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Developing and Expanding the Networks of Peanut Seed Producers of Department of Agriculture Thailand

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ABSTRACT: Developing and expanding the networks of peanut seed producers of the Department of Agriculture. The objective is to develop and expand a network of seed producers ppeanut varieties are sold with quality appropriate to the local conditions farmers can produce peanut seeds and store the seeds for their own use be sold to farmers in need in nearby areas there is an increase in peanut seeds for use within the country and selecting farmers who produce peanuts in important production areas of Thailand, including Lopburi province Lampang province and Khon Kaen province by transfer the technology for producing peanut certified seed or extension seed is choosing a planting area, planting, disease and insects, roguing, seed conditioning, harvest and seed quality. Farmers produce peanut seeds under the guidance of the Department of Agriculture with monitoring and solve problems to develop farmers to be able to produce quality peanut seeds and developed into a network of peanut seed producers of the Department of Agriculture. In 2022, there were 15 network farmers able to produce of seed yield 8,406 kg. Seed quality, Moisture 5.3%, Germination 78.7% and Purity 97.3%. In 2023, there were 30 additional network farmers able to produce of seed yield 15,478 kg. Seed quality, Moisture 6.7, Germination 79.1% and Purity 96.3% which complies with peanut seed quality standards certified seed or extension seed.

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KEYWORDS: Peanut seed, seed production, network

INTRODUCTION

Peanuts are a food crop that is important to Thai people and the country's economy. It is a raw material in the food processing industry processed products and it is a plant that is used at every step of the food chain. helps promote food security within the country. (Kriangsak, 2015) but the situation of peanut production and utilization is still unstable this is due to the shortage of good quality varieties and seeds suitable for cultivation. (Agriculture Research Development Agency, 2016) Thailand has a domestic demand for peanuts of 113,498 tons, but can produce only 25,074 tons, resulting in the import of peanuts from abroad as high as 89,387 tons, valued at more than 2,003 million baht (Wichay, 2023) And there is a demand for good quality peanut seeds, up to 5,741 tons. Peanut seed production is produced only by government agencies, the Department of Agriculture. Other government agencies such as the Department of Agricultural Extension, Cooperative Promotion Department and network groups which can produce only 155 tons of seeds (Seed Research and Development Division, 2021) and is not sufficient to meet the needs of farmers throughout the country therefore, in order to solve the problem of insufficient peanuts to meet demand therefore, peanut farmers must be developed to be able to produce seeds for their own use and have easy access to seed production sources research project to develop and expand seed producer networks peanuts of the Department of Agriculture the objective is to develop farmers and expand the network of peanut seed producers to sell to have quality that is suitable for the area including having more good seeds to use and sufficient to meet the needs of farmers by transferring the technology for producing and certified seed or extension seed from the process of selecting planting areas, planting, maintaining, and preventing and eliminating diseases and insects inspection of mixed breeds harvest improving seed condition and seed quality inspection for farmers in Lopburi, Lampang, and Khon Kaen provinces which is an important source of peanut cultivation in the country to be able to produce peanut seeds for their

own use and sold to farmers in nearby areas this will reduce seed production costs by at least 10% and have more varieties of peanut seeds available for circulation in the peanut growing system. In 2023, there will be varieties of peanut seeds for sale an increase of at least 11.25 tons, supporting an area of 90 hectare of peanut cultivation and producing peanuts for consumption and the industrial sector increased by at least 126 tons, resulting in increased income for farmers. Reduce production costs the community is strong have a good quality of life and have a stable and sustainable career.

AIMS AND OBJECTIVES

1. To develop and expand the network of peanut seed certified seed or extension seed to have quality appropriate to the area conditions

2. So that farmers can produce premium peanut seed certified seed or extension seed save the seeds for your own use and can be sold to farmers in need in nearby areas and there was at least a 20 % increase in peanut seeds for domestic use.

3. To transfer the technology of producing peanut seed certified seed or extension seed by the Department of Agriculture to farmers so that they can establish a career.

Specific Objective of the study:

To develop peanut farmers into peanut seed producers and create a sustainable network there are enough peanut seeds to meet the needs of Thailand.

