



**THAI AGRICULTURAL STANDARD**

**TAS 9001-2013**

**GOOD AGRICULTURAL PRACTICES  
FOR FOOD CROP**

**National Bureau of Agricultural Commodity and Food Standards  
Ministry of Agriculture and Cooperatives**

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(2)

**Technical Committee on the Elaboration of the Thai Agricultural Standard on  
Good Agricultural Practices for Food Crop**

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(3)

Regarding the Ministry of Agriculture and Cooperatives notification at September 30, B.E. 2552 on the Thai Agricultural Standard entitled Good Agricultural Practices for Food Crop (TAS 9001-2552) which has been published in the Royal Gazette, dated December 28, B.E. 2552 (2009), the said standard is amended to the changing situation according to the framework of ASEAN Economic Community Blueprint (AEC Blueprint). The Agricultural Standards Committee deems it necessary to revise the TAS 9001-2552 for Thai produce recognition on food safety and quality for consumption and taking more consideration on the environment, worker's health, safety and welfare.

This Standard is based on the following documents:

ASEAN. 2006. Good Agricultural Practices for Production of Fresh Fruits and Vegetables in the ASEAN region. ASEAN Secretariat.

CAC/RCP 53-2003. Code of Hygienic Practice for Fresh Fruits and Vegetables. Joint FAO/WHO Food Standards Programme. FAO, Rome.



**NOTIFICATION OF MINISTRY OF AGRICULTURE AND COOPERATIVES**

**SUBJECT: THAI AGRICULTURAL STANDARD:**

**GOOD AGRICULTURAL PRACTICES FOR FOOD CROP**

**UNDER THE AGRICULTURAL STANDARDS ACT B.E. 2551 (2008)**

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Whereas the Agricultural Standards Committee deems it necessary to establish an agricultural standard on Good Agricultural Practices for Food Crop as a voluntary standard in accordance with the Agricultural Standards Act B.E. 2551 (2008) to promote such agricultural commodity to meet its standard on quality and safety.

By virtue of Section 5, Section 15 and Section 16 of the Agricultural Standards Act B.E. 2551 (2008), the Minister of Agriculture and Cooperatives hereby issues this Notification on Establishment of Thai Agricultural Standard: Good Agricultural Practices for Food Crop as follows:

1. The Notification of the Ministry of Agriculture and Cooperatives on Thai Agricultural Standard entitled Good Agricultural Practices for Food Crop dated 30 September B.E.2552 (2009) is repealed.

2. The Thai Agricultural Standard on Good Agricultural Practices for Food Crop (TAS 9001-2013) is established as a voluntary standard, details of which are attached herewith.

Notified on 20 April B.E. 2556 (2013)  
Mr. Yukol Limlamthong  
Minister of Agriculture and Cooperatives

# **THAI AGRICULTURAL STANDARD**

## **GOOD AGRICULTURAL PRACTICES FOR FOOD CROP**

### **1. SCOPE**

This agricultural standard covers provisions of good agricultural practices (GAP) for food crops such as vegetables, fruits, field crops, spices and herbs on every step on farm and postharvest handling where produce is packed and/or collected for sale in order to obtain safe produce of proper quality for consumption by taking into account the environment, worker's health, safety and welfare.

### **2. DEFINITIONS**

For the purpose of this standard:

2.1 Hazardous substances mean materials or substances whether they are chemicals, microorganisms or microbial toxins which may be harmful to human, animal, plant, property or environment.

2.2 Pesticide means a hazardous substance used in agriculture regulated by the Department of Agriculture according to the Notification of the Ministry of Industry entitled the List of Hazardous Substances issued by virtue of the Hazardous Substances Act B.E.2535 (1992) and its amendments.

2.3 Pesticide residue means any specified substance in food, agricultural commodities or animal feed resulting from the use of a pesticide. The term includes any derivatives of pesticides such as conversion products, metabolites, reaction products and impurities considered to be toxicological significance.

