

Pomelo Production and Market Pattern of the Pomelo Quality Development Group, Samut Songkram Province, Thailand

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ABSTRACT

Pomelo is high potential crop to increase income and alleviate poverty for Thai farmers; especially, in Samut Songkram Province which faces the climate change problem. The higher temperature effects local lychee orchard has no yield; therefore, farmer likely changes lychee area to pomelo area increasingly. This research aimed to explore production and market pattern of pomelo farmer namely "Pomelo Quality Development Group, Samut Songkram Province". The quantitative and qualitative research methods were used in this research. Research questionnaire data were collected from all of the group members. The findings revealed that all farmers planted in raised beds pattern with average spacing 5.02 X 5.83 meters, planted pomelo variety namely Khoa Yai with average pomelo farm size 7.15 rais (1.15 hectares). The majority (85.37 %) planted pomelo as the main crop, propagated by themselves (90.24%), watered by springer (53.66%). They applied fertilizer and integrated pest management following the Good Agricultural Practice (GAP) recommendation. The cost of pomelo production was 12,496.97 baht / rai. In the year 2554, they got an average yield 1,020.63 kg. / rai, an averaged farm price was 22.30 baht / kg., therefore, the average income was 22,760.03 baht / rai, and the net production return was 10,263.06 baht / rai. In terms of market pattern, this farmer group divided to 2 channels which were foreign market, China exporting approximately 30% and domestic market approximately 70%. Moreover, this research developed the participatory website for the farmer group in order to promote trade opportunity and public relation. The audience satisfaction towards the website was high level (= 3.56)

Keywords: Pomelo production; Market pattern; Pomelo quality;

1. Introduction

Climate change in the present causes the increasing temperature, resulting in the agricultural production system. As a result, local lychee orchard in Samut Songkram, province in the western part of Thailand, had no yield; therefore, farmer likely changed lychee area to pomelo area increasingly. Pomelo is an interesting crop to study a production and market system. It is high potential crop to increase income and alleviate poverty for Thai farmers. Thai pomelo export trends to increase because of good taste and keep ability up to 1 month while the quality remains the same or has better taste including it is not easy bruise during long-distance transportation. Pomelo "Khao Yai (large white)

variety" is very famous in Samut Songkram Province. It was promoted to commercial product for domestic and export. Planting area of pomelo in Samut Songkram Province were 15,000 rais (2,400 hectares), concerning with 3,828 farmer families. 16 quality pomelo improvement groups were established, consisting of 723 members. Up to now, they have formed a group of quality pomelo for export, consisting of 41 members, namely "the Pomelo Quality Development Group, Samut Songkram Province (PQDG)". This group is one of the pioneers to produce pomelos safe from toxins under Good Agricultural Practice (GAP) standards with the concept of sufficiency economy philosophy. The group members have tried to integrate their local wisdoms with

the knowledge of the researchers to reduce the cost of production, as well as to reserve nature and the environment. Therefore, the study on pomelo production and market pattern in order to improve food safety, sustainability, innovation, logistics and supply chain efficiency in all orchard activities of this group, would benefit for farmers. It will lead to operating performance of business. Production and market analysis plays a key role in reducing expenditures for businesses and supporting the movement of many transactions. It is an important aspect of facilitating the farmer group to produce and sell quality pomelo and move to premium good level for getting the higher price. Therefore, the study on production pattern including the cost and benefits as well as market pattern will significant benefits to improve pomelo farmer in Samut Songkram Province.

2. Objectives

The main objectives of this research were

- 1).to study the pomelo production pattern and analyze the pomelo production cost and benefits of PQDG;
- 2) to study the pomelo market pattern and develop the participatory website for the PQDG in order to promote trade opportunity and public relation.

3. Methods

The quantitative and qualitative research method were used in this research design.

Quantitative Research : The questionnaire data both pomelo production and market pattern were collected from all (41) of the PQDG members in three districts: Bang Khonthi, Amphawa and Muang district in Samut Songkram Province during the year 2554.

