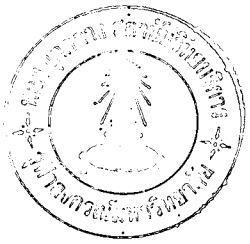


Chapter 3

Analysis of Data

The data analysis are divided into two parts.

Part I

The data analysis in this part was obtained from questionnaire part I. It's purpose is to find out the problems that planters are having concerning growing sunflowers. The data of each provinces surveyed was examined. These provinces are : Khon Kaen, Nakhon Ratchasima, Kanchanaburi, Ratchaburi, Prachuap Khirikhan and Chieng Mai.

Part II

The data analysis in this part is based on questionnaire part II and is aimed at determining to what extent planters are interested in growing sunflowers if the government will give them the support.

Part I Analysis

Prior to the data analysis, questionnaire part I attempted to find the ratio of planters who have grown sunflowers before. The ratio of those who have grown sunflowers previously is shown in Table 1.

Table 1

Percentages of sunflower plantation in six provinces

Plantation of Sunflower	Experienced		Inexperienced		Total	
Name of Provinces	Amount	%	Amount	%	Amount	%
Khon Kaen	3	10.00	27	90.00	30	100.00
Nakhon Ratchasima	7	23.33	23	76.67	30	100.00
Kanchanaburi	8	26.67	22	73.33	30	100.00
Ratchaburi	8	26.67	22	73.33	30	100.00
Prachuap Khirikhan	4	13.33	26	86.67	30	100.00
Chieng Mai	0	0	30	100.00	30	100.00
Total	30	16.67	150	83.33	180	100.00

As shown in Table 1. 180 planters were interviewed, 30 sample (16.67 %) have previously planted sunflowers and 150 samples (83.33 %) have had no previous experience.

In each province, there are 30 samples.

Khon Kaen Province 3 samples (10 %) have planted sunflower and 27 samples (90 %) have not.

Nakhon Ratchasima Province 7 samples (23.33 %) have planted sunflower and 23 samples (76.67 %) have not.

Kanchanaburi Province 8 samples (26.67 %) have planted sunflower and 22 samples (73.33 %) have never planted sunflowers.

Ratchaburi Province 8 samples (26.67 %) have planted sunflower and 22 samples (73.33 %) had never done it.

Prachuap Khirikhan Province 4 samples (13.33 %) have planted sunflower and 26 samples (86.67 %) had never planted sunflowers.

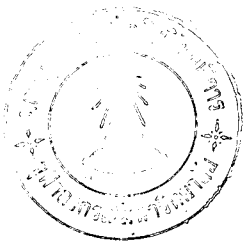
Chieng Mai Province 30 samples (100.00 %) have never planted sunflower.

The Analysis

Results of questionnaire part I, the analysis of each provinces is reported.

Khon Kaen Province

The amphers surveyed in this province were Muang and Ban-Phi Ampher Ban-Phi is about 45 Kilometers from Ampher Muang. From enquiries from provincial agricultural officers, Ban-Phi is the only ampher in Khon Kaen in which there have been sunflower plantations. In Ampher Muang and the near by areas, the Agricultural Experimental Centre of Agricultural Developing experimented growing sunflowers.



Problem for planters in Khon Kaen :

Three planters have priviously grown sunflowers, two persons had done so in 1977 and they do not grow the plants nowadays because they can not sell sunflower seeds. There is no market for sunflower seed since they are not popular. One planter pointed out that although, without much care, sunflower grew well in Khon Kaen.[1] The problem which stops planters growing sunflower, is the marketing problem.

The other planter who has grown sunflowers is now an planter with the Ardam International Co., Ltd. and he is experimenting with sunflower cultivation in an area of one ri at Ban-Lan district, amphoe Ban-Phi. He has told the interviewer that the rise of the plant's market abroad is increasing nowadays. The only problem he has in growing the plant, is the lack of pollinated bees which result in thin seeds[2] and wasted products. The idea of feeding pollinated bees is a problem since the bees may damage other plants such as cotton seed, yam bean in near by fields. His company's researchers are now trying to solve this problem by other methods and these results should be followed.

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[1]Interview with Vichai Sumanon, the planter and the owner of Chifa Species Shop, 650/4-7 Village 2 Amphoe Ban-Phi, Khon Kaen, 18 August, 1979.

[2]Thin seed is seed which has no kernel.

The problems are as follow :-

1. No markets during the last three years.
2. Thin seeds because there is the lack of pollinated bees resulting in low produce.

