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A Study of the Production and Marketing Potential of Thai Fruit: Papaya

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1. Significance of the Study

Papaya is a local economic crop which is generally grown to make many kinds of food and desserts. About 90% of the total production is for domestic consumption. Growers benefit from growing papaya because it does not require much technology to grow and the cost of cultivation is quite low. Papaya was the second largest source of income from fruit exports in 1983 and 1984 (valued at 82.5 and 68.4 million Baht, respectively). However, the export volume at present shows a sharp decline; thus in 1992 the export of both fresh and canned papaya amounted to only 37.3 million Baht. Research and development is called for in the areas of production and marketing so as to maximize productivity and to minimize problems and obstacles, because there exist good opportunities for Thai papaya in international markets, especially in the food processing industry.

This research discusses such problems and recommends some solutions.

2. The Objectives of the Study

(1) To study the principle techniques for production and marketing of papaya.

(2) To study problems and their causes in the areas of production and marketing of papaya.

(3) To suggest problem-solving techniques in such areas.

3. Advantages of the Study

(1) The study of production and marketing of papaya will help readers to understand the situation which growers, traders and authorities concerned face in growing papaya.

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(2) The study in these areas will provide some problem-solving techniques which the authorities and other people concerned could utilize to improve the production and marketing of papaya.

(3) This study will add to and broaden the scope of existing literature in this field, in addition to providing a guideline for future studies.

4. Methodology

Data collection for this study is based on the following sources:

(1) Primary Data

The researcher observed the production and marketing situation in the growing and trading areas. In addition, informal interviews were conducted with the growers, traders and authorities concerned, to study and confirm data obtained from the secondary sources.

(2) Secondary Data

The researcher studied texts, books, periodicals, documents, research reports and articles written by the government and private sectors. This study, therefore, can be regarded as a combination of documentary research and field study. For this reason it is hoped that the research will contribute some useful information to the field.

5. Scope of the Study

The project limited its study to some aspects of marketing and production potential of papaya as follows:

(a) Production

(1) Planted area, productive area, major production areas and total production

(2) Availability of agricultural technology

(3) Production costs and yield

(4) Production potential

(b) Marketing

(1) Domestic markets and demand

(2) International markets and trends

(3) Marketing channels of distribution

(4) Pricing

(5) Packaging and transportation

(6) Major export countries and competitors

(7) Food processing industry

C) Problems and Recommendations

(1) Problems and recommended solutions in production and marketing

(2) Conclusion

6. Research Findings

Papayas are a tropical crop well-known to the Thai people. They are easily grown in areas which have a deep level of underground water. Papayas blossom all year round. However, they may have fewer flowers if severe cold and drought exist. Papayas can also be classified as "vegetables", since when raw they can be used as a main ingredient in many typical Thai dishes: for instance, "somtum" (papaya salad) and "kaeng som" (papaya in spicy sweet and sour soup).

In former times papayas were naturally grown without much care. Fortunately, papayas can survive because they are quite tolerant to drought. In the past papayas were not a favored fruit to be served on the dining table because of their low price. However, an awareness and interest in consuming papayas has increased among the Thais since the second world war, when the Japanese soldiers, who preferred to consume both raw and ripe papayas, entered Thailand. Later in 1947, more tourists began to visit Thailand and they liked tropical fruits, especially papayas. Since then, this fruit has gained popularity among domestic consumers and accordingly, papayas are widely cultivated throughout the country. Lately, they have been grown commercially. At present both fresh and canned papayas are exported, to the value of millions of Baht per year.

7. Varieties of Papaya

(1) Koko

This type of papaya is popularily grown because it is preferred by consumers. The stems of Koko papaya are strong. The petiole color is dark brown, dark purple or light green. It provides quite a long fruit in various sizes ranging from small to medium. The Koko papaya has smooth skin, a large end and a small headed fruit, and pink or red flesh (edible part of the fruit). The flesh of this type of papaya is sweet, thick and firm. In addition. it tastes good to consumers either ripe or raw.

(2) Khaek Dam

The Khaek Dam papaya is another well-known type of papaya grown and consumed in Thailand. The stems of the Khaek Dam papaya are strong with a light green petiole. Khaek Dam blossoms quickly. The fruit is rather long and small and has almost the same diameter from head to end. The skin is dark green with a sweet and crispy flesh which will turn red when it is ripe.

(3) Champada

The stem of the Champada papaya is strong with light green leaves and petioles. The flowering stage is slower than the Koko and Khaek Dam types. In shape, the fruit is large and long. The flesh of the raw Champada papaya is light green and will turn to yellow when ripe. The flesh is thin and not quite firm.

(4) Sai Nam Pheung

This type of papaya is not widely grown. The stems are quite short. The petioles are green mixed with white and the fruit is longer than that of the Khaek Dam type. The Sai Nam Pheung papaya is big with a small head and large end. There is a vivid line between each lobe of the flesh. Its skin is green. The flesh becomes yellow and orange when it is ripe. It tastes sweet but the flesh is not crispy.

(5) Local Papaya

This sort of papaya is widely grown in all parts of the country. The characteristics of the fruit and stem are not distinguished. The period of flowering and bearing fruit is quite slow compared to other types. The fruit shape is small, rather round and it has thin flesh. When it is ripe, the flesh and fruit will turn yellow. The flesh is rather soft.

(6) Solo Papaya (Brazilian Type)

Solo or Brazilian papaya is a foreign variety which is favored and in great demand by foreign markets. The fruit shape is quite small and somewhat round with an average weight of 0.5 kg. When it is ripe, the flesh will become yellow and orange throughout. The fruit is sweet.

(7) Sunrise Papaya (Hawaiian Type)

Sunrise is a Hawaiian papaya having a small fruit and sweet flesh similar to the Solo papaya, but when it is ripe the flesh will be yellow and red.

(8) Pak Chong Papaya

Pak Chong papaya is a new variety developed by the seed producing and papaya breeding project of the Pak Chong Station, Kasetsart University. This type of papaya bears small to medium sized fruit. The fruit are quite round. Their flesh is thick and not too soft. It provides a sweet-tasting flesh, which turns orange when ripe. This type of papaya suits the demands of overseas markets. The fruit growers can harvest seeds for propagation themselves (Agricultural Extension Department, 1993a: 5-8)

8. Utilization of Papaya

Papaya is an economical crop of which all parts of the fruit can be utilized.

(1) The raw papaya can be used for several local dishes, such as "kaeng som", "somtum", salad, papaya in syrup, sugar-coated papaya, and salted papaya.

(2) The ripe papaya can not only be consumed fresh, providing good nutrition and delicious taste, but it can also be used as raw material in processing industries such as juice manufacture, ketchup, jam, canned papaya, powdered papaya, and candy manufacture. Also, it serves as a fruit to be put in a fruit salad.

(3) Papaya skin is used in producing food coloring and a mixture for animal feed.