Study location

- Farmer's farm, Mueang Lopburi District Lopburi Province Thailand
- Farmer's farm, Serm Ngam District Lampang Province Thailand
- Farmer's farm, Nam Phong District Khon Kaen Province Thailand

METHODOLOGY

Developing and Expanding the Networks of Peanut Seed Producers of Department of Agriculture Operated from 2022-2023. In 2022, a group of peanut farmers will be selected. In the areas of Lopburi, Lampang and Khon Kaen provinces, 15 cases by interviewing target farmers. Regarding the experience of growing peanuts farmers' intentions and the readiness of machinery and tools for producing thousands of seeds For example, a drying area and a machine to separate good and bad seeds including asking for economic and social information. problems and obstacles in growing peanuts in order to make decisions about selecting the target group of farmers to produce premium peanut seeds for sale to be a network of peanut seed producers of the Department of Agriculture along with explaining the details of the purpose of the work and transfer of peanut seed production technology including choosing a planting area, planting, maintaining and preventing and eliminating disease and insects inspection of mixed breeds harvest improving seed condition and seed quality inspection for farmers participating in the project As well as supporting production factors such as expanded varieties of peanut seeds, chemical fertilizers 46-0-0, 18-46-0 and 0-0-60, rhizobium biofertilizers and chemicals to prevent disease and insects the farmers produce peanut seeds under the guidance of the Department of Agriculture as well as inspecting and resolving problems and obstacles in seed production once the seeds are received, farmers will randomly inspect the quality of the peanut seeds for sale, including moisture, germination, and purity quality standards certified seed or extension seed. In 2023, select peanut farmers. In the areas of Lopburi, Lampang, Khon Kaen, an additional 30 people will be added, along with transferring peanut seed production technology. as well as monitoring, giving advice, solving problems obstacles and receiving cooperation from farmers in the 2022 seed producer network and Department of Agriculture officials in transferring knowledge as well as inspecting, giving advice, solving problems and obstacles.

Data recording

1. Production of fresh peanut seed pods and yield of dried peanut seed pods after improving conditions
2. Information on seed quality including moisture, germination, and purity.
3. Information on production costs, income, net income, return on investment
4. Information on storing seeds for personal use and Stock seed

Data analysis

Data were analyzed using descriptive statistics.

EXPERIMENTAL RESULTS

In 2022, select a group of peanut farmers. Lopburi, Lampang, and Khon Kaen provinces, totaling 15 to develop into a network of peanut seed producers by transferring the peanut seed production technology of the Department of Agriculture to network farmers as a result, all 15 farmers were able to produce peanut seeds with peanut seed quality standards certified seed or extension seed for 8,406 kg. of seeds as follows.

Farmer group, peanut seed producer network Nikhom Sangtoneng Subdistrict, Mueang District, Lopburi province, 5 cases, 0.32 hectare, total area 1.60 hectare, growing Khon Kaen 6 peanut variety, which is a variety that is in demand in the area can produce seeds with a yield of 6,822 kilograms of fresh peanut pods or 4,264 kg./ha. Seed conditioning yield of dry seed pods was 3,406 kilograms or 2,129 kg./ha. (Table 1) In terms of seed quality, moisture 5.2%, germination 76%, and purity 97% (Table 2) with peanut seed quality standards certified seed or extension seed moisture (maximum) 9 %, germination (minimum) 70% and purity (minimum) 96% (Seed Research and Development Division, 2022) seed products are sold to peanut farmers in Ban Mo District Saraburi Province, Thailand to be used for planting in the next season of 3,406 kilograms (Table 3) when analyzing the economic returns it has an average net cost 53,775 baht/ha, income 85,150 baht/ha, net income 31,375 baht/ha, average return to investment ratio (Benefit Cost – Ratio: BCR) 1.6 which is worth the investment. (Table 4)

Farmer group, peanut seed producer network Serm Sai Subdistrict Serm Ngam District, Lampang Province, 5 cases, 0.32 hectare, total area 1.60 hectare, growing Tainan 9 peanut variety, which is a variety that is in demand in the area able to produce seeds the yield of fresh peanut pods was 4,044 kilograms or 2,528 kg./ha when the seed condition was improved seed yield of dry seed pods was 2,362 kilograms or 1,476 kg./ha (Table 1) In terms of seed quality, moisture 5.6%, germination 81% and purity 97% (Table 2) which meets the quality standards certified seed or extension seed. Seed products are sold to peanut farmers in Serm Ngam District, Lampang province, Thailand to be used for planting in the next season of 2,362 kilograms (Table 3) when analyzing the economic returns it has an average net cost 40,375 baht/ha, income 59,050 baht/ha, net income 18,675 baht/ha, average return to investment ratio (Benefit Cost – Ratio: BCR) 1.5 which is worth the investment. (Table 4)

