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FIBER FARMING THROUGH WEED UTILIZATION

FIRST PHASE REPORT

ON

GIANT MILKWEED CLONE SELECTION

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BY

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ABSTARCT

The objectives of this study are to investigate and survey of *Calotropis gigantea* R.Br. or Giant Milkweed or Rux, and to conduct the experiments for selecting the superior clones of Rux using yield and growth rate as indicators. Rux's stems and seeds have been collected from all five physiographic regions of the country namely mountainous and valley in the north,northeastern highland,low land in central plain, mountaineous and lowland on east coast of Thailand, and southern peninsula. Rux's seedling are germinated by stem cutting for the total of 120 samples.

Rux's seedlings are preliminary selected for each region according to their ecotypes. Then the seedlings are grouped and be planted according to their localities in various stations around the country. They are located at Lumpang Province, Khon Kaen Province, Burirum Province, Nakorn Prathom Province, Cha Cheong Sao Province, and Chumporn Province. Split plot design in Randomized Block system (RBD) with 3 replications are used as main plots with 2 levels of treatment -- high and low input. In each location, random of 6 from 8 trees in each row are planned to be recorded as the experimental data representatives.

Data are recorded after planting for 6 weeks, and for every 2 weeks from Dec.1985-Dec.1986. The recorded variables are height and width of canopy, number of inflorescence per

tree, number of pods per tree, width and length of pod, fresh pod weight, fiber weight per pods. Then the annual total yield and growth rate can be obtained in which Duncan's New Multiple Range Test is applied to compare all variables of each clone. Analysis of Variance is also introduced to determine the variables'average and their differences among clones and treatments in each replication of split plot design in RBD.

The study results revealed that suitable clones can be selected from each region as follows:

Northern region (Lumpang station):There are 4 clones selected from 15 samples, N7, N13, N3, and N6 with 109.75,-74.72, 57.72, and 50.08 pods/tree/year respectively. All of four northern's clones have average tree size between 228-302 cm. in height and 208-298 cm. crown width.

Northeastern region (Kon Kaen station): NE 37, NE38 and NE29 are selected with 33, 36, and 30 pods/tree/year. It can be noted that NE37 has number of pods lower than NE38 but it has the highest numbers of inflorescence and fiber weight/pod.

Central region (Salaya station): C10 is the highest in both yield and growth.

Eastern (Khao Hin Sorn station): From 8 clones, E1, E6, and E2 are selected.

Southern (Chumporn station) S7 is the only one which can be selected from southern region.

All 12 selected clones at this stage will be used as seedlings for the next experiment -- Management Trials.

I. INTRODUCTION

Clothes, the product from fibers, are one of the four basic needs of human for a long time and have revolution in each era. From the beginning, man used leaves as clothes and changed to be leather. Thereafter, man knew how to make clothes from natural products and also the synthetic ones. Goswami et.al. (1977), classified the textile fibers into two major groups, namely -- natural fibers and man-made fibers. And the natural fibers have been classified into three sub-groups as follows;

(a) Animal fibers such as silk, wool and hair,
(b) Vegetable fibers such as cotton,kapok,jute, kenaf, ramie, linseed, marijuana, and
(c) Mineral fibers, for example, asbestos.

The man-made fibers are divided into two broad subgroups like

(a) regenerated or natural polymer and
(b) synthetic fibers.

Among these, cotton is the most popular fiber which man used as textile material since the beginning of human civilization. Technology on synthetic fiber such as Nylon, Acryl, Polyester, and Polypropylene has been developed during the last century. Although the synthetic fibers are superior to their natural counterparts in many aspects such as lightness and crease-resisting property, they also process many undesirable qualities. They often are easily charged with electrostaticity and are not good in ventilation or in absorption of perspiration as natural fiber, making it more uncomfortable to wear in hot weather.

Cotton still is the most widely used as day-to-day wear in different parts of the world. The demand of cotton production has changed considerably over the past two decades both in domestic and world markets. Cotton becomes one of the most prominent economic plant not only for textile but it has others advantages such as for woolen fabric, carpet, plastic industry, oil extract from cotton seed, margarine, its peel is also used for animal feeding and organic fertilizer.

Thailand has suitable climate for cotton planting but the major problems concerning cotton growing in this country are diseases and insects. Large amount of pesticide has to be applied with destructive consequence on the health of people and the quality of environment after a long period of using. When the used of fertilization is also required,which in time of energy crisis, means much higher cost and less net income to the cotton farmers. Furthermore, cotton has to be grown in a fairly good land which is becoming scarcer and scarcer everyday due to the over-increasing pressure for land to grow food crops to satisfy the need of the fast rising population. The natural marginal land or left over shifting cultivation, mining and other destructive lands due to human activities, which is quite abundant in Thailand, cannot be utilized for growing cotton, unless excessive cost improvement. These high cost for land improvement cannot be easily borne by farmers. Therefore,cotton is the plant which problems related not only to pest but to the high cost for management and land improve-

ment. Under the present of farmer's situation it is difficult to expand the production to meet the future demand.

Alternatively, if one can produce the vegetable fibers comparable to cotton with low cost input. This means new alternative raw material for textile product is found and if possible the left-over marginal land can be utilized. The above mentioned problems may partly be solved.

The group of plants commonly referred to as weeds have been put up into consideration as their advantages over natural fiber crops like cotton and have two significant advantages;

(a) they can grow in poor soil without irrigation and fertilization, and

(b) they are tolerant to pests and hence pesticide may not be required.

Giant milkweed or *Calotropis gigantea* R.Br. had fiber in its pod. Theerarat, K. (1984) reported that the mixture of Milkweed and cotton fibers in ratio 50:50 by weight could be used to make fabric woven by machine and hand looms. This cloth is softer and shiner than cotton, the color did not run when washed, easy to ironing.

This preliminary experiment has demonstrated that if *Calotropis gigantea* R.Br. can be developed and its fiber can be used to supplement cotton as a raw materials for textile fabric, three important benefits might ensure;

(1) The amount of energy input for mechanization, irrigation, and fertilizer would be reduced,

resulting in higher net income from the lower costs and "value added" to farmers.

(2) Less pesticide would be needed , which would reduce the health risk and possible damage to the environment.

(3) Marginal land utilization at present could be put under cultivation, thereby considerably increasing the area of cultivated land.

Since information pertaining to this plant is limited. Therefore, research has to be conducted in order to investigate the distribution of the plant, their performances under different ecological conditions and management. These include the clone selection and experiment relating to their performances (possible yield, adaptability etc.), fiber quality and also the economic analysis.

1.1 Objective

The objectives of this study are three folds as follows;

(1) To conduct the survey of Rux plant distribution in Thailand, and to collect the plant samples,

(2) To investigate the plant performances in terms of yield and growth rate under the natural and designed conditions, and

(3) To select the plants that are superior in yielding and adaptability.

1.2 Overview

Background information of Rux or ***Calotropis gigantea*** is described in Section II which including names, distribution, botanical characteristics, and the utilization of plant in Thailand. Pollination mechanism is also demonstrated in details.

Methodologies are presented in Section III and the emphasis will be on the methods of surveying, collection, preparation, site selection and experimental design. Section IV presents all data analysis in each station and discussion of the results including clones selection. Conclusion and recommendation for further studies are reported in Section V.

Specific Words

Lampang Station	:	Experimental plot in Amphoe Hang Chat, Lampang Province.
Khon Kaen Station	:	Experimental plot in Amphoe Muang, Khon Kaen Province.
Burirum Station	:	Experimental plot in Amphoe Nang Rong, Burirum Province.
Salaya Station	:	Experimental plot in the Faculty of Environmental and Resource Studies, Mahidol University. Tumbol Salaya, Amphoe Nakhon Chisri, Nakhon Phathom Province.
Khao Hin Sorn	:	Experimental plot in Tumbol Khao Hin Sorn, Amphoe Phanom Sarakham,Cha Choeng Sao Province.
Chumphon Station	:	Experimental plot in Amphoe LangSuan, Chumphon Province.
High	:	High input plot
Low	:	Low input plot
Ecotype	:	A habitat part of a group of collected milk weed clone in which represents a similarity in topography, soil group, and climate.
Clone	:	The vegetative produced progeny of a single individual.

II. LITERATURE REVIEW

2.1 Giant Milkweed : *Calotropis gigantea* R.Br

Scientific name of Giant milkweed is *Calotropis gigantea* R.Br. in Asclepiadaceae or Milkweed Family. It has many local names in each country such as;

Thailand : Ruk, Ruk Dok, Paw turn (Smitinant,T.,1980) Rux (Tuntawiroon, N.et.al.,1984), Ruk or Rux in Thai means "love or flower of love"

Java : Biduri, Saduri, Sidaguri, Widuri

Malaysia : Lembega, Kemengu, Kayu, Berduri (Burkil,I.H., 1966).

Another type of milkweed belongs to the same genus as *Calotropis* called *Calotropis procera* R.Br. is also widely distribution in arid and semi-arid regions of Caribbean, Central America, South America, Africa, India, Israel(Erdmand and Erdman,1981; Duke, 1982) and in dry Central Burma, where apparently its extension towards Malaysia ends. Although there are two Malay vernacular names have been attributed to it, but obviously the difference between *Calotropis gigantea* R.Br. and *Calotropis procera* R.Br. is that the *C.gigantea* R.Br.is more nearly a perennial tree, having softer leaves than the *C. procera* R.Br. with slightly different flowers (Burkil, I.H.,1966).

2.2 Distribution

Calotropis gigantea can be found in various parts of the world especially in arid or semi-arid region,tropical climate area. It occurs throughout India as a weed on follow land and in waste ground except in the Punjab where it is sometimes found in gardens, reaching Ceylon, extending to China, and is found southwards to Singapore, Borneo Java, the lesser Sunda Islands, and Moluccas. It is plentiful wild in Java, and indeed, it may be evidently introduced to Malaysia. This is, a very small proportion compared with its wild cousin growing by the road side, in the deforest areas, and even along sea coasts in Thailand (Tuntawiroon, T., et.al., 1984).

2.3 Botanical Characteristics

Stem Herbaceous young Giant Milkweed has green stem which cover with white hair. For the mature, its stem will change to be brown, stem alternate, milky latex present.

Leaf Simple leaf opposite from stem, leaf oblong with white woolly, petio-petiolate cover with furry hair, the wool persisting on undersurface, pale green, leave's base is the heart shaped and somewhat wrinkle, from 2.5 inches long and 1.5 inches wide to 10 inches long and 5 inches wide. Midrib broad and pale yellowish .

Flowers

(a) Type and Morphology of Flower

Inflorescence is compound umbel, flower bloom from outside as Racemes, Actinomorphic, Hermaprodite flower and Entomophilous. Flower in the inflorescence is a perfect flower. There are 40.4-41.0 flowers per inflorescence. Flower development period from the beginning until flowering is 18-22 days. The average width and length of white and purple flower are 1.785, 1.473 and 1.968,1.737 centimeters respectively. Flower will fall down in 5-7 days after flowering if it is not pollinated by insect. The suitable period for fertilizing is at the flowering day and last for 2 days. (Patravadee,1985)

(b) Flower Structure

Sepal (calyx) : 5 sepal spiral in 2 layers, Quincuncial type, 2 outer and 3 inner, five-lobed, usually with glandular scales inside.

Petal (corolla) : 5 broad lobes. Corolla-tube is short. Often with appendages forming a corona, corolla is purple or white, lobe spreading, coronal scales hairy, fleshy scales adnate to staminal tube and free or recured at base.

Stamen : 5 connate with the style into a column (the gynostegium).

Filament : is unit into a tube shorter than the anther.

Anther : usually in waxy masses called that pollinia,which has 5 pairs of pollinia. Each pairs are connected by thin bands called translator arms to a clip, the corpusculum, at the top of stigmatic slit. The entire pollination unit(two pollinia, two translator arms and a corpusculum) has the general shape of a wish bone and is called a pollinarium. The study on pollen viability is used germination test suggested by Brewbaker and Knack (1960) with 5, 10, 15 and 20 % sucrose. It found that the pollen can be well germinated at the food formula of 15 % and 20 % sucrose (Patravadee, 1985).

Ovary : two-capellate, enclosed in the staminal tube, unit by stigma above, many ovule.

Pod : green pod as ovoid oblong, mature pod put out as follicles.

Seed : brown ovate seed,has short hair(pappas) at the end of it has cluster of fiber called coma with 2.5-4 centimeters long. This is called "fiber" in this report.

White latex : found in every part (Earl,1955).

2.4 Pollination Mechanism of Milkweed Flowers

The majority of flowering plants, pollen grows on stalklike anthers; the ovules are at the best of an elongated pistil. The pollen is shed in single grains or in loose clus-

ters of a few grains; when a grain reaches the sticky surface of the stigma at the tip of the pistil, a pollen tube grows downward to the ovules, where fertilization take place. The architecture of milkweed flowers is different in several respects. The pistil is very short, where as the stigma is greatly enlarged and has the form of a deep slit. Moreover, the pollen is not shed in single grains but is packaged in structures called pollinia, in which many grains (enough to fertilize the seeds of a single pod) are held together by a waxy coating.

On the exposed surface of corpusculum is a grove that narrows from bottom to top. As an insect walks over the flower, its legs or mouthparts can become wedged in the groove. While insect then leaves, the pollinia are pulled from their sacs and the entire pollinarium is carried away. When the insect visits other milkweed flowers, it leaves on their stigmas the pollen masses which have become fastened to its legs during the earlier visits to other flowers.

The species of pollinators found in Central Thailand are *Xylocopa aestunns* (L.) ,*Xylocopa nasalis* West W. and *Xylocopa tenuiscapa* West W. They are in family Anthophoridae, Order Hymenoptera." Ma-laang-phoo " is the local name.

Figure 1(a) - 1(d) demonstrate type and morphology of flower, structure of flowers, floral diagram , floral formula and type and morphology of pollen.

TYPE AND MORPHOLOGY OF FLOWER

Family : Asclepiadaceae

Scientific name : Calotropis gigantea R.Br.

Inflorescence , Actinomorphic.

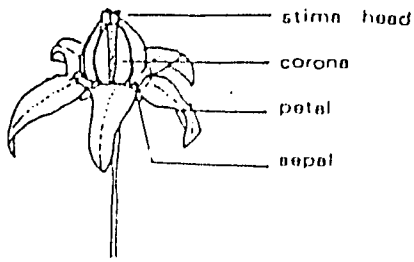
Hermaprodite flower.

Racemose (Umbelliform)

Entomophilous

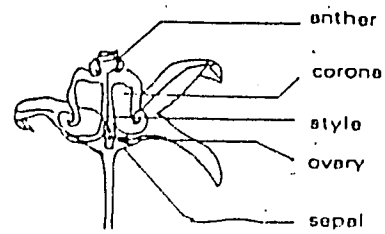
Structure of Flowers

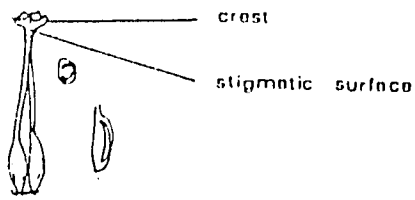
Calotropis gigantea R. Br.



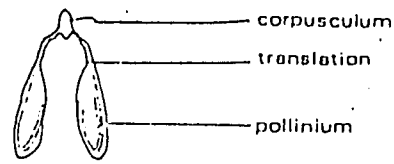
FLOWERS

HALF – FLOWER



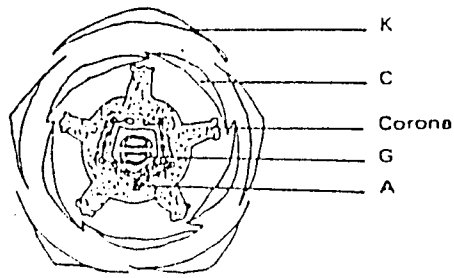


GYNOECIUM AND OVARY SECTIONS



PAIR OF POLLINATION

FLORAL DIAGRAM

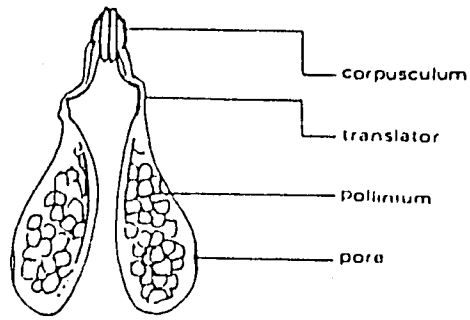


FLORAL FORMULA

*, K(5), C(5), A(5), P(1), G, G(2), O(∞), Corona(5)

*	radial symmetry
K	sepal
C	petal
A	stamen
P	pistil
G	superior ovary, superior gynoecium
G	carpel
O	ovule

TYPE AND MORPHOLOGY OF POLLEN



Type of pollen

- pollinia

  pollinia solitary in each cell,

  pendulous

Pollination

- entomophilous.
- pollen masses are attached to clip which grasp the proboscis or legs of an insect.

2.5 Utilization

In Thailand, Giant milkweed is cultivated and used for decoration in some ceremonial function.(Tuntawiroon,N.et.al., 1984). Almost every part of these plants is used in indigenous medicine, From the hand bock of the medicinal plants (Kurup,D.N.V,1979) and Poisonous plants of India , stated that the herb contains the glucoside asclepiadin. The roots contain vincetoxin, with closely resembles emission in its physiological action. The name calotropine or asclepine is the bitter principle, Its acts on the heart. The flowers are considered to be digestive, stomachic,and tonic. The dried bark is used in indigenous medicine as a substitute for ipecacuanha, as an expectorant and emetic in different dose. The leaf, applied for poulticing sores, and the juice of them is dropped in to deaf ears and sore eyes, burn and the smoke inhaled for ulceration of the nose, and kill the worm that causes toothache. Flowers and leaves may be boiled, and the decoction drunk as a stimulant.

A kind of gutta-percha is prepared from the milky sap of this plant. The floss from seeds are well known, its used for stuffing pillows. The floss has been spun, but it is too short for machinery. K.heyne (Nutt. Plant. Ned.Ind. ed. of 1927 p.1294.) states that when it was experimentally interwoven with cotton in Java, the fabrics soon became spoilt by black spots. The wood has been used for preparing charcoal in manufacture of gunpowder. The Juice has been found to contain

a proteolytic enzyme similar to papain and can extract hydrocarbon (Narinth,2526).

III. METHODOLOGY

3.1 Survey and General Background

Giant Milkweed field surveying will cover the main landforms of each physiographic region for the whole country. The surveying area is separated into 5 regions as follows;

(1) Mountainous and valley in the North

The total area is 151,375 km^2 including 17 provinces as Chiang Mai, Chiang Rai, Phrae, Nan, Mae Hong Son, Lampang,Lamphun, Payao, Utaradit, Kamphaeng phet, Phetchabun, Tak, Pichit, Uthai Thani, Pitsanulok, Sukhothai and Nakhon Sawan.

(2) Northeastern Highland

The total area is 171,379 km^2 including 17 provinces as Kalasin, Khon Kaen, Chaiyaphum, Nakhon Phanom, Ubon ratchathani, Udon Thani, Nong Kai, Nakorn Ratchasima, Buriram, Mana Sara Kham, Roi Et, Si Sa Ket, Surin, Yasothon, Mukdahan, Sakon Nakhon and Loei.

(3) Low land in Central Plain

The total area is 85,816 km^2 including 18 provinces as Bangkok,Samut Prakan,Samut Sakhon, Samut Songkhram, Pathum Thani, Nonthaburi, Ayutthaya, Saraburi, Lop Buri, Ang Thong, Sing Buri, Chai Nat, Nakhon Pathom, Suphan Buri, Ratchaburi, Kanchanaburi, Phetchaburi, and Prachuap Khirikhan.

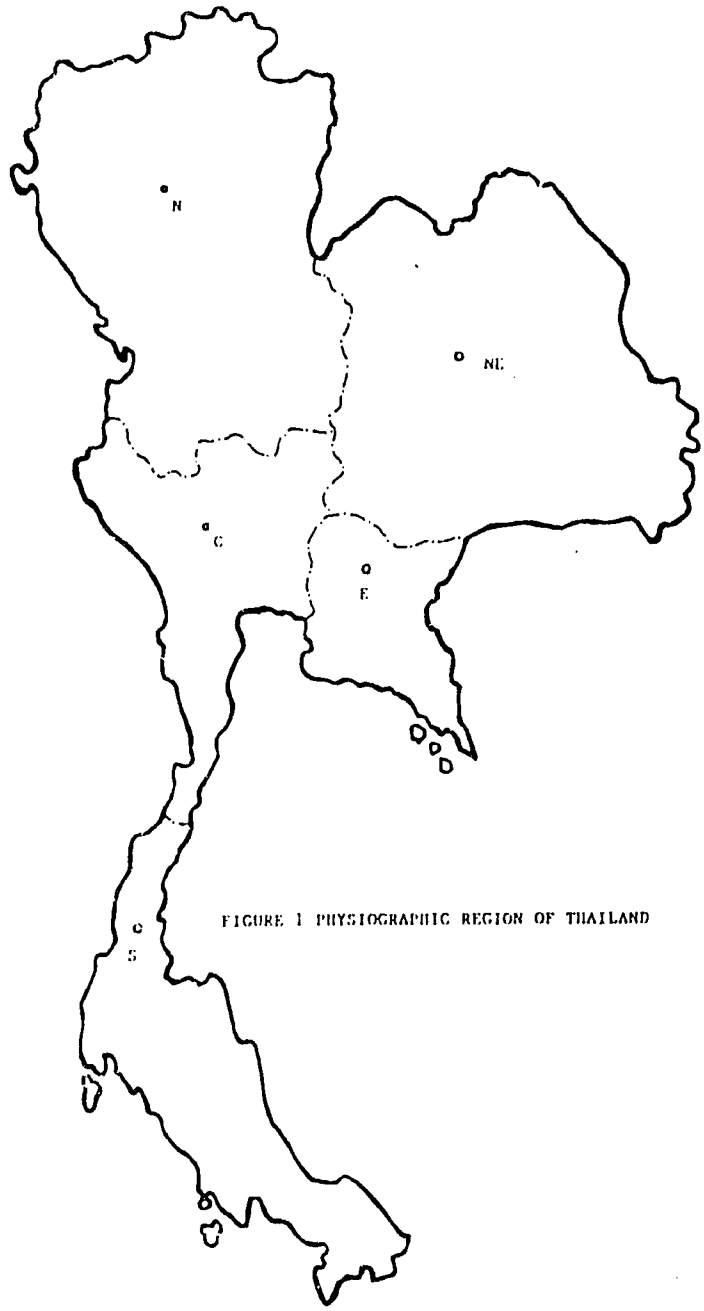


FIGURE 1 PHYSIOGRAPHIC REGION OF THAILAND

(4) Mountaineous and lowland on East Coast

The total area is 36,394 km^2 including 7 provinces as Cha Cheong Sao, Prachin Buri, Nakhon Nayok, Chanthaburi, Rayong, Trat and Chon Buri.

(5) Southern peninsula

The total area is 70,189 km^2 including 14 provinces as Krabi, Chumphon, Trang, Nakhon Si Thammarat, Narathiwat, Pattani,Phangnga, Phattalung, Phuket, Yala, Ranong, Songkhla, Satun, and Surat Thani.

The surveying routes will be designed using the main highways and provincial highways which transact or pass through different landforms in each region. Site will be examined as well as Rux plant density and its distribution. Rux plant samples will be collected for biological study and for seedling propagation.

3.2 Sample Collection

Both cutting stem and seed from different locations are collected and the primary data are recorded.

(1) Cutting are collected using the following criteria;

a) Good phenotypic performance such as good canopy (form) and healthy,

b) Straight cutting stem,

c) No sign of pest and disease, and

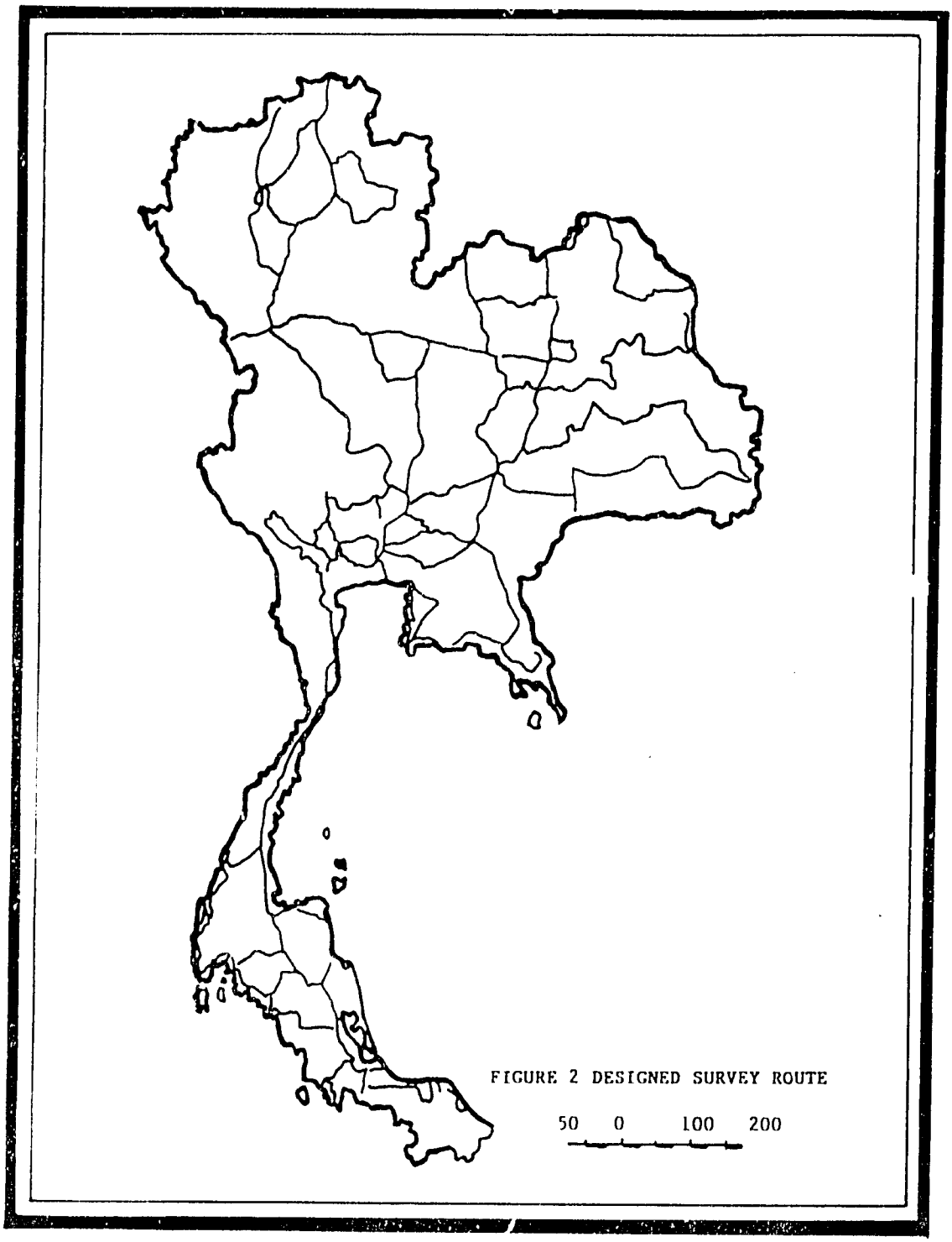


FIGURE 2 DESIGNED SURVEY ROUTE

d) Having more flowers and pods.

