

Chapter 4

Evaluation of The Survey & Suggestive Conclusion

In each of the provinces, planters who have grown sunflower are confronted with the two aspects of problems, one concerning agriculture, the other marketing.

1. Agricultural Side of Problem

Resulting in low seed output and unstable quantity, such problems are :-

1.1 Planters still lack the proper growing and maintenance knowledge.

1.2 Sunflower plants do not obtained sufficient amount of water required for growth. This is caused by poor irrigation system.

1.3 Because of hybridization, seeds do not retain their original qualities ; the size, the shape and percentage of oil output. Some plants may bloom early while others may bloom late, some will produce black and white stripes seed, some may produce plain black seed. The impurity may not be visible since the outside appearances are not distinctive from others, but the impurity is contained within the seeds. This problem affects commercial sunflower seed production badly and provoke difficulties in sorting the pures from the impurity.

Besides, there are no sources where seeds are cultivated for commercial purpose, presenting a difficulty for planters to look

for pure seeds for planting. The market price for sunflower seed at that moment was as high as 60-80 baht per kilogram.

1.4 Instability of the weather condition brings damaging effect to the planters. Such problems are prolonged heat and dry weather as occurred in Khon Kaen and Kanchanaburi provinces and off-season rainfall.

1.5 Occurrence of lean seeds in great quantity is due to :-

1.5.1 Lack of pollinated bee, due to the excessive use of insecticide in that compound, or the place is too far from the forest and there are no flowering plants in that vicinity.

1.5.2 If the planting space is too distant, the plants will yield flowers that are too large to accumulate necessary nourishment in the seeds. The flowers will be so small and plentiful that they are incapable of bearing seeds or bearing lean seeds.

1.5.3 Due to improper planting period, changing of seasons lack of irrigation system. Insufficient water during the flowering phase occurred. Although sunflower is wellknown for its durability to arid conditions, there are certain periods in which the plants need a large supply of water. If sunflowers do not have sufficient water during the first month of growing process, the plants will eventually become dwarfish and immature. If the plants lack water during the flowering period, the plants are not able to yield seeds.

1.6 Comparing sunflower seeds to many easy germinated plant

seeds such as soybeans, sunflower seeds are known to be more easily germinated. Still they have to face the problem of viability due to:-

1.6.1 It has been observed that sunflower has a period of dormancy which lasted for 1-2 months. So it is not wise to plant the seeds immediately after harvesting.

1.6.2 Normally the seeds will not lose their ability to germinate within a year unless they are subject to warm and humid conditions.

There are evidences of sunflower seeds that retain their viability up to the period of two years if they are kept in plastic bags and stored in cool dry place.¹

1.6.3 Seeds in storage and in cultivation plots may be eaten by ants and some other insects. To prevent this, seeds should be prepared by mixing the seeds with some insecticide during the storing and cultivation.

1.6.4 Sunflower seeds will not germinate in the soil with low humidity and also needs sufficient water for the germination process.

1.6.5 Seeds that are planted too deep may not be able to obtain enough air and sufficient moisture from the rains and may be unable to push through the soil layers.

¹Narong Chomaharao, "Problems in Sunflower Planting" Sunflower News 1 (August 1972) : 5.

1.6.6 Seeds that contain no nourishment will not germinate at all.



Suggestion

1. Though sunflower is a very easy-to-grow and does not need much attention, proper maintenance will undoubtedly increase the production output. Planters should equip themselves with proper knowledge and understanding of the growing and maintenance techniques which can be gained through experiences of other agricultural party. Agricultural officials and specialists of each province should share the importance of spreading this knowledge by giving advices and consultations to fellow planters.
2. Provincial agricultural deputy should aid in providing the planters with good irrigation system since water is the essential factor in determining plant growth.
3. Impurity in the seeds presents a problem difficult to solve. To the naked eyes, every seed produced by a flower is the same and this misleads the planters to believe that the seeds are pure and suitable to be planted. If the flowers, by any chance, are fertilized by the pollens of the flower of different varieties in the vicinity, the seeds will contain impurity, although their outside appearances still retain their mother features. To solve the problem, the government should give the planter a hand by producing pure seeds or giving this duty to them with proper knowledge.