(4) Papaya gum (the milky juice) provides a chemical substance called papain, a proteolytic enzyme. Papain is used in brewery, beverage production, pharmacy, butchering, fish sauce, fruit and tanning industries.

(5) Papaya tops and stems can be used to feed animals.

9. Planting

9.1 Planted Areas

Papaya is believed to have originated in tropical areas in North and Central America. The world's main papaya growing countries at present are Brazil, Mexico, Indonesia, India, Sear and the Philippines. Papayas from these areas amount to 76.7% of the world's total product, with the runner-up countries being China, Colombia, Peru and Cuba.

9.2 Favorable Weather Conditions

Papaya can be grown in all parts of Thailand. However, the major growing areas include Amphur Pak Chong in Nakhon Ratchasima, Maha Sarakham, Ratchaburi, Nakhon Pathom, Petchabun, Lop Buri and Chumphon.

9.3 Agricultural Technology

Papaya can be grown in any soil conditions. The best growing areas, however, should have a soil pH at the 6.0-6.5 level. The type of soil suitable for growing papaya is loam or marl (a mixture of lime and clay) enriched with manure. It is very important that the papaya growing site possesses a deep and well-drained top soil. Also, the area should not be flooded.

Although papaya is a tropical crop, it is tolerant of cold. However, severe cold will effect its growth and productivity and will also reduce the sweetness of the fruit. The general climatic conditions in Thailand do not cause any problems in cultivating papaya, as it is not very cold. When a papaya tree is young, it is soft and holds water, having no core as other trees have. Thus, the tree is delicate and easily damaged when strong winds arise. The tree will be stronger when it is 2-3 years old. So, it is necessary for large papaya orchards to have windbreaks built to help the young papayas to survive and to prevent the trees from falling, especially those grown in soft soil. Papaya is a short-lived crop, but it is able to live up to 15 years in its proper environment and it can grow as high as 40 feet (Agricultural Extension Department, 1993a: 1-4).

9.4 Papaya Sex

Papayas can be divided into Monoecious (having either stamen or pistil in each individual flower), and Dioecious (having both stamen and pistil in the same flower). The dioecious papaya has the most potential as it gives more abundant and bigger fruit than the monoecious type. Therefore, it is preferred by growers.

An easy guideline to obtaining dioecious papaya is to select the best dioecious plants which bear large tasty fruit, for fertilization. After selection, the grower will look for flowers which are not open, and cover the flower with a paper bag. After a few days or when the fruit begins to appear, the grower will remove the bag and wait until the fruit fully develops. The seed from these fruit will be taken for propagation. Trees grown from this seed will be mostly of the dioecious type.

9.5 Season for Gathering

Every year from June to October, papaya begins to blossom. After fruiting the growers will then gather the product and send it to papaya purchasing centers in each province.

10. Production

10.1 Planted Area, Productive Area and Production

(1) As illustrated in Table 1, the planted area and production has increased since 1990/91. In 1990/91 the planted area totalled 184,482 rai. The productive area amounted to 127,440 rai. The most productive papaya growing region was the Northeast, with a total of 98,723 rai. In the same year, the total production for the whole country was 408,038 tons, yielding an average of 3,202 kilograms per rai in a year. The average yield is the ratio between total production and total productive area. The farm price per kilogram was 4.16 Baht.

The figures in Table 1 show that the total planted area, total productive area, total production in tons, and farm price in the year 1990/91 were higher than those in 1989/90 and 1988/89.

A possible reason for this increase in papaya growing may be the higher price and better yield.

(2) The statistics presented in Table 2 show that major growing areas for all varieties of papaya in 1990/91 were Chumphon, Maha Sarakham and Nakhon Ratchasima, with 21.97%, 9.37% and 7.34% of the total growing area of the country, respectively. The provinces yielding the most product were Chumphon, Ratchaburi and Maha Sarakham. Considering only Chumphon, the planted area in 1990/91 had a total of 40,525 rai, yielding 128,463 tons of papayas.

(3) As for the varieties of papaya grown in 1990/91, Kaek Dam was the principal, a total of 66,946 rai (36.30% of all varieties grown). In addition, Kaek Dam yielded the highest value, which was approximately 3,990 Baht per rai per year. Its farm price was also the highest, 4.96 Baht per kilogram. Kaek Dam papaya was mostly grown in Chumphon. Koko was ranked the second most common variety grown, with the total planted area being 11,937 rai and giving 17,247 tons of product (Tables 3 and 4).

Table 1: Productive Area, Total Planted Area, Average Yield, Total Production and Farm Price of All Varieties of Papaya Grown (Classified by Regions from 1988/89 to 1990/91)

REGION	PRODUCTIVE AREA (RAI)			TOTAL PLANTED AREA (RAI)			AVERAGE YIELD (KG/RAI/YEAR)			TOTAL PRODUCTION (TON)			FARM PRICE (BAHT/KG)		
	1988/89	1989/90	1990/91	1988/89	1989/90	1990/91	1988/89	1989/90	1990/91	1988/89	1989/90	1990/91	1988/89	1989/90	1990/91
NORTHERN	3,707	5,706	9,298	5,728	10,402	13,971	1,63*	1,609	1,91*	6,046	9,179	17,764	3.39	3.87	4.06
NORTHEASTERN	55,987	49,274	65,668	95,070	84,460	98,723	2,637	2,201	2,550	147,637	108,430	167,461	3.99	4.13	4.71
CENTRAL PLAIN	1,371	2,223	3,373	*,895	3,034	4,519	2,474	3,491	2,236	3,392	7,762	7,543	3.63	4.62	4.71
EASTERN	2,009	4,754	6,927	3,439	6,101	8,547	1,636	1,941	1,744	3,287	9,228	12,083	3.27	4.22	4.15
WESTERN	10,585	8,31*	7,969	12,028	10,807	9,875	3,999	7,075	5,94*	42,328	58,797	47,345	2.69	3.17	2.81
SOUTHERN	3,495	3,064	34,205	3,857	6,798	48,847	3,312	4,275	4,556	*1,575	13,099	155,842	3.33	4.08	3.99
WHOLE KINGDOM	77,154	73,332	127,440	122,017	121,602	184,482	2,777	2,816	3,202	214,265	206,495	408,038	3.49	4.01	4.16

Source : Department of Agricultural Extension

Table 2: Productive Area, Total Planted Area, Average Yield, Total Production and Farm Price of All Varieties of Papayas Grown (Classified by Selected Provinces from 1988/89 to 1990/91)