The size of selected cutting is 1.5 - 2.5 cm. in diameter, 15 - 20 cm. long, 80 - 100 cuttings/tree. Both hard wood and semi-hardwood stems will be collected.

Cutting from one plant become one clone which will be coding for its origin, for examples;

N 18 means tree number 18 from the North
NE40 means tree number 40 from the Northeast
S 3 means tree number 3 from the South

(2) Seed will be selected from mature pods.

(3) Primary data collection

(a) Photogenic - location
- height and width
- leaf, flower and pod

(b) Leaf : leaf shape, color, size by measuring length and width of mature leaf average of 10 leaves.

(c) Flower : form of peduncle, flower, color, size, number of flower.

(d) Pod : form of pod, size, color, number of pods.

(e) Seed and Fiber : size, color, form, length of fiber.

(f) Insect and Disease.

(g) Soil type.

(h) Environment: recording the environmental data of collection area, landuse, natural plant, local utilization.

3.3 Experimental Design

3.3.1 Site

The purpose is to select the land which represents or having low potential for agricultural practice in each region. The main landform, accessibility, including marginal landform types will be used to indicate sites.

3.3.2 Sample Preparation

All samples were prepared for stem cutting propagation method. Each stem was cut for 8 inches long and put into plastic bag containing soil mixture of 2:3:3 for paddy-husk charcoal soil and sand. Thereafter, the seedling were selected physiographic region as well as the climatic condition.

```
                    /-\
stem cutting  <----|  |
                   |  |
              /----|-|----\
              |----|  |----|---->plastic bag with holes
              |    |  |    |
              |    \-/ ---|---> medium
              |           |
              \-----------/
```

Figure 3 Seedling preparation by stem cutting

3.3.3 Experiment

The area of 1,500 - 2,000 sq.m. are used for each experimental plot. Each plot consists of the following details;

(1) Experimental Design

a) RCBD experiment for low and high input

b) Each block will consist of 15 clones or less

c) There are 3 replications for each input block

d) Randomized design for each clone

(2) Materials Required

a) 48 seedlings for each clone plus 12 spared seedlings

b) 720 bamboo staking of 50 cm. long

c) Measuring tape

d) Sign board, replication board and main board

(3) Land Preparation

a) Deep plow 1 time

b) Harrowing 1-2 times

c) Weeding, land leveling

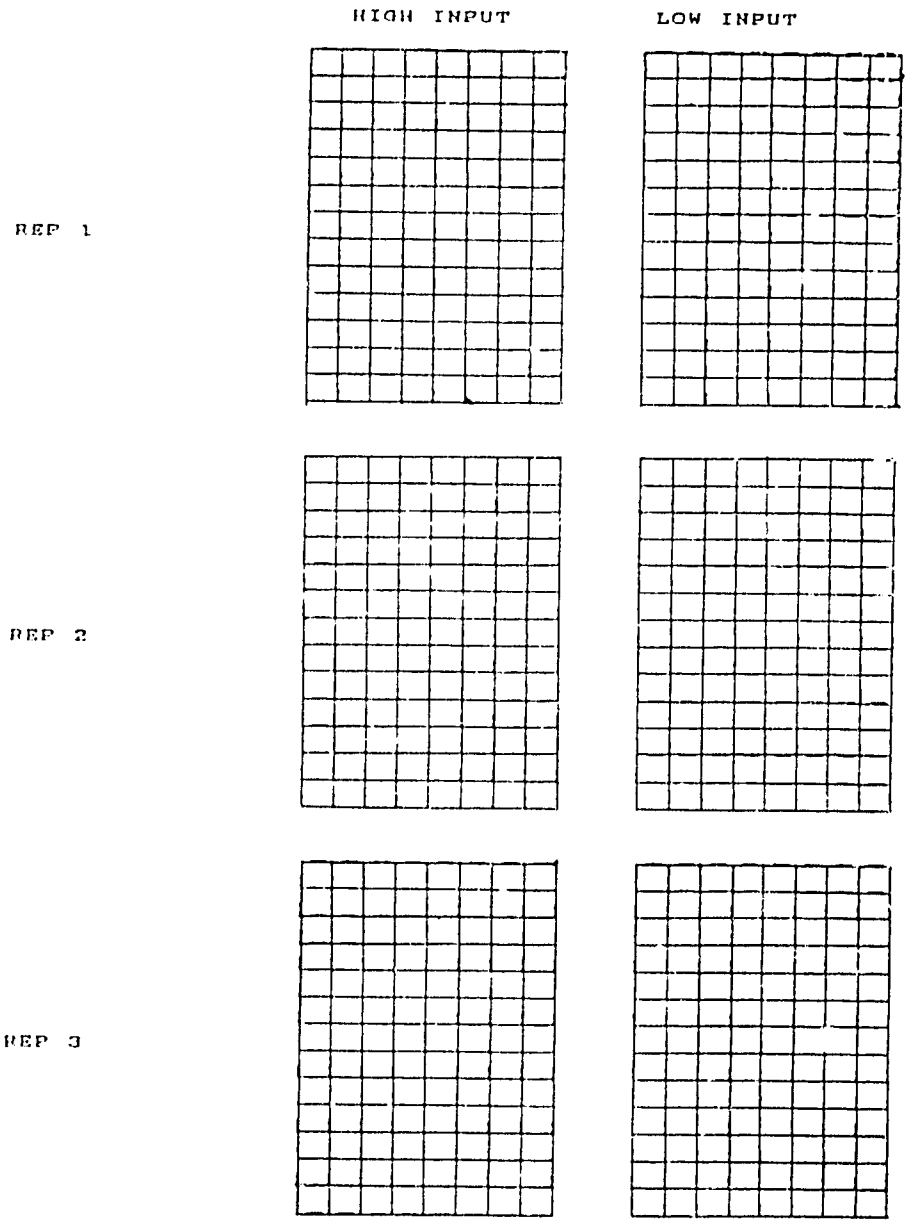
d) Lime application, raising for pH 7

e) Hole of 30 cm. in diameter and 30 cm. in depth.

(4) Management

Within the experiment plot, management were undertaken at the 2 levels of low input and high input as follows:

EXPERIMENT PLAN DESIGN (SPLIT PLOT IN RCB)



management	high input	low input
1. Fertilizer ratio rate time interval	13-13-21 120 grams/tree 3 months/time	none
2. Pesticide -Furadan -Insecticide	use insecticide 0.5 - 1 gram/tree by rate and disease	none use 3 months after planting
3. Weeding Control	manual and/or herbicide weeding	no weed control just cutting the first 3 months
4. Watering	1 time/week	watering when plant shows sign of wilting
5. Ploughing	around tree after fertilizing (one/3 months)	no ploughing
6. Munching	If the soil condition is sandy, munching should be introduced during the summer.	

(5) Data Recording

After planting for 6 weeks, the following data will be recorded;

a) Period of recording: every 2 weeks from December 1985 - December 1986.

b) Data recording:

(1) Random 6 from 8 trees in each row.

(2) Coding the random tree.

c) Growth of plant:

(1) canopy, measures every 2 weeks for height and width.

d) Number of inflorescence per tree

e) Number of pods per tree

f) Production, measures pod size, weights of fresh pod and fiber in gram.

3.4 Data Analysis

a) Average the collecting data of each sample as height and width of canopy, number of inflorescence/tree, number of pod/tree, width and length of pod, fresh pod weight, fiber weight per pods and total yield per year (No. of pod x Fiber weight) per replication.

b) Applying statistical tools -- Analysis of Variance and Duncan's New Multiple Range Test pertaining to split plot design in RBD for each replication (Appendix 3).

c) Graphing the growth rate, the number of inflorescence, and inflorescence interval of each sample.

d) Using the fiber weight/tree, number of pod/tree, fiber weight/pod, number of inflorescence/tree and height of canopy as criteria for selecting the superior clone for each ecotype of Thailand.

IV. RESULTS AND DISCUSSION

Exploration of Rux clones had been carried throughout the country since 1986. At the beginning, three major environmental factors were brought into determination of the specific ecotypes and places where Rux were found; they are climate, physiography, and soil condition. Each factor was interpreted region to region in order to confine the specific zone of Rux growing on its favorable sites. Hence the survey of Rux plant could be statistically designed with stratified-transact route application.

However, the research design has been further developed after selecting the good clones from each region by introducing to other regions for finalizing and Management Trial experiment. The examination will be the finding of Rux production of their most and the conformation when growing in other environments.

4.1 Field Survey and Selection

From region to region,the combination of ecological zones were planned to allocate the routes and locations for field check. Field surveys were conducted covering the 6 physiographic regions of Thailand and Stratified Randcm Sampling method was applied. Rux's clone were identified and collected in the following landforms:-

Region	Landform
North	Flood plain, low terrace and high terrace
Northeast	Low terrace, natural levee, karst topography, structural plain, sand dune and high terrace
Central	Flood plain, low terrace, high terrace, foothill slope and karst region
East	Plain, low terrace, beach, karst topography and coastal plain
South	Foothill slope, former tidal flat, high terrace, low terrace and beach.

Rux's plants and seeds samples were complied at the Faculty of Environment and Resource Studies for the total number of 120 samples.

Regional distributions of Rux's clone had been investigated under the field surveys in correspondence with physiography through the regions to seeking for the natural clone in survey route (Figure 3). At the stage of classifying the ecotype of Rux's clone, climate type, landform and soil were brought into consideration to distinguish the proper zone for field survey. Result from screening of those combination, field survey had been undertaken. Direction of field survey has been started from those ecological indication in all landforms with as such as possible the difference in soil types.

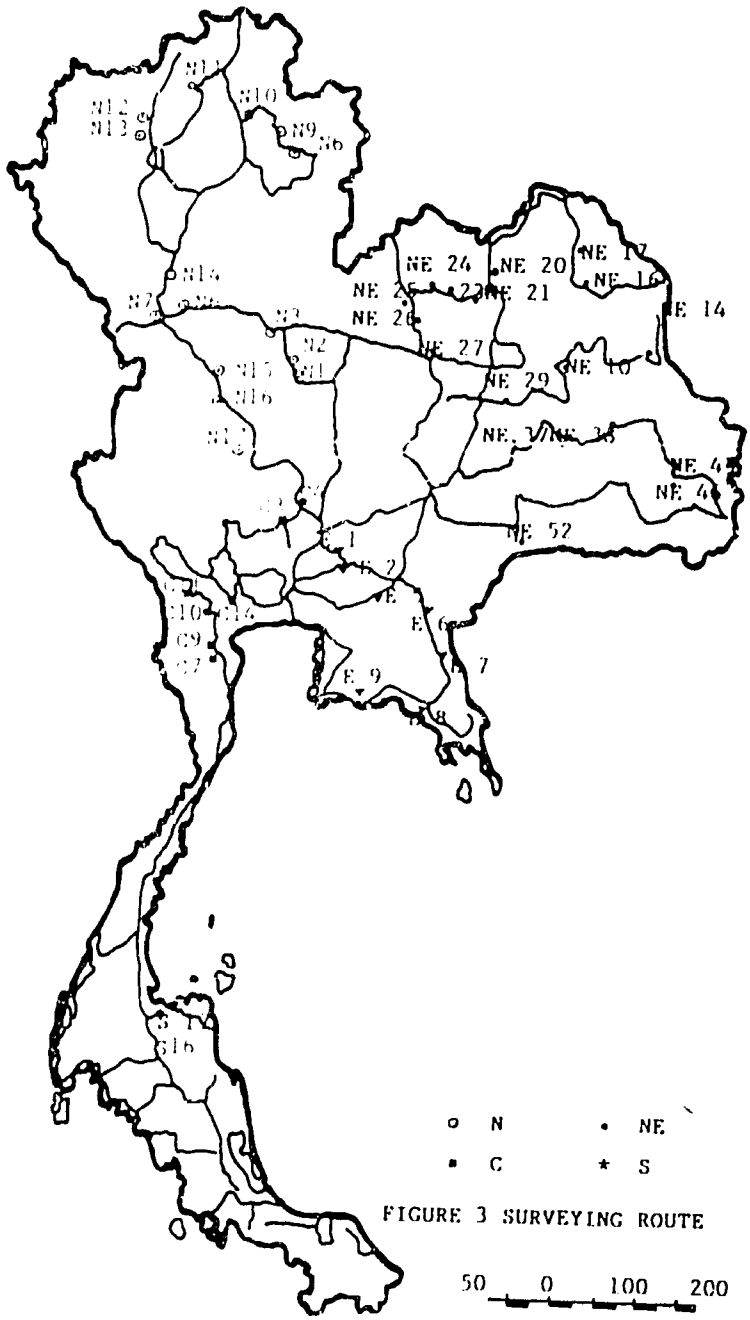


FIGURE 3 SURVEYING ROUTE

4.1.1 Ecological Zone Classification

The 3 major factors in relation to ecological condition of Rux have been technically adopted. Those are climate, physiography and soil. Identification of each factor was made and distinguished as follows:

(1) Climate

Climate in Thailand can be divided into two major groups. The first one is the the tropical monsoon climate in the south and the eastern part of eastern region. The other type is savannah climate which can be found in most parts of the country. The climate play on important role on determining the type of natural vegetation and ecological condition according to the amount and distribution of rainfall (as shown in isohyetal map of figure 1).

(2) Physiography

Main physiographical region of Thailand can be roughly divided into northern,continental highland, northeast plateau, central highland, central plain, southeast coast and peninsular Thailand. These regions are the basic consideration of classification.

(3) Soil

The properties of soils as well as environmental quality in Thailand can be classified by their physical and chemical properties in correspondence with suitability for agriculture and others.

The combination of those 3 factors were brought into establishment the ecological zone of natural Rux's clone for further experiment. Figure 4. depicts the sampling location of Rux plants for the whole country.

4.1.2 Samples Selection

Following the above mentioned criteria Rux's clones in Table 1. have been selected to be regional representative, and were use samples for clone selection experiment.

Table 1. Selected Rux Clones for Planting

(1) Northern region

Landform	Code	Color
Flood plain	N 01 P	purple
	N 07 W	white
	N 18 P	purple
	N 06 P	purple
Low terrace	N 02 P	purple
	N 08 P	purple
	N 17 W	white
	N 15 P	purple
	N 14 W	white
	N 13 P	purple
High terrace	N 03 W	white
	N 12 W	white
	N 11 P	purple
	N 09 W	white
	N 16 P	purple

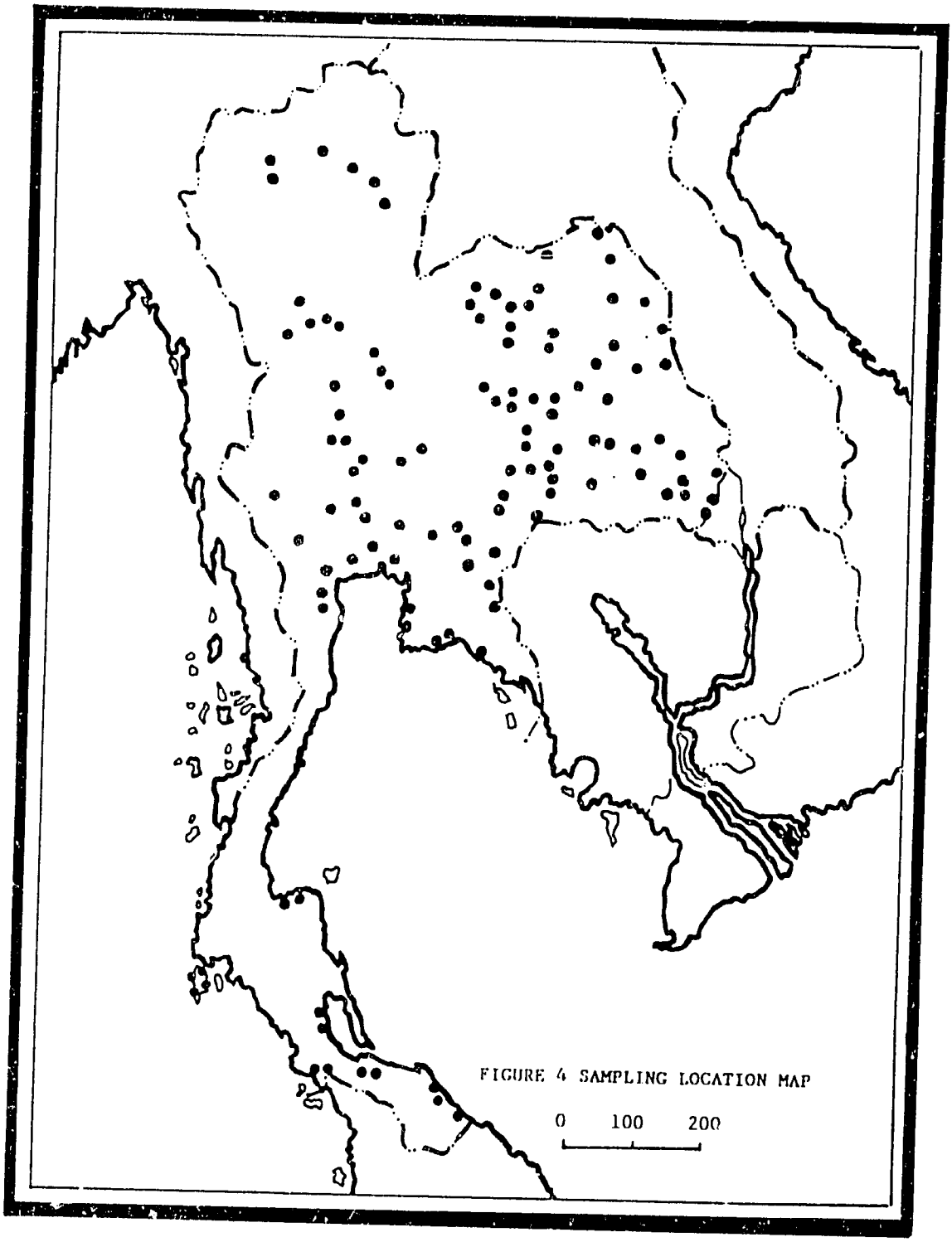


FIGURE 4 SAMPLING LOCATION MAP

(2) Northeastern region

Landform	Code	Color
Low terrace	NE 17 W NE 25 W NE 38 W NE 16 P NE 36 P	white white white purple purple
Natural levee	NE 20 W NE 14 P	white purple
High terrace	NE 29 W NE 14 P	white purple
Karst topography	NE 26 P	purple
Structural plain	NE 37 W NE 52 P	white purple
Sand dune	NE 33 P	purple

(3) Central region

Landform	Code	Color
Flood plain	C 14 W C 03 W	white white
Low terrace	C 18 W	white
High terrace	C 09 W C 07 P C 16 P	white purple purple
Foothill slope	C 12 P C 10 P	purple purple
Karst region	C 04 P	purple

(4) Eastern region

Landform	Code	Color
Plain	E 01 W	white
Low terrace	E 05 W E 02 P	white purple
Karst topography	E 06 P	purple
Beach	E 09 P E 08 P	purple purple
Coastal plain	E 11 P	purple

(5) Southern region

Landform	Code	Color
Foothill slope	S 02 P	purple
Beach	S 02 W S 09 P	white purple
Former tidal flat	S 05 W	white
High terrace	S 15 P	purple
Low terrace	S 07 W S 12 W S 17 P S 13 P	white white purple purple

All samples were prepared for stem cutting propagation method. Thereafter, the seedling were selected according to

the ecotype of the main landform under each physiographic region as well as the climatic condition. The total number of 60 clones in Table 1. were finally selected and distributed to the regions for field experiments.

4.1.3 Experimental Sites Selection

Experimental sites were selected to represent the main landform (marginal landform type) of the region. There are 6 sites, Khon-Kaen, Burirum, Lampang, Chachoengsao, Chumporn and at Salaya, Nakornpathom provinces. Figure 5 depicts the locations for experimental stations. Selected seedlings in each region were introduced into the experimental stations which represent the regional condition and also the ecological indication as illustrated in Table 2. below.

Table 2. Locations and Number of Clones in Each Region

Region	Location of Field Stations	Number of Clones
North	Hangchat, Lampang Province	15
Northeast		
(Upper)	Muang, Khon-Kaen Province	13
(Lower)	Nang-Rong, Burirum Province	8
Central	Mahidol University, Salaya Campus, Nakorn-Chai-Sri, Nakorn Pathom Province	8
East	Tumbol Khao Hin Sorn Amphoe Panom Sarakham Chachoengsao Province	8
South	Amphoe Lang-Suan, Chumporn Province	8

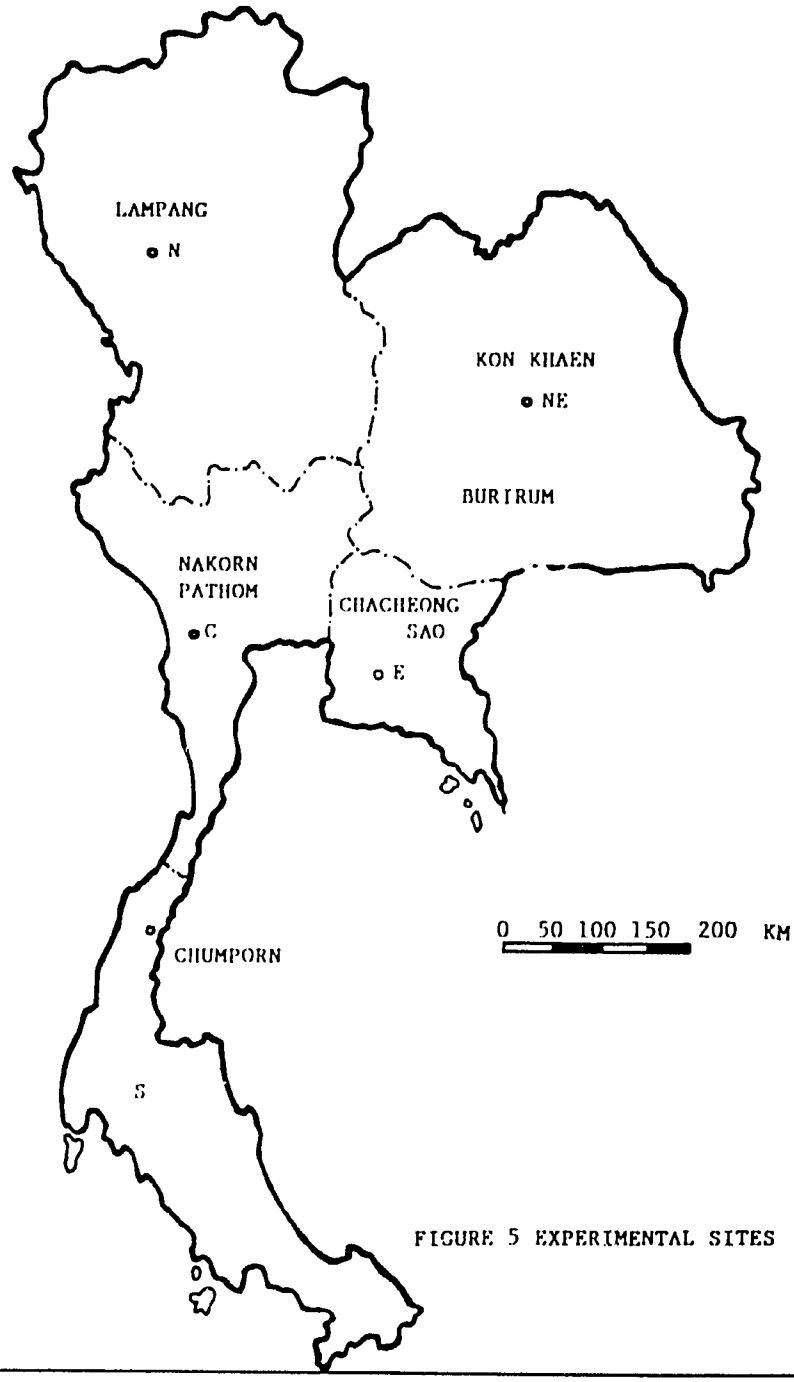


FIGURE 5 EXPERIMENTAL SITES

4.2 Agronomic Outputs

From those 6 locations of field experiment, only 5 stations could be selected as the most successful result. The agronomic outcomes will be described as follows:

4.2.1 Salaya Station

(1) Height

The height of Rux at the end of 12th month is highly significant different between low and high input as well as among clones, especially C10 has the highest height of 225.20 cm.