Besides interviewing the planters, the interviewer also interviewed officers of the Agricultural Developing Department, who experimented growing sunflower at the Plant Experimental Centre in Khon Kaen Province. They brought four varieties of sunflower seeds from the Agricultural Developing Department in Bangkok. These varieties are from Russia. The results of growing are as the following.

Figure 1 The result of growing four varieties of sunflower seeds in Khon Kaen

	Varieties			
	No.1	No.1 (A)	No.2	No.2 (A)
Place of growing	Plant Experimenting Centre	Plant Experimenting Centre	Plant Experimenting Centre	Plant Experimenting Centre
Area(Kilometers)	400	400	400	400
Distances between a plant in the same row and to the next row	70 + 50 cms.	70 + 50 cms.	70 + 50 cms.	70 + 50 cms.
Date that began growing	June 14,1979	June 14, 1979	June 14, 1979	June 14, 1979
Sprouting data	June 18,1979	June 18, 1979	June 18, 1979	June 18, 1979
Plant replaced data	June 25,1979	June 25, 1979	June 25, 1979	June 25, 1979
Pruning data	July 4,1979	July 4, 1979	July 4, 1979	July 4, 1979
Date to give fertilizers (Potassium : Nitrogen : Phosphores = 15:15:15 kilogram per ri)	July 20,1979	July 20, 1979	July 20, 1979	July 20, 1979

Figure 1 (Continue) The result of growing four varieties of sunflower seeds in Khon Kaen

	Varieties			
	No.1	No.1 (A)	No.2	No.2 (A)
Weed control data	Firstly on July 4,1979 Secondly on July 13, 1979.(Ploughing) Thirdly on July 19, 1979. (Furrowing)	Firstly on July4,1979 Secondly on July 13, 1979.(Ploughing) Thirdly on July 19, 1979.(Furrowing)	Firstly on July 4,1979 Secondly on July 13, 1979.(Ploughing) Thirdly on July 19, 1979.(Furrowing)	Firstly on July 4,1979 Secondly on July 13, 1979.(Ploughing) Thirdly on July 19, 1979.(Furrowing)
Destraction of plant pests.	NOTHING IS DONE			
Harvest Date	August 28, 1979 (3 times)	August 28, 1979 (3 times)	August 28, 1979 (3 times)	August 28, 1979 (3 times)
Produce	13.6 Kilograms per ri	17.6 Kilograms per ri	16.8 Kilograms per ri	28.8 Kilograms per ri
DATA RECORDS.**				
Colour of the base of the stem	Light green, leaf-stalks and flowers are covered with hair	Light green,leaf-stalks and flowers are covered with hair	Light green,leaf-stalks and flowers are covered with hair	Light green,leaf-stalks and flowers are covered with hair
Date that began sprouting	July 16, 1979	July 16, 1979	July 16, 1979	July 16, 1979
Leaf description	Serrate	Serrate	Serrate	Serrate
Blossom date	July 27, 1979	July 27, 1979	July 27, 1979	July 27, 1979
Pollination date	July 28, 1979	July 28, 1979	July 28, 1979	July 28, 1979
Date of 50 % pollination	August 1, 1979	August 1, 1979	August 1, 1979	August 1, 1979

Figure 1 (Continue) The result of growing four varieties of sunflower seeds in Khon Kaen

	Varieties			
	No.1	No.1 (A)	No.2	No.2 (A)
The last date of Pollination.	August 6, 1979	August 6, 1979	August 6, 1979	August 6, 1979
Height of the plants at the date of 50 % pollination. (Record from a mean height of ten plants on August 2, 1979)	61.2 cms.	80.6 cms.	60.2 cms.	101.6 cms.
Flower diameter at the date of harvest. (A mean diameter of ten plants.	71.8 cms.	82.3 cms.	60.4 cms.	96.0 cms.
A dry flower weight (a mean weight of ten flowers)	21.43 gms.	32.06 gms.	12.6 gms.	55.74 gms.
Weight of 100 perfect seeds	6 gms.	6 gms.	4.3 gms.	7.4 gms.
Percent of thin seed weight	3 %	1.2 %	2.2 %	1.3 %

The Experiment has shown that the best varieties was No.2 (A) because it gave the highest produce (28.8 kilogram per ri), the highest weight of ten dry flowers (55.74 gms), the highest weight of 100 perfect seeds (7.4 gms.) and the low percentage of thin seed (1.3 %). However, comparing the varietie No.2 (A) with the produce of sunflower seed in 1974, planters in Khon Kaen grew sunflower and could get the seeds about 250 kilogram per ri which had thin seed about 10% of the produce[3] and the variety was from Russia,[4] so the variety No.2 (A) is more recessive than the variety which had grown in 1974.