2.4 Pest means living organism such as disease, insect, animal and weed that is injurious to crop.

2.5 Fertilizer means organic, synthetic organic, inorganic materials or microorganism whether from natural or synthetic formation to supply plant nutrients by any mean or to change chemical, physical or biological properties in soil to promote plant growth.

2.6 Hygiene means all conditions and measures necessary to ensure the safety and suitability of an agricultural commodity at all stages of production and fit for consumption.

2.7 Traceability/Product Tracing means the ability to follow the movement of a food through specified stage(s) of production, processing and distribution.

### 3. REQUIREMENTS

Requirements of Good Agricultural Practices (GAP) for Food Crop shall be as in Table 1.

**Table 1 Items and Requirements of GAP for Food Crop**

Items	Requirements
1. Water (1) Water used in planting area	1.1 Water used in production shall come from the environmental sources that do not cause contamination of hazardous substances on produce.  In case of risk, water shall be analysed by either official or accredited laboratories for hazardous substance contamination. Analytical result record shall be kept as evidence.
	1.2 Do not use untreated sewage water from industrial factories or the other sources e.g. community, hospital that can cause contamination of hazardous substances. If it is necessary to use such water, there shall be clear evidence or proof showing that such water has been treated and it can be used in the production.
	1.3 Take sample of water at least once prior to entering the system of production, and during the period that environment is likely to cause contamination for analysis by official or accredited laboratories for hazardous substance analysis. Analytical result record shall be kept as evidence.
	1.4 Water used for dissolving fertilizers and pesticides shall have quality that does not decrease the effectiveness of such inputs.
	1.5 Availability of irrigated method appropriate to the crop water requirement and soil moisture level
	1.6 Availability of appropriate irrigated method to prevent water loss and minimise risk affecting environment of planting area and its vicinity.
	1.7 Availability of management of wastewater from on-farm activities e.g. sewage from toilet, other wastewater disposals in order to minimise risk affecting environment of planting area and its vicinity.
	1.8 Maintain the effectiveness of irrigation system.
	1.9 Water source for agriculture should not be of the environmental destruction.
	1.10 Availability of conservation practices for water source and its environment.

Items	Requirements
(2) Water used for hydroponics	1.11 Select planting site with sufficient water supply for quality crop production.
	1.12 Regularly change water for crop production in hydroponic system. In case of reuse, there shall be a system to reduce the amount of microbial and/or chemical contamination.
	1.13 Maintain clean water supply system as appropriate in order to prevent microbial contamination.
(3) Water used for postharvest practices	<p>1.14 Water for postharvest practices shall be of potable water quality or equivalent with particular caution on the contaminations of the following cases:</p> <ul style="list-style-type: none"> <li>- water contacted with the edible portion of produce</li> <li>- physical characteristics of the produce that hold water such as uneven leaf and other surface of produce</li> </ul>
2. Planting area	<p>2.1 Planting area shall not be located in the environment causing contamination of hazardous substances on produce.</p> <p>In case of environmental risk, soil shall be analysed by either official or accredited laboratories for hazardous substance contamination. Analytical result record shall be kept as evidence.</p>
	2.2 If it is necessary to use such contamination risk area, there shall be clear proof of treatment method to minimise the contamination to the safety level.
	2.3 Take sample of soil at least once prior to entering the system of production and during the period that environment is likely to cause contamination for hazardous substance analysis by official or accredited laboratories. Analytical result record shall be kept as evidence.
	2.4 If soil or planting material is fumigated or applied with chemicals to treat soil-borne disease, chemical type, date, rate and method of application as well as operator name shall be recorded and kept as evidence.
	2.5 New planting area shall not adversely affect the environment. If it does, mitigation or prevention measures shall be in place.
	2.6 Plot layout and plot preparation or adjustment of plot shall be taken into consideration the impacts on food safety, produce quality, environment and worker's health, safety and welfare.
	2.7 Maintain planting area in order to prevent soil degradation.