(2) Width

The width of crown canopy has also highly significant difference between low and high input of the width of C14 is 261.50 cm. which is the widest crown canopy.

(3) Inflorescence

The number of inflorescences per tree is highly significant different between low and high input. C10 has the maximum number of 519.5 inflorescences per tree.

(4) Number of pod

There is highly significant difference between low and high input and between clones. C10 provided the highest number of 16.448 pods per tree.

(5) Width of pod

There is no significant difference between

TABLE AVERAGE OF TOTAL YIELD AND CHARACTERISTICS LOCATION : SALAYA

CLONE	TOTAL YIELD /TREE	No. POD /TREE	FIBER WEIGHT /POD (gm.)	FRESH WEIGHT /POD (gm.)	No. INFLORESCENCE /TREE	POD SIZE		TREE SIZE	
						WIDTH (cm.)	LENGHT (cm.)	HEIGHT (cm.)	DTH (cm.)
C 10	16.94 a	16.488 a	1.07 a	14.54 b	519.5 a	2.907 d	10.28 a	226.2 a	242.1 bc
C 04	6.65 b	8.440 b	0.80 b	15.70 b	387.4 b	3.255 bc	9.66 b	216.7 a	250.3 abc
C 12	5.79 bc	6.087 bc	0.87 ab	17.45 b	277.3 cd	3.223 bc	9.66 b	225.9 a	248.9 abc
C 03	5.44 bc	6.420 bc	0.85 ab	16.11 b	268.0 cd	3.103 bcd	9.44 b	224.0 a	215.3 d
C 07	3.89 bcd	4.710 bcd	0.78 b	16.92 b	370.9 b	3.140 bcd	9.13 b	194.0 bc	235.8 c
C 09	3.42 bcd	3.730 cd	0.90 ab	14.39 b	334.1 bc	3.283 b	9.12 b	181.5 c	233.6 c
C 11	2.94 cd	2.795 cd	1.07 a	20.33 a	339.7 bc	3.563 a	9.41 b	218.5 a	256.8 ab
C 14	0.70 d	0.940 d	0.67 b	14.82 b	224.8 d	3.028 cd	9.14 b	203.7 b	2[illegible]1.5 a
F-test	**	**	**	**	**	**	**	**	**

Remark : Mean, for each variable and each attribute, with the same letter are not significantly different (By Duncan's new multiple range test at level 0.01)

TABLE

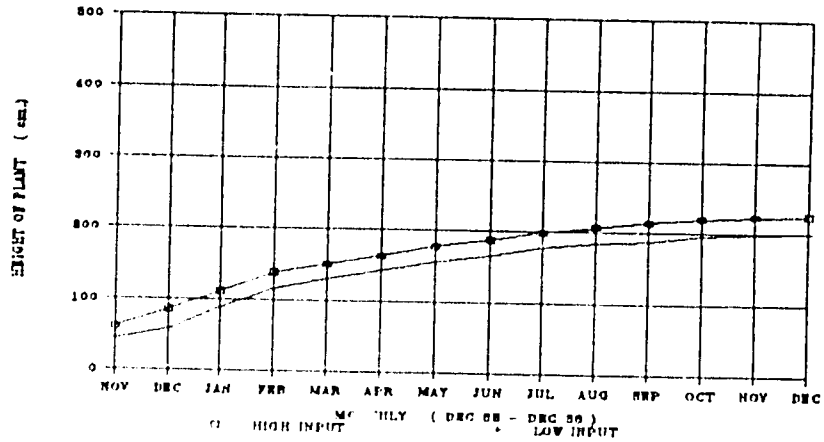
ANALYSIS OF VARIANCE FOR CLONE SELECTION BY SPLIT PLOT IN RCB EXPERIMENT

LOCATION : SALAYA

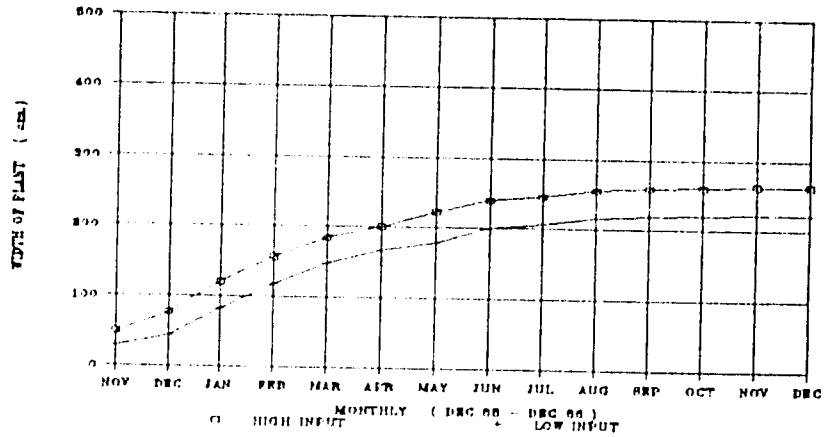
SOURCE OF VARIATION	df	MS									F-TABLE	
		TOTAL YIELD /TREE (gm.)	No. POD /TREE	FIBER WEIGHT /POD (gm.)	FRESH WEIGHT /POD (gm.)	No. INFLORESCENCE /TREE	POD SIZE		TREE SIZE			
							WIDTH (cm.)	LENGHT (cm.)	HEIGHT (cm.)	WIDTH (cm.)	95%	99%
REP	2	4.63 ns	6.50 ns	0.02 ns	1.86 ns	14456.5 *	0.134 ns	0.003 ns	746.1 ns	51.8 ns	19.00	99.00
A	1	380.75 **	473.51 *	0.03 ns	16.33 ns	547783.6 **	0.014 ns	0.045 ns	6784.9 *	18570.4 *	18.51	98.49
ERROR (A)	2	2.89	11.29	0.09	1.04	370.8	0.017	0.180	364.1	233.3		
B	7	144.30 **	135.86 **	0.11 **	23.37 **	49559.2 **	0.231 **	0.930 **	1644.1 **	1312.4 **	2.36	3.36
A x B	7	32.70 **	41.71 **	0.04 ns	5.42 ns	9161.8 **	0.024 ns	0.080 ns	76.5 ns	100.1 ns	2.36	3.36
ERROR (B)	28	4.33	6.31	0.02	3.06	1792.3	0.020	0.160	73.8	101.0		
TOTAL	47											
C.V.(A) %		29.76%	54.21%	36.11%	6.29%	5.7%	4.17%	4.44%	9.02	6.3%		
C.V.(B) %		36.39%	40.52%	16.73%	10.75%	12.4%	4.51%	4.19%	4.1%	4.1%		

ns non significant
* significant difference at level 0.05.
** highly significant difference at level 0.01.

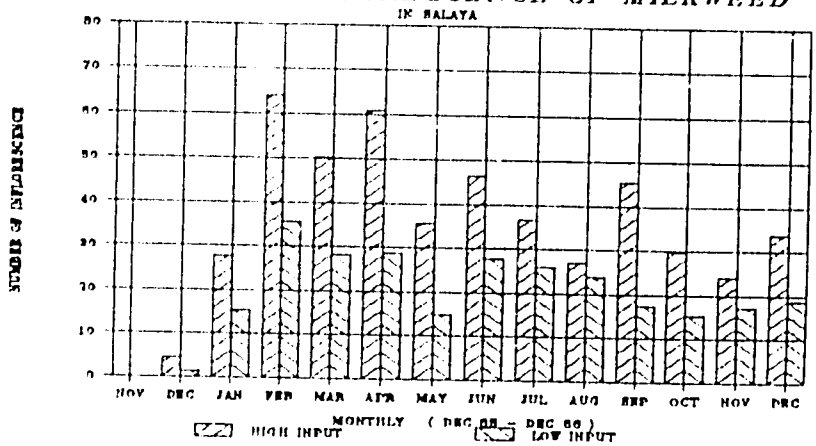
HEIGHT OF MILKWEED IN SALAYA



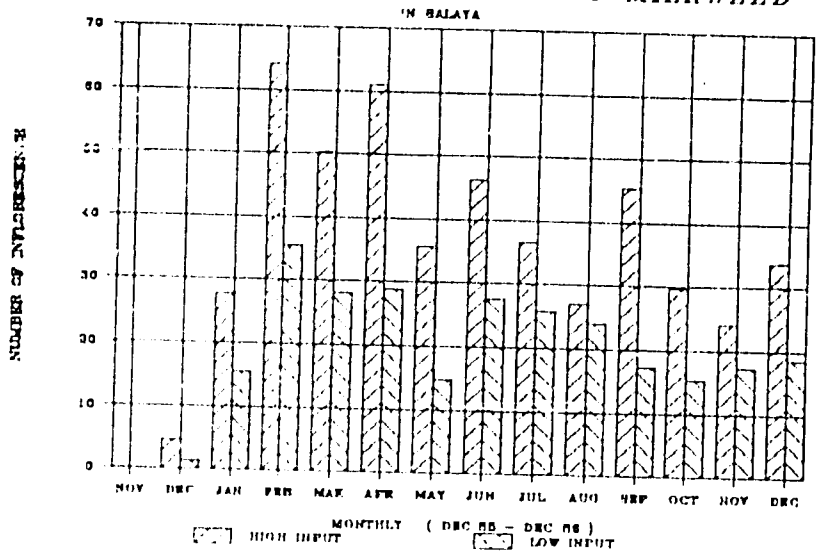
WIDTH OF MILKWEED IN SALAYA



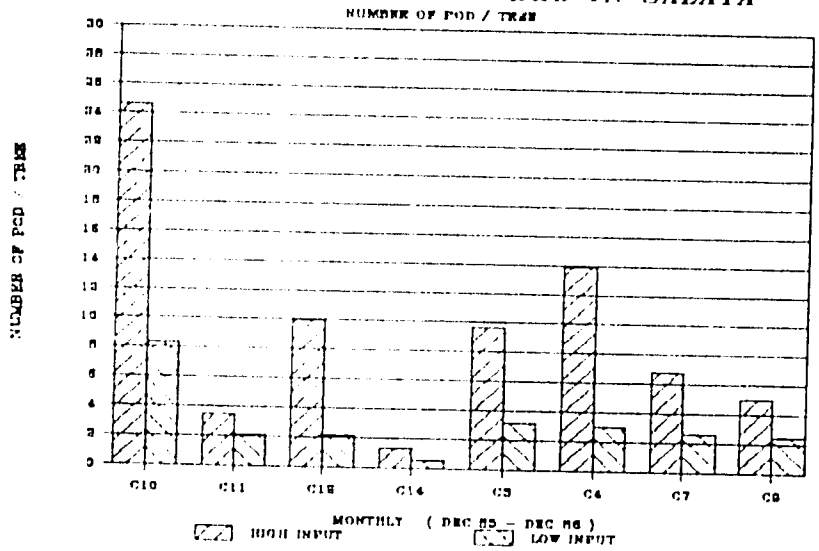
NUMBER OF INFLORESCENCE OF MILKWEED IN SALAYA



NUMBER OF INFLORESCENCE OF MILKWEED IN SALAYA



TOTAL YIELD OF MILKWEED IN SALAYA



low and high input. C11 provided the widest pod of about 3.563 cm.

(6) Length of pod

There is no significant difference between low and high input. C10 also provided the longest pod of 10.28 cm.

(7) Fresh weight of pod

There is no significant difference between low and high input but highly significant among clones. C11 provided the maximum fresh weight of 20.33 grams per pod.

(8) Fiber weight per pod

There is no significant difference in low and high input but highly significant among clones. C11 and C10 provided the maximum weight of 1.07 grams.

(9) Clone selection

C10 performs the best selection from those 8 clones with the maximum weight of fiber numbers of inflorescence and pods per tree. The C10 is then selected as the best clone.

Statistical analysis are also shown in the following tables and figures:-

4.2.2 Lampang Station

(1) Height

The height of Rux at the end of the 12th

TABLE AVERAGE OF TOTAL YIELD AND CHARACTERISTICS LOCATION : LAMPANG

CLONE	TOTAL YIELD /TREE	No. POD /TREE	FIBER WEIGHT /POD (gm.)	FRESH WEIGHT /POD (gm.)	No. INFLORESCENCE /TREE	POD SIZE		TREE SIZE	
						WIDTH (cm.)	LENGHT (cm.)	HEIGHT (cm.)	WIDTH (cm.)
N 07	51.78 a	109.75 a	0.49 bc	13.21 bcd	326.58 bc	2.64 bc	8.95 bc	262.06 e	259.25 c
N 06	46.47 ab	50.0[illegible] bcde	0.88 a	15.30 a	401.11 a	2.55 bcd	3.79 bc	275.03 de	238.00 a
N 03	45.42 ab	57.72 abcd	0.70 ab	12.84 bcde	217.70 cd	3.19 a	7.68 e	227.92 f	207.61 d
N 13	44.20 ab	74.72 b	0.55 bc	12.67 cde	338.33 cd	2.47 cd	7.87 e	276.92 cde	274.95 abc
N 02	38.52 abc	70.97 ab	0.59 bc	11.65 e	418.55 a	2.46 cd	9.03 bc	301.50 abc	291.61 ab
N 16	28.23 bcd	48.08 cdef	0.61 bc	12.57 de	266.22 cd	3.03 a	7.62 e	215.95 f	215.92 d
N 08	27.56 bcd	51.83 bcde	0.50 bc	13.03 bcde	309.47 bc	2.56 bcd	8.26 d	305.58 ab	263.81 abc
N 15	24.07 cd	59.80 abc	0.43 bc	14.13 abc	224.50 cd	2.43 cd	9.55 a	292.31 bcd	263.44 bc
N 01	16.89 cd	24.17 g	0.61 bc	14.30 ab	211.81 cde	2.64 bc	8.71 c	309.28 ab	254.17 c
N 14	15.03 d	24.22 g	0.56 bc	15.62 a	152.56 def	2.57 bcd	8.35 d	283.97 bcde	291.92 ab
N 18	14.49 d	37.17 defg	0.45 bc	13.09 bcde	354.75 ab	2.61 bc	8.88 bc	323.06 a	303.75 a
N 17	12.77 d	27.61 fg	0.53 bc	15.64 a	123.58 f	2.60 bcd	9.09 b	283.58 bcde	263.11 bc
N 11	11.91 d	35.25 efg	0.37 c	12.70 cde	402.28 a	2.36 d	8.34 d	297.50 bcd	302.50 a
N 12	11.84 d	26.81 g	0.51 bc	15.56 a	130.00 ef	2.58 bcd	8.89 bc	286.50 bcde	285.64 abc
N 09	11.45 d	25.55 g	0.53 bc	15.62 a	159.94 def	2.77 b	8.87 bc	284.47 bcde	275.31 abc
F-test	**	**	*	**	**	**	**	**	**

Remark : Mean, for each variable and each attribute, with the same letter are not significantly different (By Duncan's new multiple range test at level 0.01)

TABLE

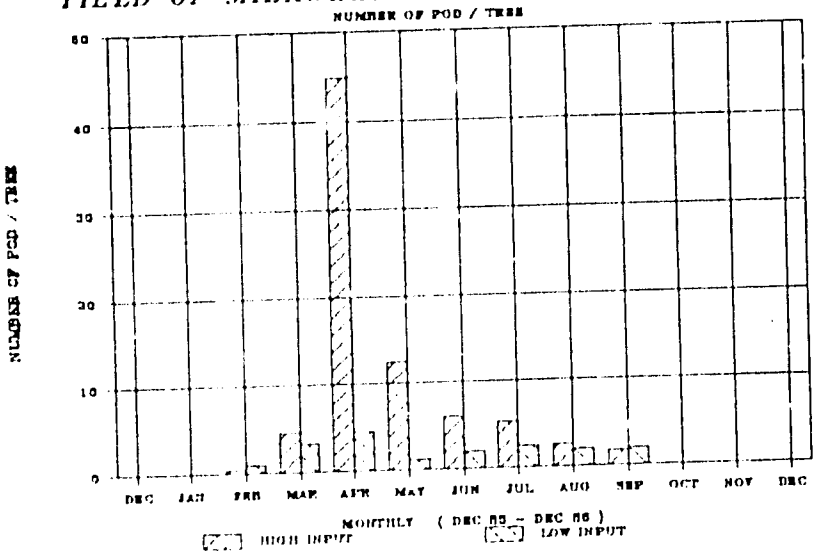
ANALYSIS OF VARIANCE FOR CLONE SELECTION BY SPLIT PLOT IN RCB EXPERIMENT

LOCATION : LAMPANG

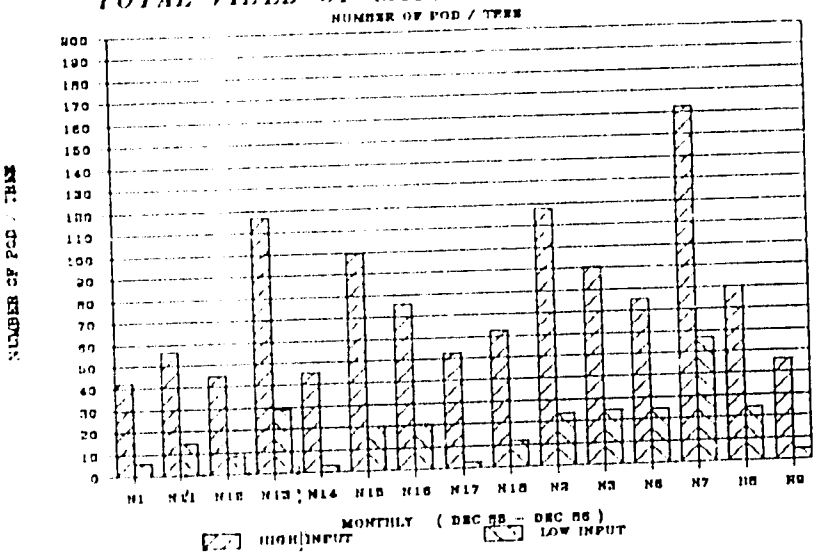
SOURCE OF VARIATION	df	MS: TOTAL YIELD /TREE (gm.)	MS: No. POD /TREE	MS: FIBER WEIGHT /POD (gm.)	MS: FRESH WEIGHT /POD (gm.)	MS: No. INFLORESCENCE /TREE	MS: POD SIZE WIDTH (cm.)	MS: POD SIZE LENGHT (cm.)	MS: TREE SIZE HEIGHT (cm.)	MS: TREE SIZE WIDTH (cm.)	F-TABLE 95%	F-TABLE 99%
REP	2	25.71 ns	769.58 ns	0.057 ns	0.84 ns	312.43 ns	0.12 ns	0.19 ns	588.79 ns	2188.45 *	19.00	99.00
A	1	25308.61 **	78940.06 **	0.034 ns	41.11 ns	895477.69 **	0.20 ns	2.06 ns	47869.33 **	58956.29 **	18.51	98.49
ERROR (A)	2	8.71	470.89	0.048	2.28	1238.29	0.41	0.64	55.65	30.18		
B	14	1297.04 **	3466.61 **	0.094 **	11.41 **	63646.00 **	0.29 **	1.85 **	4930.65 **	4995.78 **	1.88	2.42
A × B	14	475.66 **	716.33 **	0.069 **	8.61 ns	4075.30 ns	0.04 *	0.04 ns	205.17 ns	601.38 ns	1.88	2.42
ERROR (B)	56	141.92	158.01	0.027	0.78	2602.49	0.02	0.03	218.60	341.49		
TOTAL	89											
C.V.(A) %		11.11%	44.97%	40.45%	10.90%	13.07%	24.41%	9.36%	2.6%	2.02%		
C.V.(B) %		44.85%	26.05%	30.17%	6.40%	18.95%	5.31%	2.26%	5.2%	6.81%		

ns non significant
* significant difference at level 0.05.
** highly significant difference at level 0.01.

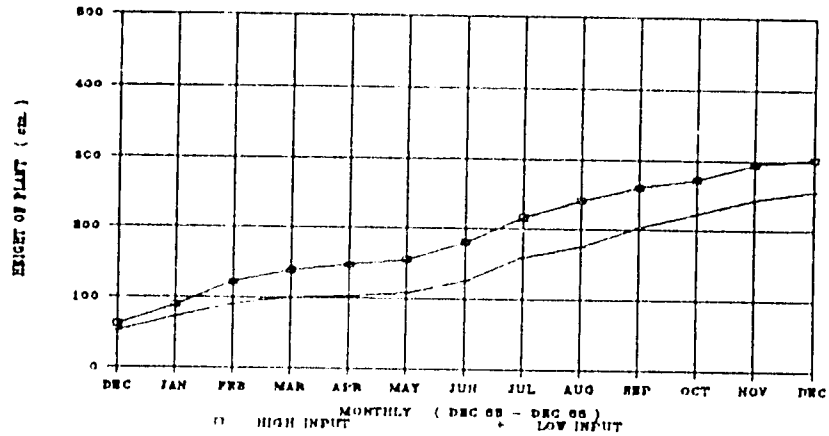
YIELD OF MILKWEED/MONTHLY IN LAMPANG



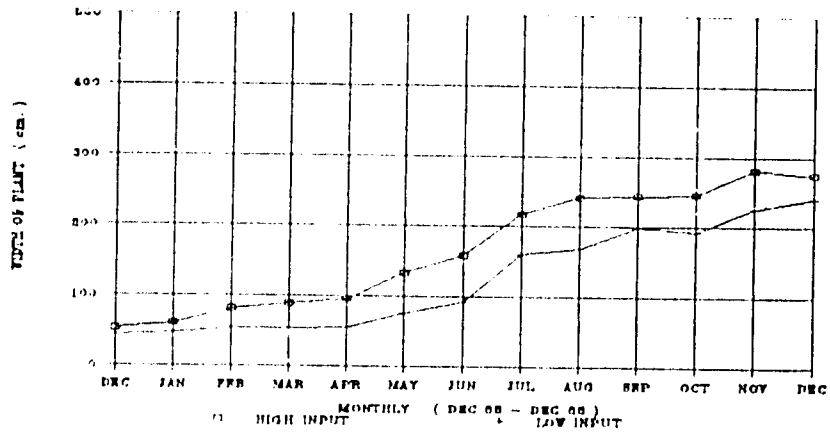
TOTAL YIELD OF MILKWEED IN LAMPANG



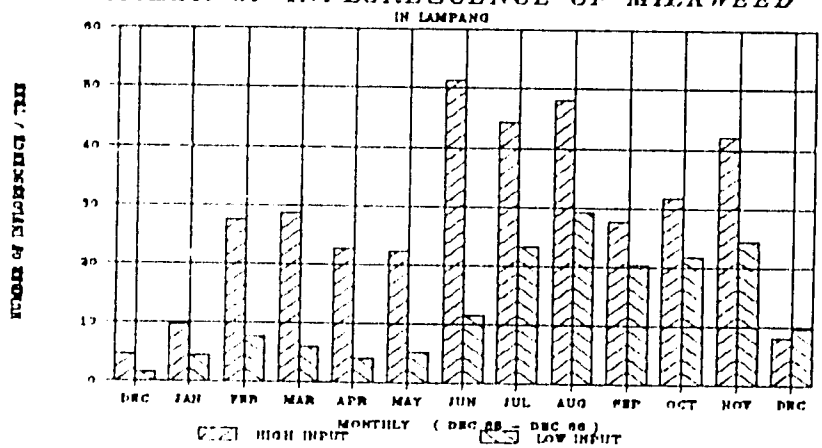
HEIGHT OF MILKWEED IN LAMPANG



WIDTH OF MILKWEED IN LAMPANG



NUMBER OF INFLORESCENCE OF MILKWEED
IN LAMPANG



month is highly significant different between low and high input as well as among clones. The N18 has the highest height of 323.06 cm.

(2) Width

The width of crown canopy has also the highly significant difference between low and high input. The widest canopy of N18 is 303.75 cm.

(3) Inflorescence

The number of inflorescences per tree is highly significant different between low and high input. N2 has the maximum numbers of 481.55 inflorescence per tree.

(4) Number of pod

There are highly significant difference between low and high input and between clones. N7 provided the highest number of 109.75 pods per tree.

(5) Width of pod

There is no significant difference between low and high input. N3 provided the widest pod of about 3.19 cm.

(6) Length of pod

There is no significant difference between low and high input. N15 provided the longest pod of 9.55 cm.

(7) Fresh weight of pod

There is no significant difference between low and high input but highly significant among clones. N17 provided the maximum fresh weight of 15.64 grams per pod.

(8) Fiber weight per pod

There is no significant difference in low and high input, but among clones are highly significant. N6 provided the maximum weight 0.88 gram per pod.

(9) Total yield

The N7 of high input has the maximum fiber weight of 51.78 grams per tree which is not so different from N6, N3, N13 and N2.

(10) Clone selection

There are 4 best selected clones from 15 clones. Those are N7, N6, N3 and N13. N7 is the most preferable clone because of the maximum yield as well as N6 which provided the highest fiber weight per pod.

The analysis of those agronomic results also shown in the following tables and figures:-

4.2.3 Khon Kaen Station

(1) Height

The height of Rux at the end of the 12th month is no significant different between low and high input as well as among clones, especially, NE38 with the highest height of 282.55 cm.