Farmer group, peanut seed producer network Sai Mun Subdistrict, Nam Phong District, Khon Kaen province, 5 farmers, 0.32 hectare, total area 1.60 hectare, grows Khon Kaen 9 peanut variety, which is a variety that is in demand in the area able to produce seeds, the yield of fresh peanut pods was 4,806 kilograms or 3,038 kg./ha when the seed condition was improved, the yield of dry seed pods was 2,638 kilograms or 1,649 kg./ha.(Table 1) In terms of seed quality, moisture 5.1%, germination 79%, and purity 98% (Table 2) seed products are sold to peanut farmers in Nam Phong District Khon Kaen province, Thailand to be used for planting in the next season of 2,638 kilograms (Table 3) when analyzing the economic returns. It has an average net cost 30,188 baht/ha, income 65,950 baht/ha, net income 35,763 baht/ha average return-to-investment ratio (Benefit Cost – Ratio: BCR) 2.2 which is worth the investment. (Table 4)

Table 1. Yield and yield of peanut seeds of network farmers Lopburi, Lampang and Khon Kaen provinces, In 2022

No.	Farmer groups	No. of farmer	Planted area (ha)	Grain yield (Kg.)		Seed yield (Kg.)	
				Total	kg./ha	Total	kg./ha
1	Mueang, Lopburi	5	1.60	6,822	4,264	3,406	2,129
2	Serm Ngam, Lampang	5	1.60	4,044	2,528	2,362	1,476
3	Nam Phong, Khon Kaen	5	1.60	4,860	3,038	2,638	1,649
Total/average		**15**	**4.80**	**15,726**	**3,276**	**8,406**	**1,751**

Table 2. Peanut seed quality after improving conditions of network farmers Lopburi, Lampang and Khon Kaen provinces, In 2022

No.	Farmer groups	Seed quality		
		Seed moisture (%)	Seed germination (%)	Seed purity (%)
1	Mueang, Lopburi	5.2	76.0	97.0
2	Serm Ngam, Lampang	5.6	81.0	97.0
3	Nam Phong, Khon Kaen	5.1	79.0	98.0
Average		**5.3**	**78.7**	**97.3**

Table 3. Seed distribution information of network farmers Lopburi, Lampang and Khon Kaen provinces, In 2022

No.	Farmer groups	Stock seed (kg)	Sold seed (kg)	Planting area (ha)
1	Mueang, Lopburi	0	3,406	27.2
2	Serm Ngam, Lampang	0	2,362	18.9
3	Nam Phong, Khon Kaen	0	2,638	21.1
Total		**0**	**8,406**	**67.2**

Table 4. Cost, net cost, and net income Peanut seed production by network farmers Lopburi, Lampang and Khon Kaen provinces, In 2022

No.	Farmer groups	Economic returns					
		Seed yield (kg/ha)	Cost price (bath/kg)	Net cost (bath/ha)	Income (bath/ha)	Net income (bath/ha)	BCR
1	Mueang, Lopburi	2,129	40	53,775	85,150	31,375	1.6
2	Serm Ngam, Lampang	1,476	40	40,375	59,050	18,675	1.5
3	Nam Phong, Khon Kaen	1,649	40	30,188	65,950	35,761	2.2
Average		**1,751**	**40**	**41,446**	**70,050**	**28,604**	**1.8**

In 2023, select 30 peanut farmers who are interested in producing additional seeds to become a peanut seed producer network by farmers in the seed producer network in 2022 in collaboration with Department of Agriculture officials transferring peanut seed production technology to network farmers as a result, all 30 farmers in the network are able to produce quality peanut seeds that meet the breeding standards for sale received 15,478 kilograms of seeds as follows:

