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Mango Production Cost Under Tailor-Made Fertilizer Technology in Bangkha District, Chachoengsao Province, Thailand

Prawach Chourwong[*], Panya Mankeb and Tippawan Limunggura

Faculty of Agricultural Technology, King Mongkut's Institute of Technology Ladkrabang, Bangkok, 10520, Thailand.

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This research aimed to analyse the cost of fertilizer application in the process of growing mango by comparing the fertilizer cost per tree between before and after using the Tailor-Made Fertilizer (T-M-F) technology. The study was conducted on mangoes aged 3-5 years in Bang Khla district, Chachoengsao province. The data were collected by structure interviews from 30 all mango gardeners who adopted the T-M-F technology and analysed by pair t- test. The result showed that the cost of fertilizer application with the T-M-F technology ($\mu = 30.27$) was highly significant ($p < 0.01$) lower than the cost before using this technology ($\mu = 68.27$). In addition, the mango production increased slightly from 26 to 27 kg. per tree .

Keywords: Tailor-Made Fertilizer technology, mango, Cost

Introduction

Tailor-Made Fertilizer (T-M-F) technology that farmers decide to use fertilizer for their plants properly. Research by Prof. Dr. Tassanee Attanand and his team developed from 1997 to 2008 using monitoring kits, Nitrogen (N) Phosphorus (P) and Potassium (K). in soil. The farmers are able to analyze the soil manually, economically and inexpensively. make use of chemical pesticides decrease as not to create environmental problems, however, empowering farmers to make a paradigm shift thinking systematically, the value of local wisdom and field trials, as well as the knowledge of the soil. and fertilizer knowledge to farmers wlii mani pulaed Continew (Tassanee, 2016) A sample of research by Tassanee *et al*. (2007), the purpose of this research was to train farmers to grow rice and sugar cane in the area of local nutrition by doing a test plot and a demo plot. The results of this study were the recommendations for rice and sugarcane fertilizer predicted by the computer

[*] **Coressponding Author:** PrawachChourwong ; **E-mail address:** meng4dr2009@hotmail.com

program and tested in the field. About 200 farmers wer trained in the T-M-F technology on farmers day organized by farmers in each province.As part of the extension, farmers learn about soil and fertilizer management. and extend the results to fellow members. The decision-making power of farmers is a technique that empowers farmers. The adoption and extension of farmers' outcomes is likely to be improved. In addition, Suwanna P. and Sompor I. (2010) conducted a study on economic impact assessment. The results showed that the farmers were encouraged to learn the correct way to use the fertilizer.In addition to increasing the yield per unit area for farmers. Also bring about cost savings in production and increase revenue to farmers followed. For the calculation of economic benefits. It was found that investment in the research project was worthwhile. and it will give rise to higher economic benefits when technology is increasingly accepted. The study suggested that there should be an extension of the technology of plant nutrient management in the area to be accepted into the national policy. Product Yield element and nutrient accumulation of sugarcane. The experimental results of chemical fertilizer application based on soil analysis resulted in higher yield of cane than chemical fertilizer application. And the total amount of nitrate and potassium accumulated in the northern part of cane and sugar cane 1 resulted in an increase in the amount of nitrite accumulation along with the increase in the rate of nitrate fertilizers. The application of chemical fertilizer as recommended by the department of agriculture resulted in the highest phosphorus accumulation.

Mango is an important economic crop of Chachoengsao Province. Due to the cultivation of mango with good taste. And standard quality importantly, mango is safe for consumers. Because of the good agricultural practices (GAP), some mango farmers have started to T-M-F technology to grow mangoes. The total mango production of the provinces was 18,664 tons, valued at 720 million Baht and the export of 1,000 tons was 72 million Baht. The highest area was 5,482 rai, followed by Phanom Sarakham 2,104 Rai and Ratchasan District 1,050 rai, respectively.The most abundant mango Nam Dok Mai number 4 flowers, followed by Green mango and Namdokmai Sithong (Chachoengsao Provincial Agriculture Office, 2016) Therefore, the researchers is interested in studying the cost and Production of mango production at the age of 3-5 years. The farmers who adopted T-M-F technology in Bang Khla district, Chachoengsao province.

Objectives: This research aimed to analyses the cost of fertilizer application in the process of growing mango by comparing the fertilizer cost per tree. In Bang Khla district Chachoengsao province.

Materials and methods

Population and sample

There were 2 types of data collection This research: (1) primary sources; data from interving with mango growers in Bang Khla district, Chachoengsao province: and (2) secondary sources from research as well as published documents and the Internet To study theories, concepts, and academic principles that are critical to the analysis. And set cost-orientation guidelines. And mango Productivity of farmers who T-M-F technology. Population and groups Sample of this research. Establish population as mango growers. In Bang Khla district, Chachoengsao province, and selected specific samples. There are 30 mango growers.

Methods

The instrument used for this research was a structured interview. The first was the general data of interview respondents, including age, education and experience in mango orchard management. Part 2: Information on mango fertilize cost and prodcution to T-M-F technology.