TABLE AVERAGE OF TOTAL YIELD AND CHARACTERISTICS LOCATION : KHON KAEN

CLONE	TOTAL YIELD /TREE	No. POD /TREE	FIBER WEIGHT /POD (gm.)	FRESH WEIGHT /POD (gm.)	No. INFLORESCENCE /TREE	POD SIZE WIDTH (cm.)	POD SIZE LENGHT (cm.)	TREE SIZE HEIGHT (cm.)	TREE SIZE WIDTH (cm.)
NE 37	26.51 a	32.74 ab	0.80	11.16 a	141.28 a	2.63	8.64 abc	246.00 bc	243.92 a
NE 38	24.85 a	36.00 a	0.67	11.26 a	117.47 ab	2.80	8.75 abc	292.55 a	204.32 b
NE 29	22.35 ab	29.67 ab	0.70	10.90 a	94.19 bcd	2.71	8.45 abcd	259.56 abc	243.92 a
NE 26	13.01 bc	16.70 cd	0.75	11.23 a	88.86 bcde	2.79	9.12 a	258.28 abc	251.31 a
NE 52	12.65 bc	22.50 bc	0.53	10.68 a	102.14 abc	2.62	8.96 ab	233.79 bc	220.81 ab
NE 25	11.71 c	17.59 cd	0.71	9.16 abc	76.17 bcde	2.56	8.06 cde	261.81 ab	242.89 a
NE 10	10.10 c	15.12 cd	0.74	8.24 bc	101.78 abc	2.53	7.65 e	251.17 bc	208.97 b
NE 16	9.63 c	13.36 cd	0.74	7.46 bc	68.75 cde	2.65	7.75 de	242.94 bc	228.61 ab
NE 13	9.53 c	15.72 cd	0.57	9.76 abc	83.64 bcde	2.46	8.41 abcd	251.47 bc	250.72 a
NE 47	7.74 c	14.11 cd	0.68	9.05 abc	55.14 de	2.55	8.17 bcde	251.14 bc	205.44 b
NE 21	6.12 c	10.28 cd	0.62	10.48 ab	76.14 bcde	2.77	9.54 abc	239.64 bc	222.44 ab
NE 17	5.57 c	8.17 d	0.72	10.76 a	58.85 cde	2.58	8.73 abc	245.34 bc	226.56 ab
NE 20	3.66 c	6.67 d	0.61	9.95 ab	46.50 e	2.59	8.55 abc	232.00 c	201.83 b
F-test	**	**	ns	**	**	ns	**	*	*

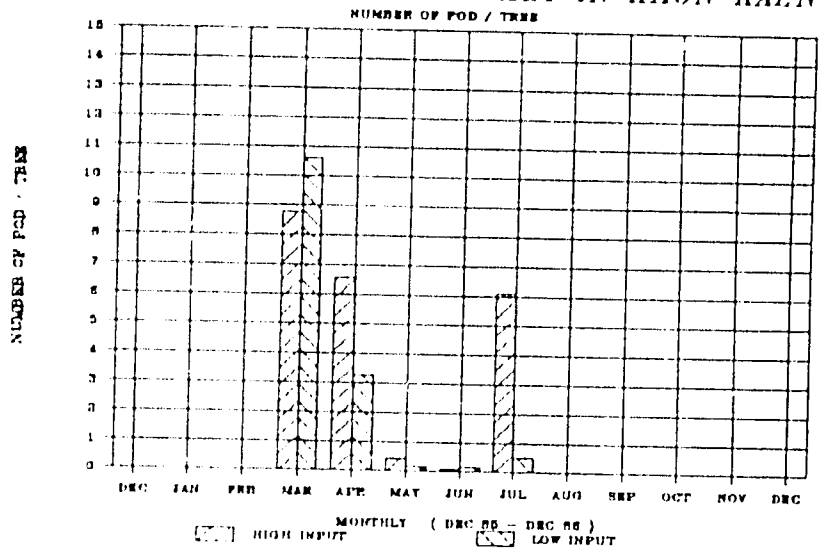
Remark : Mean, for each variable and each attribute, with the same letter are not significantly different (By Duncan's new multiple range test at level 0.01)

TABLE ANALYSIS OF VARIANCE FOR CLONE SELECTION BY SPLIT PLOT IN RCB EXPERIMENT LOCATION : KHON KAEN

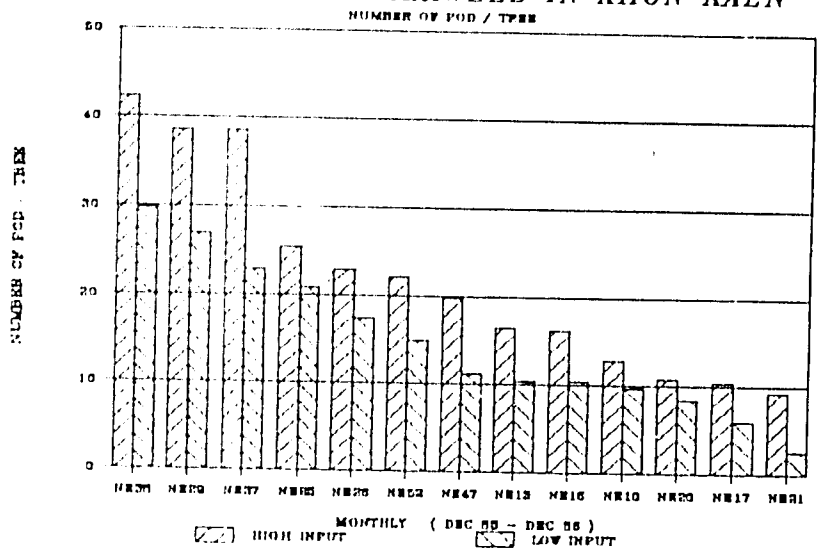
SOURCE OF VARIATION	df	MS									F-TABLE	
		TOTAL YIELD /TREE (gm.)	No. POD /TREE	FIBER WEIGHT /POD (gm.)	FRESH WEIGHT /POD (gm.)	No. INFLORESCENCE /TREE	POD SIZE		TREE SIZE			
							WIDTH (cm.)	LENGHT (cm.)	HEIGHT (cm.)	WIDTH (cm.)	95%	99%
REP	2	46.15 ns	25.50 ns	0.10 ns	10.43 ns	483.07 ns	0.01 ns	0.64 ns	1016.90 ns	229.61 ns	19.00	99.00
A	1	351.75 ns	1025.54 ns	0.33 *	4.55 ns	52876.30 *	0.13 ns	0.64 ns	7909.17 ns	11199.38 ns	18.51	98.49
ERROR (A)	2	248.60	358.43	0.01	6.10	2201.47	0.06	1.18	5721.78	1205.68		
B	12	328.00 **	516.37 **	0.03 ns	8.56 **	4186.55 **	0.06 ns	1.10 **	1066.73 *	1975.48 **	1.90	2.48
A × B	12	105.35 **	75.33 ns	0.06 *	2.91 ns	570.84 ns	0.05 ns	0.27 ns	402.02 ns	393.88 ns	1.90	2.48
ERROR (B)	48	39.72	52.80	0.03	1.90	640.54	0.04	0.18	431.80	361.79		
TOTAL	77											
C.V.(A) %		124.95%	103.14%	14.97%	24.61%	54.90%	9.50%	12.89%	30.19%	15.28%		
C.V.(B) %		49.94%	39.59%	26.10%	13.75%	29.61%	7.72%	5.14%	8.29%	8.37%		

ns non significant
* significant difference at level 0.05.
** highly significant difference at level 0.01.

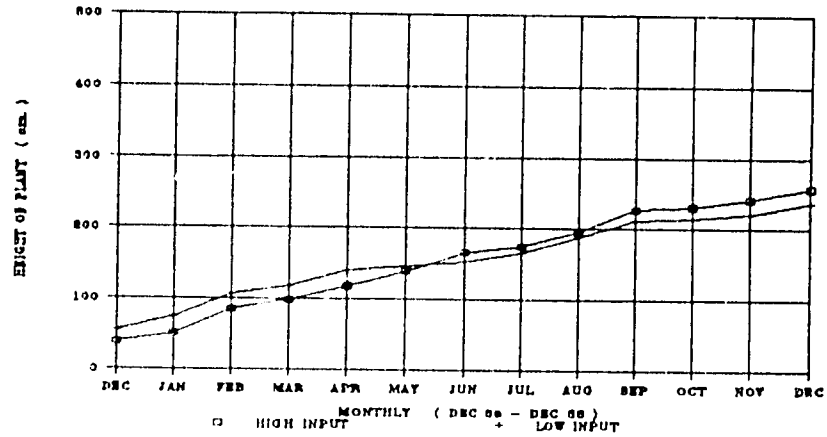
YIELD OF MILKWEED/MONTHLY IN KHON KAEN



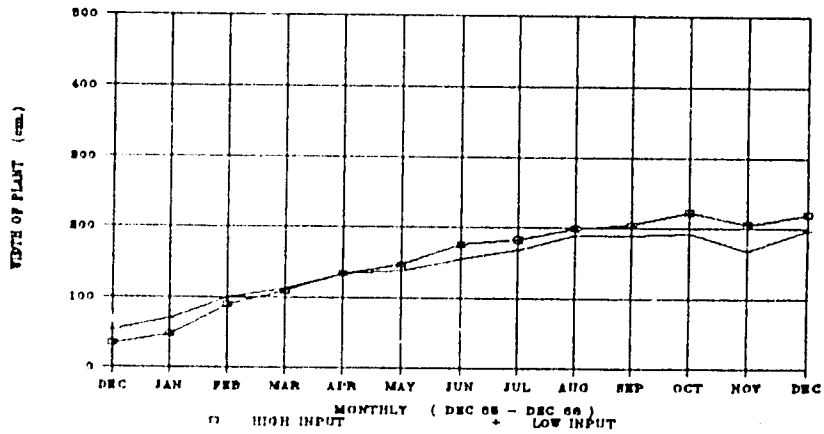
TOTAL YIELD OF MILKWEED IN KHON KAEN



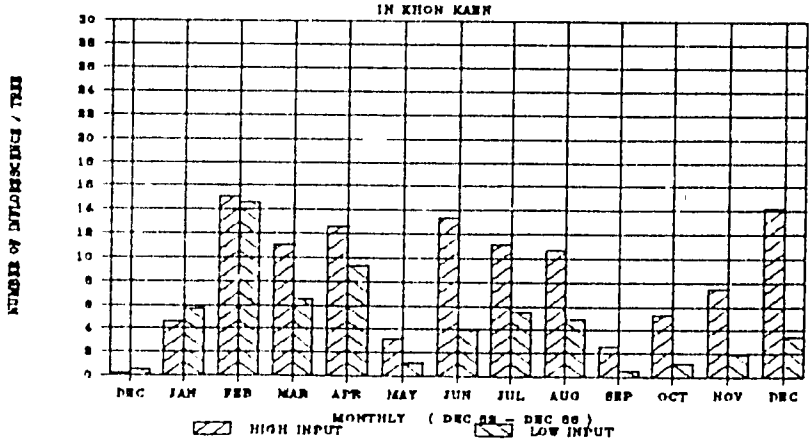
HEIGHT OF MILKWEED IN KHON KAEN



WIDTH OF MILKWEED IN KHON KAEN



NUMBER OF INFLORESCENCE OF MILKWEED
IN KHON KAEN



(2) Width

There is no significant difference between low and high input but highly significant difference among clones. Ne26 has the widest crown canopy.

(3) Inflorescence

The number of inflorescences per tree is significant different between low and high input. NE37 has the maximum numbers of 141.28 inflorescences per tree.

(4) Number of pod

There is no significant difference between low and high input in the number of pods.

(5) Width of pod

There is no significant difference between low and high input.

(6) Length of pod

There is no significant difference between low and high input. Ne26 has the longest pod of 9.12 cm.

(7) Fresh weight of pod

There is no significant difference between low and high input but highly significant among clones. NE38 provided the maximum fresh weight of 11.26 grams per pod.

(8) Fiber weight per pod

There is the significant difference of fiber weight per pod in low and high input.

(9) Total yield

NE37 provided the maximum weight of 26.51 grams per tree which is the same as NE38 and NE29.

(10) Clone selection

NE37 is the most selected clone because of its maximum number of inflorescence and yield.

Statistical analysis also shown in the following tables and figures:-

4.2.4 Khao Hin Sorn Station

(1) Height

There is no significant difference between low and high input as well as among clones. E2 has the highest height of 256.64 cm.

(2) Width

The width of crown canopy has also the significant difference between low and high input. E9 has the widest canopy of 248.67 cm.

(3) Inflorescence

The number of inflorescences per tree is no significant difference between low and high input and also among clones. E2 has the maximum number of inflorescences per tree.

(4) Numbers of pod

There is no significant difference between

TABLE AVERAGE OF TOTAL YIELD AND CHARACTERISTICS LOCATION : KHAO HIN SORN

CLONE	TOTAL YIELD /TREE	No. POD /TREE	FIBER WEIGHT /POD (gm.)	FRESH WEIGHT /POD (gm.)	No. INFLORESCENCE /TREE	POD SIZE		TREE SIZE	
						WIDTH (cm.)	LENGHT (cm.)	HEIGHT (cm.)	WIDTH (cm.)
E 01	6.43 a	7.28 a	0.89 ab	17.09 bc	38.61	3.46 ab	9.93 bc	254.05	240.78
E 06	4.38 ab	3.94 abc	1.01 a	21.97 a	44.11	3.79 a	11.26 a	253.67	244.09
E 02	4.14 abc	6.06 ab	0.71 bc	16.59 bcd	45.69	3.28 bc	10.00 bc	256.64	242.22
E 11	3.19 abc	5.11 abc	0.64 bc	15.55 bcd	35.03	3.50 ab	8.40 e	252.42	237.53
E 07	2.17 bc	2.58 bc	0.86 ab	17.41 b	40.06	3.56 bc	10.65 ab	249.33	242.17
E 05	1.46 bc	1.69 bc	0.84 ab	15.16 cd	34.59	3.28 bc	9.19 cde	255.64	239.[illegible]
E 08	1.19 bc	1.83 bc	0.57 c	14.43 d	31.69	3.02 c	8.96 de	247.00	239.00
E 09	0.49 c	1.22 c	0.52 c	16.20 bcd	36.39	3.35 bc	9.82 bcd	244.72	248.67
F-test	*	**	**	**	ns	**	**	ns	ns

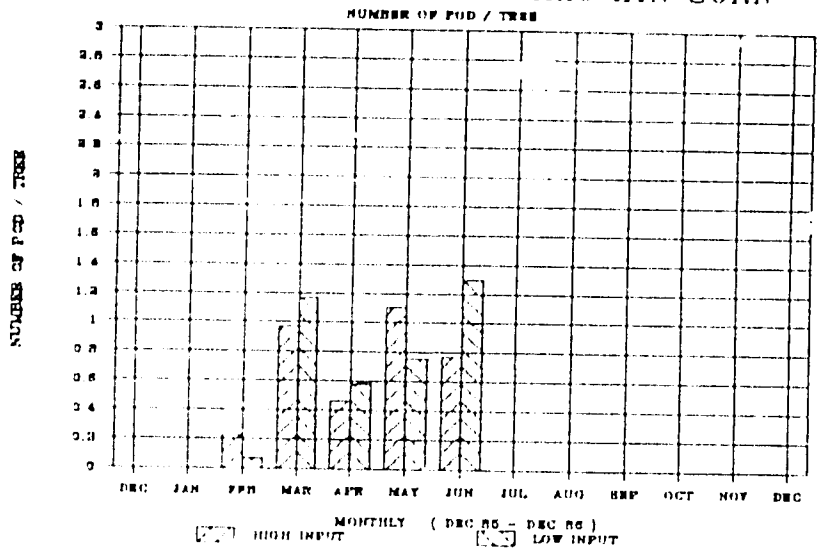
Remark : Mean, for each variable and each attribute, with the same letter are not significantly different (By Duncan's new multiple range test at level 0.01)

TABLE ANALYSIS OF VARIANCE FOR CLONE SELECTION BY SPLIT PLOT IN RCB EXPERIMENT LOCATION : KHAO HIN SORN

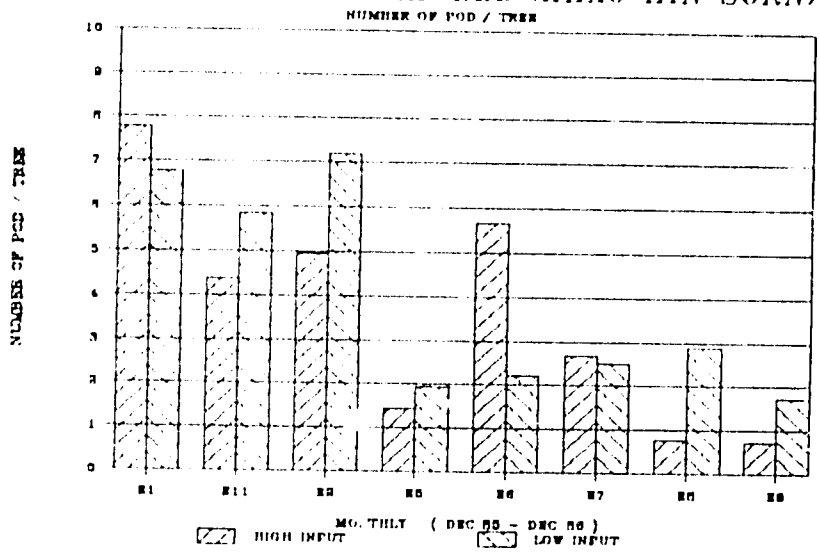
SOURCE OF VARIATION	df	MS									F-TABLE	
		TOTAL YIELD /TREE (gm.)	No. POD /TREE	FIBER WEIGHT /POD (gm.)	FRESH WEIGHT /POD (gm.)	No. INFLORESCENCE /TREE	POD SIZE		TREE SIZE			
							WIDTH (cm.)	LENGHT (cm.)	HEIGHT (cm.)	WIDTH (cm.)	95%	99%
REP	2	10.46 ns	14.00 ns	0.09 ns	0.49 ns	693.22 ns	0.02 ns	1.36 ns	5461.11 ns	4169.11 ns	19.00	99.00
A	1	0.52 ns	1.33 ns	0.06 ns	2.02 ns	50.00 ns	0.24 ns	0.89 ns	445.17 ns	3924.26 ns	18.51	98.49
ERROR (A)	2	20.19	34.62	0.11	2.36	1737.94	0.01	0.43	496.74	268.14		
B	7	23.66 *	30.25 **	0.17 **	32.07 **	140.08 ns	0.28 **	5.06 **	108.18 ns	74.53 ns	2.36	3.36
A x B	7	6.23 ns	5.29 ns	0.02 ns	1.13 ns	95.94 ns	0.04 ns	0.32 ns	96.40 ns	101.50 ns	2.36	3.36
ERROR (B)	28	7.77	7.06	0.01	1.61	102.11	0.04	0.29	149.41	115.35		
TOTAL	47											
C.V.(A) %		153.34%	158.37%	45.93%	9.15%	108.93%	3.78%	6.78%	8.85%	6.77%		
C.V.(B) %		95.11%	71.53%	18.71%	7.56%	26.40%	6.11%	5.54%	4.85%	4.44%		

ns non significant
* significant difference at level 0.05.
** highly significant difference at level 0.01.

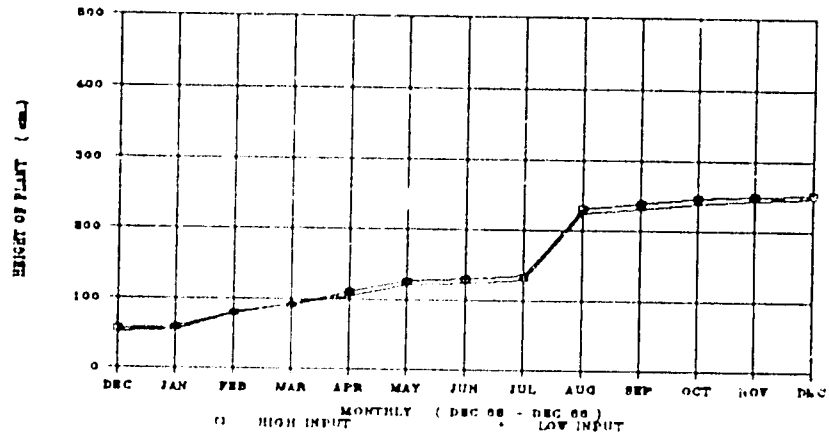
YIELD OF MILKWEED IN KHAO HIN SORN



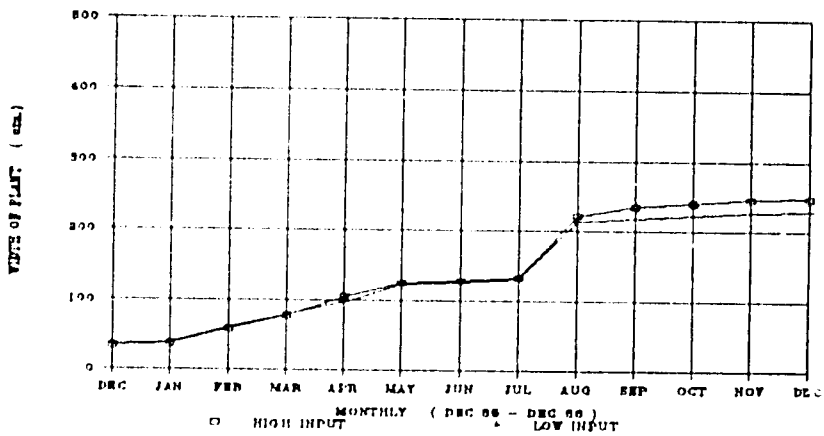
TOTAL YIELD OF MILKWEED (KHAO HIN SORN)



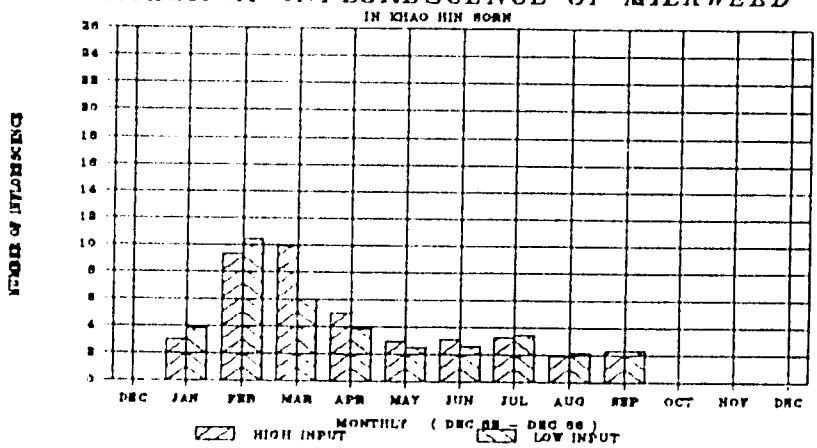
HEIGHT OF MILKWEED IN KHAO HIN SORN



WIDTH OF MILKWEED IN KHAO HIN SORN



NUMBER OF INFLORESCENCE OF MILKWEED
IN KHAO HIN SORN



low and high input but highly significant difference among clones. E1 provided the maximum output of 7.28 pods per tree.

(5) Width of pod

There is no significant difference between low and high input. E6 has the widest pod of 3.79 cm.

(6) Length of pod

There is no significant difference between low and high input. E6 provided the longest pod of 11.26 cm.

(7) Fresh weight of pod

There is the significant difference between low and high input but highly significant difference among clones. E6 provided the maximum fresh weight of 21.97 grams per pod.

(8) Fiber weight per pod

There is no significant difference in low and high input but highly significant difference among clones. E6 has the maximum fiber weight of 1.01 grams per pod.

(9) Total yield

E1 provided the maximum fiber weight of 6.43 grams per tree followed by E6, E2 and E11.

(10) Clone selection

The best selected clones are E1, E6 and E2

because of the largest pod and higher fiber weight per pod.

Statistical analysis also shown in the following tables:-

4.2.5 Chumporn Station

(1) Height

The height of Rux is highly significant difference between low and high input as well as among clones. S17 has the highest height of 203.2 cm.

(2) Width

The width of canopy has highly significant difference between low and high input. S7 has the widest canopy of 292.1 cm.

(3) Inflorescence

Number of inflorescence per tree are highly significant different between low and high input. S7 has the maximum number of 134.28 inflorescences per tree.

(4) Numbers of pod

There is highly significant difference between low and high input and among clones. S7 has the maximum number of 10.81 pods per tree.

(5) Width of pod

There is highly significant difference among clones. S12, S2 and S5 has the same widest pod of about 3.473 cm.