PROVINCE	PRODUCTIVE AREA (RAI)			TOTAL PLANTED AREA (RAI)			AVERAGE YIELD (KG/RAI/YEAR)			TOTAL PRODUCTION (TON)			FARM PRICE (BAHT/KG)		
	1988/89	1989/90	1990/91	1988/89	1989/90	1990/91	1988/89	1989/90	1990/91	1988/89	1989/90	1990/91	1988/89	1989/90	1990/91
PAYAO	561	709	780	892	1,106	1,200	1,695	1,437	1,314	951	1,019	1,025	4.83	4.50	7.33
LAMPANG	642	1,167	1,486	883	1,486	1,956	2,882	1,293	1,272	1,850	1,535	1,890	3.66	4.50	5.41
SUKHOTHAI	245	213	572	424	1,231	1,441	1,245	1,185	1,886	305	253	1,079	3.50	2.33	4.58
UTTARADIT	86	220	1,148	118	1,179	1,379	3,000	3,504	4,298	264	771	4,934	2.50	4.00	2.75
KALASIN	2,565	2,793	2,793	4,635	4,764	4,764	3,994	3,240	3,240	10,245	9,049	9,049	3.83	4.33	4.16
KHON KAEN	4,127	2,451	2,451	8,575	4,940	4,940	786	786	786	3,224	1,926	1,926	4.50	4.50	4.50
CHAIYAPHUM	2,589	2,382	2,285	3,130	4,198	4,071	3,050	2,500	2,000	7,897	5,955	4,570	2.66	3.12	2.83
NAKHON PHANOM	658	1,561	1,461	1,281	2,197	1,998	2,141	2,101	7,334	1,409	3,280	10,715	4.66	4.66	9.00
NAKHON RATCHASIMA	9,319	10,528	8,205	13,970	15,510	13,545	2,314	2,250	2,293	21,564	23,684	18,818	4.33	5.33	6.16
BURI RUM	1,339	1,580	1,602	2,251	2,669	2,682	2,212	2,260	2,247	2,962	3,571	3,599	2.95	3.25	3.75
MAHA SARAKHAM	14,750	4,434	10,557	27,150	11,446	17,325	3,500	2,737	2,504	51,625	12,138	26,437	1.50	3.41	3.08
YASOTHON	673	1,038	2,448	954	2,802	3,097	2,500	2,428	2,448	1,683	2,520	5,993	4.00	4.00	4.50
ROI ET	3,694	5,132	2,264	5,143	7,196	3,222	2,729	2,469	1,637	10,082	12,669	3,706	4.50	5.16	5.00
LOEI	1,672	1,798	3,004	3,002	3,117	4,597	3,586	2,230	2,841	5,997	4,010	8,534	1.00	2.50	2.33
SI SA KET	2,602	2,060	10,816	5,686	5,385	11,981	3,016	3,177	3,139	7,847	6,545	33,951	3.33	3.58	4.41
SAKON NAKHON	3,320	3,310	3,757	6,249	5,705	6,207	360	360	2,509	1,194	1,190	9,426	4.33	4.33	4.33
SURIN	1,460	1,483	1,818	2,428	2,095	2,781	1,746	1,756	1,971	2,549	2,604	3,583	2.75	3.00	5.00
NONG KHAT	582	604	1,089	971	1,146	1,797	3,977	5,990	5,951	2,315	3,618	6,481	10.16	6.66	5.50
UDON THANI	4,077	4,951	7,670	5,466	6,236	10,624	2,600	1,751	1,700	10,600	8,670	13,038	4.00	3.33	3.25
UBON RATCHATHANI	2,132	2,578	2,687	3,389	4,061	4,156	2,529	2,211	2,219	5,392	5,701	5,962	3.41	3.66	6.33
SARA BURI	0	220	1,525	0	274	1,985	0	6,719	1,250	0	1,478	1,907	0.00	4.00	4.16
CHANTHA BURI	1,326	2,306	4,160	2,306	2,306	4,160	1,200	1,300	1,300	1,591	2,998	5,408	5.00	3.50	3.00
CHON BURI	235	1,193	1,011	595	1,915	1,374	3,330	1,063	1,100	783	1,268	1,112	1.00	7.25	5.33

Table 2 (Continued)

PROVINCE	PRODUCTIVE AREA (RAI)			TOTAL PLANTED AREA (RAI)			AVERAGE YIELD (KG/RAI/YEAR)			TOTAL PRODUCTION (TON)			FARM PRICE (BAHT/KG)		
	1988/89	1989/90	1990/91	1988/89	1989/90	1990/91	1988/89	1989/90	1990/91	1988/89	1989/90	1990/91	1988/89	1989/90	1990/91
PRACHIN BURI	395	642	1,147	474	1,178	2,086	2,120	2,063	1,705	838	1,325	1,956	3.00	3.25	4.33
KHANCHANABURI	872	1,064	1,215	1,037	1,354	1,215	3,236	7,303	7,480	2,822	7,771	9,088	3.12	3.37	3.12
PHETCHABURI	359	508	972	737	1,037	1,426	3,907	4,690	4,465	1,403	2,382	4,340	1.25	1.75	2.63
RATCHABURI	7,127	4,713	3,726	7,859	5,609	4,657	4,716	9,404	7,586	33,609	44,322	28,265	4.50	2.58	2.65
KRABI	0	59	325	0	99	1,037	0	250	1,017	0	15	330	0.00	5.16	4.33
CHUMPHON	2,951	1,180	28,387	2,951	3,074	40,525	3,500	5,182	4,525	10,329	6,115	128,463	1.07	4.00	2.10
SURAT THANI	97	617	2,914	97	1,647	3,584	4,000	6,059	7,186	388	3,738	20,940	8.50	3.00	2.83

Source : Department of Agricultural Extension

Table 3: Productive Area, Total Planted Area, Average Yield, Total Production and Farm Price for Khaek Dam Papaya (Classified by Regions from 1988/89 to 1990/91)

PROVINCE	PRODUCTIVE AREA (RAI)			TOTAL PLANTED AREA (RAI)			AVERAGE YIELD (KG/RAI/YEAR)			TOTAL PRODUCTION (TON)			FARM PRICE (BAHT/KG)		
	1988/89	1989/90	1990/91	1988/89	1989/90	1990/91	1988/89	1989/90	1990/91	1988/89	1989/90	1990/91	1988/89	1989/90	1990/91
NORTHERN	713	1,202	2,234	1,194	2,957	4,238	1,436	1,540	1,934	1,024	1,851	4,320	4.30	4.80	5.03
NORTHEASTERN	4,124	8,084	9,858	6,483	15,266	15,383	2,085	2,253	2,493	8,600	18,212	24,574	4.60	4.50	5.20
CENTRAL PLAIN	957	1,241	1,339	1,328	1,697	1,742	2,570	2,840	2,818	2,459	3,524	3,773	4.75	5.71	6.00
EASTERN	368	743	1,322	674	1,340	2,085	2,478	1,684	1,815	912	1,251	2,400	3.55	5.66	5.00
WESTERN	1,560	1,682	1,987	1,830	2,710	2,690	2,749	3,565	4,292	4,288	5,997	8,527	3.00	3.57	3.21
SOUTHERN	3,196	1,858	27,635	3,246	4,973	40,808	3,423	5,008	4,829	10,939	9,304	133,460	3.97	4.86	4.90
WHOLE KINGDOM	**10,918**	**14,810**	**44,375**	**14,755**	**28,943**	**66,946**	**2,585**	**2,710**	**3,990**	**28,223**	**40,140**	**177,055**	**4.14**	**4.80**	**4.96**