The Agricultural authorities of the Agricultural Experiment Centre have suggested reasons for the low produce of experimented sunflowers which results from :-

1. The varieties which the authorities brought them from the Agricultural Developing Department, Bangkok, are not suitable and they did not even know names of these varieties.

2. The distance between a sunflower plant in the same row and the next row are pretty far (70 + 50 cms.) This result a low quantity of sunflower plants per ri.

3. The plants were grown at the beginning of the rainy season in which there was heavy rain. Crowing in the wrong season made the seed spoil.

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[3]Applied Science Research Centre of Thailand, Institude - "Sunflower News" 2 (March 2, 1974) : 10.

[4]The varity "Savatovskij" from Russia which the Applied Science Institude Supplied to the Agriculturists.

In the North East, sunflowers should be grown from August to September during which the amount of rainfall is just right for the young plants. When the rainy season is over, the flowers are fully grown and this protects the seeds from spoiling.[5]

The experiment has shown that growing sunflowers in order to get good results and high quantity must be based on many factors such as :

1. Appropriate variety.
2. Growing technique.
3. Right season.
4. Fertility of soil. Fertilizers should be added in poor soil.

Details of the productive developing programme for sunflower seeds will be mentioned in Chapter 4.

Nakhon Ratchasima Province

The amphoes surveyed in this province were Amphoe Muang and Amphoe Pakchong. Agricultural provincial authorities have been informed that both amphoe, especially Pakchong, had sunflower plantations seven to eight years ago and many planters were interested

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[5]Applied Science Research Centre of Thailand, Institude "Sunflower News" (August, 1974) : 3.

in growing sunflowers at that time.[6]

Of the seven planters who grew sunflower, five grew them seven to eight years ago and the other two ones grew them five years ago. At present there are no planters growing sunflowers.

The Problems

1. The low amount of sunflower seeds, is caused by

1.1 Too many thin seeds. Only twenty five percent of all seeds are good.[7] The causes are

1.1.1 Lack of bees in pollination.

1.1.2 Lack of water while blooming.

1.1.3 Too much space either in or between each row of sunflowers.

1.1.4 Flower sizes are too big to accumulate necessary nourishment in the seeds.

1.2 Impure line of plant. Plant breeding in the way of cross pollination brings out seeds differing from the seed of the parents in morphology, size and oil percentage and attachment of seeds.

2. There was no profit in selling sunflower seeds. The problems stem from :-

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[6]Interview with Suchat Phayakanan, Agriculturial Provincial Officer of Nakhon Ratchasima, 2 December, 1979.

[7]Interview with Tanue Sanitwong, the planter, 2 December, 1979.

2.1 Government guaranteed prices were very low. (2.15 baht per kg.)

2.2 Low amount and uncertain quantities that make the expenses be more than income.[8]

Kanchanaburi Province

The amphoes surveyed in this province are amphoe Muang and amphoe Ta-ma-ga. Agricultural provincial authorities informed us that the amphoe Muang had the most sunflower plantations in the province and in amphoe Ta-ma-ga there were some planters who were interested in an experimented of growing the plant.

On inspection, the researcher found the following problems:-

Of the eight planters who had previously grown sunflower 1 grew the plant 10 years ago 4 grew the plant 5 years ago and 3 grew the plant 3 years ago I.E. 1970, 1974, 1977. There are none who are growing the plant nowadays because of many problems.

1. Seed variety problems. In order to get high productive and good quality seeds, the same varieties of seed must be planted. Many varieties of sunflower seed, if planted in the same place will result in cross-fertilization[9] and different varieties will be produced

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[8]Interview with Charan Poontanate, the planter, 15 June, 1980.

[9]Cross fertilization : Pollination of a plant variety with a difficult variety. The pollens may be carried to others by the wind or bees.

which may increase in the later generation. Cross-fertilization causes poor marketing because the new seed varieties which occured are not the same as the original ones. They are different in size, shape, oil percentage, blooming time and new seed production time. These new seed varieties can not be planted anymore and must be replaced by new ones. Laterly, new good varieties are very rare and expensive. It costs about sixty to eighty baht per kilogram. General seed varieties, which are sold at about twenty-five baht per kilogram, are composed of many variety together and these will yield low amount of sunflower seeds.[10]

2. Price and marketing of sunflower seed. The government guranteed price, which is 2.15 baht per kilogram, is too low if compared with production costs and the planters will get a very low profit from this price.