TABLE AVERAGE OF TOTAL YIELD AND CHARACTERISTICS LOCATION : CHUMPORN

CLONE	TOTAL YIELD /TREE	No. POD /TREE	FIBER WEIGHT /POD (gm.)	FRESH WEIGHT /POD (gm.)	No. INFLORESCENCE /TREE	POD SIZE		TREE SIZE	
						WIDTH (cm.)	LENGHT (cm.)	HEIGHT (cm.)	WIDTH (cm.)
S 07	34.687 a	[illegible] a	1.67 b	13.64 c	132.80 a	3.06 b	8.92 c	190.2 ab	292.1 a
S 09	12.873 b	3.92 b	1.69 b	16.93 a	93.80 ab	3.16 b	9.59 b	202.3 a	260.5 abc
S 13	11.343 b	3.92 b	1.56 b	13.28 c	108.30 ab	3.19 ab	8.21 de	184.9 ab	230.4 bcd
S 17	7.473 b	4.06 b	0.97 c	10.88 d	76.40 ab	2.94 b	7.94 de	203.2 a	246.6 abcd
S 12	1.773 b	0.42 b	1.98 b	15.02 b	102.00 ab	3.47 a	8.47 cd	182.0 ab	277.7 ab
S 03	0.470 b	0.39 b	0.84 cc	5.70 e	42.30 b	2.49 b	6.75 f	176.5 abc	208.9 cde
S 02	0.467 b	0.14 b	2.92 a	14.86 b	49.80 ab	3.47 a	10.18 a	138.8 c	189.4 de
S 05	0.000 b	0.00 b	0.31 d	11.33 d	21.80 b	3.47 a	7.80 e	150.4 bc	159.4 e
F-test	**	**	**	**	**	**	**	**	**

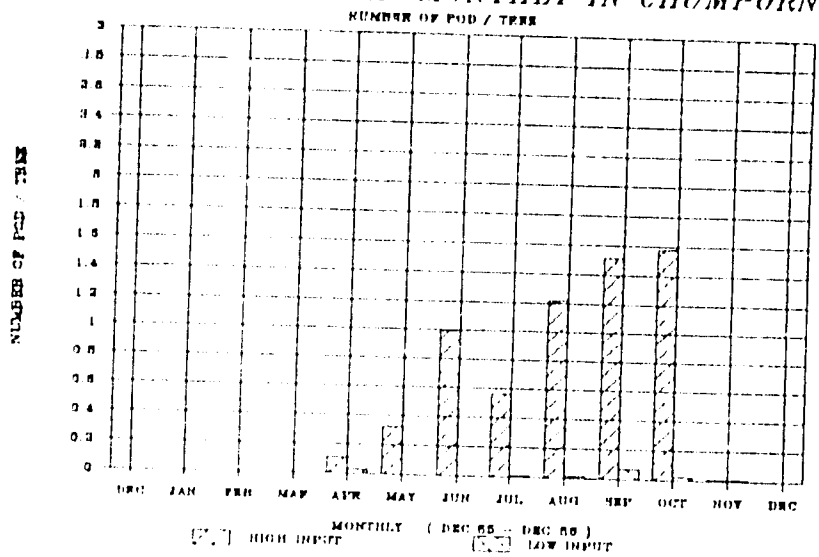
Remark : Mean, for each variable and each attribute, with the same letter are not significantly differen
(By Duncan's new multiple range test at level 0.01)

TABLE ANALYSIS OF VARIANCE FOR CLONE SELECTION BY SPLIT PLOT IN RCB EXPERIMENT LOCATION : CHUM PORN

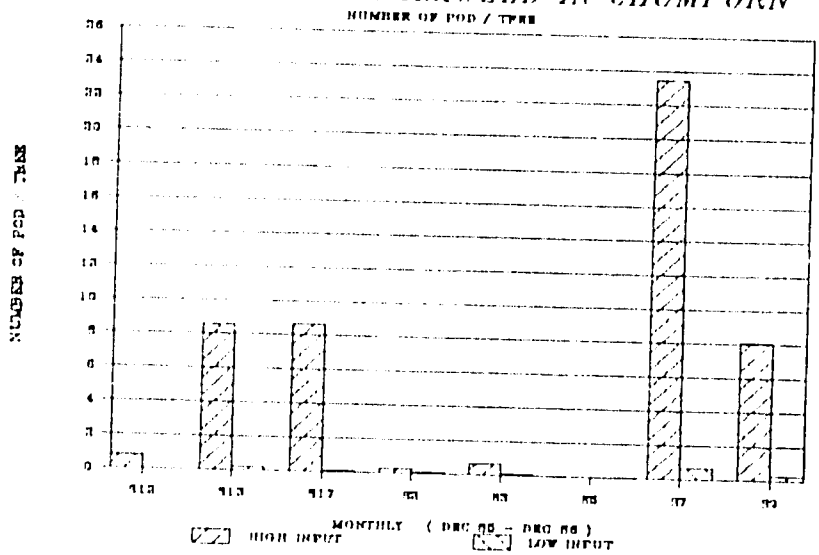
SOURCE OF VARIATION	df	MS: TOTAL YIELD /TREE (gm.)	MS: No. POD /TREE	MS: FIBER WEIGHT /POD (gm.)	MS: FRESH WEIGHT /POD (gm.)	MS: No. INFLORESCENCE /TREE	MS: POD SIZE WIDTH (cm.)	MS: POD SIZE LENGHT (cm.)	MS: TREE SIZE HEIGHT (cm.)	MS: TREE SIZE WIDTH (cm.)	F-TABLE 95%	F-TABLE 99%
REP	2	14.770 ns	5.75 ns	0.366 ns	0.327 ns	1103.9 ns	0.045 ns	0.139 ns	609.4 ns	1232.3 ns	19.00	99.00
A	1	411.588 **	376.88 *	1.927 **	35.685 **	235733.7 **	0.343 **	[illegible].488 **	155743.4 **	224233.1 **	18.51	98.49
ERROR (A)	2	57.329	4.28	0.107	0.228	1575.1	0.026	0.117	430.4	821.4		
B	7		80.90 **			8557.2 **			3206.7 **	12288.2 **	2.36	3.36
A x B	7		74.20 **			5899.9 ns			655.4 ns	703.1 ns	2.36	3.36
ERROR (B)	28		11.78			2452.3			591.0	1182.9		
TOTAL	47											
C.V.(A) %		87.7%	70.04%	22.0%	3.8%	50.6%	5.1%	4.0%	11.6%	12.3%		
C.V.(B) %			116.15%			63.2%			13.6%	14.8%		

ns non significant
* significant difference at level 0.05.
** highly significant difference at level 0.01.

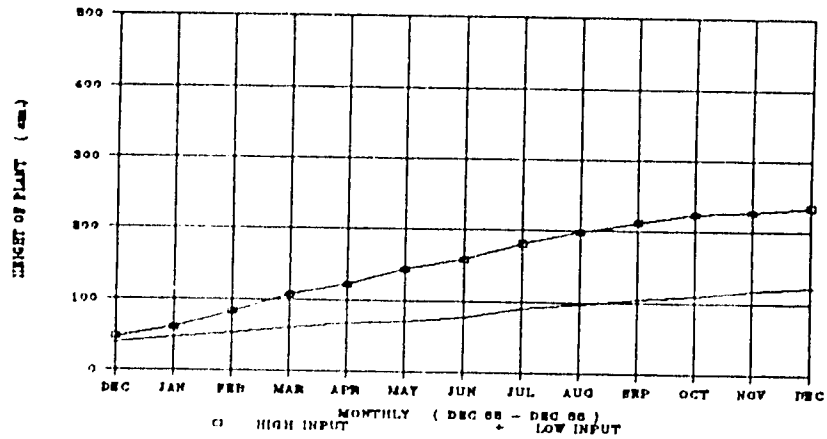
YIELD OF MILKWEED/MONTHLY IN CHUMPORN



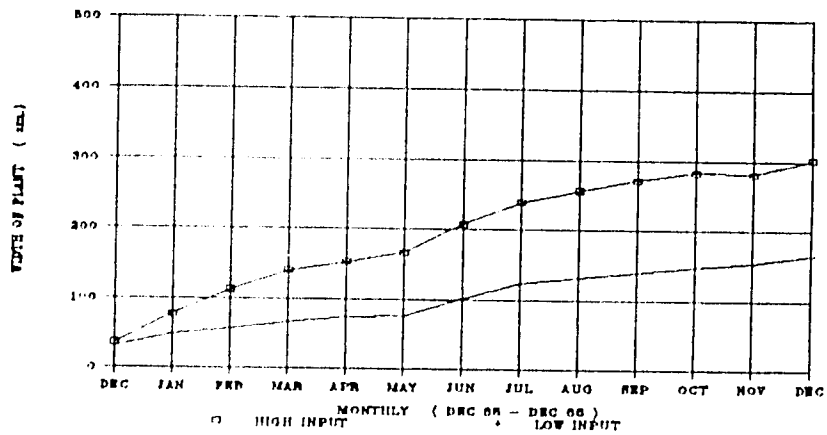
TOTAL YIELD OF MILKWEED IN CHUMPORN



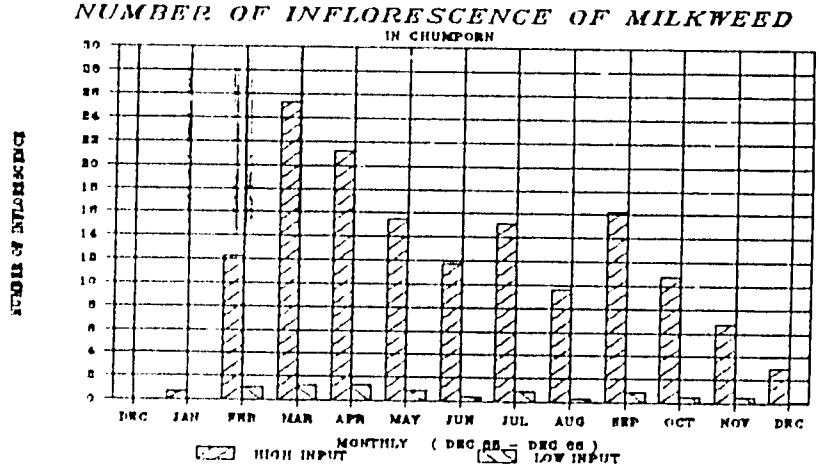
HEIGHT OF MILKWEED IN CHUMPORN



WIDTH OF MILKWEED IN CHUMPORN



NUMBER OF INFLORESCENCE OF MILKWEED
IN CHUMPORN



(6) Length of pod

There are highly significant difference among clones. S2 provided the longest pod of about 10.18 cm.

(7) Fresh weight of pod

There is highly significant difference among clones. S9 has the maximum weight of pod about 16.93 grams.

(8) Fiber weight per pod

There is highly significant difference of fiber weight per pod and among clones. S2 provided the maximum weight of 2.92 grams per pod.

(9) Total yield

The fiber weight per tree is highly significant difference among clones. S7 gives the maximum fiber weight of 34.678 grams per tree.

(10) Clone selection

S7 is only one clone which can be selected because of the maximum fiber weight, number of inflorescences and pods per tree.

Analysis also shown in the following tables:-

4.3 Selection of Superior Clones

The superior clones of Rux can be selected within the 14 maximum yield from the experiments in the following table:-

Region	Experimental	Clones selection
North	Lampang	N6 N7 N3 N13
Northeast (Upper)	Khon Kaen	NE37 Ne38 Ne29
Northeast (Lower)	Burirum	NE4 NE45
Central	Salaya	C10
East	Khao Hin Sorn	E1 E6 E2
South	Chumporn	S7

V. CONCLUSION AND FURTHER STUDIES

With respect to the experiment and methodology designed for Giant Milkweed or Rux superior clones selection,seedlings from each region were planted in six stations which represent major physiographic regions of the country. These seedlings were prepared from cutting stem gathered during field investigation. The criteria for clone selection in the field was based on the "ecotype" concept. Each ecotype represents a specific physical environmental conditions: soil, climate, physiographic position and parent material. Rux were planted on the analogous environment, the only remaining differences are clones and the interaction between clone and the environment. The experimental results also revealed that Rux clones brought up statistically difference in growth and fiber. The characteristics of plant such as numbers of pod, fiber yield, and their growth rates were varied and be reflected by the coefficient of variation. Therefore, at this stage, it can be inferred that Rux clones of *Calotropis gigantea* R.Br. in each region are varied in performance, and their responses to the environment are unlike or having dissimilar adaptability.

Stating the fact that there are at least three factors which will have the influences on the phenotype of living things both in plant and animal kingdom especially on quantitative characteristics. These factors are genotype (g), environment (e),and the interaction between gene and the environment (ge). The relationship between three factors and pheno-

type can be displayed by mathematical function as follows:

$$p = f(g, e, ge)$$

where p is phenotype,

g is genotype factor,

e is environment factor, and

ge is interaction between gene and environment.

The plan of this study was to bring about in details which intend to cover the clone level of Rux, then the phenotype (p) should be reinstated by clone (c) of Rux plant. This implies,

$$c = f(g, e, ge)$$

where c is clone, and

f symbolizes as function of ( ).

As mentioned earlier, the consistency of sites' environment was controlled by management practices and site selection, the experimental results of yield and growth will delineate only the gene factor and the interaction between gene and environment. Rux in this study, is under the consideration to be performed as fiber source function, then fiber products or number of pods yielded by Rux plant were used as criteria for the superior clone selection is conscientious. Assessment for selecting Rux plant in each station will depict the regional superior clones from selected samples tabulated in Table 2, Section IV.

"Low" and "High" inputs were two treatments designed to express as natural control and as comparable management of Rux planting in each station respectively. And truly, responses to designed inputs were different among clones due to genotype and the interaction to environment factors. This was significantly confirmed by yield and growth results. High yield and low yield clones were differentiated into two groups distinctively,and about 3-4 clones could be selected for each experimental station. However, results from Kon Kaen Station and Khao Hin Sorn Station were slightly deviated in which the growth rates from both high and low inputs have been affected by the climatic fluctuation of delayed rainy season at the beginning of planting period. The result from Chumporn Station was also the proof of Rux's characteristics of not, naturally, favoring to grow in the humid area such as the southern part of the country. This can be confirmed by field investigation which has been extended further down to the end of peninsula -- Malaysia. Where the amount of rainfall increases toward the south, Rux's population density appears to be decreased.

Besides selecting Rux superior clones in each region which is the first step of study approach, necessary data and related factors were also recorded in order to determine the feasibility of using the fiber for textile material. Economic analysis in terms of unit cost, benefit in return,and textile engineering process and quality will be the next approach of this project.

Yield per unit area is one of the important constraint to introducing Rux fiber into fabric world. The amount of fiber given from the experimental plot was within the reasonable range but it is expected more yield from some specific clones since they produced a significant amount of inflorescences. Mechanisms concerning number of inflorescences and the relation to fruit setting should be pay more attention in further investigation, since the variation of the fruit setting of Giant Milkweed's pods will directly affect yield. The selected superior clones from this study must be tested under the wide range of environmental conditions for genetic adaptability or the interaction of plant and the environment. Therefore, the experimental trial to compare among clones in every station is then prepared for the second phase study.

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APPENDIX A

EXPERIMENT PLAN DESIGN (SPLIT PLOT IN RCB)

AT EXPERIMENT STATION IN SALAYA

		HIGH INPUT	LOW INPUT	
	C3			C14
	C12			C11
	C4			C7
REP 1	C10			C4
	C7			C12
	C11			C3
	C8			C10
	C14			C8
	C4			C7
	C12			C8
	C8			C10
REP 2	C10			C11
	C14			C12
	C7			C3
	C3			C14
	C11			C4
	C8			C11
	C12			C14
	C14			C12
REP 3	C7			C10
	C4			C3
	C11			C8
	C10			C7
	C3			C4

EXPERIMENT PLAN DESIGN (SPLIT PLOT IN RCB)

AT EXPERIMENT STATION IN KHON KAEN

		HIGH INPUT	LOW INPUT	
	NE13			NE47
	NE10			NE37
	NE25			NE30
	NE20			NE21
	NE30			NE20
	NE47			NE20
REP 1	NE52			NE20
	NE20			NE17
	NE16			NE10
	NE37			NE16
	NE17			NE13
	NE20			NE52
	NE21			NE25
	NE10			NE30
	NE52			NE13
	NE25			NE47
	NE13			NE25
	NE47			NE20
	NE30			NE37
REP 2	NE21			NE20
	NE17			NE52
	NE16			NE20
	NE20			NE17
	NE30			NE16
	NE37			NE21
	NE20			NE10
	NE25			NE17
	NE47			NE25
	NE13			NE37
	NE17			NE13
	NE37			NE26
	NE20			NE20
REP 3	NE30			NE21
	NE21			NE30
	NE20			NE47
	NE30			NE10
	NE13			NE52
	NE10			NE20
	NE52			NE16

EXPERIMENT PLAN DESIGN (SPLIT PLOT IN RCB)

AT EXPERIMENT STATION IN KHAO HIN SORN

		HIGH INPUT	LOW INPUT	
REP 1	E8			E7
	E9			E2
	E2			E8
	E5			E5
	E11			E11
	E7			E1
	E1			E9
	E6			E6
REP 2	E1			E2
	E9			E11
	E5			E5
	E2			E8
	E7			E9
	E8			E6
	E6			E1
	E11			E7
REP 3	E11			E6
	E2			E5
	E5			E1
	E1			E11
	E7			E6
	E9			E7
	E8			E9
	E6			E2

EXPERIMENT PLAN DESIGN (SPLIT PLOT IN RCB)

AT EXPERIMENT STATION IN CHUMPORN

		HIGH INPUT	LOW INPUT	
	S17			S8
	S8			S12
	S7			S2
REP 1	S2			S5
	S5			S17
	S12			S3
	S3			S13
	S13			S7
	S7			S5
	S2			S17
	S13			S8
REP 2	S17			S13
	S8			S2
	S3			S7
	S5			S12
	S12			S3
	S5			S2
	S8			S5
	S7			S7
REP 3	S2			S3
	S3			S8
	S13			S13
	S12			S17
	S17			S12

APPENDIX B

TABLE N O 1 HEIGHT OF MILKWEED IN LAMPANG

NO.	CODE	1 DEC	2 JAN	3 FEB	4 MAR	5 APR	6 MAY	7 JUN	8 JUL	9 AUG	10 SEP	11 OCT	12 NOV	13 DEC
N1	H	62.50	92.39	129.06	148.56	159.83	164.78	187.22	226.50	262.72	276.78	292.94	309.33	331.33
N11	H	60.56	88.17	116.67	134.28	142.22	151.06	177.67	212.33	241.67	267.61	280.00	304.67	315.06
N12	H	54.67	72.44	98.72	111.72	124.17	133.17	164.06	212.50	231.89	258.72	271.00	294.72	301.17
N13	H	60.22	92.33	121.17	136.44	139.00	146.22	166.39	220.56	239.00	258.56	270.00	286.06	290.94
N14	H	59.00	92.93	123.83	138.00	141.94	149.56	187.50	223.61	253.28	270.56	287.94	303.44	320.61
N15	H	59.00	76.78	106.11	119.39	127.61	142.22	173.78	222.17	259.17	273.22	280.72	308.78	316.94
N16	H	60.89	87.61	108.50	122.39	136.22	144.94	143.33	169.50	183.22	212.72	216.94	228.61	230.56
N17	H	52.50	71.00	113.33	130.61	139.39	147.44	185.67	233.67	258.83	270.11	283.33	307.22	314.06
N18	H	70.39	96.17	141.17	157.94	169.39	183.44	211.11	254.11	261.89	288.89	302.78	328.44	340.67
N2	H	61.56	89.22	125.56	137.94	157.67	163.11	186.89	220.33	245.33	267.72	279.28	303.44	316.28
N3	H	54.78	84.28	110.17	128.17	147.33	146.83	156.78	174.39	193.00	209.28	226.67	241.22	244.72
N6	H	64.61	98.83	133.89	158.33	159.50	159.44	190.22	216.61	240.56	254.17	264.44	289.22	286.78
N7	H	60.17	89.72	124.89	144.78	153.83	154.94	176.56	208.72	225.67	246.33	252.67	274.39	281.00
N8	H	70.06	111.67	143.28	157.83	156.94	169.00	202.78	224.11	253.39	274.61	291.50	316.00	324.33
N9	H	63.22	93.56	128.28	142.50	152.67	161.11	187.44	226.94	255.56	271.56	280.83	304.61	313.94
N1	L	55.67	77.56	93.56	108.33	105.50	115.28	131.39	171.33	186.28	222.22	247.78	270.28	286.44
N11	L	58.56	78.22	95.33	105.94	111.78	120.67	136.67	161.28	179.67	216.17	232.50	267.94	280.11
N12	L	54.50	71.00	85.67	92.50	105.17	99.78	113.06	149.83	160.78	204.28	219.17	242.61	258.00
N13	L	53.61	76.78	93.78	105.56	105.72	110.94	122.72	156.06	165.83	200.78	215.11	247.94	256.22
N14	L	44.33	57.56	70.78	76.94	78.22	83.44	105.67	141.39	155.94	189.44	213.61	229.44	242.22
N15	L	52.17	68.06	81.11	86.89	94.28	94.61	122.22	157.61	170.89	207.44	226.67	246.44	265.39
N16	L	45.67	55.83	65.28	72.22	80.50	80.28	92.72	128.56	143.11	156.72	165.39	182.39	195.28
N17	L	41.28	52.44	64.72	88.33	83.56	80.33	99.94	140.28	161.00	178.22	214.11	230.72	243.06
N18	L	57.83	88.89	110.78	121.50	122.89	131.94	146.22	183.78	201.39	235.83	262.50	285.56	299.89
N2	L	47.72	73.33	99.22	117.39	117.78	127.50	137.78	173.39	190.61	221.06	247.78	266.61	282.94
N3	L	52.00	73.67	85.78	92.44	85.72	108.17	116.50	138.83	149.89	169.28	180.39	197.33	199.33
N6	L	65.94	94.94	115.61	125.72	128.33	133.22	147.44	178.39	187.56	216.78	224.72	240.78	251.89
N7	L	49.67	71.50	96.39	104.78	117.11	112.56	132.67	161.83	175.61	197.39	213.06	226.72	236.61
N8	L	5[illegible].94	77.61	104.72	115.00	112.67	131.06	150.50	191.11	217.89	235.56	244.39	273.44	281.00
N9	L	53.56	70.50	82.50	87.72	88.17	92.83	110.67	157.28	171.94	203.17	222.72	249.56	254.56
AVG	H	60.94	89.13	121.64	137.93	147.18	154.49	179.83	216.40	240.34	260.06	272.07	293.74	301.89
AVG	L	52.30	72.53	89.58	100.09	102.49	108.17	124.41	159.40	174.56	203.62	222.06	243.85	255.53

TABLE N O 2 WIDTH OF MILKWEED IN LAMPANG

NO.	CODE	1 DEC	2 JAN	3 FEB	4 MAR	5 APR	6 MAY	7 JUN	8 JUL	9 AUG	10 SEP	11 OCT	12 NOV	13 DEC
N1	H	64.33	62.00	80.67	87.33	94.56	124.56	156.89	214.50	262.00	234.94	223.61	262.28	264.67
N11	H	49.56	58.39	81.11	93.50	104.11	141.67	165.11	206.39	249.94	252.11	262.50	296.61	300.89
N12	H	46.11	52.06	72.33	79.61	87.17	117.33	150.00	221.11	236.56	249.56	243.44	273.56	274.17
N13	H	59.83	61.89	81.89	81.78	91.67	136.00	172.67	218.94	256.78	252.78	246.94	284.94	261.89
N14	H	55.61	63.94	83.00	91.61	94.61	138.78	175.83	225.11	251.33	247.56	267.22	299.44	306.22
N15	H	46.44	53.11	70.11	79.89	91.89	125.83	144.83	214.83	250.50	242.22	238.06	271.33	266.17
N16	H	50.28	61.50	72.56	81.56	77.50	124.44	138.67	184.94	180.89	225.22	214.00	236.89	237.50
N17	H	47.22	51.28	74.00	85.28	93.33	128.78	146.67	225.83	258.00	256.28	240.83	284.11	275.94
N18	H	51.83	60.83	81.61	93.39	106.33	149.39	171.78	252.00	263.17	257.94	274.44	322.56	288.89
N2	H	55.78	61.33	84.56	91.56	102.06	154.33	164.56	228.28	247.33	251.94	268.06	302.94	296.67
N3	H	47.39	57.33	71.06	79.33	87.67	127.67	136.83	177.11	183.94	200.11	193.28	223.06	215.06
N6	H	47.72	58.17	81.00	99.61	104.83	129.61	164.00	222.67	234.61	252.78	256.11	291.67	264.83
N7	H	56.61	64.17	87.83	92.56	100.39	129.56	143.56	210.56	226.28	243.83	235.56	272.39	270.83
N8	H	59.39	65.44	90.33	94.33	100.89	137.28	173.33	229.00	258.89	238.94	257.72	303.50	285.72
N9	H	55.83	68.83	91.22	91.72	89.44	142.39	166.83	227.78	258.00	255.33	260.[illegible]	289.83	306.17
N1	L	46.28	45.22	50.89	47.61	50.17	72.83	90.78	159.56	166.83	184.28	178.94	216.83	207.06
N11	L	47.50	54.67	62.44	68.39	64.78	87.72	112.50	176.17	177.78	239.94	236.67	266.72	291.17
N12	L	45.39	45.61	55.61	55.17	58.00	81.11	102.44	167.72	158.39	218.44	207.22	237.44	272.67
N13	L	49.44	48.28	55.39	57.06	60.00	89.00	102.39	164.06	174.56	204.22	204.72	235.94	254.56
N14	L	45.28	43.94	49.33	49.17	49.83	76.50	95.94	163.17	156.00	201.06	204.44	240.56	264.67
N15	L	38.11	40.50	50.56	49.28	48.67	71.22	90.67	156.50	158.11	208.39	183.67	218.06	229.56
N16	L	34.22	38.72	43.50	41.06	43.17	56.39	58.50	123.83	136.72	146.56	140.56	172.67	173.11
N17	L	38.83	39.17	44.06	50.06	48.67	69.22	84.00	148.56	159.39	180.00	161.83	195.00	214.56
N18	L	44.50	49.78	58.50	56.22	56.06	80.28	103.39	168.83	188.11	215.17	211.11	252.94	281.11
N2	L	41.11	48.61	51.72	48.78	53.44	70.83	85.67	171.83	179.17	200.78	209.56	238.33	254.17
N3	L	41.56	52.17	51.22	52.72	43.17	66.33	73.00	140.94	140.28	154.78	152.22	180.94	173.06
N6	L	48.72	55.22	65.44	64.67	68.06	88.39	105.56	180.22	173.17	230.34	223.61	256.39	276.28
N7	L	43.06	48.11	56.61	52.22	60.73	69.22	76.67	160.94	176.33	190.11	172.22	212.72	219.78
N8	L	44.67	47.56	56.78	56.72	59.61	81.50	91.72	173.11	212.39	203.11	206.11	237.72	251.28
N9	L	42.50	48.67	48.56	50.50	58.28	72.78	93.72	157.89	165.83	199.28	185.83	224.28	232.78
AVG	H	52.93	60.02	80.22	88.20	95.10	132.51	158.10	217.27	241.21	244.10	245.45	281.01	274.37
AVG	L	43.41	47.[illegible]	53.37	53.31	54.8[illegible]	75.55	91.13	160.89	168.20	198.47	191.91	225.77	239.72