Source : Department of Agricultural Extension

Table 4: Productive Area, Total Planted Area, Average Yield, Total Production and Farm Price for Koko Papaya (Classified by Regions from 1988/89 to 1990/91)

REGION	PRODUCTIVE AREA (RAI)			TOTAL PLANTED AREA (RAI)			AVERAGE YIELD (KG/RAI/YEAR)			TOTAL PRODUCTION (TON)			FARM PRICE (BAHT/KG)		
	1988/89	1989/90	1990/91	1988/89	1989/90	1990/91	1988/89	1989/90	1990/91	1988/89	1989/90	1990/91	1988/89	1989/90	1990/91
NORTHERN	420	610	957	628	956	1,675	1,287	1,538	1,518	540	938	1,543	3.88	4.66	5.16
NORTHEASTERN	1,992	3,107	4,125	3,245	7,299	7,274	1,913	2,268	2,625	3,810	7,047	10,829	4.70	4.37	5.34
CENTRAL PLAIN	74	145	181	44	228	275	2,657	2,759	2,722	37	400	493	3.50	5.25	5.62
EASTERN	60	191	325	132	388	532	2,457	2,453	2,355	147	469	765	3.93	5.33	4.50
WESTERN	214	323	455	328	527	678	3,255	4,012	2,654	696	1,286	1,208	2.85	3.30	2.96
SOUTHERN	91	346	846	317	532	1,501	2,621	2,998	2,955	239	1,037	2,500	4.00	4.63	5.03
WHOLE KINGDOM	2,791	4,722	6,889	4,694	9,930	11,937	1,960	2,369	2,504	5,470	11,187	17,247	3.97	4.55	4.90

Source : Department of Agricultural Extension

"Green Papaya" refers to all varieties of raw papaya sold for cooking such as for somtum. The green papaya was grown on 95,484 rai.

10.2 Cost of Production and Profit

In 1988, papaya growers spent approximately 3,078.33 Baht per rai on their investment. As the figures for "total cost of production" (Table 5) show, variable cost was marked at 2,688.46 Baht, fixed cost was recorded at 389.87 Baht. The variable cost includes pesticides, fertilizers, seeds for propagation and wages etc.

Talking the case of the planting year 1988, for example, farmers sold their product to traders, when the papaya reached the blossoming stage, at 3.49 Baht per kilogram and the average production per rai equaled 2,785 kilograms. The following costs and profit can be estimated.

The total revenue per rai	2,785x3.49	=	9,719.65	Baht
The average cost per rai		=	3,078.33	Baht
The estimated profit per rai after deduction of cost		=	6,641.32	Baht

This profit per rai was a rather high incentive for growers (Office of Agricultural Economics, 1993: 24).

11. Marketing

This section describes characteristics of the marketing channels of distribution, pricing, MIS, packaging and international markets.

11.1 Papaya Markets

The markets for papaya can be grouped as follows: (Agriculture Department and Agricultural Extension Department, 1992: 337-338)

(1) Local Markets

a. Local Wholesale Market

The volume of trade of papaya at local market level is considered very small when compared to the total product in the whole year and the large volume in each seasonal year. The growers normally sell the total farm product to wholesalers. The wholesalers will then deal with other marketing functions.

Table 5: Cost of Production for Papaya Grown in the Central Region with Average per Rai (as of 1988) (Unit: Baht)

Cost	Cash	Non-Cash	Total
I. Variable Cost			
1. Labor Cost			
1. Planting and Land Improvement	364.09	319.38	683.47
2. Maintenance	228.83	388.20	617.03
3. Harvesting	191.69	120.91	312.60
2. Materials Cost			
1. Plants	107.65	-	107.65
2. Fertilizer	370.99	-	370.99
3. Weed Control and Pesticide	183.01	-	183.01
4. Gas and Lubricants	115.60	-	115.60
5. Supporting Stakes and Miscellaneous Materials	7.49	-	7.49
3. Other Varible Costs			
1. Machine Maintenance	2.57	-	2.57
2. Opportunity Cost	-	288.05	288.05
Total Variable Cost	1,571.92	1,116.54	2,688.46

Table 5 (Continued)

Cost	Cash	Non-Cash	Total
II. Fixed Cost			
1. Land Taxes	1.08	-	1.08
2. Land Use or Rent	192.77	64.32	257.09
3. Machine Depreciation	-	95.48	95.48
4. Opportunity Cost	-	36.22	36.22
Total Fixed Cost	193.85	196.02	389.87
Total Cost per Rai	1,765.77	1,312.56	3,078.33
Production Cost per Kg	0.63	0.47	1.10
Production per Rai (Kgs)	2,785.00		

Source: Office of Agricultural Economics

b. Local Provincial Papaya Wholesale Center

The center is the main recipient of the total product for a province.

c. Local Retail Market

Local retailers are retailers for the particular province.

(2) Central Markets in Bangkok

Central markets in Bangkok are the fruit markets at Mahanak and Pak Klong Talad. The traders at the markets buy papaya from middlemen who purchase directly from the growers by weight or whole orchard sales. The intermediaries may be traders from Bangkok, since these live quite near to the growing areas in the central region.

(3) International Markets

The papaya exporters buy and collect the product from central markets in Bangkok, then pack and export to foreign markets in Asia and Europe.