Qualitative Research : This research used participatory action research to create the farmer group website. The research conducted meetings for the research team which consisted of 2 academic persons, 1 extension officer and 30 farmers participated in planning, collecting data and pictures from the secondary data sources, decision-making and sorting the data to determine the web diagram of the card (Storyboard) and web design, developing PQDG website, implementing of trade opportunity promotion and public relation as well as monitoring

and evaluation the website. Moreover, this research evaluated farmer knowledge of basic website development by pretest and posttest design, including evaluated the customer's satisfaction of research website from 385 samples.

4. Results

4.1 Profile of respondents

The results showed that farmer characteristics were 51.22 percent being female, 54.24 years of age, 3.90 persons in family with 2.00 of them worked for pomelo activities. The average permanent hire worker was 0.07 person and temporary hire worker was 0.85 person. All of them were Buddhist. 85.37 percent grew pomelo as the main occupation, while 14.63 percent grew as a secondary profession. Their experiences in pomelo cultivation were 17.90 years. The average holding pomelo own land was 7.05 rais (1.13 hectares), and majority of them (85.37 %) were owned their land, while 7.77 percent were tenants and rented average land to grow pomelo 8.08 rais (1.29 hectares), including paying land rent at the farm 3,391 baht/rai/year.

48.78 percent had got knowledge to grow pomelo by self-development together with extension officers and group members. 95.12 percent had been trained to grow pomelo and 53.85 percent had been trained from government and private sectors. Beside the PQDG membership, 36.59 percent of the group were also addition being member of other groups. 82.93 percent used their own funds to grow pomelo. They used the average funds 49,048.78 baht/year/household

4.2 Pomelo production pattern

All farmers planted in raised beds pattern with average spacing 5.02 X 5.83 meters, planted pomelo variety namely Khoa Yai with average farm size 7.15 rais (1.15 hectares). 80.49 percent checked the integrity quality of pomelo grafts before planting. The majority (85.37 %) planted pomelo as the main crop, 90.24 percent propagated by themselves, 53.66 percent watered by springer, 68.29 percent dredged the raceway in the garden, 95.12 percent pruned the pomelo branches and 65.85 percent cut grass and plied up the pomelo base, 43.90 percent braced pomelo fruits and 51.22 percent trimmed the flowers and fruits. All applied fertilizer and the majority (82.93 %) used both organic and chemical fertilizers. The majority (65.85 %) weeded manually, only 2.44 percent applied chemical herbicides. 41.46

percent used chemical pesticides for pomelo pest protection, 17.07 percent eliminated pests by using biological substances and 12.20 percent used both biological and chemical pesticides (Table 4.1). However, the results revealed that they managed pomelo production pattern following the Good Agricultural Practice (GAP) recommendation. The study found that some pomelo growers (24.39%) faced severe problem of labor shortage.

In terms of cost and return analysis, the results showed that the cost of production was 12,496.97 baht/rai, consisting of agricultural

materials 3,389.97 baht/rai (including the costs of fertilizer 1,816.25 baht, electricity and fuel 1,405.42 baht, herbicides 1.31 baht, pesticides 158.97 baht, crutch equipment 4.43 baht, trimming flowers and fruits equipment 3.59 bath), hired labor 2,263.32 baht/rai, their own labor 6,843.68 baht/rai. In the year 2554, they got an average yield 1,020.63 kg./rai, an averaged farm price was 22.30 baht/kg., therefore, the average income was 22,760.03 baht/rai, and the net return of farmer production was 10,263.06 baht/rai (Table 4.2).

Table 4. 1 Pomelo production and market pattern.