TABLE N O 3 INFLORESCENCE OF MILKWEED IN LAMPANG

NO.	CODE	1 DEC	2 JAN	3 FEB	4 MAR	5 APR	6 MAY	7 JUN	8 JUL	9 AUG	10 SEP	11 OCT	12 NOV	13 DEC	TOTAL /TREE
N1	H	2.33	7.50	28.06	30.67	22.28	13.89	28.89	35.44	39.94	26.00	28.28	49.11	10.39	322.78
N11	H	6.50	11.22	33.89	40.00	39.83	19.89	59.06	50.00	65.00	36.94	48.17	67.06	11.33	488.89
N12	H	1.22	3.39	13.28	15.67	12.17	5.39	11.17	22.50	25.94	10.72	15.28	34.61	6.89	178.22
N13	H	3.33	7.00	25.61	23.83	23.17	26.56	67.50	63.83	74.61	52.94	46.56	44.78	6.83	466.56
N14	H	2.06	7.39	21.83	21.17	14.28	10.28	17.56	32.17	30.56	13.06	24.61	35.28	9.28	239.50
N15	H	3.56	8.61	25.61	34.89	25.39	15.56	33.61	37.00	41.17	24.28	28.28	42.06	7.28	327.28
N16	H	14.94	18.83	35.44	31.56	27.94	24.28	61.72	48.17	39.44	26.17	22.67	29.39	6.06	386.61
N17	H	1.56	4.39	16.72	19.50	13.89	4.94	12.89	26.78	24.06	14.56	16.11	34.28	4.33	194.00
N18	H	1.89	8.44	27.28	33.83	31.06	38.89	89.33	66.72	67.28	35.44	35.89	40.22	7.44	492.72
N2	H	4.00	10.17	36.22	34.28	24.56	43.28	84.33	64.39	80.17	49.56	60.22	51.78	10.94	563.89
N3	H	12.22	14.61	27.72	31.56	22.39	19.50	59.33	35.56	30.83	13.89	11.22	16.44	4.83	300.61
N6	H	2.17	8.44	26.72	25.17	22.00	49.56	82.39	50.78	71.61	44.33	47.33	54.78	8.00	493.28
N7	H	6.00	13.39	44.67	41.78	20.44	17.67	42.94	42.61	43.33	24.17	39.61	75.22	13.28	425.11
N8	H	4.44	12.44	30.39	24.83	28.56	37.83	76.83	46.44	54.67	28.44	31.33	29.56	6.22	414.00
N9	H	3.83	8.33	19.06	20.78	12.44	7.00	23.36	42.50	35.50	14.00	19.33	27.44	6.39	240.17
N1	L	0.44	3.06	6.83	5.78	3.06	2.61	1.89	6.44	15.39	10.50	12.50	23.06	9.28	100.83
N11	L	3.33	8.11	13.33	10.44	7.17	6.67	19.06	35.39	51.00	42.39	40.72	53.00	25.06	315.67
N12	L	0.44	2.61	4.22	1.89	2.89	0.78	1.17	9.61	14.39	9.11	12.78	17.22	4.67	81.78
N13	L	0.67	3.61	8.39	7.50	6.33	8.39	18.05	25.94	40.61	29.22	29.89	22.61	8.89	210.11
N14	L	0.22	1.94	2.83	1.28	0.94	0.22	0.11	15.11	10.83	6.44	8.22	14.05	3.39	65.61
N15	L	1.06	4.11	6.28	5.67	3.56	1.89	3.89	14.78	18.00	16.06	18.83	21.44	6.17	121.72
N16	L	4.94	6.50	7.78	5.89	4.11	5.78	14.06	25.22	26.67	16.72	13.89	10.28	4.00	145.83
N17	L	0.28	1.22	2.33	1.61	2.44	0.56	0.39	11.50	8.11	4.28	6.39	11.78	2.28	53.17
N18	L	0.56	4.56	8.72	7.00	5.67	8.11	20.78	24.17	42.39	27.22	31.78	23.33	12.50	216.78
N2	L	1.33	5.06	10.39	7.11	3.33	11.78	22.33	40.89	47.44	40.89	30.39	35.44	15.83	273.22
N3	L	7.72	8.11	9.56	9.00	3.61	5.06	17.94	29.00	17.22	10.39	8.28	4.67	4.22	134.78
N6	L	0.83	5.78	7.83	5.50	7.17	10.72	22.94	35.39	62.56	42.06	48.67	44.06	15.44	308.94
N7	L	1.72	6.00	13.44	10.33	3.89	7.28	11.22	26.44	29.50	19.17	33.06	48.44	17.56	228.06
N8	L	0.94	4.44	9.11	10.29	6.89	7.11	17.89	36.78	36.17	20.72	21.17	23.33	10.11	204.94
N9	L	0.39	2.44	4.11	1.89	0.61	0.39	1.61	13.44	17.11	9.61	9.89	14.33	3.89	79.72
AVG	H	4.67	9.61	27.50	28.63	22.69	22.30	51.37	44.33	48.27	27.63	31.66	42.13	8.10	368.91
AVG	L	1.66	4.50	7.58	6.08	4.11	5.16	11.56	23.34	29.16	20.32	21.76	24.47	9.62	169.41

TABLE N O 4 NO.POD/TREE/YEAR OF MILKWEED IN LAMPANG

NO.	CODE	1 DEC	2 JAN	3 FEB	4 MAR	5 APR	6 MAY	7 JUN	8 JUL	9 AUG	10 SEP	11 OCT	12 NOV	13 DEC	TOTAL /TREE
N1	H	0.00	0.00	0.06	2.56	35.94	2.22	0.44	0.89	0.11	0.28	0.00	0.00	0.00	42.50
N11	H	0.00	0.00	0.06	1.50	44.22	4.11	2.11	2.72	0.39	0.94	0.00	0.00	0.00	56.06
N12	H	0.00	0.00	0.06	1.28	35.17	2.94	1.78	1.39	1.00	1.50	0.00	0.00	0.00	45.11
N13	H	0.00	0.00	0.00	0.67	68.94	25.11	8.56	7.50	2.67	3.33	0.00	0.00	0.00	116.78
N14	H	0.00	0.00	0.28	1.28	33.78	5.11	2.06	1.72	0.67	0.50	0.00	0.00	0.00	45.39
N15	H	0.00	0.00	0.00	1.33	49.39	14.78	5.22	17.22	8.56	3.06	0.00	0.00	0.00	99.56
N16	H	0.00	0.00	4.00	11.11	42.28	10.06	5.56	1.22	0.50	0.83	0.00	0.00	0.00	75.56
N17	H	0.00	0.00	0.00	5.11	40.00	2.00	0.94	2.39	1.17	0.78	0.00	0.00	0.00	52.39
N18	H	0.00	0.00	0.00	0.33	34.83	14.11	7.67	3.67	1.39	0.56	0.00	0.00	0.00	62.56
N2	H	0.00	0.00	0.11	7.28	61.83	29.06	11.50	4.44	1.06	2.61	0.00	0.00	0.00	117.89
N3	H	0.00	0.00	0.94	12.39	51.28	16.00	6.00	1.89	0.78	1.44	0.00	0.00	0.00	90.72
N6	H	0.00	0.00	0.28	3.67	39.17	17.72	10.72	2.28	1.00	0.44	0.00	0.00	0.00	75.28
N7	H	0.00	0.00	0.61	11.28	61.28	23.11	15.00	27.11	17.39	6.94	0.00	0.00	0.00	162.72
N8	H	0.00	0.00	0.33	4.17	43.89	17.83	10.17	1.89	0.67	0.61	0.00	0.00	0.00	79.56
N9	H	0.00	0.00	0.06	3.33	30.06	3.72	3.28	3.17	1.44	0.94	0.00	0.00	0.00	46.00
N1	L	0.00	0.00	0.94	1.72	2.61	0.00	0.11	0.00	0.11	0.33	0.00	0.00	0.00	5.83
N11	L	0.00	0.00	1.22	5.17	5.72	0.17	0.83	0.56	0.17	0.61	0.00	0.00	0.00	14.44
N12	L	0.00	0.00	0.56	2.61	0.78	0.00	0.17	1.39	1.83	1.17	0.00	0.00	0.00	8.50
N13	L	0.00	0.00	1.39	6.78	9.67	2.17	1.94	2.61	1.61	2.61	0.00	0.00	0.00	28.78
N14	L	0.00	0.00	0.22	0.83	0.33	0.00	0.00	0.33	0.78	0.56	0.00	0.00	0.00	3.06
N15	L	0.00	0.00	0.44	1.83	4.44	0.22	1.67	4.83	2.72	3.89	0.00	0.00	0.00	20.06
N16	L	0.00	0.00	0.94	2.61	4.78	3.11	3.89	2.22	1.11	2.00	0.00	0.00	0.00	20.67
N17	L	0.00	0.00	0.28	0.83	0.50	0.11	0.00	0.33	0.56	0.22	0.00	0.00	0.00	2.83
N18	L	0.00	0.00	0.17	1.78	3.17	0.61	1.78	2.17	0.78	1.33	0.00	0.00	0.00	11.78
N2	L	0.00	0.00	0.78	3.33	7.89	2.61	2.33	1.22	3.00	2.89	0.00	0.00	0.00	24.06
N3	L	0.00	0.00	2.22	4.06	5.39	2.17	4.50	2.39	1.50	2.50	0.00	0.00	0.00	24.72
N6	L	0.00	0.00	1.17	2.61	7.20	2.44	4.00	3.11	3.22	1.06	0.00	0.00	0.00	24.89
N7	L	0.00	0.00	2.50	5.22	6.28	3.61	5.00	14.50	10.83	8.83	0.00	0.00	0.00	56.78
N8	L	0.00	0.00	1.17	7.00	8.89	0.94	3.22	1.61	0.50	0.78	0.00	0.00	0.00	24.11
N9	L	0.00	0.00	0.28	1.61	1.06	0.00	0.17	0.78	0.17	1.06	0.00	0.00	0.00	5.11
AVG	H	0.00	0.00	0.45	4.49	44.80	12.53	6.07	5.30	2.59	1.65	0.00	0.00	0.00	77.87
AVG	L	0.00	0.00	0.95	3.20	4.59	1.21	1.97	2.54	1.93	1.99	0.00	0.00	0.00	18.37

TABLE K O 1 HEIGHT OF MILKWEED IN KHONKAEN

NO.		1 DEC	2 JAN	3 FEB	4 MAR	5 APR	6 MAY	7 JUN	8 JUL	9 AUG	10 SEP	11 OCT	12 NOV	13 DEC
NE10	H	37.22	51.33	86.11	104.83	124.11	140.83	162.50	170.83	186.39	227.94	223.22	230.11	249.50
NE13	H	30.33	53.11	80.22	95.17	119.00	140.28	166.39	178.89	191.11	236.28	233.00	250.72	267.28
NE16	H	41.89	46.33	77.78	87.28	107.61	135.83	156.72	168.06	189.72	215.22	214.67	225.11	243.33
NE17	H	29.00	43.67	77.33	93.17	113.94	131.67	170.39	162.22	204.17	228.06	229.39	237.56	259.94
NE20	H	39.00	52.56	74.00	83.99	103.22	123.33	150.89	155.83	176.11	214.06	213.78	229.89	245.56
NE21	H	39.67	32.56	86.11	74.33	89.89	124.72	141.17	156.11	185.00	213.50	210.69	228.39	234.39
NE25	H	49.67	65.56	92.33	107.50	134.94	155.28	182.33	185.28	206.67	245.94	245.17	260.72	280.17
NE26	H	38.56	54.78	89.56	131.28	127.78	140.28	181.89	181.11	204.44	230.22	250.78	258.94	271.67
NE29	H	47.33	61.22	111.83	125.61	142.00	160.28	187.56	195.56	215.78	247.78	244.94	258.44	277.28
NE37	H	40.11	46.78	93.06	103.33	116.17	141.94	173.22	179.72	200.83	220.61	238.56	250.17	261.94
NE38	H	33.89	42.56	95.33	113.50	139.94	160.00	184.00	194.17	208.89	241.94	262.67	264.89	287.06
NE47	H	38.67	40.11	74.00	83.67	98.72	120.00	148.94	162.50	189.44	223.72	215.56	231.44	254.17
NE52	H	32.78	51.56	80.17	94.39	105.61	121.67	147.89	154.44	173.33	206.39	216.08	217.22	216.11
NE10	L	54.78	78.44	114.61	126.78	159.89	156.11	159.83	173.33	195.00	226.28	220.06	191.50	239.50
NE13	L	61.06	73.22	105.78	114.44	140.94	142.78	150.22	159.72	179.72	211.17	217.00	221.72	231.89
NE16	L	57.28	73.33	104.44	114.28	137.22	147.22	156.56	168.61	186.39	219.94	205.94	221.67	237.78
NE17	L	47.44	56.78	89.11	98.78	126.94	140.83	141.94	153.89	178.06	208.61	209.06	217.44	220.50
NE20	L	53.44	61.44	81.56	82.61	102.83	119.72	133.83	145.00	170.83	191.17	196.06	206.06	213.44
NE21	L	55.44	82.33	116.67	133.44	154.39	157.22	156.67	168.33	195.56	211.17	219.44	222.17	236.56
NE25	L	59.67	79.33	112.61	125.39	151.44	152.72	151.61	165.28	188.61	213.33	213.11	221.17	242.17
NE26	L	58.33	76.11	107.83	116.06	134.50	147.78	140.89	160.00	184.17	214.11	213.11	223.17	232.83
NE29	L	65.44	83.89	120.22	129.61	150.72	150.28	153.89	165.28	187.22	209.89	224.78	227.39	239.39
NE37	L	56.33	82.44	110.78	112.56	133.72	144.17	154.61	166.67	191.39	221.39	213.89	216.22	228.89
NE38	L	51.78	74.33	113.83	140.83	168.28	168.61	172.94	190.56	206.94	231.50	238.56	243.78	277.61
NE47	L	43.11	60.00	80.72	95.89	120.17	137.78	149.39	160.83	196.11	195.28	201.61	236.33	233.94
NE52	L	56.11	84.22	111.78	121.06	139.39	142.22	149.83	160.00	180.56	197.06	206.61	220.56	238.22
AVG	H	38.32	50.16	84.45	97.53	117.15	138.16	165.68	173.82	194.76	227.05	230.67	241.82	257.57
AVG	L	55.40	74.75	105.38	116.29	140.03	146.73	151.71	164.42	186.97	211.51	213.79	220.71	236.36

TABLE K O 2 WIDTH OF MILKWEED IN KHON KAEN

NO.	CODE	1 DEC	2 JAN	3 FEB	4 MAR	5 APR	6 MAY	7 JUN	8 JUL	9 AUG	10 SEP	11 OCT	12 NOV	13 DEC
NE10	H	33.44	45.22	64.83	80.89	98.89	112.50	137.72	143.33	171.39	180.33	208.83	159.83	168.22
NE13	H	37.33	51.33	84.11	109.89	139.17	151.67	185.78	196.67	205.39	221.28	244.44	261.28	256.72
NE16	H	34.22	45.33	79.67	97.78	128.44	141.94	164.17	167.50	193.78	194.11	227.28	197.94	206.22
NE17	H	37.00	39.78	91.39	108.72	129.33	141.67	176.78	189.72	208.61	208.00	217.44	202.94	219.00
NE20	H	31.00	42.22	75.61	97.61	121.89	136.39	164.94	170.83	183.33	184.33	188.61	186.39	204.50
NE21	H	29.67	28.56	73.22	93.89	113.83	126.22	161.06	173.33	186.67	204.44	204.83	192.89	199.50
NE25	H	39.22	66.67	108.11	129.17	154.33	166.11	207.11	222.22	226.11	225.67	242.44	240.33	250.06
NE26	H	35.22	44.33	106.17	122.33	158.72	147.78	205.17	201.94	216.94	212.89	255.06	248.89	251.83
NE29	H	35.56	80.22	131.33	151.72	193.11	188.06	221.56	211.94	218.28	232.94	256.61	225.00	257.67
NE37	H	41.11	55.44	108.83	129.28	161.39	166.67	194.94	203.33	214.44	207.00	256.00	232.50	236.67
NE38	H	27.44	42.11	82.50	100.06	121.67	137.50	152.39	166.39	195.28	182.33	180.89	153.33	195.61
NE47	H	33.56	33.11	66.11	89.33	105.72	164.17	149.72	158.33	181.67	200.83	188.22	186.22	208.78
NE52	H	32.11	43.44	82.[illegible]	101.78	111.72	127.89	159.67	169.03	184.44	199.03	220.83	182.78	201.22
NE10	L	48.22	73.00	87.28	96.44	98.56	115.28	133.00	146.67	177.78	185.89	178.11	143.33	146.28
NE13	L	44.33	64.56	100.83	112.61	135.33	137.50	166.06	177.78	194.17	179.28	214.50	199.28	219.78
NE16	L	53.72	69.56	104.17	113.56	130.78	133.61	160.72	178.89	197.22	185.61	209.72	196.50	211.22
NE17	L	49.11	60.11	89.17	101.61	127.50	131.39	152.28	164.17	186.39	195.28	197.11	167.44	207.50
NE20	L	48.00	59.56	81.67	91.11	109.33	116.94	137.50	147.50	172.22	173.78	170.89	162.94	168.17
NE21	L	63.89	78.44	112.22	127.93	146.28	158.69	167.00	182.78	202.83	203.06	181.89	166.78	215.83
NE25	L	64.11	77.33	103.44	123.17	146.89	154.72	178.61	190.28	210.00	205.89	207.00	175.83	211.67
NE26	L	56.44	70.78	106.50	120.11	141.33	148.61	164.00	176.94	190.56	189.89	216.61	189.56	217.11
NE29	L	46.56	76.11	123.28	137.22	159.67	153.61	167.39	178.61	190.56	200.89	211.72	176.11	209.33
NE37	L	61.00	82.56	112.17	125.61	160.06	160.00	166.67	177.78	198.39	200.39	223.00	164.17	205.56
NE38	L	56.67	72.11	95.33	103.44	123.56	116.67	135.28	150.56	169.72	186.11	150.83	131.11	166.94
NE47	L	42.00	52.11	76.78	84.39	101.89	114.44	126.78	138.61	161.11	177.56	158.06	136.78	176.39
NE52	L	59.67	69.78	104.50	114.50	137.22	138.61	157.06	169.72	196.94	175.61	182.89	17[illegible].28	205.44
AVG	H	34.30	47.52	88.81	108.65	133.71	146.81	175.46	182.66	198.95	204.09	222.42	205.41	219.69
AVG	L	53.36	69.69	99.79	111.66	132.18	136.94	154.79	167.71	188.30	188.40	192.49	168.16	197.02

TABLE K O 3 INFLORESCENCE OF MILKWEED IN KHON KAEN

NO.	CODE	1 DEC	2 JAN	3 FEB	4 MAR	5 APR	6 MAY	7 JUN	8 JUL	9 AUG	10 SEP	11 OCT	12 NOV	13 DEC	TOTAL /TREE
NE10	H	0.72	6.72	16.83	11.83	14.33	5.11	11.39	9.67	9.33	2.61	6.17	12.11	18.28	125.11
NE13	H	0.00	4.00	13.67	12.00	15.00	2.83	15.78	13.00	12.72	1.22	1.89	5.67	12.78	110.56
NE16	H	0.39	3.61	12.33	8.94	8.94	0.83	5.17	5.61	9.28	2.00	4.61	9.28	15.00	86.00
NE17	H	0.00	2.28	9.50	5.61	7.61	0.78	12.22	11.00	10.61	2.50	4.06	8.06	11.50	85.72
NE20	H	0.11	2.89	9.28	4.33	5.06	0.39	9.78	8.17	9.39	1.17	2.06	5.83	14.00	71.44
NE21	H	0.17	2.78	10.93	8.50	13.78	1.17	10.72	7.83	8.89	1.78	4.56	5.72	10.50	87.22
NE25	H	0.28	4.22	15.67	10.50	10.50	2.11	12.44	11.28	13.89	2.50	5.89	7.61	16.22	113.11
NE26	H	0.22	4.83	17.78	11.94	17.39	4.78	17.44	15.06	11.06	1.39	3.61	5.28	11.28	122.56
NE29	H	0.11	6.61	22.00	14.83	14.44	4.06	20.28	16.67	12.00	0.89	5.17	4.22	11.11	132.39
NE37	H	0.22	7.89	26.56	21.11	22.39	9.00	19.56	15.39	11.33	7.44	10.89	10.28	20.89	182.94
NE38	H	0.11	6.28	18.06	17.06	14.67	3.39	17.94	13.94	12.22	2.17	7.89	11.11	20.78	145.61
NE47	H	0.00	1.67	8.94	6.44	8.06	2.39	7.22	6.06	9.28	1.89	5.33	4.06	9.11	70.44
NE52	H	0.17	6.39	15.00	11.00	11.17	4.17	13.67	11.50	8.33	5.61	7.39	8.06	13.83	116.28
NE10	L	0.83	10.00	18.89	8.67	10.72	1.78	5.61	5.50	4.39	0.17	2.56	2.61	6.72	78.44
NE13	L	0.11	5.11	19.56	6.39	8.72	0.44	1.56	5.22	5.17	0.22	0.17	0.44	3.61	56.72
NE16	L	0.61	5.72	11.94	5.83	8.22	0.67	1.72	6.11	5.56	0.56	0.06	1.06	3.44	51.50
NE17	L	0.11	1.33	7.39	2.94	5.44	0.11	1.06	4.72	4.67	0.78	0.22	1.22	2.00	32.00
NE20	L	0.11	0.78	2.89	1.94	5.72	0.00	0.39	3.61	[illegible].39	0.06	0.06	0.94	1.67	21.56
NE21	L	0.94	8.56	17.17	7.28	11.06	0.67	4.33	6.28	4.44	0.50	0.50	1.67	1.67	65.06
NE25	L	0.22	4.22	11.22	3.17	5.11	0.50	1.78	4.78	4.89	0.72	0.11	1.28	1.22	39.22
NE26	L	0.44	5.56	15.83	5.06	9.06	1.22	3.83	6.50	5.89	0.67	0.44	0.44	0.22	55.17
NE29	L	0.11	3.11	14.72	6.89	9.72	1.06	4.89	6.06	4.89	0.33	1.22	1.56	1.44	56.00
NE37	L	0.78	8.78	20.94	10.78	16.28	4.67	10.89	6.50	5.39	0.89	4.17	2.72	6.83	99.61
NE38	L	0.89	10.89	18.44	8.89	13.72	1.44	7.44	6.78	4.50	0.94	2.11	4.72	8.56	89.33
NE47	L	0.33	2.33	7.78	5.50	8.44	1.22	1.61	3.06	4.94	0.22	0.67	1.44	2.28	39.83
NE52	L	0.89	7.72	22.56	12.17	9.67	1.89	6.72	6.44	5.72	0.94	2.94	4.56	5.78	88.00
AVG	H	0.19	4.63	15.03	11.09	12.56	3.15	13.35	11.17	10.64	2.59	5.35	7.48	14.25	111.49
AVG	L	0.49	5.70	14.56	6.58	9.39	1.21	3.99	5.50	4.91	0.54	1.17	1.90	3.50	58.42

TABLE K 0 4 YIELD OF MILKWEED IN KHON KAEN (MONTHLY)
(POD/TREE)