Researches have been conducted in search for species suitable for planting in Thailand, by experiment planting of different species found in Thailand, such as the Native Species, Native Non Soong Species, Giant Russia Species, Tall Single Species, Saratovskij Species, and Sunfola Species, utilizing the same planting and maintenance techniques. Results showed that the Native Species and Native and Native Non Soong Species are slow in flowering and blossoming than the Saratovskij specie, having the life span of 155 days. Saratovskij specie has a life span of 105 days and Giant Russian and Tall Single species have a life span of 93 days. Researches also conducted the production output of difference species which results are as follows:²

<u>Species</u>	<u>Output</u>
Saratovskij	170 Kg. per rai
Sunfola	154 Kg. per rai
Giant Russia	117.96 Kg. per rai
Tall Single	104 Kg per rai
Native Specie	91.20 kg. per rai
Native Non Soong	87.85 Kg. per rai

It is clearly seen that the Saratovskij and Sunfola species are appropriate to be planted in Thailand, since they yield the highest output per rai and having an estimated life span of 100-200 days.

²Jiraporn Chanjanakijksakul "Study on Certain Characteristic of Six Sunflower Varieties." Journal of Agricultural Science 5 (April, 1978): 412-413. pp.

Saratovskij had been introduced to the planters during the promotion period of 1972-1975 under the name of S.V.1 (ส.ว.1)

4. Appropriate planting period will lead to high quality seeds and high percentage seed output. The weather and other natural conditions vary from place to place, so it is not plausible to state the exact season favourable for planting sunflower. It is the duty of the Provincial Agricultural Deputy to have the planters in his province to know the suitable season in their own province, by giving advices and by doing the experiment planting in various seasons. Field experiment on that region will provide the planters with the opportunity to participate in on-the-spot study by themselves.

There have been researches on the suitable period for planting sunflower, the researches state that the Northeastern Region is more favourable for planting sunflower than the North and Central Region.³

The suitable planting period in the northeastern region fall on the month of August, because at this time, sunflower is able to sustain rain-water for the germination process, and for the two months onward until it starts flowering. Sufficient water should be supply to sunflower during this period, there should not be any rain at all

³Kwanyun Vichpant and Jiraporn Chanjanakijksakul "Study of the Suitable Period for Growing Sunflower." Journal of Agricultural Science 5. (April, 1978) : 233 p.

for the conveniency in the harvesting and drying works. The best month for planting sunflower in the central region is December and the favorable period is from the tail of rainy season (the month of September) to the tail of summer (the month of March).⁴

5. The occurrence of thin seed is a serious problem that causes readily reduction on the production output. The causes of thin seeds are manifold as have already been discussed. The capability to yield seed depends on several factors. The process of fertilization of flowers into seeds will be incomplete if any of these factors are lacking.⁵

5.1 Pollination. Sunflower, as classified into the cross pollinated category, requires insects to help the pollination process. The most important pollinated agent is the bee. By mixing 1-2 cases of bee with sunflower pollens in an area of 625 rais will raise the seeds output by 200-300 Kg.⁶ This natural pollinated method will yield a 62.72 to 82.91 per cent chance of fertilization while for the self-pollinated method, the percentage will fall between 10.10 to 35.07.⁷ Therefore, it is recommended to keep bees or having bees in the neighborhood of sunflower plantation. Presently in Amphoer tabsakae, province of Prachuap Khirikhan, there are bee keeping along with coconut planting, this vicinity is considered very

⁴Ibid

⁵Kwanyun Vichapant "Fertilization Of Sunflower" Sunflower News (October 1973) : 5 p.

⁶Ibid

⁷Ibid P.6.

advantageous for planting sunflower.

5.2 Water. Water is the most important factor necessary for the process of germination, growth, flowering and fertilization. Sunflower will normally grow in the soil with a 70 per-cent humidity of the field capacity. If the soil humidity falls off to 15 per-cent of the field capacity, the growing and other processes will cease to function, especially if this lack of humidity happens during the 20 days before flowering, the period when sunflower is producing the pollens, and 20 days after blooming, the period for fertilization process. Lacks of water during these two periods will produce thin seeds and reduce the seed output by as high as 35 %.⁸ For this reason, sunflower should be given sufficient water from the time of fertilization. Combining this factor with proper planting method and good irrigation system will have good effect on the fertilization of flower into seeds and on the production output. But agriculturist has to spare careful attention on flood and prevent caged-in of water. Sunflowers grown in poor drainage system are easily infested to rotten disease. These plants will wither and die before the seeds are ripe, hence the seeds turn thin.

5.3 Food elements Fundamental food elements for sunflowers are Nitrogen, Phosphorus and Potassium, and certain trace elements such as sulphur, manganese, calcium, copper, zinc, boron and molybdenum.