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[10]Interview with Kluing Klimsuk - the planter, 10 February, 1980.

Production Cost of Sunflower Seed[11]

2 Kilograms must be used per ri (on the average). One kilogram of the seed variety costs by average about 70 baht.[12]

The cost of the seed variety	140 Baht
Plughting twice that cost	80 "
Labour	30 "
Gross cutting labour (once)	100 "
Fertilizer costs	20 "
The cost of removing the hulls of sunflower seed	70 "
Total production cost per ri	440 "
Sunflower seed	250 Kilograms per ri
Garantee price	2.15 Baht per one Kg.
Income per one ri	537.50 Baht.
Less Cost of Transportation (15 baht per kilogram)	37.50 "
Net Income	500.00 "
Profit (500.00-440.00)	60.00 "

[11]Interview with Chakkrich Polkul, the planter, 10 February 1980.

[12]The price of pure variety seed.

Most of the planters who had grown sunflowers changed to growing cassava because the cassava marketing was expanding very quickly in 1973-1974.[13] Production cost and profits from planting cassava is here demonstrated by comparing them with those of planting sunflower.

Production costs of planting cassava in 1974	= 503.20 baht per ri[14]
Average yield obtained	= 2,050 Kg. per ri[15]
Selling costs of cassava	= 0.31 baht per kg.[16]
Income	= 635.50 baht per ri
Profit	= 132.30 baht per ri

This data clearly shows that the planters were able to set a higher profit from planting cassava than sunflower, about 72.30 baht per ri. They could also find markets for cassava easier than for sunflower because cassava was selling well on the market.

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[13] Business Economic, Department ; Commerce, Ministry, "A Research on Cassava Products," Bangkok, 1977 : 15.

[14] Ibid

[15] Ibid

[16] Ibid

Conclusively, the problems of the planters in Kanchannaburi province are :-

1. Lack of goods seed varieties for planting.

2. Marketing problems.

   2.1 No demand in the market. Inadequate supply of sunflower seeds.

   2.2 Government guaranteed price was too low.

It was 2.15 baht per kilogram. The reson is that the profit was not high enough to keep the industry grow.

Ratchaburi Province

The researcher interviewed in two amphoes:- amphoe Jombung and amphoe Muang because they were informed by the Agricultural Developing Department authorities of the province that there were many planters in these areas. The researchers gussed that there might be many planters who had grown sunflower or were interested in the plant. In Jombung, there was sunflower seed contest at the Agricultural Development Fair from December 14-16, 1973. There were fourteen contestants.[17] This instance made the researcher sure that there must be some planters who had grown sunflowers and were interested in the plant in this amphoe.

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[17]Applied Science Research Centre of Thailand, Institude "Sunflower News" 1 : March 1974 : 2.

Conclusion

Of the eight planters who had grown sunflower, two had grown sunflowers ten years ago (1970) and six had grown sunflower five years ago. (1975)

Problems that affect planters

1. Low quantity of sunflower seeds. There are too many thin seeds because :-

   1.1 The plant was poorly watered, especially in the period between stem growing and blooming. This problem was because of poor irrigation and the agriculturists did not know the appropriate growing time.

   1.2 Insufficient soil fertilizer. Most planters have a poor knowledge of growing sunflowers and keeping the plant productive.

   1.3 Lack of pollinated bees. Especially in the dry season, there are a few pollinated bees.

2. Marketing Problems.

The planters can not find buyers who will give suitable prices for sunflower seed. Their income from selling sunflower seed in comparison with other plants such as sugar cane and cassava is very much lower, since there are too many thin seed

and very low yields obtained. The uncertain quantity of the seed obtained caused the price to change and moreover, the quantity is not enough to meet the demand of the buyers. This causes investors not to be willing to take investment risks. If they invest, they will be in a very difficult situation when there is not enough sunflower seed to supply the industry. The uncertainly is one of the problems that loosens the demand for sunflower seeds in the market and the planters cannot sell their yield.

Conclusively, the main problems of the planters in Ratchaburi province are : low yield and uncertain quantity because planters are not knowledgeable in planting sunflower. They do not know the suitable time for planting and the technique of soil fertilization. Poor irrigation is also another problem. These manufacturing problems bring down the demand for sunflower seed in the market. The planters can not sell their products and have to quit growing sunflower occupationally.[18]

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[18]Interview with Moll Reanton. planter, 22 January, 1980.