NO.	H/L	1 DEC	2 JAN	3 FEB	4 MAR	5 APR	6 MAY	7 JUN	8 JUL	9 AUG	10 SEP	11 OCT	12 NOV	13 DEC	TOTAL /YEAR
NE38	H	0.00	0.00	0.00	18.00	12.83	0.44	0.11	10.89	0.00	0.00	0.00	0.00	0.00	42.28
NE29	H	0.00	0.00	0.00	16.56	13.89	1.17	0.17	6.78	0.00	0.00	0.00	0.00	0.00	38.56
NE37	H	0.00	0.00	0.00	13.36	9.49	1.50	0.33	13.85	0.00	0.00	0.00	0.00	0.00	38.53
NE25	H	0.00	0.00	0.00	10.67	7.06	0.44	0.00	7.28	0.00	0.00	0.00	0.00	0.00	25.44
NE26	H	0.00	0.00	0.00	9.00	7.50	0.61	0.06	5.78	0.00	0.00	0.00	0.00	0.00	22.94
NE52	H	0.00	0.00	0.00	8.00	5.00	0.44	0.06	8.61	0.00	0.00	0.00	0.00	0.00	22.11
NE47	H	0.00	0.00	0.00	7.11	7.44	0.50	0.00	4.72	0.00	0.00	0.00	0.00	0.00	19.78
NE13	H	0.00	0.00	0.00	5.33	6.50	0.17	0.44	4.00	0.00	0.00	0.00	0.00	0.00	16.44
NE16	H	0.00	0.00	0.00	8.06	5.00	0.22	0.11	2.83	0.00	0.00	0.00	0.00	0.00	16.22
NE10	H	0.00	0.00	0.00	6.67	4.00	0.11	0.06	2.11	0.00	0.00	0.00	0.00	0.00	12.94
NE20	H	0.00	0.00	0.00	3.39	1.78	0.00	0.00	5.61	0.00	0.00	0.00	0.00	0.00	10.78
NE17	H	0.00	0.00	0.00	3.44	2.11	0.06	0.06	4.78	0.00	0.00	0.00	0.00	0.00	10.44
NE21	H	0.00	0.00	0.00	4.11	2.83	0.06	0.00	2.28	0.00	0.00	0.00	0.00	0.00	9.28
NE38	L	0.00	0.00	0.00	18.00	9.22	0.67	0.67	1.17	0.00	0.00	0.00	0.00	0.00	29.72
NE37	L	0.00	0.00	0.00	19.61	5.28	0.28	0.22	1.56	0.00	0.00	0.00	0.00	0.00	26.94
NE52	L	0.00	0.00	0.00	16.89	4.33	0.28	0.17	1.22	0.00	0.00	0.00	0.00	0.00	22.89
NE29	L	0.00	0.00	0.00	15.22	4.44	0.44	0.28	0.39	0.00	0.00	0.00	0.00	0.00	20.78
NE10	L	0.00	0.00	0.00	13.28	3.28	0.11	0.22	0.56	0.00	0.00	0.00	0.00	0.00	17.44
NE13	L	0.00	0.00	0.00	10.28	4.28	0.11	0.11	0.22	0.00	0.00	0.00	0.00	0.00	15.00
NE21	L	0.00	0.00	0.00	8.94	2.28	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.00	11.28
NE16	L	0.00	0.00	0.00	8.50	1.56	0.00	0.11	0.33	0.00	0.00	0.00	0.00	0.00	10.50
NE26	L	0.00	0.00	0.00	7.89	2.17	0.22	0.06	0.11	0.00	0.00	0.00	0.00	0.00	10.44
NE25	L	0.00	0.00	0.00	8.00	1.39	0.06	0.11	0.17	0.00	0.00	0.00	0.00	0.00	9.72
NE47	L	0.00	0.00	0.00	5.83	2.22	0.17	0.11	0.11	0.00	0.00	0.00	0.00	0.00	8.44
NE17	L	0.00	0.00	0.00	3.61	1.78	0.00	0.11	0.39	0.00	0.00	0.00	0.00	0.00	5.89
NE20	L	0.00	0.00	0.00	1.67	0.44	0.11	0.00	0.33	0.00	0.00	0.00	0.00	0.00	2.56
AVG	H	0.00	0.00	0.00	8.75	6.57	0.44	0.11	6.12	0.00	0.00	0.00	0.00	0.00	21.98
AVG	L	0.00	0.00	0.00	10.59	3.28	0.19	0.17	0.50	0.00	0.00	0.00	0.00	0.00	14.74

TABLE 8 0 1 HEIGHT OF MILKWEED IN BURIRUM

CLONE	L/H	1 DEC	2 JAN	3 FEB	4 MAR	5 APR	6 MAY	7 JUN	8 JUL	9 AUG	10 SEP	11 OCT	12 NOV	13 DEC
A	H	49.40	57.14	87.34	103.27	107.61	120.22	130.78	152.63	186.26	233.56	248.28	244.31	242.92
B	H	58.06	63.11	93.17	109.17	122.28	132.28	143.33	167.00	190.89	240.00	260.83	259.81	264.39
C	H	54.72	59.61	76.89	94.00	109.28	124.83	141.00	170.28	199.39	247.28	252.44	268.67	282.06
D	H	49.97	55.21	77.30	91.16	96.98	120.83	142.94	171.14	201.14	257.33	260.37	274.78	283.00
E	H	53.56	60.17	82.11	90.44	97.67	118.83	143.47	168.39	188.22	238.33	248.89	169.03	167.92
F	H	46.81	55.27	72.83	86.56	92.25	110.39	128.61	158.12	190.94	241.53	248.13	184.11	185.94
G	H	58.17	69.28	99.83	106.83	122.39	143.33	149.44	179.11	208.00	261.33	275.28	172.72	179.78
H	H	51.72	59.39	91.22	102.28	118.39	144.89	161.94	187.61	206.11	250.17	261.33	194.33	198.06
A	L	49.89	54.50	74.69	73.28	88.03	101.00	103.89	127.36	157.78	183.47	187.50	252.92	249.00
B	L	50.22	56.17	72.97	74.39	84.00	92.58	100.06	123.89	156.39	189.06	190.28	253.33	256.25
C	L	50.28	51.00	55.92	53.75	60.19	74.81	83.41	106.81	132.87	163.94	162.50	270.40	282.19
D	L	50.67	54.89	69.52	67.67	85.57	91.80	104.83	130.07	161.72	183.83	193.50	154.72	162.92
E	L	58.08	63.68	78.53	74.32	86.72	95.89	104.33	120.28	145.48	172.93	169.98	190.92	194.61
F	L	46.80	49.56	61.73	63.33	71.36	80.37	86.67	106.82	140.00	163.08	168.50	175.22	183.00
G	L	52.17	60.11	79.90	77.72	84.64	99.39	109.61	133.84	166.97	188.89	198.72	227.33	227.00
H	L	47.96	54.63	66.03	66.78	75.54	88.40	99.70	123.53	150.26	173.56	183.00	167.78	167.36
AVG	H	52.80	59.90	85.09	97.96	108.36	126.95	142.69	169.29	198.37	246.19	256.94	220.97	225.51
AVG	L	50.76	55.57	69.91	68.98	79.51	90.53	99.06	121.58	151.43	177.35	181.75	211.58	215.29

TABLE 8 0 2 WIDTH OF MILKWEED IN BURIRUM

CLONE	L/H	1 DEC	2 JAN	3 FEB	4 MAR	5 APR	6 MAY	7 JUN	8 JUL	9 AUG	10 SEP	11 OCT	12 NOV	13 DEC
A	H	49.73	53.80	74.74	86.27	96.41	140.09	143.83	207.60	229.11	283.00	269.10	275.72	270.72
B	H	48.06	50.28	69.11	75.44	84.33	122.00	131.44	182.22	196.67	243.50	240.83	241.67	237.50
C	H	40.89	47.22	65.50	77.06	92.94	121.50	133.56	188.72	224.61	269.94	265.72	277.22	286.08
D	H	39.91	43.74	59.76	68.97	80.78	111.56	134.70	180.86	213.82	251.48	256.17	262.33	263.76
E	H	46.17	51.67	69.61	69.61	81.94	109.56	135.61	184.22	215.67	257.72	243.00	252.22	250.95
F	H	40.64	44.30	59.07	69.21	82.08	108.03	132.22	180.22	209.90	260.25	253.91	267.22	271.53
G	H	49.67	54.72	71.50	80.33	92.21	121.80	135.83	189.42	221.64	252.44	265.11	278.67	282.11
H	H	47.67	53.67	77.33	95.78	102.56	135.33	152.39	202.56	235.39	278.06	274.06	286.94	306.67
A	L	44.00	46.22	54.92	47.28	65.83	98.00	118.83	156.94	169.42	193.97	190.69	182.78	200.83
B	L	40.50	42.67	49.67	44.06	49.03	82.61	97.64	127.53	146.58	177.31	164.11	158.06	152.50
C	L	37.11	36.50	41.18	38.06	44.33	63.63	81.63	108.92	129.70	159.49	148.19	144.72	135.78
D	L	36.50	40.50	49.06	47.56	61.22	98.78	108.17	141.93	165.44	197.39	176.56	185.00	183.50
E	L	40.94	42.08	55.15	52.90	62.50	87.83	103.04	133.73	160.37	170.90	170.31	182.08	200.31
F	L	33.58	35.19	47.12	43.75	52.78	68.28	82.00	116.37	147.28	188.63	184.08	172.58	183.75
G	L	44.28	45.06	56.16	44.13	51.50	82.17	97.11	132.62	148.29	172.36	168.61	175.94	193.61
H	L	39.32	41.61	47.97	43.44	53.47	80.71	96.00	133.54	152.43	179.10	180.00	172.17	169.33
AVG	H	45.34	49.93	68.33	77.83	89.16	121.23	137.45	189.48	218.35	262.05	258.49	267.75	271.16
AVG	L	39.52	41.23	50.15	45.15	55.08	81.50	98.05	131.45	152.44	179.89	172.82	171.67	177.45

TABLE B 0 3 INFLORESCENCE OF MILKWEED IN BURIRUM

CLONE	L/H	1 DEC	2 JAN	3 FEB	4 MAR	5 APR	6 MAY	7 JUN	8 JUL	9 AUG	10 SEP	11 OCT	12 NOV	13 DEC	TOTAL
A	H	0.00	6.72	19.44	7.06	2.78	3.50	15.26	40.50	43.06	6.56	3.78	0.00	0.00	148.67
B	H	0.00	8.61	17.39	14.22	5.61	6.11	26.72	55.94	108.83	57.22	11.72	0.00	0.00	312.39
C	H	0.00	5.78	13.44	8.28	3.28	0.39	4.00	23.89	40.28	15.83	6.72	0.00	0.00	121.89
D	H	0.00	3.44	8.28	4.39	2.44	0.44	2.33	12.78	26.44	12.17	3.72	0.00	0.00	76.44
E	H	0.00	7.61	14.72	4.28	4.39	2.00	7.83	25.83	37.78	15.33	7.61	0.00	0.00	127.39
F	H	0.00	6.56	13.11	3.72	2.28	0.83	5.22	24.61	42.83	15.11	4.06	0.00	0.00	118.33
G	H	0.00	6.83	14.44	7.44	6.33	3.72	9.33	23.00	35.11	13.89	4.67	0.00	0.00	124.78
H	H	0.00	7.89	16.83	11.00	6.11	1.33	7.28	40.28	42.72	15.17	4.89	0.00	0.00	155.50
A	L	0.00	3.67	7.39	2.11	0.94	0.83	4.33	26.50	17.00	0.67	0.17	0.00	0.00	63.61
B	L	0.00	4.83	4.44	2.94	1.17	1.11	8.50	30.50	30.67	4.94	1.78	0.00	0.00	90.89
C	L	0.00	1.78	2.83	0.56	0.39	0.06	0.33	1.89	2.78	1.33	0.22	0.00	0.00	12.11
D	L	0.00	2.11	3.94	1.72	0.44	0.00	0.78	7.28	13.00	1.33	0.28	0.00	0.00	30.89
E	L	0.00	5.89	6.94	1.78	1.94	0.56	1.83	11.56	17.11	4.06	1.33	0.00	0.00	53.00
F	L	0.00	2.39	2.00	0.67	0.1	0.06	0.67	3.89	5.56	1.28	0.28	0.00	0.00	17.50
G	L	0.00	3.89	5.17	1.00	1.1	0.89	2.06	8.28	13.17	1.11	0.78	0.00	0.00	37.44
H	L	0.00	2.11	3.61	1.33	1.0	0.06	0.22	6.94	11.06	1.67	0.33	0.00	0.00	28.39
AVG	H	0.00	6.68	14.96	7.55	4.15	2.29	9.75	30.85	47.13	18.91	5.90	0.00	0.00	148.17
AVG	L	0.00	3.33	4.54	1.51	0.97	0.44	2.34	12.10	13.79	2.04	0.65	0.00	0.00	41.73

TABLE B 0 4 NO.POD/TREE/YEAR OF MILKWEED IN BURIRUM

CLONE	L/H	1 DEC	2 JAN	3 FEB	4 MAR	5 APR	6 MAY	7 JUN	8 JUL	9 AUG	10 SEP	11 OCT	12 NOV	13 DEC	TOTAL
A	H	0.00	0.00	0.00	7.28	7.61	0.11	1.94	3.17	36.39	1.61	1.39	0.00	0.00	61.50
B	H	0.00	0.00	0.00	1.72	2.89	0.06	0.22	0.44	9.50	0.17	0.06	0.00	0.00	15.06
C	H	0.00	0.00	0.00	2.28	10.33	0.50	0.39	0.39	39.39	0.33	0.67	0.00	0.00	54.28
D	H	0.00	0.00	0.00	2.72	5.72	0.33	0.78	1.00	23.11	0.78	0.39	0.00	0.00	34.83
E	H	0.00	0.00	0.00	4.44	7.00	0.28	0.61	2.28	67.72	0.61	1.00	0.00	0.00	83.94
F	H	0.00	0.00	0.00	2.39	5.83	0.06	0.61	1.94	26.00	0.61	1.83	0.00	0.00	39.28
G	H	0.00	0.00	0.00	2.00	11.39	0.06	3.39	4.50	18.94	2.56	0.67	0.00	0.00	43.50
H	H	0.00	0.00	0.00	3.44	15.72	0.39	1.28	2.00	41.39	1.28	1.06	0.00	0.00	66.56
A	L	0.00	0.00	0.00	1.78	3.39	0.00	0.28	0.76	12.50	0.00	0.11	0.00	0.00	18.83
B	L	0.00	0.00	0.00	0.39	0.44	0.00	0.00	0.00	2.67	0.00	0.00	0.00	0.00	3.50
C	L	0.00	0.00	0.00	1.22	1.56	0.00	0.00	0.00	4.33	0.00	0.06	0.00	0.00	7.17
D	L	0.00	0.00	0.00	1.50	2.11	0.00	0.00	0.00	7.56	0.00	0.28	0.00	0.00	11.44
E	L	0.00	0.00	0.00	1.94	3.78	0.11	0.22	0.33	16.72	0.00	0.00	0.00	0.00	23.11
F	L	0.00	0.00	0.00	0.39	0.89	0.22	0.00	0.06	6.33	0.00	0.22	0.00	0.00	8.11
G	L	0.00	0.00	0.00	0.56	1.50	0.00	0.22	0.17	4.61	0.00	0.00	0.00	0.00	7.06
H	L	0.00	0.00	0.00	0.94	2.39	0.00	0.00	0.17	7.33	0.00	0.28	0.00	0.00	11.11
AVG	H	0.00	0.00	0.00	3.28	8.31	0.22	1.15	1.97	33.06	0.99	0.88	0.00	0.00	49.87
AVG	L	0.00	0.00	0.00	1.09	2.01	0.04	0.09	0.19	7.76	0.00	0.12	0.00	0.00	11.29

TABLE C 0 1 HEIGHT OF MILKWEED IN SALAYA

CLONE	L/H	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
C10	H	61.48	90.58	121.88	146.04	163.96	176.13	192.21	200.42	209.38	219.42	227.50	232.83	235.83	236.83
C11	H	66.42	93.13	118.79	144.29	160.58	173.96	185.13	199.21	206.63	209.96	216.13	218.38	221.38	222.38
C12	H	71.42	91.94	113.13	140.83	156.96	169.29	188.13	202.42	212.50	218.67	226.46	234.42	237.42	238.42
C14	H	55.58	76.32	96.25	121.75	128.38	140.75	153.25	165.21	180.21	192.67	202.46	211.79	214.79	215.79
C3	H	65.99	98.68	127.46	158.38	166.96	179.50	192.71	201.79	214.04	226.04	235.88	242.04	245.04	246.04
C4	H	56.78	84.17	116.71	147.25	164.83	182.17	195.21	206.25	217.13	221.21	223.67	227.46	230.46	231.46
C7	H	51.08	76.33	103.04	129.67	136.92	145.29	162.46	169.13	179.75	190.67	198.17	203.50	206.50	207.50
C9	H	53.56	69.38	88.71	111.83	125.71	136.54	152.08	155.29	167.00	177.29	184.29	189.83	192.83	193.83
C10	L	38.57	61.19	98.92	122.83	138.83	149.17	162.50	169.88	184.88	196.17	200.83	211.58	214.58	215.58
C11	L	49.51	61.88	94.33	122.15	145.02	160.80	176.99	190.62	195.38	200.04	201.89	210.59	213.59	214.59
C12	L	58.78	69.86	92.21	115.63	133.50	146.21	160.17	173.21	188.99	193.18	199.01	209.32	212.32	213.32
C14	L	42.39	54.79	73.75	96.92	105.58	118.63	138.50	150.58	166.38	174.25	177.50	187.58	190.58	191.58
C3	L	34.32	52.18	92.67	126.46	141.58	154.58	163.29	172.75	187.17	193.21	198.04	204.58	207.58	208.58
C4	L	42.49	58.28	90.13	124.96	146.29	158.92	170.57	180.54	188.67	191.88	193.75	197.92	200.92	201.92
C7	L	33.85	51.71	83.78	112.29	117.88	132.42	144.88	151.29	164.04	168.79	170.71	176.54	179.54	180.54
C9	L	42.99	56.67	76.92	97.17	107.33	119.04	130.42	136.71	150.85	156.37	159.79	165.24	168.24	169.24
AVG	H	60.29	85.07	110.74	137.51	150.29	162.95	177.65	187.46	198.33	206.99	214.32	220.03	223.03	224.03
AVG	L	42.86	58.32	87.84	114.60	129.63	142.47	155.93	165.70	178.29	184.24	187.69	195.42	198.42	199.42

TABLE C 0 2 WIDTH OF MILKWEED IN SALAYA

CLONE	L/H	1 NOV	2 DEC	3 JAN	4 FEB	5 MAR	6 APR	7 MAY	8 JUN	9 JUL	10 AUG	11 SEP	12 OCT	13 NOV	14 DEC
C10	H	49.92	83.26	127.13	159.79	186.46	203.04	215.04	239.17	245.17	255.17	258.17	260.17	262.17	262.17
C11	H	46.63	72.64	119.46	154.38	178.25	196.17	220.88	250.00	256.00	266.00	269.00	271.00	273.00	273.00
C12	H	51.92	86.32	135.21	172.50	207.00	213.54	245.00	249.58	255.58	265.58	268.58	270.58	272.58	272.58
C14	H	45.53	75.21	120.42	166.04	198.25	216.83	236.17	255.08	261.08	271.08	274.08	276.08	278.08	278.08
C3	H	52.78	83.54	122.50	155.67	176.50	186.88	197.38	213.46	219.46	229.46	232.46	234.46	236.46	236.46
C4	H	50.60	75.97	123.67	155.13	178.21	206.25	228.25	252.08	258.08	268.08	271.08	273.08	275.08	275.08
C7	H	43.24	62.64	102.29	144.58	178.08	193.58	216.58	234.67	240.67	250.67	253.67	255.67	257.67	257.67
C9	H	48.47	70.00	106.04	137.96	164.08	183.00	220.92	223.54	229.54	239.54	242.54	244.54	246.54	246.54
C10	L	29.63	46.67	87.13	122.63	152.29	172.21	180.08	198.96	204.96	214.96	217.96	219.96	221.96	221.96
C11	L	30.18	39.72	84.25	120.80	149.86	175.74	195.70	217.67	223.67	233.67	236.67	238.67	240.67	240.67
C12	L	30.75	45.90	88.21	121.88	161.25	180.50	187.50	202.25	208.25	218.25	221.25	223.25	225.25	225.25
C14	L	28.31	41.18	88.13	134.58	168.00	190.42	198.17	221.83	227.83	237.83	240.83	242.83	244.83	244.83
C3	L	28.51	47.29	63.75	110.42	132.33	148.58	149.79	171.04	177.04	187.04	190.04	192.04	194.04	194.04
C4	L	30.81	49.03	84.08	113.88	137.88	166.92	176.13	202.50	208.50	218.50	221.50	223.50	225.50	225.50
C7	L	24.53	38.16	64.94	98.00	136.00	144.54	161.63	190.92	196.92	206.92	209.92	211.92	213.92	213.92
C9	L	27.01	42.64	79.17	116.21	137.17	157.88	169.88	197.71	203.71	213.71	216.71	218.71	220.71	220.71
AVG	H	49.63	76.20	119.59	155.73	183.35	199.91	222.53	239.70	245.70	255.70	258.70	260.70	262.70	262.70
AVG	L	28.72	43.82	82.46	117.30	146.85	167.10	177.36	200.36	206.36	216.36	219.36	221.36	223.36	223.36

TABLE C 0 3 NUMBER OF INFLORESCENCE IN SALAYA (NUMBER/TREE)

CLONE	L/H	1 NOV	2 DEC	3 JAN	4 FEB	5 MAR	6 APR	7 MAY	8 JUN	9 JUL	10 AUG	11 SEP	12 OCT	13 NOV	14 DEC	TOTAL
C10	H	0.00	7.87	43.82	86.71	72.08	88.96	46.75	57.29	45.21	33.13	70.21	60.79	55.29	71.21	693.13
C11	H	0.00	3.39	20.50	65.83	48.42	51.83	36.96	50.06	42.08	34.08	50.79	24.45	23.70	26.01	434.21
C12	H	0.00	3.07	29.69	90.08	52.50	57.67	32.38	38.42	29.21	19.50	35.42	18.42	12.75	23.06	400.25
C14	H	0.00	2.29	16.00	43.58	28.59	33.87	25.54	31.50	26.23	20.96	29.96	20.68	11.64	12.82	272.21
C3	H	0.00	3.62	31.07	59.25	52.63	53.15	15.13	17.61	13.91	10.21	27.79	34.96	14.79	30.55	345.79
C4	H	0.00	6.04	39.29	83.67	69.38	76.21	39.83	49.50	36.19	22.88	53.04	27.46	23.28	37.64	527.13
C7	H	0.00	4.36	20.64	49.00	42.04	71.50	38.08	65.29	51.21	37.13	53.75	25.25	28.44	46.87	481.08
C9	H	0.00	5.17	20.62	44.50	36.46	54.92	51.25	60.03	48.95	37.88	42.42	25.96	23.98	22.94	422.42
C10	L	0.00	2.33	20.08	45.17	36.54	39.82	18.48	33.46	32.85	32.25	25.71	29.38	33.57	33.32	345.79
C11	L	0.00	1.00	12.40	35.74	28.73	33.05	21.54	33.93	30.86	27.79	17.97	15.35	18.55	14.76	245.13
C12	L	0.00	0.67	13.47	34.77	23.68	20.27	8.96	19.67	14.33	9.00	7.40	7.43	10.91	10.65	154.62
C14	L	0.00	0.33	12.02	34.23	25.93	21.73	12.84	20.96	22.56	24.17	13.96	8.20	6.53	9.75	177.46
C3	L	0.00	1.00	16.58	35.54	29.33	22.96	8.49	9.16	10.59	12.01	10.77	17.92	15.44	22.64	190.13
C4	L	0.00	1.20	21.61	43.25	32.67	32.34	13.13	24.00	21.06	18.13	13.00	12.40	16.47	20.70	247.67
C7	L	0.00	2.14	14.06	27.93	26.00	32.90	17.11	42.15	36.99	31.83	21.30	13.65	18.65	24.12	260.63
C9	L	0.00	2.11	13.78	27.29	22.50	27.15	18.03	37.58	37.02	36.46	23.08	18.87	18.03	13.26	245.75
AVG	H	0.00	4.48	27.70	64.08	50.26	61.01	35.74	46.28	36.62	26.97	45.42	29.75	24.23	33.89	447.03
AVG	L	0.00	1.35	15.50	35.49	28.16	28.78	14.82	27.61	25.78	23.95	17.40	15.40	17.27	18.65	233.37

TABLE C 0 4 PRODUCT OF MILKWEED IN SALAYA (YIELD/TREE)

CLONE	L/H	1 NOV	2 DEC	3 JAN	4 FEB	5 MAR	6 APR	7 MAY	8 JUN	9 JUL	10 AUG	11 SEP	12 OCT	13 NOV	14 DEC	TOTAL
C10	H	0.00	0.00	0.00	1.67	7.17	4.04	4.71	0.54	1.42	1.17	3.92	0.00	0.00	0.00	24.62
C11	H	0.00	0.00	0.00	0.08	1.46	0.54	0.42	0.17	0.25	0.08	0.50	0.00	0.00	0.00	3.50
C12	H	0.00	0.00	0.00	0.25	2.92	1.67	2.71	0.33	0.79	0.75	0.58	0.00	0.00	0.00	10.00
C14	H	0.00	0.00	0.00	0.00	0.25	0.13	0.21	0.17	0.21	0.17	0.21	0.00	0.00	0.00	1.35
C3	H	0.00	0.00	0.00	0.21	3.92	1.50	3.13	0.46	0.13	0.08	0.21	0.00	0.00	0.00	9.63
C4	H	0.00	0.00	0.00	0.92	3.71	1.08	4.75	0.42	0.33	0.17	2.50	0.00	0.00	0.00	13.88
C7	H	0.00	0.00	0.00	0.04	0.83	0.63	3.63	0.71	0.46	0.21	0.29	0.00	0.00	0.00	6.79
C9	H	0.00	0.00	0.00	0.00	0.29	0.50	0.71	0.33	0.42	1.00	1.75	0.00	0.00	0.00	5.00
C10	L	0.00	0.00	0.00	0.46	3.79	1.67	0.38	0.00	0.13	0.83	1.13	0.00	0.00	0.00	8.38
C11	L	0.00	0.00	0.00	0.00	0.96	0.71	0.08	0.00	0.13	0.21	0.00	0.00	0.00	0.00	2.08
C12	L	0.00	0.00	0.00	0.00	1.08	0.58	0.04	0.00	0.00	0.42	0.04	0.00	0.00	0.00	2.17
C14	L	0.00	0.00	0.00	0.00	0.28	0.13	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.54
C3	L	0.00	0.00	0.00	0.04	1.67	0.79	0.25	0.00	0.00	0.33	0.13	0.00	0.00	0.00	3.21
C4	L	0.00	0.00	0.00	0.08	1.13	1.04	0.08	0.00	0.13	0.54	0.00	0.00	0.00	0.00	3.00
C7	L	0.00	0.00	0.00	0.13	0.83	0.83	0.42	0.00	0.04	0.38	0.00	0.00	0.00	0.00	2.62
C9	L	0.00	0.00	0.00	0.00	0.42	0.46	0.08	0.00	0.00	1.29	0.21	0.00	0.00	0.00	2.46
AVG	H	0.00	0.00	0.00	0.40	2.57	1.26	2.53	0.39	0.50	0.45	1.24	0.00	0.00	0.00	9.34
AVG	L	0.00	0.00	0.00	0.09	1.28	0.78	0.17	0.00	0.05	0.50	0.19	0.00	0.00	0.00	3.06