Items	Requirements
	<p>2.8 Select crops for planting in accordance with soil type. Planting practices should not cause any risk to the environment.</p> <p>2.9 Code and information of planting plot shall be made available by specifying farm owner name and contact address, name and contact address of plot keeper (if any), farm location map, farm and plot layout and crop and variety grown.</p> <p>2.10 Provide land use history for at least the past two years</p> <p>2.11 Area used for planting shall comply with relevant laws and regulations.</p>
3. Pesticides	<p>3.1 If pesticide is used, follow the recommendation of the Department of Agriculture (DOA), Ministry of Agriculture and Cooperatives or instruction on the label registered with DOA. Stop applying pesticide before harvest in accordance with the withdrawal period indicated on the label of each pesticide or the official recommendations.  In case there is evidence or doubt of improper use, the produce shall be analysed for pesticide residues by either official or accredited laboratories for pesticide residues analysis. Record shall be kept as evidence.  In case the result of pesticide residue analysis is higher than the maximum residue limit under the relevant standards or laws, causes shall be investigated and corrective action shall be taken or preventive measure shall be in place to avoid the reoccurrence of incidences. Such record shall be kept as evidence.</p> <p>3.2 Do not use or possess pesticides prohibited to manufacture, import, export or hold under the Hazardous Substances Act B.E. 2535 (1992) and its amendments.</p> <p>3.3 In case the production is for export, do not apply pesticides prohibited by trade partner countries or follow their requirements.</p> <p>3.4 Availability of documents and information on permitted or prohibited pesticides for both domestic use and trading partner countries.</p> <p>3.5 Properly select chemical sprayer and equipment including spraying method. The sprayers shall be regularly checked so that they are ready to be used effectively.</p> <p>3.6 Do not mix more than 2 types of pesticides unless it is recommended by the involved government agencies or there is supporting scientific information.</p>

Items	Requirements
	3.7 Appropriate Integrated Pest Management shall be applied to minimise the use of pesticides.
	3.8 The container of the leftover pesticide which cannot be used up in one application shall be tightly closed and kept in the pesticide storage. If pesticide is transferred to another container, the new container shall be clearly identified.
	3.9 Types of pesticides shall be orderly grouped in the specified secure storage to prevent mishandling, contaminating to produce and harming to personnel.
	3.10 Other chemicals such as fuel, cleaning agents, and other non agricultural substances shall be stored in good order to prevent produce exposure and environment contamination.
	3.11 Clean chemical sprayer and equipment after each use and dispose the rinsed water by using method that does not contaminate the environment.
	3.12 The empty pesticide container shall be destroyed to prevent reuse or disposed with proper method.
	3.13 The deteriorated or expired pesticide container shall be kept in the secured location, and destroyed in order to prevent reuse or disposed with proper method.
	3.14 Record or make a list of stocked pesticides.
	3.15 Operators and/or supervisors shall have proper knowledge of pesticide use. They know pests, the selection of pesticides and application rates, sprayers and related equipment.
	3.16 Operators shall have knowledge and skill to protect themselves from pesticide application and first aids.
	3.17 While working with pesticides, the operators shall wear proper clothes with personal protective equipment i.e. mask or nose covering cloth, gloves, hats and boots in order to protect themselves from toxic substances.
	3.18 Pesticide spraying operator shall always be on the windward direction. Care shall be taken that the mist shall not contaminate the adjacent plots and environment.
	3.19 The operator shall take shower, shampoo and change clothes right after each pesticide application. Used clothes shall be cleaned every time and separated from the normal laundry.
	3.20 Availability of first aid kit and complete set of accidental protective equipment such as eyewash solution, clean water, sand etc.
	3.21 Availability of instruction document in case of accident or emergency clearly displayed in the chemical storage area.