Prachuap Khirikhan Province

Amphoe Tabsaka and Amphoe Muang in this province were mainly inspected because the Agriculturist Developing Department authorities of the province stated that there had been sunflower plantations in this area and that amphoe Tabsaka was also the place where there was a lot of bee tending and such a place was appropriate for growing sunflower.

Problems of planters who have grown sunflowers.

There are four planters who 5 years ago grew sunflower. Each points out the same problem which is the marketing problem. They can not find buyers because :-

1. When they began growing sunflower, it was the beginning period of government support for sunflower cultivation and there was very few sunflower seed industry, the demand of sunflower seed was therefore very low.

2. The government guarantee price was too low and it was not worth the effort when compaired with the high cost the expenses which were due to :-

2.1 The planters trying to get pure and good varieties to grow, they expected to obtain high produce with good quantities, but the high cost caused high production costs.

2.2 The buyers of sunflower seeds included transportation cost when selling to industries. The planters could therefore sell sunflower seed at lower prices than the guarantee price and many of them suffered a loss.

The interviewer was granted an interview with the squadron leader Tawil Promwipa, the planter who used to grow sunflowers. He expressed his opinion that growing sunflower at the present time forced one to face marketing problems and other problems such as :-

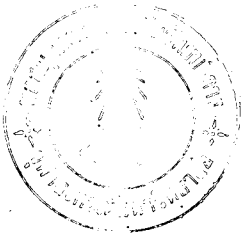
1. Weather. Eventhough the sunflower plant is very resistant to dry weather, it still needs water especially in the period,between seedling and blooming. The weather recently is much hotter and dryer and mereover, irrigation is insufficient to supply this area. This makes it difficult to do a good job in regard to sunflower cultivation.

2. Worker problems. Worker are less capable, they usually use poor techniques which cause a low yield. It is so hard to control every worker because the sunflower is grow over a very large area.

3. Thief problem. There are a lot of robber nowadays. They try to rob everything on the plantation including seed produce. These cause a lot of trouble to planters.

Conclusively, the planters have the problem of marketing, they can not sell theur produces because of :-

1. Low demand
2. Production costs greater than what is gained in sales.



Chieng Mai Province

Chieng Mai province is in the north of Thailand and has a long winter season. The fertilized soil in Chieng Mai is very rich and appropriate for growing sunflowers. The amphoes chosen to be serveyed were Chiengdao and Phang because in this area there are a lot of tobacco, gram, soya bean and garlic farms. Besides, there are also well grown flower gardens.

Problems of the planters who had grown sunflowers

All thirty planters have not grown sunflower over the last ten years because they grew plants which gave a high yield with good quality and were easily sold, for example tobacco, garlic, Indian cotton, gram, soya bean sesamum and vegetables.

93.33 % of the planters interviewed do not show any interest in growing sunflower. They do not want to take risks especilly the marketing risk of which their opinions are :-

1. Even though sunflower growing is supported by the government planters do not have confidence of being successful. Twenty five persons or 83.33 % of the thirty planters failed in growing other government supported plants such as okra and chrisantimum, therefore they have no confidence in the government program. Government officers who are concerned have never checked and followed up the program results, they have not taken any responsibility in the yields of the plants which

they support and they leave the planters to face the marketing problems on their own. Moreover, the real selling price is always lower than the guaranteed price which was set during the initial growing period.

2. The planters do not want to take the risk of investing because they do not know how much profit they will get and so do not have enough security in regard to profit.

3. 80 % of the planters do not know the value and advantages of growing the plant.

Since the planters have never grown sunflower, the researcher do not know the exact problem existing, but by inquiring provincial agricultural educationists and officers from the Plant Experimental Centre of Doi Angkang, they can point out problem of growing sunflowers. They suggest that there is no problem in growing techniques but rather in marketing. Since there are many marketing questions about sunflower demand, how to put the plant in the markets and whether the selling price is appropriate or not. Planters always have to face these problems in growing new plants.

Concerning growing, the location and weather of Chieng Mai province is appropriate for growing many plants. If the planters use correct techniques, they will surely obtain high yields and good quality. There is also no thin seed problem because they are a lot of pollinated bees in the area. Besides, good irrigation can supply water thoughout the growing period in the areas where about 84 % of

planters are found.

Based on the experience of the planters, the Agricultural Provincial officers and other agricultural authorities in Doi Angkang, we can conclude that marketing is the main problem. The question is whether the demand is high enough to suit the yield produced which influences the selling price.