11.2 Marketing Channels of Distribution

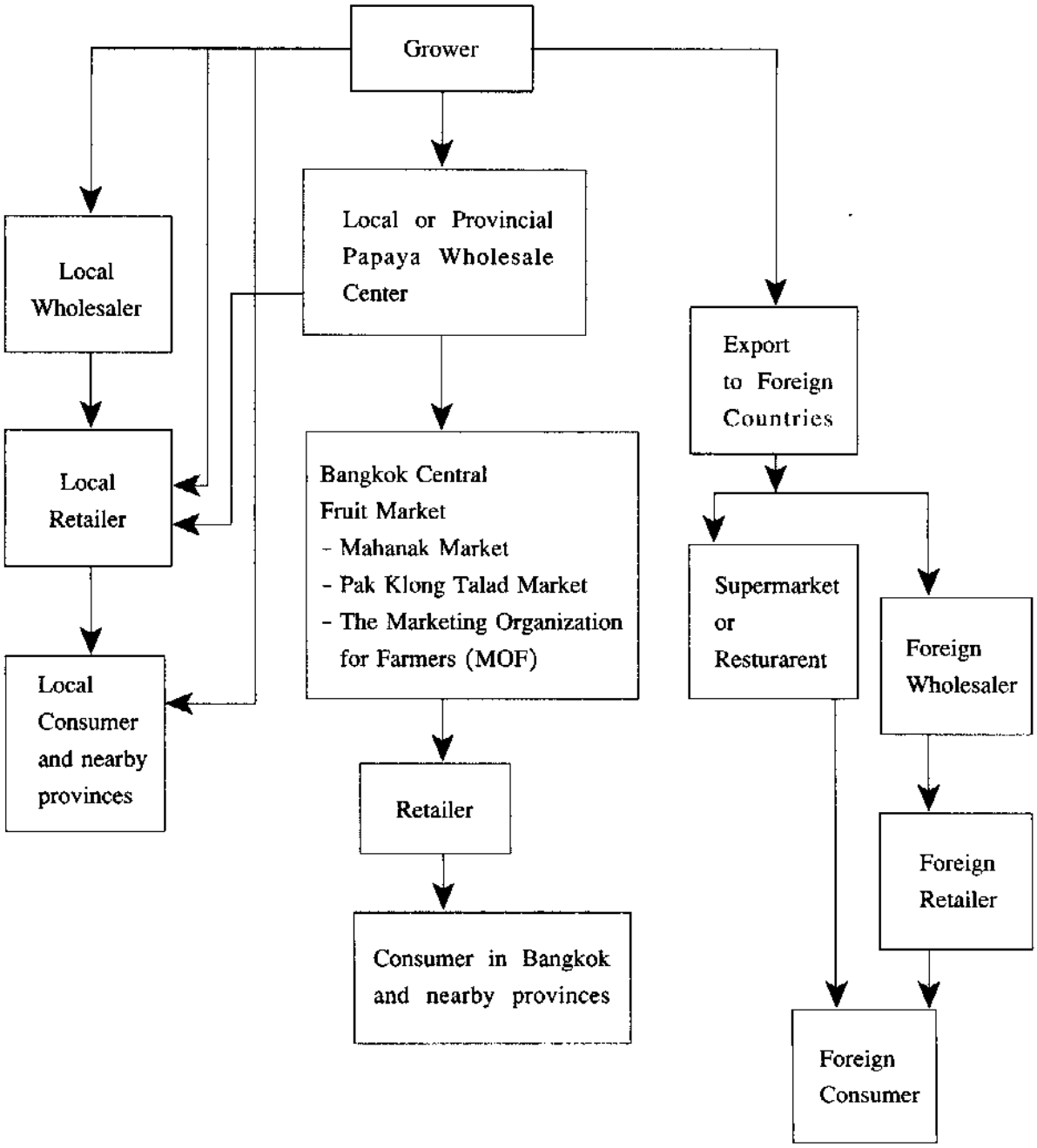
Most papaya grown in the main growing areas in the central region will be sent to the Northeastern markets, for which the local production is insufficient, due to the unfavorable weather conditions and the great demand for consumption in somtum. Ninety percent of all the country's yield of papaya is for local consumption and the remaining ten percent is for export.

The middlemen who purchase papaya directly from growers will purchase the fruit by weight, or sale of the total orchard product (Illustration A), so as to sell to retailers and consumers in that province or nearby provinces.

Every year from June to October growers will gather papaya and send them to the provincial wholesale center or purchasing center in each province. Fifteen percent of all the total provincial production in the purchasing center is consumed in the province while the other 85% is sold to central markets in Bangkok, e.g. Mahanak Market, The Marketing Organization for Farmers (MOF) and Pak Klong Talad.

Exporters buy papaya from the growers or retailers in the central markets in Bangkok. They will then send the fruit to supermarkets and restaurants overseas so as to sell them to consumers there. Some exporters sell papayas to overseas wholesalers who will again sell the fruit to their retailers. The methods of selling to exporters or ultimate consumers may be by weight or by number of fruit.

Illustration A: Papaya Marketing Channels of Distribution



Source: Business Economics Department

11.3 International Market or Export Market

Papaya are all-season fruit suitable for export. Most exporters of papaya are also vegetable and other fruit exporters. They will export papaya together with vegetables and other fruit. These exporters buy papaya from local traders or intermediaries. Most of them are small exporters (working in small family businesses) and will export papaya in addition to sale to domestic consumers.

The Thai government has stipulated an export promotional policy to curb the country's sharply rising trade deficit, with fruit export being a new, crucial source of income. The policy has actually been implemented since 1980. Papaya has been one of the main fruits for export, bringing in millions of Baht income in foreign currency.

Fresh papaya export has fluctuated. In 1978, the export of papaya was 4,511 tons, valued at 10.67 million Baht. In 1982 and 1983, the export volumes were 12,444 and 16,393 tons valued at 68.5 and 82.5 million baht respectively. The volume fell to 4,178 tons, valued at 24.9 million Baht, in 1987 (see Tables 6 and 7). The export volume in 1985 was 5,814 tons, valued at 36.7 million Baht. However, with the sharp drop noted in 1991, it amounted to 89.2 tons, valued at 0.93 million Baht; and the export volume amounted to only 74.7 tons, valued at 1.46 million Baht, in 1992 (Customs Department, 1992).

The reduction was due to the unsatisfactory quality of the papaya, the high cost of air freight and the strong competition with other exporters.

Up until 1991, the biggest importer of papaya from Thailand had been Hong Kong, taking 90% of the total export. The remaining 10% of the volume was exported to other Asian and European countries. The prominent competitors in the Hong Kong market are China, Taiwan and Japan. In winter they export Chinese pears, apples and persimmons to Hong Kong and thus Hong Kong will reduce its export orders of papaya from Thailand. As for Europe, Thailand has to compete with the leading papaya exporters of South America, namely, Brazil and Uruguay. Though the papaya from those countries is tasteless compared to that from Thailand, the price is cheaper. In 1991 the three countries that imported most papaya from Thailand were Hong Kong, Sri Lanka, and Austria. In 1992, Sri Lanka, Germany, and Malaysia were ranked first,

Table 6: Quantity and Value of Papaya Exports Classsified by Countries

(As of 1985-1992)

Quantitiy : **Kilograms**
Value : **Baht**
Source : **Data Collected from Customs Department**