⁸Ibid

Soils that are abundant in food elements are likely to yield more in quantity and better in quality. Therefore the soil should be supplied with proportional amount of fertilizer. Agricultural officer should keep the responsibility in advising the planters on the matter of fertility of the soil which varies from place to place. During the planting period, the planters should always be observing the structure of the stalks, the flowers and the leaves.

Apart from factors that are important for the fertilization process thin seeds also happens because the distance between plants are too separated, which makes the flowers too big to accumulate necessary nourishment in the seeds. Space between plants should be narrow up. Desirable distance between two planting holes should be about 20-40 cm., depending on the fertility of the soil. Occurrence of many small flowers leads to production of thin seeds. Planters should root up these plants and destroy them when they starts to flower.

In short, the planters could solve the problems on the agricultural side if they have the proper knowledge of planting and maintenance techniques, which practically differ from province to province due to geographical and climate differences. Provincial agricultural deputy, agricultural personnel and specialists should study for the proper growing and maintenance management well-adapted for their own provinces and distribute this knowledge from their research for the planters.

As for the seed variety, there must be analysis and experimental planting to seek the proper seed variety for Thailand.

2. Problems Concerning Marketing

From previous researches, it is obvious that markets for sunflower seeds are very rare and concentrated in a narrow circle of some agricultural party and certain industry. Problems that arise on the marketing aspect are :

2.1 There is no demand of sunflower seed in the market.

Because the problems on agricultural side has greatly decreased seed production, destabilized seeds output and quality, making it insufficient to satisfy the industrial demand that utilizes sunflower seeds as raw material such as the vegetable oil industry which needs 200 tons of sunflower seeds for its daily consumption. Factories are not able to purchase the seeds in quantity necessary for their production capacity.⁹ Consequently the plan to produce vegetable oil from sunflower seeds have to be aborted.

2.2 Problems of Price. **Planters do fell that the**

minimum insured price established by the government on June 5, 1973, which was 2.15 Baht¹⁰ per kilogram, was too low to make a profit from.

⁹Production Department, Viwat Industry Co., Ltd. Interviewed 14 December 1979.

¹⁰Applied Science Research Centre of Thailand, Institute. "Report on Discussion Meeting on the Subject of Sunflower" (June 5, 1973.).

Comparing the cost of production and sales income between tapioca and sunflower seeds in the province of Kanchanaburi, tapioca earns the planters the profit of 72 bahts more per ri, when the production cost are equivalent.

Present Market Condition

Markets for sunflower seeds can be found only in the circle of retailers by selling them in the form of leisure food product, such as water-melon seeds, and in the form of decorative plant seeds, and also as animal feed product which can be found in the provinces of Chiang Mai, Khon Kaen and Kanchanaburi. Selling price for sunflower seeds falls between 20-25 bahts.¹¹

Importation of Sunflower Seeds

The importing figures, obtained from the statistical section of the Custom Department, are shown in the following tables.

¹¹From surveys conducted in several provinces, between October 1979 to February 1980.

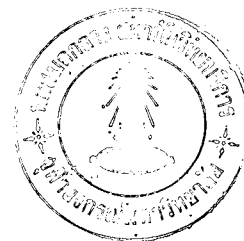


Table 7

Importation of Sunflower Seeds

Producing Country	Jan.-Dec. '77		Jan.-Dec. '78		¹² Jan.-June '79		¹³ Nov. '79	
	quantity Kg.	value baht.	quantity Kg.	value baht.	quantity Kg.	value baht.	quantity Kg.	value baht.
Hong Kong	1,504	12,607	-	-	-	-	-	-
Netherland	-	-	4,000	48,900	3,000	47,980	4,000	45,962
The United Kingdom	-	-	50	1,126	-	-	-	-
Australia	-	-	-	-	3,000	26,201	-	-
Total	1,504	12,607	4,050	50,026	6,000	74,093	4,000	45,963

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¹²No importation during July - October 1979

¹³No importation during December 1979 - April 1980.

Table 7. illustrates instability in the quantity import but it also shows the potentiality to increase in every successive years. In 1977, the quantity imported was only 1,504 Kilograms and it was increased to 4,050 Kilograms in 1978. During January - June 1979, the quantity imported was 6,000 and in the month of November 1979 alone, the imported quantity was 4,000 Kilograms.

It is not known precisely the purpose of the importations, but from previous researches, the researcher, considering the fact that although the imported quantity has increased from year to year but after totaling the amount is still insufficient to serve as raw material for industrial consumption especially the vegetable oil industry, assume that the imported sunflower seed is used for research works, and experimental planting conducted to find the varieties suitable to be planted in Thailand, and it is used also for animal feed (bird, chicken) because of its high protein contents, it is also consumed as leisure food and planted for ornamental plants.