Table 2

To show the degree of planters who have grown sunflower when they have had government supports, which include suggestion on growing techniques and developing maintenance. The support also includes service for the planters who are concerned with seed variety, fertilizer, credit account, irrigation, and marketing etc. Marketing service will be shown by trying to put the seed products on the market and giving the lowest price they can sell or a guaranteed price. These supports are done for the purpose of making the economic and social life of the planters better.

Table 2

Interest in sunflowers plantation : planters who had grown sunflower

Degree of interest	Interested		Not Sure		No interested		Total	
Province	amount	%	amount	%	amount	%	amount	%
Khon Kaen	0	0	2	66.67	1	33.33	3	100.00
Nakorn Ratchasima	0	0	2	28.57	5	71.43	7	100.00
Kanchanaburi	0	0	0	0	8	100.00	8	100.00
Ratchaburi	0	0	3	37.50	5	62.50	8	100.00
Prachuap Khiri Khan	0	0	0	0	4	100.00	4	100.00
Chieng Mai	0	0	0	0	0	0	0	0
Total	0	0	7	23.33	23	76.67	30	100.00

As shown in Table 2, 30 samples have grown sunflower, 23 samples (76.67 %) showed no signs of interest, 7 samples (23.33 %) were not sure and none were seriously interested in growing sunflowers.

Each of the provinces is here examined.

Khon Kaen province 3 samples have grown sunflower, only a samples (33.33 %) showed no signs of interest, 2 samples (66.67 %) were not sure and non were seriously interested in growing sunflowers.

Nakhon Ratchasima province 7 samples have grown sunflowers, 5 samples (71.43 %) showed no sign of interest, 2 samples (28.57 %) were not sure and none were seriously interested in growing sunflowers.

Kanchanaburi province 8 samples have grown sunflowers and all of them showed no sign of interest.

Ratchaburi province 8 samples have grown sunflowers, 5 samples (62.50 %) showed no sign of interest, 3 samples (37.50 %) were not sure and non were seriously interested in growing sunflowers.

Prachuap Khiri Khan province 4 samples have grown sunflowers and all of them showed no sings of interest.

Chieng Mai province No sample had ever grown sunflower during the last ten years.

Part II analysis

Table I data is analysed, 150 samples (88.33 %) have not grown sunflowers.

Number of samples are from the following provinces.

Khon Kaen	27 Samples
Nakhon Ratchasima	23 "
Kanchanaburi	22 "
Ratchaburi	22 "
Prachuap Khiri Khan	26 "
Chieng Mai	30 "
Total	150 Samples

Table 3

To show whether these planters knew the sunflower, for example the characteristics of flower, stem and leave etc.

Table 3

Knowledge about the sunflowers : what is sunflower ?

Knowing the sunflower	Yes		No		Total	
Provinces	amount	%	amount	%	amount	%
Khon Kaen	24	88.89	3	11.11	27	100.00
Nakhon Ratchasima	20	86.96	3	13.04	23	100.00
Kanchanaburi	22	100.00	0	0	22	100.00
Ratchaburi	19	86.36	3	13.64	22	100.00
Prachuap Khiri Khan	21	80.77	5	19.23	26	100.00
Chieng Mai	29	96.67	1	3.33	30	100.00
Total	135	90.00	15	10.00	150	100.00

As shown in Table 3, of the 150 sample planters who had never grown sunflowers, 135 samples (90.00 %) knew what sunflowers are and 15 samples (10.00 %) did not.

Each province is examined as the following :-

Khon Kaen province 27 samples had never grown sunflowers 24 samples (88.89 %) knew what sunflowers were and 3 samples (11.11%) did not.

Nakhon Ratchasima province 23 samples had never grown sunflowers, 20 samples (86.96 %) knew what sunflowers were and 3 samples (13.04 %) did not.

Kanchanaburi province 22 samples had never grown sunflowers and all of them (100.00 %) knew what sunflowers were.

Ratchaburi province 22 samples had never grown sunflowers, 19 samples (86.36 %) knew what sunflowers were and 3 samples (13.64%) did not.

Prachuap Khiri Khan province 26 samples had never grown sunflowers, 21 samples (80.77 %) knew what sunflowers were and 5 samples (19.23 %) did not.

Chieng Mai province 30 samples had never grown sunflowers, 29 samples (96.67 %) knew what sunflowers were and 1 sample (3.33 %) did not.

Table 4

To show whether the **planters know how sunflowers could** be widely used.