Export / Countries	1985		1986		1987		1988		1989		1990		1991		1992	
	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
1. Hong Kong	5,328,793	32,942,118	3,986,093	22,156,491	3,974,804	22,192,972	4,024,674	24,132,692	1,141,766	7,428,241	238,293	2,049,919	71,939	634,886	1,104	7,140
2. Netherlands	180	1,440	1,835	15,095	1,691	11,570	4,873	48,506	27,773	421,072	1,190	13,195	4	21	1,247	53,270
3. Malaysia	14,880	75,514	800	7,934	-	-	52,440	600,141	38,220	345,589	100	22,577	-	-	5,000	111,421
4. Japan	115	3,019	1,530	6,120	32	320	779	35,246	6,006	157,349	100	7,567	-	-	-	-
5. UK	2557	63,567	10	100	662	7,849	-	-	709	11,320	45	794	-	-	-	-
6. Singapore	128,415	869,265	33,837	193,716	19,670	61,915	2,515	21,259	9,063	49,392	2,592	12,960	-	-	2,250	58,836
7. Canada	80	7,145	534	7,608	587	3,465	-	-	3,101	24,230	590	8,796	-	-	-	-
8. Brunei	3,000	16,500	2,997	16,600	11,094	60,641	2,856	28,560	1,064	21,280	100	1,558	-	-	-	-
9. USA	4,539	136,942	5,991	197,388	6,675	224,446	-	-	2,145	13,860	737	24,093	-	-	-	-
10. Switzerland	3,880	28,724	228	2,301	1,481	18,515	32	119	361	14,867	1,610	30,159	370	20,760	394	33,684
11. Saudi Arabia	222,799	1,307,214	92,325	746,203	105,089	1,069,574	7,565	66,699	236	2,160	-	-	-	-	-	-
12. United Arab Emirates	1,208	17,748	2,558	31,849	-	-	472	3,781	841	10,272	391	3,997	-	-	-	-
13. Austria	-	-	-	-	-	-	-	-	-	-	-	-	220	4,806	-	-
14. Germany	-	-	-	-	-	-	-	-	-	-	-	-	2,226	91,700	5,100	367,217
15. South Korea	-	-	-	-	-	-	-	-	-	-	-	-	60	2,060	-	-
16. Sri Lanka	-	-	-	-	-	-	-	-	-	-	225	900	14,398	181,140	56,276	813,318
17. Taiwan	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2,041	10,205
18. Other Countries	104,423	1,312,572	48,585	971,851	56,550	1,331,443	25,407	417,207	3,780	97,188	933	19,338	-	-	2,588	66,719
Total	5,814,869	36,776,771	4,177,320	24,353,256	4,176,437	24,922,719	4,131,813	25,354,210	1,235,065	8,596,580	246,896	2,196,055	89,228	936,731	74,750	1,464,974

Table 7: Quantity and Value of Papaya Exports Classified by Countries (from 1980 to 1984)

Quantitiy : Kilograms
Value : Baht

Country	1980		1981		1982		1983		1984	
	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
1. Hong Kong	5,309,000	15,510,000	9,521,000	34,612,000	12,224,000	66,856,000	15,241,000	75,436,000	11,429,000	60,200,000
2. Netherlands	-	-	-	-	-	-	-	-	5,000	60,000
3. Malaysia	3,000	16,000	6,000	25,000	2,000	8,000	78,000	411,000	-	-
4. UK	-	-	-	-	-	-	-	-	2,000	50,000
5. Singapore	4,000	53,000	17,000	166,000	178,000	1,244,000	850,000	4,729,000	754,000	3,800,000
6. Canada	-	-	-	-	-	-	-	-	1,000	20,000
7. Brunei	-	-	-	-	-	-	-	-	1,000	20,000
8. USA	-	-	-	-	-	-	-		7,000	70,000
9. Saudi Arabia	-	-	2,000	19,000	11,000	119,000	68,000	569,000	-	-
10. France	2,000	25,000	7,000	62,000	18,000	141,000	105,000	817,000	122,000	1,200,000
Others	14,000	158,000	22,000	277,000	11,000	131,000	51,000	494,000	269,000	2,980,000
Total	**5,332,000**	**15,762,000**	**9,575,000**	**35,161,000**	**12,444,000**	**68,499,000**	**16,393,000**	**82,456,000**	**12,590,000**	**68,400,000**

Source : Customs Department

second and third respectively for countries importing papaya from Thailand. The values were 0.81, 0.36, 0.11 million Baht, respectively (Tables 6 and 7).

Thailand exports both raw and ripe papaya. The favored varieties of papaya for export are Khaek Dam, Khaek Nuan, Sai Nam Phueng and local varieties. The average size and weight per fruit is 0.5-2 kg. The export to Europe and USA will be via air freight with packaging in paper boxes, while the export to Asian countries will be through sea freight with packaging in wicker baskets holding 25-30 kg per basket.

(a) The Demand of International Markets for Fresh Papaya

(1) European consumers prefer the Khaek Dam papaya weighing about 500-800 grams per fruit. (A 500 gm papaya to be eaten by one person, is the most preferred size for European consumers.)

(2) Asian consumers demand the Khaek Dam and Koko papaya, with a weight of about 0.5-2 kg. The Hong Kong markets, specifically, prefer papayas with a weight of 1.5-2 kilograms per fruit. This size is suitable for one person.

The domestic demand, however, is for long papayas, with a weight of only 1-2 kg.

(b) The Demand of International Markets for Canned Papaya

The trend for canned papaya has shown an immense increase within the last decade. In 1983, the volume was 133 tons, valued at 2.5 million Baht, while the volume went up to 2.701 tons, valued at 57.4 million Baht, in 1991. In 1992, the total volume was 1,710 tons, valued at 35.9 million Baht. The principal trader was Japan, with a volume of trade of 315 tons, valued at 9.450 million Baht. The second most important trader comprized mainly European countries, namely, France. The Netherlands, Italy, Germany, The USA and Switzerland (Tables 8,9).

Table 8: Quantity and Value of Canned Papaya Exports Classified by Country (from 1985 to 1992)