Farmer group, peanut seed producer network Nikhom Sangtoneng Subdistrict, Mueang District, Lopburi province, 10 cases, 0.32 hectare, total area 3.20 hectare (Figure 1) planting Khon Kaen 6 peanut variety, which is a variety that is in demand in the area able to produce seeds, the yield of fresh peanut pods was 7,204 kilograms or 2,251 kg/ha when the seed condition was improved, the yield of dry seed pods was 4,868 kilograms or 1,521 kg/ha (Table 5) seed quality has a moisture 5.0%, germination 72.5%, and purity 97% (Table 6) seed products are sold to farmers peanuts in nearby areas to be planted in the next season 4,868 kilograms (Table 7) when analyzing the economic returns it has an average net cost 35,025 baht/ha, income 60,850 baht/ha, net income 25,825 baht/ha, average return-to-investment ratio (Benefit Cost – Ratio: BCR) 1.7 which is worth the investment. (Table 8)

Farmer group, peanut seed producer network Serm Sai Subdistrict Serm Ngam District, Lampang province, 10 cases, 0.32 hectare, total area 3.20 hectare (Figure 2) planting Khon Kaen 5 peanut variety, which is a variety that is in demand in the area able to produce seeds, the yield of fresh peanut pods was 11,100 kilograms or 3,469 kg/ha when the seed condition was improved, the yield of dry seed pods was 6,060 kilograms or 1,894 kg/ha (Table 5) seed quality had a moisture 9.0%, germination 86.6% and purity 96% (Table 6) seed production was sold to peanut farmers in Serm Ngam District, Lampang province, for use in planting in the next season, amounting to 5,960 kilograms, and stock seed 100 kilograms to next season (Table 7) when analyzing the economic returns it has an average net cost 47,188 baht/ha, income 75,750 baht/ha, net income 28,563 baht/ha, average return-to-investment ratio (Benefit Cost – Ratio: BCR) 1.6 which is worth the investment. (Table 8)

Farmers group, peanut seed producers network Sai Mun Subdistrict, Nam Phong District, Khon Kaen province, 10 farmers, 0.32 hectare, total area 3.20 hectare (Figure 3) grows Khon Kaen 6 peanut variety, which is a variety that is in demand area able to produce seeds, the yield of fresh peanut pods was 7,144 kilograms or 2,233 kg/ha when the seed condition was improved, the yield of dry seed pods was 4,550 kilograms or 1,422 kg/ha (Table 5) seed quality had moisture content 6.2%, germination 78.3% and purity 96% (Table 6) seed production was sold to peanut farmers in Nam Phong District area. Khon Kaen province, for use in planting in the next season, amounting to 3,920 kilograms, and stock seed 630 kilograms to next season (Table 7) when analyzing the economic returns it has an average net cost 28,750 baht/ha, income 56,875 baht/ha, net income 28,125 baht/ha, average return-to-investment ratio (Benefit Cost – Ratio: BCR) 1.9, which is worth the investment. (Table 8)

Table 5. Yield and yield of peanut seeds of network farmers Lopburi, Lampang and Khon Kaen provinces, In 2023

No.	Farmer groups	No. of farmer	Planted area (ha)	Grain yield (Kg.)		Seed yield (Kg.)	
				Total	kg./ha	Total	kg./ha
1	Mueang, Lopburi	10	3.2	7,204	2,251	4,868	1,521
2	Serm Ngam, Lampang	10	3.2	11,100	3,469	6,060	1,894
3	Nam Phong, Khon Kaen	10	3.2	7,144	2,233	4,550	1,422
Total/average		**10**	**9.6**	**25,448**	**2,651**	**15,478**	**1,612**

Table 6. Peanut seed quality after improving conditions of network farmers Lopburi, Lampang and Khon Kaen provinces, In 2023

No.	Farmer groups	Seed quality		
		Seed moisture (%)	Seed germination (%)	Seed purity (%)

1	Mueang, Lopburi	5.0	72.5	97.0
2	Serm Ngam, Lampang	9.0	86.6	96.0
3	Nam Phong, Khon Kaen	6.2	78.3	96.0
Average		**6.7**	**79.1**	**96.3**

Table 7. Seed distribution information of network farmers Lopburi, Lampang and Khon Kaen provinces, In 2023

No.	Farmer groups	Stock seed (kg)	Sold seed (kg)	Planting area (ha)
1	Mueang, Lopburi	0	4,868	38.9
2	Serm Ngam, Lampang	100	5,960	48.5
3	Nam Phong, Khon Kaen	630	3,920	36.3
Total		**730**	**14,748**	**123.7**

