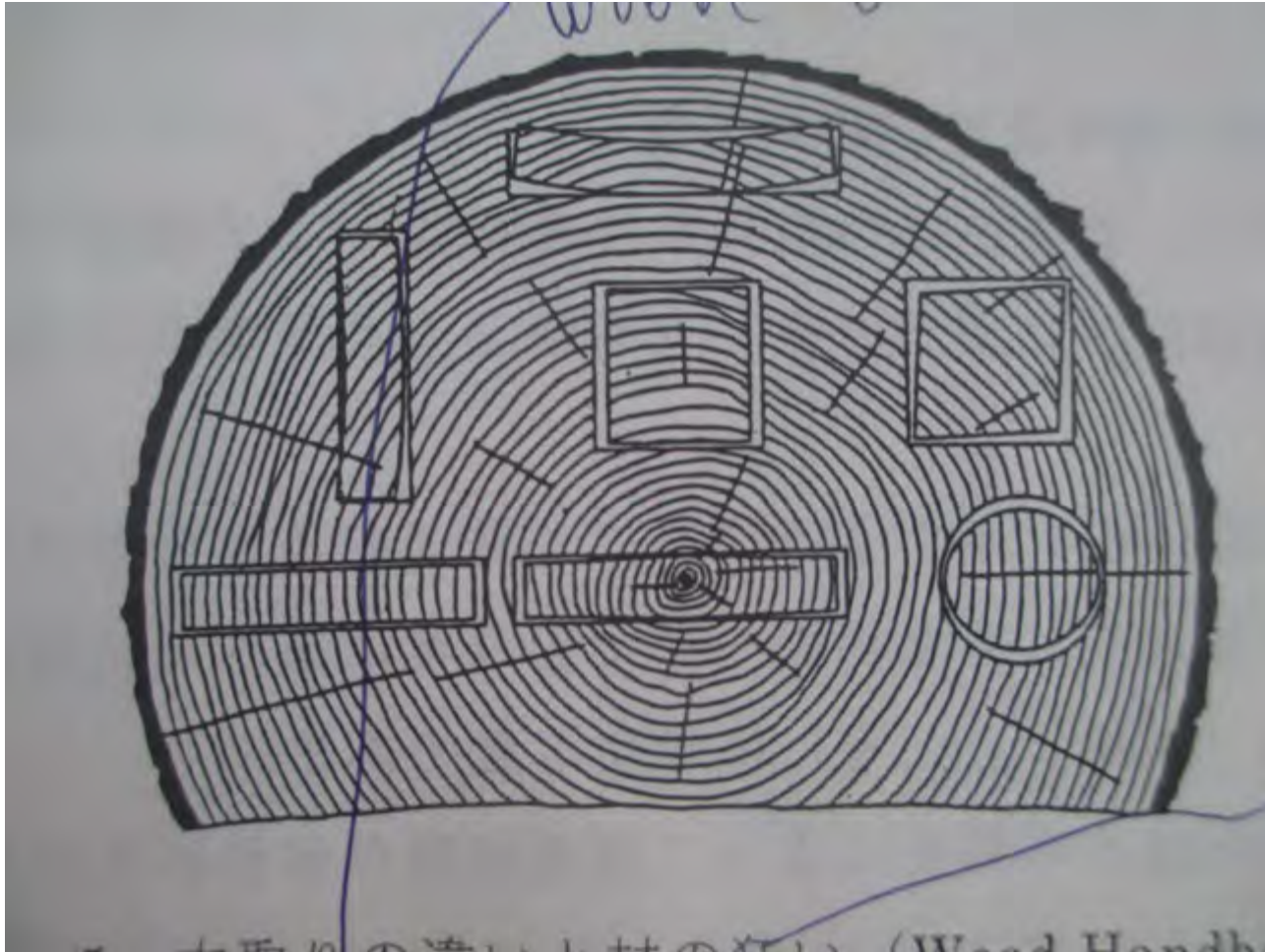


# Arrangement order

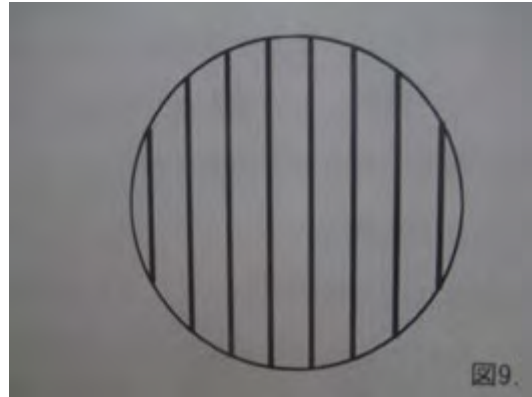




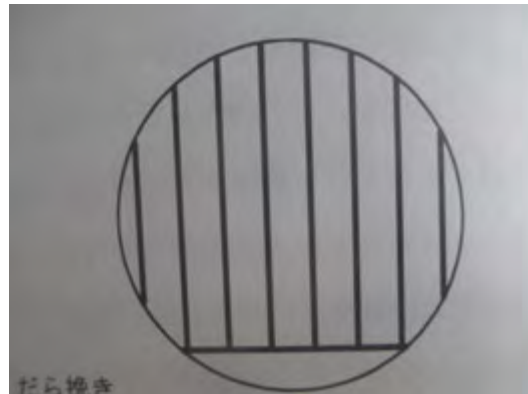
# Wood Twist

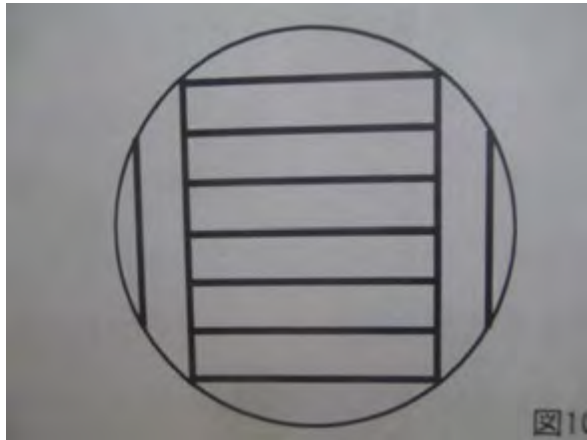


# Wood conversion

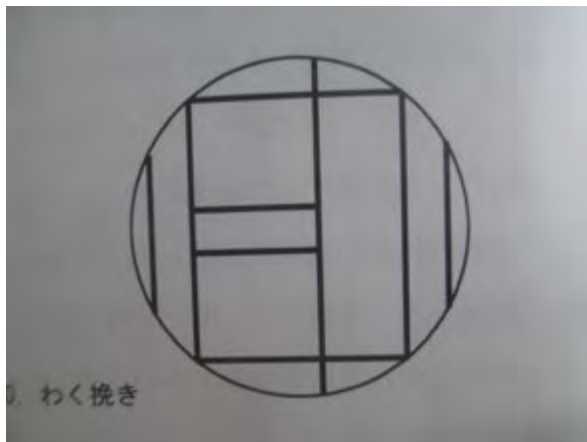


- Work is easy in return wood.
- Board making is suitable.

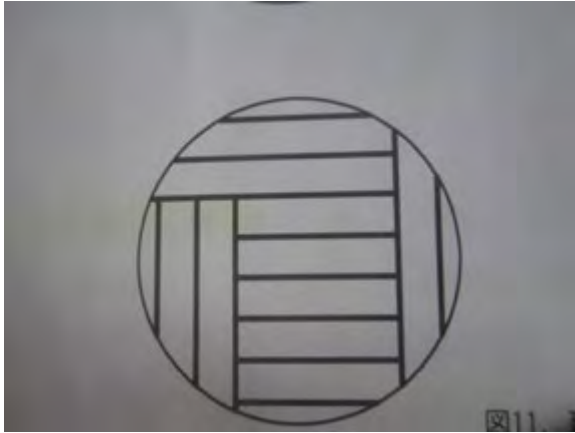