Quantity: Kilograms Value: Baht

Source : Data from Customs Department

Export / Countries	1985		1986		1987		1988		1989		1990		1991		1992	
	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
1. Austria	-	-	-	-	-	-	6,630	154,580	2,040	51,620	-	-	-	-	-	
2. Australia	15,300	297,841	272	5,200	-	-	20,167	389,334	3,585	67,310	-	-	-	-	-	-
3. Belgium	6,378	140,729	15,241	304,250	-	-	17,403	297,655	16,354	340,737	52,170	1,029,394	51,638	994,421	20,237	439,608
4. Canada	-	-	54,767	1,053,541	-	-	19,609	455,679	11,116	271,441	48,694	1,045,175	57,941	1,206,115	31,500	733,088
5. Switzerland	271	5,617	-	-	-	-	18,474	371,991	18,367	365,990	36,278	738,520	18,000	356,420	74,258	1,513,816
6. Germany	-	-	2,712	43,116	-	-	36,592	5,369	93,264	1,500,559	57,124	1,224,082	141,964	4,229,773	84,381	1,822,832
7. Denmark	-	-	-	-	-	-	678	13,152	675	13,556	-	-	-	-	-	-
8. Spain	-	-	15,637	292,815	-	-	66,986	1,285,478	39,691	984,934	-	-	-	-	-	-
9. Finland	4,082	111,825	13,252	354,081	-	-	1,356	30,890	13,806	336,811	-	-	-	-	-	-
10. France	17,690	315,345	106,592	1,787,405	-	-	132,791	2,523,715	236,950	4,419,462	96,011	2,091,814	452,784	9,945,691	418,673	8,260,131
11. UK	960	24,596	33,670	709,978	-	-	62,991	1,287,264	66,097	1,311,301	67,122	1,414,511	23,782	512,353	18,025	360,344
12. Hong Kong	81	1,514	-	-	-	-	13,569	272,599	8,492	158,331	-	-	-	-	-	-
13. Italy	-	-	1,360	25,047	-	-	24,056	430,275	21,250	395,380	462,920	8,806,246	804,182	14,880,361	245,495	4,353,047
14. Japan	62,823	1,381,667	11,071	236,621	-	-	118,774	2,219,941	70,383	1,409,709	147,747	4,106,745	183,935	5,129,848	315,127	9,450,695
15. Netherlands	4,068	79,140	11,457	173,138	32,821	657,327	64,948	1,265,567	23,248	454,501	78,492	1,662,930	343,260	8,574,906	246,843	4,569,501
16. Norway	18	1,404	-	-	1,475	30,962	5,492	160,097	136	1,934	-	-	-	-	-	-
17. New Zealand	680	12,573	510	10,599	883	20,793	8,158	158,984	8,339	166,667	-	-	-	-	-	-
18. Portugal	-	-	-	-	-	-	1,275	26,764	17,628	330,655	-	-	-	-	-	-
19. Sweden	-	-	-	-	-	-	4,524	84,125	339	6,125	20,464	497,363	94,249	2,302,332	21,785	484,839
20. USA	1,220	26,583	2,085	31,335	3,978	79,396	53,535	984,564	33,410	581,226	116,587	2,334,218	94,448	1,910,783	118,492	1,557,954
21. Turkey	-	-	-	-	-	-	2,034	46,335	-	-	-	-	-	-	-	-
22. Puerto Rico	-	-	-	-	-	-	1,530	26,260	-	-	-	-	-	-	-	-
23. South Korea	-	-	-	-	18,768	291,252	37,536	583,541	-	-	-	-	-	-	-	-
24. Taiwan	-	-	-	-	-	-	16	233	-	-	-	-	-	-	-	-
25. Others	271	7,705	678	14,312	358,440	6,902,878	2,712	743,010	30,091	408,949	160,409	3,231,917	435,552	9,250,142	115,311	2,336,579
Total	113,892	2,406,546	268,314	5,041,438	416,365	7,982,608	721,835	13,817,400	715,261	13,878,192	1,344,018	28,183,345	2,701,735	57,393,145	1,710,127	35,982,632

Table 9: Total Quantity and Value of Canned Papaya Exports (from 1983 to 1984)

Year	Quantity (Tons)	Value (Million Baht)
1983	133	2.5
1984	282	5.8

Source: Customs Department.

11.4 Packaging

The purposes of packaging are:

(1) For sale to domestic consumers.

Papayas are packed in a paper box perforated with small holes. The box contains 2.5, 5.6 up to 12 kg of papayas. Transport will be via truck. During transport from the farm, the papayas will be placed one on top of one another, with newspaper inserted between the fruit.

(2) For export to overseas markets.

The packing will be in plastic baskets, wooden boxes, or wicker baskets. For Asian markets, the package sizes are 10, 20, 30, and 40 kg. For European markets the packages will range from 5 to 10 and 15 kg.

The Science and Technology Research Institute of Thailand has now designed a special paper box to pack papaya to be transported via air freight. Seven to nine 1.2 to 1.5 kg papayas can be packed in such a box. Before packing the fruit will be wrapped with a foam net or soft paper. The net weight for each box is not to exceed 12 kg. In addition, boxes of the same size have also been designed for transporting papaya via sea freight. However, the boxes are thicker and more costly than those for transport by air.

11.5 Pricing.

The price of papaya depends on the season and the volume produced. At the beginning of the year, the price is high. During mid-year the price drops, and it will increase towards the end of the year. The price will also depend on the demand from the markets. The domestic price is set by the growers and traders using the price at the central market in Bangkok Metropolis as a criterion for bargaining. The export price is dependant on quality, size, quantity, variety of papaya, transport cost, weight, and packaging. From Table 10, considering farm price, wholesale price, and retail price, the retail price in 1991-1993 tended to increase and it was double the wholesale price. In 1983, the retail price was close to the wholesale price. At present retailers, or intermediaries, gain more profit from the difference between the wholesale and retail price than the growers, e.g. in 1991 the growers only earned 4.96 Baht/kg, while the wholesale price was 7.12 Baht/kg and the retail price was 14.46 Baht/kg

(Tables 10 to 12). If considering solely the retail price for the whole year, in 1992 January was the month with the highest price. The price than dropped from April to June and increased again after September (Table 12).

11.6 Marketing Information System (MIS)

Traders use their own experience as a source of market information in addition to asking information from other traders. The growers obtain market information from other growers and traders.

Table 10: Farm, Wholesale and Retail Price for All Varieties of Papaya (from 1982 to 1993)

Year	Farm Price	Wholesale Price	Retail Price
1993	-	Khaek Dam 8.70	13.53
1992	-	Khaek Dam 8.31	13.50
1991	Khaek Dam 4.96 Koko 4.90	Khaek Dam 7.12	14.46
1990	Khaek Dam 4.80 Koko 4.55	Khaek Dam 12.40	-
1989	Khaek Dam 4.14 Koko 3.97	Khaek Dam 9.02	11.02
		Koko 6.41	
1988	3.49	Khaek Dam 5.85	8.27
1987	6.21	7.93	9.84
1986	-	Khaek Dam 7.68	9.59
1985	-	5.11	7.50
1984	4.79	6.25	9.94
1983	4.15	6.79	8.04
1982	3.34	-	-

Source : Internal Trade Department, Office of Agricultural Economics, and interviews conducted with farmers and traders for confirmation.

Note : 1) The figures shown without a statement of variety of papaya are to be taken as an average for all varieties.

2) Items shown with no figures indicate that there was no survey for that particular item.

Table 11: Bangkok Wholesale Price for Khaek Dam Papaya Classified by Months (from 1986 to 1993)

MONTH	AVERAGE WHOLESALE PRICE (BAHT/KG)							
	1986	1987	1988	1989	1990	1991	1992	1993
JAN	6.50	-	9.50	5.64	12.00	-	7.50	7.50
FEB	6.50	-	6.26	7.00	14.00	-	7.50	8.70
MAR	6.50	-	4.50	7.00	9.38	-	7.50	9.00
APR	6.50	-	4.89	7.00	8.25	-	7.50	9.00
MAY	7.70	-	6.00	7.00	11.38	-	7.50	9.00
JUN	8.50	-	6.00	8.55	12.00	-	7.50	9.00
JUL	8.50	-	5.50	11.00	15.62	6.39	8.36	-
AUG	8.50	-	5.50	11.00	14.25	-	8.80	-
SEP	8.50	-	5.50	11.00	18.75	7.00	9.50	-
OCT	8.50	-	5.50	11.00	15.25	7.23	9.50	-
NOV	8.50	-	5.50	11.00	9.75	7.50	9.50	-
DEC	7.40	-	5.50	11.00	8.12	7.50	9.02	-
AVERAGE	7.68	-	5.85	9.02	12.40	7.12	8.31	8.70