Table 8. Cost, net cost, and net income Peanut seed production by network farmers Lopburi, Lampang and Khon Kaen provinces, In 2023

No.	Farmer groups	Economic returns					
		Seed yield (kg./ha)	Cost price (bath/kg.)	Net cost (bath/ha.)	Income (bath/ha)	Net income (bath/ha)	BCR
1	Mueang, Lopburi	1,521	40	35,025	60,850	25,825	1.7
2	Serm Ngam, Lampang	1,894	40	47,188	75,750	28,563	1.6
3	Nam Phong, Khon Kaen	1,422	40	28,750	56,875	28,125	1.9
Average		**1,612**	**40**	**36,988**	**64,492**	**27,504**	**1.7**

Figure 1: Peanut seed production plots of the network farmer group. Nikhomsangtoneng Subdistrict, Mueang District, Lopburi Province Thailand, In 2023

Figure 2: Peanut seed production plots of the network farmer group. Serm Sai Subdistrict Serm Ngam District, Lampang Province Thailand, In 2023

Figure 3: Peanut seed production plots of the network farmer group. Sai Mun Subdistrict, Nam Phong District, Khon Kaen Province Thailand, In 2023

Summary of experimental results

From the development of peanut farmers in the area Lopburi, Lampang and Khon Kaen provinces to become a network of seed producers peanuts of the Department of Agriculture they received knowledge and technology for producing peanut seeds makes farmers have knowledge and understanding in seed production and understand things that need to be studied before producing seeds, such as selecting an area, planting, maintaining, and preventing and eliminating diseases and insects inspection of mixed breeds harvest improving seed condition and seed quality inspection as a result, farmers can produce seeds for their own use and sell to farmers in nearby areas. In 2022, they can produce 8,406 kilograms of peanut seeds, supporting a planting area of 67.2 hectare, using seed at a rate of 125 kilograms/hectare. As a result, peanut seeds for consumption and the industrial sector will increase by at least 105,000 kilograms (average yield 1,562.5 kilograms/hectare). In 2023, peanut seeds can be produced at 15,478 kilograms, supporting planting areas of 123.8 hectare, resulting in peanut seeds for use consumers and the industrial sector increased by at least 193,400 kilograms growers peanuts have access to good seed production sources in the area peanut seeds are of good quality reduce the problem of seed shortage as a result, production costs are reduced this is because peanut production costs come from expensive seed costs therefore, if farmers can produce good quality seeds for their own use in the community, it will help reduce seed production costs moreover you can rest assured that the seeds used are of good quality and meet standards therefore, transfer of knowledge on seed production technology to provide farmers with knowledge and understanding along with creating demonstration plots for seed production along with developing a group of farmers who can produce peanut seeds there is an exchange of knowledge between officials of the Department of Agriculture and farmer groups this makes it possible to raise the level from a peanut farmer to a producer of good quality peanut seeds that meet standards as a result, farmers have good seeds to use, sufficient to meet the needs of the entire country in addition, it increases income reduce production costs and create stability for farmers and the country. (Agricultural Research Development Agency, 2016)

REFERENCES

1. Agricultural Research Development Agency. (2016). Maize, soybeans, mung beans and peanuts. Direction of Thai economic crops in ASEAN. Pornsap Printing Company Limited. Bangkok.
2. ISTA. 2020. International rules for seed testing. International Seed Testing Association, Bassesdorf, Switzerland. Available at : www.seedtest.org/en/home.html Accessed : January 20, 2021.
3. Kriangsak Suwantharadon. (2015). Thailand's strategy for food security and safety in Animal feed corn, soybeans, mung beans and peanuts. https://www.arda.or.th/datas/1. Food crop strategy_Dr. Kriangsak.pdf.
4. Seed Research and Development Division. (2021). Report on plant seed production plans for 2021. Department of Agriculture. Bangkok.
5. Seed Research and Development Division. (2022). Soybean seed production manual. soybean mung beans and peanuts. Department of Agriculture. Bangkok.
6. Wichan Ingsrisawang. (2023). Development of peanut varieties and production technology to increase productivity for the central and southern regions. Northern region of Thailand. Agricultural Research Development Agency. https://www.moac.go.th/news-preview-451091791029.