(N = 41)

Item	Number	Percent
Planting area		
Raised beds pattern	41	100.00
Pomelo variety		
Khoa Yai	41	100.00
Integrity verification		
Do not check	8	19.51
Check	33	80.49
Pomelo occupation		
Main crop	35	85.37
Secondary crop	6	14.63
Varieties supply		
Propagated by themselves	37	90.24
From others	4	9.76
The water system		
Spray water boat	2	4.88
springer	22	53.66
Tube	14	34.15
Shovel with dipper	3	7.32
Area management*		
Dredging raceway	28	68.29
Pruning	39	95.12
Cutting grass and heaping the pomelo base	27	65.85
Fruit bracing		
Don't	23	56.10
Do	18	43.90
Flowers and fruits trimming		
Don't	20	48.78
Do	21	51.22
Fertilizer application		
Organic fertilizer	6	14.63
Chemical fertilizer	1	2.44
Both organic and chemical fertilizer	34	82.93
Item	Number	Percent

Weed control		
Don't	13	31.71
Manual labor	27	65.85
Herbicides	1	2.44
Pest control		
Don't	9	21.95
Chemical pesticides	17	41.46
Biological substances	7	17.07
Both biological and chemical pesticides	5	12.20
Chemical pesticides and Manual control	2	4.88
Biological and chemical pesticides together with manual control	1	2.44
Selling place		
Selling products at farm gate	9	21.95
Sending products to the market	32	78.05
Product transportation		
4 wheels	35	85.37
Others	6	14.63
Way of increasing revenue*		
Buying cheap agricultural materials	25	60.98
Reducing transportation expense	11	26.83
Increasing pomelo price	13	31.71
Reducing the cost of production	29	70.73
Delaying the selling time	17	41.46
Others	6	14.63

* Answer more than one

Table 4.2 Pomelo cost and return in the year 2554.

Item	Number
1. Agricultural materials (Baht/rai)	3,389.97
1.1 Fertilizer	1,816.25
1.1.1 Organic fertilizer	1,005.54
1.1.2 Chemical fertilizer	810.71
1.2 Electricity and fuel	1,405.42
1.3 Herbicides	1.31
1.4 Pesticides	158.97
1.5 Crutch equipment	4.43
1.6 Trimming flowers and fruits equipment	3.59
2. Hired labor	2,263.32
3. Their own labor	6,843.68
Total cost (Baht/rai)	12,496.97
Yield/rai (Kg./rai)	1,020.63
Farm price (Baht/Kg.)	22.30
Income (Baht/rai)	22,760.03
Net return (Baht/rai)	10,263.06

4.3 Pomelo market pattern

In terms of market pattern, this farmer group divided to 2 channels which were foreign market,

China exporting approximately 30% and domestic market approximately 70% such as local market, central market, super market and modern trade.

The majority (78.05 %) sold their products at farm gates, only 21.95 percent brought their products to the markets. Most of them (85.37 %) used the four wheels for transportation. The majority (70.73%) opined the way to increase revenue that they attempted to reduce the cost of operations and tried to buy cheap agricultural materials.

Moreover, this research developed the participatory website for the farmer group in order to promote trade opportunity and public relation. The results revealed that participatory website: www.Pomelo-samutsongkram.com. had quality

standard with 0.85 IOC scores. The quality content was evaluated by their representative group members with 0.90 IOC scores while the quality design was evaluated by the experts with 0.80 IOC scores. (Table 4.3). In terms of learning process, the result found that the group member participatory performed in planning, data collecting, implementing, monitoring and evaluation. These processes increased their knowledge of basic website development. It showed that after training and participating in research activities, they got higher score (13.96) than before training scores (5.59) at the 0.05 statistical significance. (Table 4.4). The audiences' satisfaction towards the website was high level (\bar{x} = 3.56) (Table 4.5).

Table 4.3 The overall of Index of congruence (IOC) of website : www.Pomelo-Samutsongkram.com

Item	IOC	Meaning
Content		
1. Content of Homepage	1	Suitable
2. Content of Webpage About us	1	Suitable
3. Content of Webpage Member	0.85	Suitable
4. Content of Webpage Product	0.75	Suitable
5. Content of Webpage Contact us	1	Suitable
6. Content of Webpage Web link	0.83	Suitable
Mean	0.90	Suitable
Design		
1. Homepage	0.80	Suitable
2. Webpage	0.80	Suitable
Mean	0.80	Suitable
Grand mean	0.85	Suitable

Table 4.4 Comparison of farmer knowledge evaluation between pretest and posttest

Training	n	\bar{X}	S.D.	t-test	Sig.
Before	30	5.59	3.44	14.12	0.0021*
After	30	13.96	1.73		

* at the 0.05 significant level.