TABLE E 0 1 HEIGHT OF MILKWEED IN MHAO HIN SORN

NO.	CODE	1 DEC	2 JAN	3 FEB	4 MAR	5 APR	6 MAY	7 JUN	8 JUL	9 AUG	10 SEP	11 OCT	12 NOV	13 DEC
E1	H.	55.97	55.83	82.11	83.17	116.61	135.39	138.56	142.11	231.94	243.94	250.00	242.78	247.39
E11	H.	59.84	62.01	81.00	95.28	106.17	113.56	115.61	121.33	226.06	239.17	245.06	248.11	251.00
E2	H.	56.31	59.83	77.22	91.28	106.67	118.22	121.89	126.06	241.41	245.00	251.83	259.33	262.00
E5	H.	50.64	56.18	76.00	88.52	100.22	115.33	118.61	122.61	235.44	235.50	246.11	256.83	259.11
E6	H.	63.50	67.83	87.33	98.39	110.39	134.61	137.89	141.78	225.44	238.89	244.11	247.06	249.78
E7	H.	51.28	54.89	72.11	85.61	110.61	125.17	129.06	133.17	227.06	242.63	250.00	251.61	254.06
E8	H.	55.40	58.96	79.52	89.76	115.89	135.23	139.00	143.06	224.03	237.68	241.90	245.69	248.17
E9	H.	59.19	64.73	82.97	95.42	113.56	133.83	137.78	141.89	225.28	225.94	241.50	246.00	245.11
E1	L.	51.31	53.11	80.72	87.72	115.06	128.39	132.17	136.44	219.50	229.89	240.83	246.22	248.67
E11	L.	55.77	59.50	82.89	96.67	98.00	111.39	115.28	119.72	224.83	229.78	245.61	245.11	247.56
E2	L.	55.22	57.94	76.11	87.69	99.72	117.33	121.17	125.22	225.50	233.06	239.22	245.06	247.28
E5	L.	51.00	53.89	76.00	87.28	97.56	111.06	114.83	119.00	228.94	233.89	236.72	244.72	247.06
E6	L.	50.28	53.72	84.83	93.22	114.83	133.28	136.94	141.00	232.28	237.56	241.94	246.78	254.89
E7	L.	49.79	51.49	75.44	89.67	102.33	117.61	121.50	125.89	226.72	227.83	234.89	234.11	236.67
E8	L.	48.22	51.28	76.06	86.06	101.44	119.94	123.61	127.72	220.72	224.61	235.39	239.44	241.83
E9	L.	53.44	56.28	78.17	96.89	107.72	124.47	126.39	132.50	218.33	222.78	234.94	241.83	244.22
AVG	H	56.52	60.03	79.85	90.93	110.76	126.42	129.80	133.00	230.96	238.62	245.31	249.68	252.00
AVG	L	51.88	54.65	78.78	90.67	104.58	120.43	124.24	128.44	224.85	229.92	238.69	242.91	246.02

TABLE E 0 2 WIDTH OF MILKWEED IN MHAO HIN SORN

NO.	CODE	1 DEC	2 JAN	3 FEB	4 MAR	5 APR	6 MAY	7 JUN	8 JUL	9 AUG	10 SEP	11 OCT	12 NOV	13 DEC
E1	H.	29.71	32.56	60.61	71.17	113.44	131.83	135.33	139.06	228.56	241.00	241.61	241.61	243.94
E11	H.	31.64	34.58	55.83	76.83	98.22	116.72	120.11	124.17	207.22	221.28	232.67	237.72	239.83
E2	H.	35.36	38.36	62.09	82.28	105.22	126.78	129.61	133.44	228.28	230.00	235.44	243.61	246.00
E5	H.	35.78	35.46	55.58	77.00	92.00	113.06	116.78	121.00	222.11	236.56	240.72	246.72	243.33
E6	H.	38.89	42.61	64.56	87.94	112.72	132.22	135.50	139.56	216.00	246.89	247.28	246.00	247.72
E7	H.	32.69	36.11	56.56	76.61	108.11	132.22	135.61	139.67	229.17	239.56	245.17	253.44	255.72
E8	H.	33.64	36.64	54.04	69.98	110.53	130.40	130.32	137.60	228.17	231.52	236.47	241.11	243.83
E9	H.	34.44	39.09	53.96	75.76	99.83	112.50	119.67	123.67	213.72	231.94	242.89	257.11	261.00
E1	L.	36.39	39.50	57.39	71.67	108.44	127.72	131.39	135.56	211.67	216.78	224.67	228.06	232.28
E11	L.	35.17	38.28	62.50	77.00	98.11	110.56	114.94	118.61	212.83	217.61	224.11	228.67	231.22
E2	L.	31.61	34.22	59.67	76.83	91.89	120.44	124.11	128.67	211.33	215.89	221.56	231.94	234.44
E5	L.	34.08	38.06	62.83	82.50	88.33	108.83	111.83	116.56	214.61	219.11	219.78	224.22	226.50
E6	L.	41.75	44.78	66.89	83.17	96.93	126.22	130.22	134.06	218.72	223.83	225.06	229.72	230.89
E7	L.	35.61	38.30	59.11	74.22	97.39	129.28	132.94	136.78	203.94	208.89	213.44	217.39	220.11
E8	L.	35.11	37.89	59.83	75.89	99.22	127.50	131.78	135.50	215.39	219.89	220.06	228.00	230.17
E9	L.	40.67	43.06	67.00	85.06	102.39	127.00	130.61	134.83	214.50	219.44	226.00	227.50	230.28
AVG	H	34.02	36.95	58.00	77.20	105.01	124.47	127.87	132.27	221.65	234.84	240.28	245.92	247.67
AVG	L	36.30	39.14	61.90	78.29	95.58	122.19	125.98	130.07	212.83	217.68	221.83	226.94	229.49

TABLE E 0 3 INFLORESCENCE OF MILKWEED IN KHAO HIN SORN

NO.	CODE	1 DEC	2 JAN	3 FEB	4 MAR	5 APR	6 MAY	7 JUN	8 JUL	9 AUG	10 SEP	11 OCT	12 NOV	13 DEC	TOTAL
E1	H	0.00	4.06	5.22	12.44	7.28	3.83	4.83	3.78	1.83	2.00	0.00	0.00	0.00	45.78
E11	H	0.11	3.17	8.83	12.50	5.50	2.61	3.39	3.72	2.17	1.89	0.00	0.00	0.00	43.89
E2	H	0.00	4.06	9.89	12.78	7.39	3.61	3.72	4.17	2.11	3.11	0.00	0.00	0.00	50.83
E5	H	0.00	1.78	7.28	5.06	3.94	3.89	2.50	3.78	2.11	3.61	0.00	0.00	0.00	33.94
E6	H	0.00	2.78	14.61	10.00	3.94	2.94	2.78	2.39	1.83	0.94	0.00	0.00	0.00	42.22
E7	H	0.06	3.56	9.72	11.94	6.67	2.17	2.78	3.33	1.56	2.26	0.00	0.00	0.00	44.06
E8	H	0.00	1.22	9.72	5.17	2.50	2.00	1.67	2.11	2.17	2.44	0.00	0.00	0.00	29.00
E9	H	0.11	3.00	9.33	9.61	2.56	2.33	3.22	2.94	1.94	2.22	0.00	0.00	0.00	37.28
E1	L	0.00	3.61	9.33	5.94	2.78	2.06	1.61	2.72	1.06	2.33	0.00	0.00	0.00	31.44
E11	L	0.17	4.28	10.89	6.56	2.22	1.72	2.67	4.67	2.50	3.17	0.00	0.00	0.00	38.83
E2	L	0.06	4.72	9.39	8.44	6.17	2.61	3.33	3.17	1.72	0.94	0.00	0.00	0.00	40.56
E5	L	0.00	3.39	11.50	4.39	2.56	1.89	2.17	4.22	2.17	2.94	0.00	0.00	0.00	35.22
E6	L	0.06	4.83	12.28	6.79	5.94	3.61	3.50	4.00	2.50	2.50	0.00	0.00	0.00	46.00
E7	L	0.00	2.56	10.06	5.00	5.00	3.22	3.28	2.11	3.06	1.83	0.00	0.00	0.00	36.11
E8	L	0.00	3.61	8.06	4.89	3.94	3.28	2.44	3.72	1.89	2.56	0.00	0.00	0.00	34.39
E9	L	0.00	4.06	11.56	5.00	2.06	1.94	1.67	2.78	2.83	2.61	0.00	0.00	0.00	35.50
AVG	H	0.03	3.01	9.33	9.94	4.97	2.92	3.11	3.28	1.97	2.31	0.00	0.00	0.00	40.58
AVG	L	0.03	3.88	10.38	6.00	3.83	2.54	2.58	3.42	2.22	2.36	0.00	0.00	0.00	37.26

TABLE E 0 4 NO.200/TREE/YEAR OF MILKWEED IN KHAO HIN SORN

NO.	CODE	1 DEC	2 JAN	3 FEB	4 MAR	5 APR	6 MAY	7 JUN	8 JUL	9 AUG	10 SEP	11 OCT	12 NOV	13 DEC	TOTAL
E1	H	0.00	0.00	0.78	2.28	1.78	2.89	0.06	0.00	0.00	0.00	0.00	0.00	0.00	7.78
E11	H	0.00	0.00	0.00	0.78	0.50	0.56	2.56	0.00	0.00	0.00	0.00	0.00	0.00	4.39
E2	H	0.00	0.00	0.56	1.17	0.17	2.06	1.00	0.00	0.00	0.00	0.00	0.00	0.00	4.94
E5	H	0.00	0.00	0.00	0.33	0.11	0.06	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.44
E6	H	0.00	0.00	0.33	1.94	0.61	2.28	0.50	0.00	0.00	0.00	0.00	0.00	0.00	5.67
E7	H	0.00	0.00	0.17	0.67	0.33	0.61	0.89	0.00	0.00	0.00	0.00	0.00	0.00	2.67
E8	H	0.00	0.00	0.00	0.33	0.11	0.28	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.78
E9	H	0.00	0.00	0.00	0.28	0.11	0.17	0.17	0.00	0.00	0.00	0.00	0.00	0.00	0.72
E1	L	0.00	0.00	0.17	2.61	0.94	1.33	1.72	0.00	0.00	0.00	0.00	0.00	0.00	6.78
E11	L	0.00	0.00	0.00	0.94	0.78	1.22	2.89	0.00	0.00	0.00	0.00	0.00	0.00	5.83
E2	L	0.00	0.00	0.44	2.78	0.72	0.94	2.28	0.00	0.00	0.00	0.00	0.00	0.00	7.17
E5	L	0.00	0.00	0.00	0.72	0.28	0.22	0.72	0.00	0.00	0.00	0.00	0.00	0.00	1.94
E6	L	0.00	0.00	0.00	0.56	1.00	0.17	0.50	0.00	0.00	0.00	0.00	0.00	0.00	2.22
E7	L	0.00	0.00	0.00	0.44	0.22	1.11	0.72	0.00	0.00	0.00	0.00	0.00	0.00	2.50
E8	L	0.00	0.00	0.00	0.78	0.50	1.06	0.56	0.00	0.00	0.00	0.00	0.00	0.00	2.89
E9	L	0.00	0.00	0.00	0.50	0.22	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.72
AVG	H	0.00	0.00	0.23	0.97	0.47	1.10	0.78	0.00	0.00	0.00	0.00	0.00	0.00	3.55
AVG	L	0.00	0.00	0.08	1.17	0.58	0.76	1.30	0.00	0.00	0.00	0.00	0.00	0.00	3.88

TABLE S 0 1 HEIGHT OF MILKWEED IN CHUMPORN

CLONE	L/H	1 DEC	2 JAN	3 FEB	4 MAR	5 APR	6 MAY	7 JUN	8 JUL	9 AUG	10 SEP	11 OCT	12 NOV	13 DEC
S12	H	51.22	67.83	90.22	114.61	129.50	144.22	159.89	184.17	205.28	223.72	239.61	228.33	234.78
S13	H	46.61	57.06	78.44	104.78	118.83	138.83	154.28	176.00	196.17	211.17	220.78	229.06	234.89
S17	H	44.50	67.28	84.67	108.28	121.56	166.67	182.39	203.72	225.83	238.83	252.50	266.72	270.72
S2	H	36.22	45.22	69.06	94.72	112.50	105.67	119.78	145.83	155.56	164.72	172.11	175.89	182.89
S3	H	46.50	63.44	87.28	112.44	126.44	145.83	158.22	183.28	197.78	216.50	227.39	234.00	241.89
S5	H	47.39	49.78	69.61	95.17	111.39	130.44	138.78	154.67	166.56	177.78	188.94	186.06	191.17
S7	H	51.94	64.22	83.22	105.72	121.11	155.22	172.50	197.67	214.83	226.06	237.33	243.22	251.78
S9	H	52.83	70.44	95.11	117.39	129.61	163.00	179.06	201.94	223.17	236.89	250.89	249.83	261.89
S12	L	35.94	50.28	56.72	64.56	76.00	79.17	84.56	94.06	100.83	109.17	114.11	120.06	127.61
S13	L	43.61	50.17	56.61	64.44	69.50	74.28	82.33	97.44	103.78	111.67	116.61	122.17	134.00
S17	L	48.00	45.56	51.94	61.06	68.06	71.78	81.67	92.83	99.89	111.61	118.44	142.00	134.22
S2	L	30.94	38.22	42.00	51.83	55.50	53.10	58.06	79.33	79.61	85.56	87.72	90.89	93.50
S3	L	34.39	45.89	52.94	61.83	63.56	69.11	76.33	87.89	91.06	98.06	100.56	105.17	109.00
S5	L	37.22	43.89	47.83	56.00	63.67	64.50	73.54	81.94	85.50	91.44	94.22	103.67	108.89
S7	L	34.50	44.11	50.00	59.61	63.00	65.11	69.78	86.11	96.56	104.06	110.56	117.39	124.83
S9	L	44.33	60.44	64.06	71.94	81.28	86.00	93.67	104.44	111.83	121.72	126.00	133.72	139.83
AVG	H	47.15	60.66	82.20	106.64	121.37	143.74	158.11	180.91	198.15	211.96	223.69	226.64	233.75
AVG	L	38.62	47.32	52.76	61.41	67.57	70.38	77.49	90.51	96.13	104.16	108.53	116.88	121.49

TABLE S 0 2 WIDTH OF MILKWEED IN CHUMPORN

CLONE	CODE	1 DEC	2 JAN	3 FEB	4 MAR	5 APR	6 MAY	7 JUN	8 JUL	9 AUG	10 SEP	11 OCT	12 NOV	13 DEC
S12	H	42.22	87.72	124.56	151.00	163.50	185.11	237.50	277.89	299.39	325.94	335.61	327.33	363.00
S13	H	34.11	62.22	100.50	134.44	147.44	153.17	195.00	227.61	245.83	264.44	272.39	267.44	283.89
S17	H	45.67	87.56	115.33	145.17	156.94	174.67	222.78	252.17	268.22	288.39	300.22	303.50	325.06
S2	H	35.67	66.78	107.83	134.00	147.56	140.28	182.22	204.89	221.44	231.61	237.56	231.00	249.28
S3	H	26.06	75.72	114.89	143.33	153.22	170.72	212.22	231.61	243.67	247.22	264.83	266.50	285.67
S5	H	27.00	55.06	89.22	120.50	135.17	127.67	157.50	182.56	198.50	207.11	220.22	199.17	222.06
S7	H	43.22	97.00	127.00	148.39	159.72	195.67	238.17	273.44	295.72	317.39	325.61	347.56	360.44
S9	H	28.17	78.50	119.00	144.61	156.22	181.67	218.22	261.44	274.61	291.50	305.22	303.61	320.78
S12	L	26.78	56.22	67.50	76.50	86.11	86.17	111.89	139.50	149.06	159.39	170.50	173.61	192.17
S13	L	34.39	48.11	58.56	69.89	71.78	72.00	102.61	127.94	141.06	147.17	157.22	164.67	175.72
S17	L	35.00	50.94	57.56	65.72	73.28	75.17	104.67	125.56	136.33	145.50	154.56	159.78	168.06
S2	L	28.94	49.61	54.78	63.78	67.28	65.88	84.72	106.59	106.33	112.39	120.72	124.78	129.50
S3	L	23.61	42.06	48.61	61.28	65.22	72.56	97.67	113.61	119.44	124.50	125.56	127.72	132.17
S5	L	28.67	37.89	46.28	57.22	60.00	45.11	65.12	71.00	78.44	85.06	84.78	92.87	96.75
S7	L	31.44	45.06	52.94	61.44	79.39	91.33	122.17	151.17	163.61	171.44	186.78	199.06	223.83
S9	L	37.11	58.11	66.94	76.78	93.39	90.67	123.89	152.11	162.89	170.28	180.28	186.83	199.94
AVG	H	35.26	76.32	112.29	140.18	152.47	166.12	207.95	238.95	255.92	271.70	282.71	280.76	301.27
AVG	L	30.74	48.50	56.65	66.58	74.56	74.86	101.59	123.43	132.15	139.47	147.55	153.66	164.77

TABLE S 0 3 INFLORESCENCE OF MILKWEED IN CHUMPORN

CLONE	REP	1 DEC	2 JAN	3 FEB	4 MAR	5 APR	6 MAY	7 JUN	8 JUL	9 AUG	10 SEP	11 OCT	12 NOV	13 DEC	TOTAL
S12	H	0.00	0.06	12.00	25.11	25.33	16.22	18.28	23.06	13.94	19.44	25.33	11.61	8.44	198.83
S13	H	0.00	0.94	12.89	25.67	22.83	19.11	20.78	20.06	16.72	26.83	19.39	12.44	4.89	202.56
S17	H	0.00	0.83	11.61	26.28	22.56	17.56	11.67	12.06	10.78	16.67	8.56	6.06	2.11	146.72
S2	H	0.00	0.67	11.50	28.78	17.94	8.72	6.17	9.89	3.22	8.83	0.33	0.28	0.00	96.33
S3	H	0.00	0.00	5.50	21.72	20.28	11.28	4.06	6.94	4.22	7.22	1.72	0.56	0.11	83.61
S5	H	0.00	0.00	2.56	10.50	12.50	5.39	1.94	2.83	1.72	3.33	0.61	0.39	0.06	41.83
S7	H	0.00	2.22	25.22	30.78	22.83	29.22	23.44	33.22	17.39	28.17	13.56	14.28	3.17	242.50
S9	H	0.00	1.06	17.44	34.11	25.61	17.06	7.61	13.61	8.94	19.06	16.72	8.61	5.50	175.33
S12	L	0.00	0.00	0.83	1.89	0.78	0.22	0.06	0.39	0.33	0.17	0.28	0.06	0.11	5.11
S13	L	0.00	0.17	1.83	1.79	2.33	1.11	0.28	1.22	0.33	1.89	1.56	1.28	0.28	14.06
S17	L	0.00	0.00	1.17	1.00	1.39	0.61	0.17	0.56	0.11	1.00	0.00	0.11	0.00	6.11
S2	L	0.00	0.00	0.61	0.61	0.33	0.78	0.33	0.50	0.00	0.00	0.00	0.00	0.00	3.17
S3	L	0.00	0.00	0.06	0.17	0.22	0.39	0.00	0.00	0.00	0.06	0.00	0.00	0.00	0.89
S5	L	0.00	0.00	0.06	0.33	0.22	0.44	0.28	0.11	0.00	0.28	0.06	0.00	0.00	1.78
S7	L	0.00	0.06	2.06	1.61	2.33	2.56	2.11	4.17	1.17	2.72	1.39	2.61	0.39	23.17
S9	L	0.00	0.00	2.11	3.11	3.28	1.22	0.17	0.33	0.44	0.89	0.50	0.06	0.06	12.17
AVG	H	0.00	0.72	12.34	25.37	21.24	15.44	11.74	15.21	9.62	16.19	10.78	6.78	3.03	148.47
AVG	L	0.00	0.03	1.09	1.31	1.36	0.92	0.42	0.91	0.30	0.88	0.47	0.51	0.10	8.31

TABLE S 0 4 YIELD OF MILKWEED IN CHUMPORN (YIELD/TREE)

CLONE	L/H	1 DEC	2 JN	3 FEB	4 MAR	5 APR	6 MAY	7 JUN	8 JUL	9 AUG	10 SEP	11 OCT	12 NOV	13 DEC	TOTAL
S12	H	0.00	0.00	0.00	0.00	0.00	0.11	0.39	0.06	0.06	0.17	0.06	0.00	0.00	0.83
S13	H	0.00	0.00	0.00	0.00	0.00	0.11	0.61	1.33	1.89	1.89	2.72	0.00	0.00	8.56
S17	H	0.00	0.00	0.00	0.00	0.67	0.89	0.33	0.61	1.61	2.28	2.22	0.00	0.00	8.61
S2	H	0.00	0.00	0.00	0.00	0.00	0.06	0.11	0.00	0.11	0.00	0.00	0.00	0.00	0.28
S3	H	0.00	0.00	0.00	0.00	0.00	0.11	0.11	0.11	0.11	0.17	0.11	0.00	0.00	0.72
S5	H	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
S7	H	0.00	0.00	0.00	0.00	0.22	0.83	3.78	2.11	4.89	5.83	5.72	0.06	0.00	23.44
S9	H	0.00	0.00	0.00	0.00	0.00	0.50	2.67	0.28	1.11	1.78	1.78	0.00	0.00	8.11
S12	L	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
S13	L	0.00	0.00	0.00	0.00	0.06	0.00	0.00	0.00	0.00	0.17	0.00	0.00	0.00	0.22
S17	L	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.00	0.00	0.00	0.06
S2	L	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.11	0.00	0.00	0.00	0.11
S3	L	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.00	0.00	0.00	0.06
S5	L	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
S7	L	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.11	0.17	0.22	0.17	0.06	0.00	0.72
S9	L	0.00	0.00	0.00	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.06	0.00	0.00	0.28
AVG	H	0.00	0.00	0.00	0.00	0.11	0.33	1.00	0.56	1.22	1.51	1.58	0.01	0.00	6.32
AVG	L	0.00	0.00	0.00	0.00	0.03	0.00	0.00	0.01	0.02	0.08	0.03	0.01	0.00	0.18

APPENDIX C

Table 1 Mean of data / Replication

Treatment	Replication			Total of each Treatment
	I	II	III	
A1B1	a1b1r1	a1b1r2	a1b1r3	a1b1
A1B2	.	.	.	a1b2
A1B3	.	.	.	a1b3
A1B4	.	.	.	a1b4
A1B5	.	.	.	a1b5
A1B6	.	.	.	a1b6
A1B7	.	.	.	a1b7
A1B8	.	.	.	a1b8
Sum(A1R)	a1r1	a1r2	a1r3	a1
A2B1	a2b1r1	a2b1r2	a2b1r3	a2b1
A2B2	.	.	.	a2b2
A2B3	.	.	.	a2b3
A2B4	.	.	.	a2b4
A2B5	.	.	.	a2b5
A2B6	.	.	.	a2b6
A2B7	.	.	.	a2b7
A2B8	.	.	.	a2b8
Sum(A2R)	a2r1	a2r2	a2r3	a2
Sum (R)	r1	r2	r3	G.T.

Table 2 ANALYSIS OF VARIATION

SOURCE OF VARIATION	df	SS	MS	F
Replication	r-1			
A	a-1			
Error (a)	(r-1)(a-1)			
B	b-1			
A x B	(a-1)(b-1)			
Error (b)	a(r-1)(b-1)			
Total	abr-1			

r = Number of Replication

a = Number of Main plot

b = Number of Sub plot (collection sample)

CALCULATION BY :

1. C.F. $= \frac{(G.T.)^2}{abr}$

2. Total SS $= (a1b1r1)^2 + (a1b1r2)^2 + \ldots\ldots + (a2b8r3)^2 - C.F.$

3. Rep SS $= \frac{(r1)^2 + (r2)^2 + (r3)^2}{16} - C.F.$

4. A SS $= \frac{(a1)^2 + (a2)^2}{24} - C.F.$

5. Error(a)SS $= \frac{(a1r1)^2 + (a1r2)^2 + (a1r3)^2 + (a2r1)^2 + (a2r2)^2 + (a2r3)^2}{8}$

   $- C.F. - A\ SS. - Rep\ SS$

6. B SS $= \frac{(b1)^2 + (b2)^2 + \ldots\ldots\ldots + (b8)^2}{6} - C.F.$

7. [AxB] SS $= \frac{(a1b1)^2 + (a1b2)^2 + \ldots\ldots\ldots + (a2b8)^2}{3} - C.F. - A\ SS - B\ SS$

8. Error(b)SS = Total SS -Rep SS -A SS-Error(a)SS-B SS-[AxB] SS

9. MS = SS / df

10. F(Rep) = Rep SS / E(a)MS

11. F(a) = A MS / E(a) MS

12. F(b) = B MS / E(b) MS

13. F(AxB) = [AxB] MS / E(b) MS

If the mean are different (F-test is significant) that test the mean by DMRT (Duncan's new multiple range test)

METHOD OF TESTING THE DIFFERENT MEAN BY DMRT.

$$LSR = SSR * Sy$$

CALCULATING :

1. Calculate $Sy = \sqrt{\frac{\text{Error mean square}}{n}}$

2. Calculate LSR at P=2 to P=8

3. Mean ordering

4. Find the different of mean and compares with LSR of each level , If different > LSR showing the significant.