Table 4

Knowledge about the sunflower : uses

A sunflower could be widely used	Yes		No		Total	
Provinces	amount	%	amount	%	amount	%
Khon Kaen	10	41.67	14	58.33	24	100.00
Nakhon Ratchasima	19	95.00	1	5.00	20	100.00
Kanchanaburi	13	59.09	9	40.91	22	100.00
Ratchaburi	12	63.16	7	36.84	19	100.00
Prachuap Khiri Khan	7	33.33	14	66.67	21	100.00
Chieng Mai	13	44.83	16	55.17	29	100.00
Total	74	54.81	61	45.19	135	100.00

As shown in Table 4, of the 135 samples who knew sunflower, 74 samples (54.81 %) accepted that sunflowers could be widely used and 61 samples (45.19 %) did not.

Each province is examined as the following :-

Khon Kaen province Of the 24 samples who were familar with sunflowers, about 10 samples (41.67 %) accepted that sunflowers could be widely used and 14 samples (58.33 %) did not.

Nakhon Ratchasima province Of the 20 samples who were familar with sunflowers, about 19 samples (95.00 %) accepted that sunflowers could be widely used and only a sample (5.00 %) did not.

Kanchanaburi province Of the 22 samples who were familar with sunflowers, about 13 samples (59.09 %) accepted that sunflowers could be widely used and 9 samples (40.91 %) did not.

Ratchaburi province Of the 19 samples who were familar with sunflowers, about 12 samples (63.16 %) accepted that a sunflowers could be widely used and 7 samples (36.84 %) did not.

Prachuap Khiri Khan province Of the 21 samples who were familar with sunflowers, about 7 sampels (33.33 %) accepted that sunflowers could be widely used and 14 samples (66.67 %) did not

Chieng Mai province Of the 29 samples who were familar with sunflowers, about 13 samples (44.83 %) accepted that sunflowers could be widely used and 16 samples (55.17 %) did not.

Table 5

To show whether the **planters knew that their land was** appropriate for growing sunflowers. It means that they must have knowledge of growing techniques, weather that is suitable for growing the plant etc. They can decide and compare whether the plant will be well grown in their areas or not.

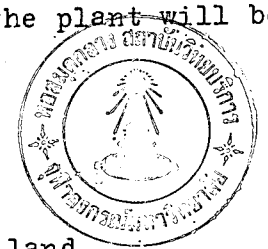


Table 5

Knowledge about the sunflowers : appropriate land

Their land is appropriate for growing sunflowers	Yes		No		Total	
Provinces	amount	%	amount	%	amount	%
Khon Kaen	18	75.00	6	25.00	24	100.00
Nakhon Ratchasima	19	95.00	1	5.00	20	100.00
Kanchanaburi	8	36.36	14	63.64	22	100.00
Ratchaburi	15	78.95	4	21.05	19	100.00
Prachuap Khiri Khan	11	52.38	10	47.62	21	100.00
Chieng Mai	7	24.14	22	75.86	29	100.00
Total	78	57.78	57	42.22	135	100.00

As shown in Table 5, of the 135 samples who were familar with sunflowers, 78 samples (57.78 %) knew that their land was appropriate for growing sunflowers and 57 samples (42.22 %) did not.

Each of the following provinces is now examined :-

Khon Kaen province Of the 24 samples who were familar with sunflowers about 18 samples (75.00 %) knew that their land was appropriate for growing sunflowers and 6 samples (25.00 %) did not

Nakhon Ratchasima province Of the 20 samples who were familar with sunflowers, about 19 samples (95.00%) knew that their land was appropriate for growing sunflowers and only a sample (5.00 %) did not.

Kanchanaburi province Of the 22 samples who were familar with sunflower, about 8 samples (36.36 %) knew that their land was appropriate for growing sunflowers and 14 samples (63.64%) did not.

Ratchaburi province Of the 19 samples who were familar with sunflowers, about 15 samples (78.95 %) knew that their land was appropriate for growing sunflowers and 4 samples(21.05 %) did not.

Prachuap Khiri Khan province Of the 21 samples who were familar with sunflowers, about 11 samples (52.38 %) knew that their land was appropriate for growing sunflowers and 10 samples (47.62 %) did not.

Chieng Mai province Of the 29 samples who were familar with sunflowers, about 7 samples (24.14 %) knew that their land was appropriate for growing sunflowers and 22 samples (75.86 %) did not.

Table 6

To show the degree of interest planters who had never grown sunflowers in growing sunflowers if they receive supports from the government.

