Research article

Organic Agriculture Certification on Thai Agricultural Standard in Upper Northeast Thailand

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Abstract Many countries have controlled measures for imported agricultural commodities. The Department of Agriculture has taken responsibility for the organic agriculture certification, including the quality control of agricultural commodities within the Thai Agricultural Standards (TAS) in the upper-northeast region of Thailand (11 provinces). The objective of this study was to report the factors involved in obtaining and maintaining organic agriculture certification within the entire chain of production. Within our initial year in 2018, there were 73 farms with organic certification (21.92%) and 260 non-certified farms (78.08%) from a total population of 333 farms. The 100% organic certifications consisted of 32 certified farms (86.47%) and 5 non-certified farms (13.51%) from a population of 37 farms. A reassessment of 68 farms at the end of 2018 determined that 63 farms (92.65%) had obtained organic certification versus 5 non-certified farms (7.35%). In the transition period into 2019, 60 farms (28.17%) had obtained organic certification, whereas 153 farms were non-certified (71.83%) from 213 farms. The 100% organic certification was achieved by 56 farms (94.92%) with only 3 uncertified farms (5.09%) from a population of 59 farms. Our re-assessment produced 78 certified farms (98.73%) and only a single non-certified farm (1.27%) from 79 farms. The trend of certifications over two years (2018 and 2019) showed that certified organic agriculture production increased from 38.37 to 55.27%, whereas non-certifications decreased from 61.64 to 44.73%; from 438 to 351 farms, respectively. We determined that there were six main reasons for non-certification of farms: the inability to sustain organic agricultural production within TAS; the lack of a buffer zone to deter pollution from adjacent plantations; the lack of available recorded data for both traceability and verification; the use of chemicals that did not follow TAS protocols; planting areas within some environments caused the contamination of hazardous substances; and, several farms did not have the proper land-rights documents. Improvements and compliance within these areas will, therefore, result in an environmental ecological balance, as well as increased food safety.

Keywords Thai agricultural standard, certification, organic agriculture

INTRODUCTION

Several interesting trends have emerged in the global food market, in which consumers have begun to look for safer and better-controlled foods produced in more environmentally friendly, authentic, local systems. Many countries have implemented controlled measures for the importation of

agricultural commodities, resulting in the enhanced recognition of food safety and quality for consumption, and further consideration of the environment and the worker's health, safety, and welfare. Organic agriculture production has expanded in Thailand, from 37,684 hectare planting areas in 2014 to 2,791 farm 45,587 hectare areas in 2015; an increase of 20.97% (2,791 farms) (National Agricultural Development Strategy, 2017). Global food markets demanded that Thailand adhere to various standards in farming, such as the Good Agricultural Practice (GAP) and organic certifications.

The certification body within Thailand's Department of Agriculture is responsible for the inspection and adherence to standards, resulting in organic agriculture certification. The organic agricultural standards cover provisions instituted within the Thai Agricultural Standard (TAS) 9000: Part 1-2009 determines the holistic production management systems which enhance and promote an agro-ecosystem, including biodiversity and biological cycles. It emphasizes the use of natural materials and avoids the use of synthetic materials, plants, animals, or microorganisms derived from genetic modification. An organic production system is designed to handle agricultural products with careful emphasis on processing methods, to maintain the organic integrity and vital qualities of the product at all stages. Accordingly, the organic production requirements for plants shall be used throughout the entire transition period of at least 12 months before the planting of annual crops, and 18 months before the first harvest of organic produce of perennial crops. The producer's transition period occurs at the time organic practice and adherence to the prescribed standards begins, typically when a farmer applies for certification (National Bureau of Agriculture Commodity and Food Standards, Ministry of Agriculture and Cooperatives, 2009). However, farmers often lack their knowledge and understanding of several TAS standards; such as the use of composts, cropping systems, and the control of diseases and pests.

OBJECTIVE

The objective of this study, therefore, was to report upon the situation of organic farming practices within the upper-northeast region of Thailand in the years 2018 and 2019 and to determine the factors involved in obtaining and maintaining the organic agriculture certification within the entire chain of production.

METHODOLOGY

This paper is based on the results from previous reports within this region, as well as the preliminary results from an ongoing study. Our methodology consisted of the following elements:
1. the Organic agriculture certification and the factors related to both obtaining and maintaining certification throughout the entire chain of production, as well as within the 100% certification status,
2. the investigation and possible solutions for the prevention and recurrence of non-certification within the transition from 2018 to 2019.

The area of study, the upper-northeast region of Thailand, included the following 11 provinces: Kalasin, Khon Kean, Chiyaphum, Nakhon Phanom, Loei, Mukdahan, Sakon Nakhon, Nong Khai, Bueng Kan, Nong Bua Lam Phu, and Udon Thani.

RESULTS AND DISCUSSION

Our study identified 73 farms with organic certification (21.92%) and 260 non-certified farms (78.08%) from a total population of 333 farms. The 100% organic certifications consisted of 32 certified farms (86.47%) and 5 non-certified farms (13.51%) from a population of 37 farms. A reassessment of 68 farms at the end of 2018 determined that 63 farms (92.65%) had obtained organic certification versus 5 non-certified farms (7.35%). In the transition into 2019, 60 farms (28.17%) had obtained organic certification, whereas 153 farms were non-certified (71.83%) from 213 farms. The 100% organic certification was achieved by 56 farms (94.92%) with only 3 uncertified farms (5.09%)

from a population of 59 farms. Our re-assessment produced 78 certified farms (98.73%) and only a single non-certified farm (1.27%) from 79 farms. The trend of certifications over the two years (2018 and 2019) showed that certified organic agriculture production increased from 38.37 to 55.27%, whereas non-certifications decreased from 61.64 to 44.73%; from 438 to 351 farms, respectively.