Suggestions.

1. When the planters have followed the guidelines in tackling the problems on the agricultural side successfully, production output will increase and the quality will improve, and the market demand will be adequately satisfy.

2. The Government should assist the Bank of agriculture and agricultural cooperative and some other financial institutions in providing the planters with long-term investment loan to invest in sunflower planting.

3. The minimum insured price set by the government is good for the planters but it should be on a level in which they can make a profit from.

During the initial period of promotion, the government may have to buy the seeds from the planters in a rather high price to help the planters and in setting a confident atmosphere on the market.

From the opinion survey conducted on the planters and provincial agricultural deputies the present price should be fixed, at 6-7 baht per Kilogram where as the quality examination should be included.¹⁴

¹⁴ Researcher is not in the position to suggest a definite price for sunflower seed for there are no any measures taken on the sales and production of sunflower seeds. So there are numerical figures available. The price suggested are obtained by comparing to other agricultural crop estimated from the experiences of planters and some other agriculturally related people. Researcher believe that in order to successfully promoting the production and sales of sunflower seed, government and agricultural organ should pay much attention to the setting up of the selling price for sunflower seed.

The planters should establish an agricultural institution such as cooperative or agricultural party for the purpose of buying sunflower seed from the planter and manage the selling on its own authority. The possibility of setting up of institution of distinctive features will help the planters in raising their bargaining power on the selling.

5. The Government should promote for a more extensive and diverse usages from sunflower seeds, bringing sunflower to public attention, supporting and inducing the investment on industry that utilize sunflower seeds as raw material with the intention to expand the local market.

6. The Government should set the standard for commercial sunflower seeds to avoid any dispute that arise from this line of trading.

Production Promotion

Analysis shows that 76.67 per cent of the planters who have ever planted sunflowers have lost their desire to plant them again. (Table 2) This attributes to the fact that the planters have no confidence in the governmental promotion program, especially the promotion of certain new crop which will always face many problems where in nobody are responsible to assist the planters in tackling these problems. However planters whom have ever grown sunflower

as a crop are very few in number comparing to the planters who have never grown sunflowers. Therefore, if there are any promotions on sunflower seed production again, they can be efficiently carried out by setting the program on any of the province first. If good result is obtained, then the program will proceed to other provinces. So, the problem is to determine the province which will be promoted first.

As for the determination, the order of the provinces to be promoted six provinces that have been under surveillance will be considered and place them in order depending on their degree of interest in planting sunflower as a crop. If the Government resolves to give the promotion (Table 6). This ordering will proceed from No.1 to No.6 order No.1 will be the province which the planters showed their highest rate of interest. Provinces with the planters that have lessened degree are shown in their lower order consequently 2, 3, 4.

Table 8 shows the classification of the six provinces into their order for promotion depending on the interest in planting sunflower as a crop of the planter within each provinces.

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Table 8Provinces ordering due to rate of interest

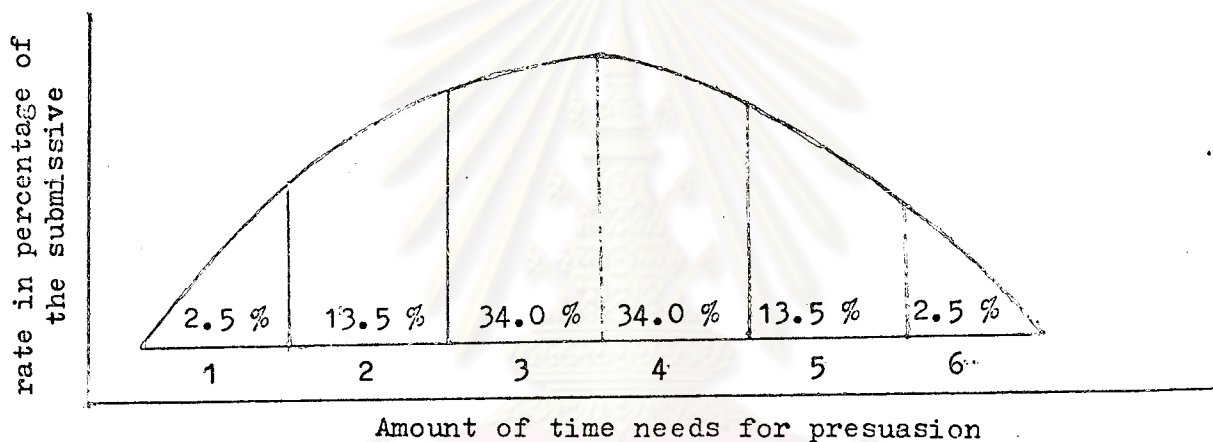
Promotion order	rate of interest	very interested	not sure	not interested
	provinces			
1	Chieng Mai	33.33	56.67	10.00
2	Khon Kaen	33.33	51.85	14.81
3	Kanchanaburi	22.73	40.91	36.36
4	Ratchaburi	18.18	45.45	36.36
5	Prachuap Khiri Khan	15.38	69.23	15.39
6	Nakhon Ratchasima	13.04	34.78	52.17