Source: Internal Trade Department

Table 12: Bangkok Retail Price for Khaek Dam Papaya Classified by Months (from 1985 to 1993)

MONTH	AVERAGE RETAIL PRICE (UNIT : BAHT/KG)								
	1985	1986	1987	1988	1989	1990	1991	1992	1993
JAN	7.50	7.50	8.50	12.50	7.64	-	-	14.00	14.00
FEB	7.50	7.50	8.50	8.60	9.00	-	-	11.00	14.00
MAR	7.50	7.50	8.23	6.50	9.00	-	-	11.00	14.00
APR	7.50	7.50	7.50	7.16	9.00	-	-	11.00	14.00
MAY	750	9.60	7.50	9.00	9.00	-	-	11.00	12.66
JUN	7.50	11.00	7.50	9.00	10.55	-	-	11.00	12.50
JUL	7.50	11.00	7.50	9.00	13.00	-	-	13.14	-
AUG	7.50	11.00	7.50	7.50	13.00	-	-	14.40	-
SEP	7.50	11.00	12.27	7.50	13.00	-	-	16.50	-
OCT	7.50	11.00	14.05	7.50	13.00	-	15.39	16.50	-
NOV	7.50	11.00	14.50	7.50	13.00	-	14.00	16.50	-
DEC	7.50	9.50	14.50	7.50	13.00	-	14.00	15.90	-
AVERAGE	7.50	9.59	9.84	8.27	11.02	-	14.46	13.50	-

Source: Internal Trade Department

12. PROBLEMS AND RECOMMENDATIONS

The climatic and soil fertility conditions as well as the steady increase in demand for processed papaya by foreign markets are favorable factors which have boosted the expansion of papaya growing in Thailand. However, the export of papaya faces several constraints and obstacles as follows.

(1) Problems of papaya quality failing to satisfy the foreign market demand.

The overseas markets require small sweet papayas weighing approximately 0.5 kg. The fruit must have yellowish and thick flesh with little empty space within the fruit and it should be possible to maintain the quality during transport. Thai papayas are however large and weigh about 1.5-2 kg. The flesh is red and easily deteriorates during transport. This may result from a lack of adequate hygienic control before packing, allowing bacteria to develop and damage the fruit while it is being transported.

Recommendations:

(1) Growers should find for cultivation superior quality papayas which bear a smaller size of fruit, weighing about 0.5 kg, having yellowish flesh and thicker and tougher skin. Kasetsart University has developed the Pak Chong variety, which weighs about 0.6 kg, but it has not been so popular among growers and domestic consumers.

(2) The authorities concerned should set guidelines for standardized practice before and after harvesting of papaya. These guidelines should include the selection of fruit size and packaging system.

(2) Problems of future bulk production of papaya oversupplying the market.

As there has been a quick expansion in papaya growing for export, and as climatic conditions are favorable, the output is steadily increasing. This may cause problems to growers who are not well prepared for a situation where production results in oversupply.

Recommendations:

(1) The government should determine a policy to seek new markets abroad to expand opportunities for papaya export. Up until 1991, Hong Kong was the only major foreign market for Thailand's papaya crop. At present Thailand still depends on just this one market. Thus a distribution of international markets is necessary to reduce

the risk of losing the large market in Hong Kong. Interesting markets for Thai papaya that should be opened and promoted include Japan, the USA, Europe, Sri Lanka, Singapore and Malaysia.

(2) More processing industries should be set up to accept the huge output of the papaya farms. Examples of such industries are papaya powder, canned papaya and papain for export to other countries. The export prospects for wine made from papaya are still bright, as there is less competition abroad. At present Kenya is the greatest producer of papaya wine and is quite successful in this business.

(3) Problems relating to transport

The quality of papaya easily deteriorates during many hours of transport. A limit exists to sending papaya to remote markets in that they have to be shipped by airfreight, requiring a high investment cost on the part of exporters. The price, inclusive of transport, then cannot compete with that from closer growing areas. The shipment of papaya by sea freight is possible only to nearby markets. In addition, the quality of packaging is inferior to international standards.

Recommendations:

There should be research projects conducted in the field of papaya quality control, in order to prolong freshness and quality, such as by irradiation of fruit. With such newly developed techniques, papaya can take more time over transport and thus can be shipped by sea freight, enabling exporters to lower their cost. Moreover cheap but durable packages should be developed, so as to minimize handling costs in order to compete with other exporters overseas.

(4) Problems of lack of international marketing information.

Growers and exporters do not effectively handle business in the international market because they lack effective information for estimating market demands: for instance, when and where papaya is required and what quality as well as volume each market requires. In addition, they need to learn about consumer behavior in overseas markets.

Recommendations:

Research projects are urgently required, to be launched in cooperation by both the government and private sectors, to pinpoint the demands of foreign

markets, as to quantity, quality, price and varieties of papaya, and the characteristics of business (marketing and competition) in the importing countries.

(5) Problems of pesticide residues in papaya.

Fumigation of fruit exported is strictly required by some international markets, especially Japan and the USA, before allowing the fruit to pass. Papaya is among the fruits facing this requirement.

Many plant diseases can destroy papaya. Farmers, therefore use chemical substances to protect the fruit. Incorrect use of such a substance causes chemical residues to be left on the fruit. Plant diseases and pesticide residues are the major reasons cited by international markets when fruit is rejected.

Recommendations:

(1) Growers should be aware of the proper techniques for eradicating pests and diseases and use chemical pesticides at a non-hazardous level.

(2) Authorities should keep papaya growers informed of the most practical techniques to prolong the fruit quality after harvesting in addition to enforcing inspection and control, to standardize the quality of papaya exported, and issue a certificate of quality guarantee for fruit passing the quality control process.

(3) Authorities should produce vaccines to protect papaya from crop diseases and distribute them to the farmers. The Kampaengsan campus of Kasetsart University has developed a vaccine to prevent crop disease caused by virus but it is not widely known.

13. Conclusion

Thailand can produce a high yield from papaya farming since the climatic conditions are favorable to the growing of papaya. Papayas are easily grown, having less problems of pests, insects and diseases than other crops. In addition the investment for papaya cultivation is less than for other crops. All these factors help boost the expansion of papaya farms.

Papaya was once one of the main fruits to be exported, bringing much foreign exchange to the country. It helped reduce the trade deficit and helped support domestic employment. But the trend from 1989 onwards shows a steady reduction in the volume of papaya exported. This alarming trend was due to certain constraints in the field of

cultivation and also a lack of knowledge of marketing. It is, therefore, hoped that these problems will be adequately solved, so as to restore the situation in 1983, when Thailand exported quite a large volume of papaya, valued at 82.5 million Baht; and brighten the prospects for papaya export in the future, especially for the processed fruit industry.

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