Table 1 Inspection within the transitional period, certification and non-certification (2018 to 2019), 100 % organic certification, and re-assessment certification (TAS)

Year/ inspections		Inspection		Certification			Non-certification		
		farms	Area (hectare)	farms	%	Area (hectare)	farms	%	Area (hectare)
2018	Transition period	333	161.30	73	21.92	44.85	260	78.08	116.45
	100 % organic certifications	37	32.02	32	86.49	29.74	5	13.51	2.27
	Re-assessment	68	114.69	63	92.65	106.40	5	7.35	8.29
2019	Transition period	213	110.54	60	28.17	42.18	153	71.83	68.37
	100 % organic certifications	59	41.06	56	94.92	38.46	3	5.08	2.59
	Re-assessment	79	116.96	78	98.73	116.92	1	1.27	0.04
Total	Transition period	546	271.84	133	24.36	87.02	413	75.64	184.82
	100 % organic certifications	96	73.07	88	91.67	68.21	8	8.33	4.86
	Re-assessment	147	231.65	141	95.92	223.32	6	4.08	8.33

The results of our study in 2018 identified several areas of responsibility for organic agricultural non-certification including 19 fruit farms and 42 vegetable farms: the inability to sustain organic agricultural production within TAS: the lack of a buffer zone to deter pollution from adjacent plantations; the absence of any available recorded data for both traceability and verification; the use of chemicals that did not follow TAS protocols; planting areas within some environments caused the contamination of hazardous substances; and, several farms did not have the proper land-rights documents.

In 2019, non-certification farms were present in 108 integrated agricultural farming systems, including four fruit farms, 34 vegetable farms, and 11 herb farms with the same reasons above.

CONCLUSION

The finding through the transitional period of 2018 to 2019 was farmers' lack of understanding of organic agriculture production (TAS certification). 133 certified farms (24.36%) encompassing an area of 87.02 hectare and 413 non-certified farms (75.64%) covering an area of 184.82 hectare from a population of 546 farms (271.84 hectare). Eighty-eight farms were identified for 100% organic certifications (91.67%) in an area of 68.21 hectare, as well as eight non-certified farms (8.33%) in an area of 4.86 hectare for a total of 96 farms (73.07 hectare). The non-certifications were due primarily to the framers' conversion back to the use of non-organic chemicals for pest and disease control. Our re-assessment identified 141 farms (95.92%) in an area of 223.32 hectare and 6 non-certified farms (4.08%) in an area of 8.33 hectare from a population of 147 farms encompassing 231.65 hectare, due to the farmers' lack of available recorded data for traceability and verification. Further re-assessment resulted in an increase of certifications to 95.92%, demonstrating the farm's compliance to TAS standards, as well as the farmers' acceptance of the required protocols, with an average score of 4.2, and an average application (TAS) score of 70.79 (Chawit, 2018).

Table 2 Analysis of non-certification farms from 2018 to 2019

	2018		2019	
	Non-certification	List	Non-certification	List
Integrated system	333	No organic agriculture production according to TAS. No buffer zone to deter from pollution and adjacent plantations. No available recorded data for traceability and verification. Chemical use did not follow TAS standards. Several environments caused the contamination of hazardous substances on produce. Planting areas had no land rights documentation.	108	No organic agriculture production according to TAS. No buffer zone to deter from pollution and adjacent plantations. No available recorded data for traceability and verification. Chemical use did not follow TAS standards. Planting areas had no land rights documentation.
Fruit	19	No organic agriculture production according to TAS. No available recorded data for traceability and verification. No buffer zone to deter from pollution and adjacent plantations. Chemical use did not follow TAS standards. Planting areas had no land rights documentation.	4	No organic agriculture production according to TAS. No buffer zone to deter from pollution and adjacent plantations. No available recorded data for traceability and verification. Planting areas had no land rights documentation.
Vegetable	42	No organic agriculture production according to TAS. No buffer zone to deter from pollution and adjacent plantations. Chemical use did not follow TAS standards. Planting areas had no land rights documentation.	34	No organic agriculture production according to TAS. No buffer zone to deter from pollution and adjacent plantations. No available recorded data for traceability and verification. Chemical use did not follow TAS standards. Several environments caused the contamination of hazardous substance on produce. Planting areas had no land rights documentation.

In addition to the six main obstacles to obtaining organic agriculture certification (TAS), Chawit, 2018; determined that two primary obstacles existed in both obtaining and maintain organic certification according to the Thai Agricultural Standard 9000, Part 1-2009. Firstly, organic fertilizers were difficult to obtain; and secondly, farmers lacked the knowledge and experience to create a buffer line for soil, water, and pest control.

Our recommendations to farmers seeking organic agriculture certification and adherence to TAS practices included: 1. Working proactively to obtain the knowledge and understanding of organic agriculture production for TAS certification; 2. Learning to create barriers or ridges (buffer zone) necessary to buffer against contamination through the soil, water, or air from adjacent plantations; 3. Generate the fertility and biological activity of the soil needed to maintain the necessary organic materials according to Jiraschayaporn, 2017; in which a prototype for the production and management of organic fertilizer was capable of producing an increase in organic matter (Surin, Thailand); and 4. Pests, diseases, and weeds shall be controlled by the appropriate species and varieties, including the appropriate rotation programs, mechanical cultivation, conservation of natural enemies of pests by providing favorable habitats, and maintaining the ecosystem. We noted in the above-mentioned research, that the average income per farmer was 193 USD per hectare.

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