Table 8 shows that the planters in the provinces of Chieng Mai and Khon Kaen have the highest rate of interest that is 33.33. If there is going to have any promotion on the sunflower seed production, these two provinces should be places into prime order in which Chieng Mai may be taken as the specimen for Northern region. In case that only one province is to selected for promotion in the first place, Chieng Mai is the best choice with lowest rate of the planters who are not interested in planting sunflower, 10.00 per cent. Besides, its environmental conditions are suitable for, many flowering plant, providing the bees for pollination process.

A closed examination at the rate of planters who are

still doubtful show that it is higher than the rate of other two groups, with exception of Nakhon Ratchasima. These are the group of planters who can be induce to sunflower planting if the promotion on some other places proves successful. The principles of promotion draw up by some researchers are shown in the following figure.

Figure 2¹⁵ Illustrates 6 groups of people chosen for production
Production



1. Witty and venturing type
2. Wait and see type
3. Hesitated type
4. Hard-headed type
5. Lazy and unconcern type
6. Useless type

¹⁵Gua Suthivanich "Education of the Agriculturist". Lecture sheet for Vocational Section, Department of Education, University of Agriculture, 1977.

For the first few groups, a promoter needs only some time for persuasion. The time will increase proportionally with the increased order. The first and second group are of the minority that can be persuaded in a short time. These two groups should be chosen for promotion and set up as an example for the latter group. The third and fourth group are of hesitated and changeable nature but after they have witnessed the favourable outcome from the investment of the first two groups they will acquiesce to the persuasion and follow the suggestion in a latter time. The last two groups usually be cancelled from the promotion since they are unworthy and too costly, on the expense and time to put the effort for.

It is noted that the province of Nakhon Ratchasima has the rate of 52.17 % of planters who are not interested in growing sunflower and this is a higher rate than those who are doubtful. It is possible that the planters in the province already have a good income from other eminent occupations, such as raising cattle, cow and poultry, accordingly they have no desire to venture into other lines of profession especially sunflower plantation which is considered a new and risky crop.

Conclusion

Guidelines in Solving Problems That Arise From Sunflower Planting.

1. Agricultural technicians and provincial agricultural officers should take part in distributing the knowledge and advising the planters on proper growing techniques and maintenance management, and provide them with a good irrigation system.

2. The Government should provide the planters with suitable seed varieties in a rather fair price. Officers at various experimental stations that are oriented with the process may be given the duty to produce the seed or this privilege may be given to planters with the proper knowledge. But the individual planters should not be allowed to produce their own seed varieties which will effect on sunflower seed production due to the impurities of the seed varieties that will yield low production output and poor quality seeds.

3. To prevent the problems of thin seed, the plant should be grown on suitable spot, such as place with no utilization of insecticide, or in the vicinity of a forest, or in places that keeps bee. Planters are advised to keep bees within his plantation.

4. The Government should help in investing for the planter, finding sources for long-term investment fund such as Bank of Agriculture, agricultural cooperatives, and some other financial institutions.

5. The Government should establish a minimum insured price on a level the planters could make a profit from.

6. The Government should promote a more expansive and diverse usages from sunflower seeds, increase the demand and expand the market.

7. Standard for sunflower seed should be established.

8. Planters should establish agricultural cooperatives or agricultural parties to raise their bargaining power on the selling.

After a comparison on the rate of interest in growing sunflower as a crop among planters in six provinces, it is found that planters in the province of Chiang Mai have the highest rate, 33.33 per cent, and the rate of those who are not interested are very little. Researchers suggested that in order to promote sunflower seed production, this program must be push with consistent effort in some province first. When the attempt is successful and all previous problems are solved, it will be a favorable example for other provinces to follow. Results from the researches show that Chiang Mai and Khon Kaen are the provinces that should be promoted first.

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