Table 4.5 The customer satisfaction of website: www.Pomelo-Samutsongkram.com

Item	Customer and Audiences' s satisfactions (n =385)		
	\bar{X}	S.D	Meaning
1. Content	3.52	0.74	High
2. Design-Characters	3.57	0.76	High
3. Design-Picture	3.57	0.81	High
4. Design-Color	3.59	0.81	High
5. Data access and search	3.53	0.86	High
6. Design of presentation	3.54	0.86	High
7. Consisting of benefit and utilization	3.58	0.82	High
Grand mean	3.56	0.80	High

5. Conclusions

The major findings from this research are summarized below.

1. The pomelo production pattern of PQDG of all members planted in raised beds pattern with average spacing 5.02 X 5.83 meter, planted pomelo variety namely Khoa Yai with average pomelo farm size 7.15 rais (1.15 hectares). The majority of them planted pomelo as the main crop, propagated by themselves, watered by springer. They applied fertilizers and integrated pest management following the Good Agricultural Practice (GAP) recommendation. The cost of pomelo production was 12,496.97 baht/rai, they got an average yield 1,020.63 kg./ rai, an averaged farm price was 22.30 baht/kg., therefore, the average income was 22,760.03 baht / rai, and the net return of farmer production was 10,263.06 baht/rai.

2. The pomelo market pattern of PQDG divided to two channels which were foreign market, China exporting approximately 30%, and domestic market approximately 70%. The participatory website for the farmer group was developed in order to enhanced farmer learning process of basic website knowledge, as well as to promote trade opportunity and public relation. The audience satisfaction towards the website was high level ($\bar{X}=3.56$)

6. Discussion

Most farmers (85.37%) planted pomelo as the main source of earnings under their own land. These reasons indicated that they had self-motivation to willingly improve their occupation continuously. In addition, most farmers (95.12%) had been trained in pomelo courses, this reflected that the members of PQDG had enthusiasm to increase and develop the pomelo business with each other. Most members had the opportunity to enhance

their knowledge and experience. This implied the good relationship within the group and with related agencies, and supporting the operations of the group. The group tried to improve productivity and quality, taste and food safety. They attempted to use biological pesticide up to 39.27 percent, although the use of chemical pesticides in pomelo had long been known for a long time. In addition, in cases of chemical application, they had awareness of the food safety. The results were consistent with the fact that the PQDG had passed the certification standards of Good Agriculture Practices (GAP).

One of the strengths of this group was the raised beds pattern farming, having water ditches for allowing moisture in the soil. It could reduce water shortage problem, caused the PQDG to be high potential for sustainable production level. However, the results showed that some farmers faced severe problem of labor. It had been noted to be careful and prepare for the problem of labor shortage in the future. Pomelo producers trend to be an increasing aging society owing to the average age of pomelo growers of the study was 54.24 years. The consensus issue of National Statistics Office (2555) noted that the new generation of the population age group during 15-24 years (adolescents) in the last two decades likely reduced to work in agricultural sector almost three times , from 35.3 percent in the year 2530 to 12.1 percent in 2554

7. Recommendations

PQDG should strengthen the processes involved with continuous activities related to the pomelo production and increase the traceability system of the group members. The packaging design should be developed for product attraction and added value of the product through training and participatory processes. PQDG should focus on the fair trade system under the world competitiveness. In addition, PQDG and relevant sectors should find the

means to enhance the group's product quality or raise to premium level such as registration of the geographical indication (GI) protection. This will entrust the product quality to customers. GI as a tool to create competitive opportunities of the community products for greater market penetration.

PQDG and relevant sectors should encourage new generation to involve in the pomelo family business, encourage them to love and inherit the career of their ancestors for sustainability of local pomelo production.

PQDG should utilize the website of the farmer group to benefit the group business operations, and should update the information in this website continually in the future. Finally, they should provide training courses for young members to enhance their computer, internet and website development skills.

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