Statistical Analysis

A Comparison of Mango cost of fertilizer application with the T-M-F technology. With the before and after of fertilizing analysis. and test the hypothesis with t-test (Panya M, 2016).

Results

The results of the general data collection of farmers found that mango cultivated uder T-M-F technology. The age of farmers was 55-65 years, followed by the 35-40 years. elementary school 80% and 25 years for mango gardening experience.

The results of data collection on mango planting cost before and after cutting technology applied in mango orchard of farmers. In addition, the mango production increased slightly from 26 to 27 kg. per tree. The average cost of planting was 68.27 baht per tree, decreasing to 30.27 baht per tree. details are shown in Table 2.

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Table 1 Fertilizer Costs per tree, Mango production of farmers who T-M-F technology.

Garden	Fertilizer Costs (THB. per tree)		Garden	Fertilizer Costs (THB. per tree)		Garden	Fertilizer Costs (THB. per tree)	
	After	Before		After	Before		After	Before
M001	32.80	66.00	*M011*	32.50	60.00	*M021*	26.00	54.00
M002	32.80	56.00	*M012*	28.00	54.00	*M022*	24.00	74.00
M003	28.00	74.00	*M013*	32.00	74.00	*M023*	25.00	74.00
M004	27.00	66.00	*M014*	32.00	72.00	*M024*	37.20	74.00
M005	32.80	74.00	*M015*	32.00	74.00	*M025*	24.00	66.00
M006	29.60	74.00	*M016*	31.20	72.00	*M026*	35.00	54.00
M007	24.00	74.00	*M017*	30.00	66.00	*M027*	24.00	72.00
M008	32.00	74.00	*M018*	28.00	54.00	*M028*	42.00	54.00
M009	35.36	74.00	*M019*	32.00	74.00	*M029*	26.00	74.00
M010	32.80	74.00	*M020*	36.00	72.00	*M030*	24.00	74.00

Table 2 Fertilizer Costs per tree and production, Mango production of farmers who T-M-F technology.

list	T- M – F (1)	Old (2)	Difference	
			Kg. per tree (3) = (1)-(2)	percent (4) = (3)/(2)*100
production (Kg. per tree)	27.00	26.00	1.00	3.85
Fertilizer Costs (THB. per tree)	30.27	68.27	38.00	55.70

Comparison of production volume between mango planting adopted and rejected by T -M - F technology. It was found that mango growers who T -M - F technology. received more production than farmers who did not adopted the technology of cutting 1 kg per tree. 3.85 percent and the comparison of fertilizer cost It was found that the farmers who adopted the T -M - F technology. T -M - F technology. were lower than the farmers who did not T - M - F technology. 38 baht per tree, or 55.70 percent.

Table 3 Results Statistical analysis of cost of fertilizer application per tree.

	T- M – F (Mean)	Old (Mean)	t	Sig.
Fertilizer Costs	30.27	68.27	21.34	0.000**

** significant ($p < 0.01$)

From Table 3, the average cost of fertilizer application of mango planting different The statistical significance at 0.01 was found to be adoped by the research hypothesis. By the cost of fertilizer. The farmers who adopted the T -M - F technology. Were lower than those who did not T -M - F technology.

Discussion

This research aimed to analyses the cost of fertilizer application in the process of growing mango by comparing the fertilizer cost per tree. In Bang Khla district Chachoengsao. Comparison of fertilizer costing It was found that farmers who adopted the T-M-F technology. had lower cost than farmers who did not adopted T-M-F technology. In comparison with production, it was found that farmers who T -M - F technology had more mango production than farmers who did not T -M - F technology. The results support the hypothesis of this research. As Prawach (2013), research on the cost reduction of jasmine rice with T -M - F technology. in Chachoengsao province. The cost of production is 4,403.39 baht / rai and the average yield is 467.62 kg / rai. Proposed approach by transfer of cost reduction technology by soil sampling method to analyze soil value from real field plot. As a result, farmers were able to reduce the fertilizer cost from 1,440 to 468 Baht / Rai, or 67.57%, and Prawach (2014). Grow jasmine rice of Than Thip group. In the district of Banchong. Phanom Sarakham district Chachoengsao. The production cost was up to 2,565 baht per rai and the average yield was 550 kilograms per rai. Transfer technology to reduce costs through the use of T -M - F technology. And how to make bio-compost. And do insect repellent. In conclusion, farmers could reduce the cost of growing jasmine rice 105 during the planting process, down from 2,565 baht / rai to only 1,200 baht / rai, accounting for 46.78% and average yield of 650 kilograms per rai. Saowanut *et al*. (2014) Study and development of suitable technology for plant nutrient management for corn on sloping land. It found that niche nutrient management " T-M-F " is the right technology. As a result, the farmers decide on the use of chemical fertilizer as recommended. It can

reduce the production cost of chemical fertilizer by 15-50% and result in a 2-12% increase in yield.

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