- It is suitable for producing boards of constant width

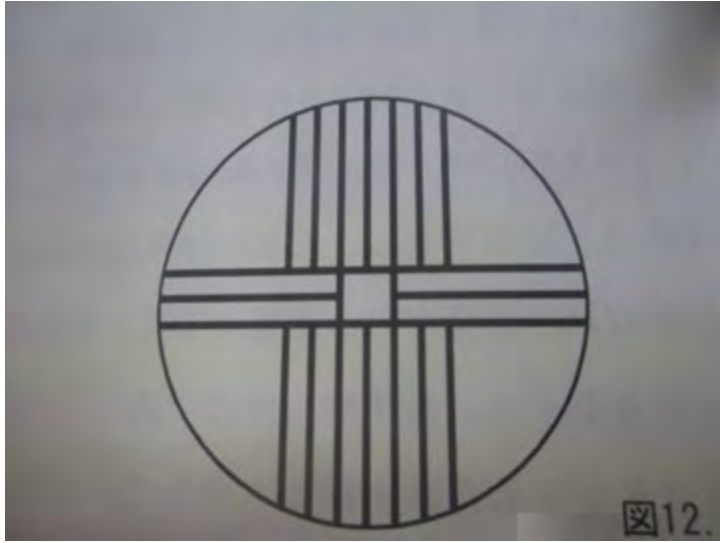






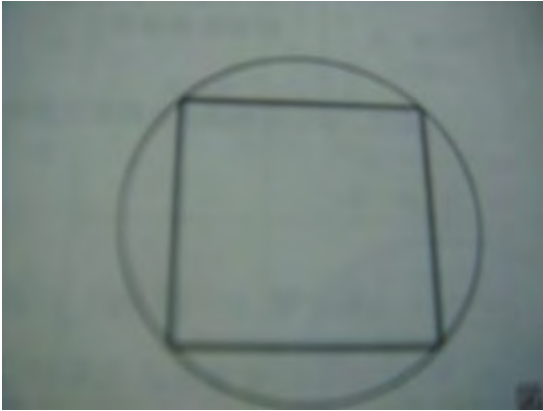
- Products of the high quality can be produced because it removes when the falt goes it.



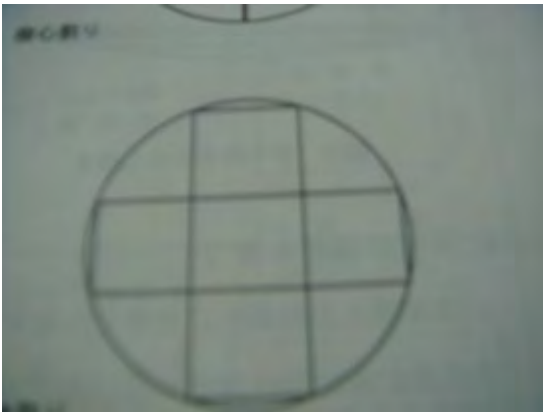


- The quartersawn product





- It is suitable for sawing the large diameter wood



Thank you