Table 6

Interest in sunflowers plantation : planter who had never grown sunflowers

Degree of interest	interested		not sure		not interested		Total	
Provinces	amount	%	amount	%	amount	%	amount	%
Khon Kaen	9	33.33	14	51.85	4	14.81	27	100.00
Nakhon Ratchasima	3	13.04	8	34.78	12	52.17	23	100.00
Kanchanaburi	5	22.73	9	40.91	8	36.36	22	100.00
Ratchaburi	4	18.18	10	45.45	8	36.36	22	100.00
Prachuap Khiri Khan	4	15.38	18	69.23	4	15.39	26	100.00
Chieng Mai	10	33.33	17	56.67	3	10.00	30	100.00
Total	35	23.33	76	50.67	39	26.00	150	100.00

As shown in Table 6, of the 150 samples had never grown sunflowers 35 samples (23.33 %) were interested in growing sunflowers, 76 samples (50.67 %) were not sure and 39 samples (26.00 %) showed no signs of interest.

Each of the following provinces in examined :-

Khon Kaen province Of the 27 samples who had never grown sunflower, about 9 samples (33.33 %) were interested in growing sunflowers, 14 samples (51.85 %) were not sure and 4 samples (14.81%) showed no signs of interest.

Nakhon Ratchasima province Of the 23 samples who had never grown sunflowers, 3 samples (13.04 %) were interested in growing sunflowers, 8 samples (34.78 %) were not sure and 12 samples (52.17%) showed no signs of interest.

Kanchanaburi province Of the 22 samples who had never grown sunflowers, 5 samples (22.73%) were interested in growing sunflowers, 9 samples (40.91 %) were not sure and 8 samples (36.36 %) showed no signs of interest.

Ratchaburi province Of the 22 samples who had never grown sunflowers, 4 samples (18.18 %) were interested in growing sunflowers, 10 samples (45.45 %) were not sure and 8 samples (36.36 %) showed no signs of interest.

Prachuap Khiri Khan province Of the 26 samples who had never grown sunflowers, 4 samples (15.38 %) were interested in growing sunflowers, 18 samples (69.23 %) were not sure and 4 samples (15.39 %) showed no signs of interest.

Chieng Mai province. Of the 30 samples who had never grown sunflowers, 10 samples (33.33 %) were interested in growing sunflowers, 17 samples (56.67 %) were not sure and 3 samples(10.00%) showed no signs of interest.

Conclusion of the analysis

Of the 180 planters who were interviewed 30 samples (16.67%) had previously planted sunflowers and 150 samples (83.33 %) had not. (Table I)

Base on Table I, the planters were classifiedld into two groups.

Group I

Planters who had grown sunflowers

16.67 % of the group as shown in Table I had grown sunflowers. 76.67 % showed no signs of interest, 23.33 % were not sure and none were seriously interested in growing sunflowers, (Table 2) 90.00 % of the group planted sunflowers five years ago.

There was no spectacular sucess in sunflower cultivation because of the many problems which can be devided into two main categories.

1. Problems concerning production.

These resulted from obtaining low yields and uncertain quantities of sunflower seeds. The causes are summerized as follows:-

1.1 The planters used poor techniques in growing and maintaining sunflowers. They are lacked of good irrigation.

1.2 Impure strain of plants. Plant breeding in the way of cross pollination will bring out seeds differing from the parents such as in morphology, size and oil percentage and attachment of seeds.

1.3 They are due to climate changes.

1.4 There were too many thin seeds because of :-

1.4.1 The lack of bees in pollination.

1.4.2 Too little space either in or between each row of sunflowers.

1.4.3 The lack of water while blooming.

2. Problems concerning distribution

2.1 No market demand.

According to these growing problems, there was an inadequate supply of the sunflower seeds.

2.2 The government guaranteed price was to low.

It was 2.15 baht per kilogram. The result is that the profit was not high enough to make the growing of sunflowers worth while.

Group II

Planters who had never grown sunflowers

As shown in Table 1, 83.33 % had never grown sunflowers, 90.00 % of this group knew what sunflowers are and 10.00 % did not (Table 3). Among the planters who were familiar with sunflowers, about 54.81 % accepted that sunflowers could be widely used (Table 4), 57.78 % knew that their land are appropriate to grow sunflowers. (Table 5).

In case of government support, only 23.33 % answered that they were really interested in sunflower cultivation, and 50.67 % were uncertain and 26.00 % were not interested in growing sunflowers at all (Table 6).