Items	Requirements
4. Pre-harvest quality management	
(1) Production control plan	4.1 Availability of production control plan in order to obtain desired produce based on Good Agricultural Practices or information from recognized research, government agencies, experts of that crop or trading partners in order to establish control measures at every step that may affect safety and/or produce quality and/or environment and/or worker's health, safety and welfare.
(2) Production Inputs	4.2 List and record on production inputs and their sources. Details of important production inputs such as seeds or planting material, fertilizers, supplements and pesticides required in the production process shall be provided as well as specifying the details on volume and date of purchase.
- Seeds or Planting Materials or Propagated Parts	4.3 Seeds or planting materials or propagated parts shall be obtained from reliable sources, true to type of variety meeting the market demand and traceable to their sources and history.
	4.4 Do not plant seeds or planting materials or propagated parts which are known to be poisonous for consumption unless there is the recommendation on proper way to consume.
	4.5 If dressing the seeds with pesticides, follow the recommendation on method and rate on the officially registered label and keep the record.
- Fertilizers and Soil Conditioners	4.6 Availability of good management for the application of fertilizer and soil conditioners to prevent physical, chemical and microbiological contamination on produce to the level unsafe for consumption. The fertilizers shall be registered with the Department of Agriculture, Ministry of Agriculture and Cooperatives.
	4.7 In case organic fertilizer is produced on farm, it shall be completely fermented or decomposed or sufficiently processed by other means not to cause transmission of diseases to human. Record the method, date and duration of such process.
	4.8 Do not use human sewage for fertilizer.
	4.9 Mixing, storage, and transferring fertilizer and soil conditioners areas or place for composting shall be separated and located in the area that does not pose any contamination to food crop areas and water source.
	4.10 Apply fertilizers appropriate to the cultivated crop at the rate recommended on the label.
	4.11 For hydroponics, monitoring shall be taken on the use of plant nutrient solution and record.

Items	Requirements
(3) Agricultural tools and equipment	4.12 Provide sufficient and appropriate agricultural tools and equipment for operations.
	4.13 Provide separated, secure and easy to access storage for agricultural tools and equipment.
	4.14 Regularly check tools and equipment including electrical appliances in order to prevent accident and hazard to operators.
	4.15 Check tools and equipment that require accuracy in the operation such as pesticide spraying nozzles at least once a year. In case of deviation, repair or replace so that it functions effectively according to its standard operation.
	4.16 Clean tools and equipment including containers used to hold and transport produce each time before and after use.
(4) Management of production steps	4.17 Availability of production management system in order to obtain produce which meets the trading partners' requirements.
(5) Disposal of waste and unused or irrelevant to production materials	4.18 Infected plant parts shall be burnt outside the planting plot, taking into consideration of its impact on the environment.
	4.19 Clearly separate types of waste and unused or irrelevant to production materials. Provide sufficient garbage disposal areas or clearly specify their locations. In addition, waste reduction during the production process shall be carried out.
5. Harvest and postharvest handlings	5.1 Harvested produce at the appropriate harvesting period. Produce shall be of quality that meets the market or trading partner's requirements.
	5.2 The harvesting shall be carried out hygienically in order to prevent contamination affecting safety for consumption.
	5.3 Sort off unqualified produce. In case there is quality grading and sizing before distribution, the produce shall be sorted in accordance with its standard or trading partner's requirements.
	5.4 Use tools or specific method to prevent produce from bruises or damage due to harvesting.
	5.5 Prevent contamination of hazardous substances on already sorted or packed produce on farm. Harvested produce shall not be placed directly on the ground.
	5.6 Clearly separate waste and pesticide containers from those used for harvest and transport of produce in order to prevent contamination.
	5.7 Equipment, containers and materials directly contacted with produce shall be made of materials that do not cause contamination.

Items	Requirements
	<p>5.8 Maintain the cleanliness of equipment and containers in order to prevent contamination to produce and check so that they are ready to use.</p> <p>5.9 Provide separate storage for equipment, containers and materials from pesticides or other chemicals, fertilizers and soil conditioners including preventing contamination from pests.</p> <p>5.10 Separate the inferior quality produce from the good ones with plan to utilize such unqualified produce as well as check for the comingling.</p> <p>5.11 Site for postharvest handlings shall have structure that is able to prevent risk of contamination to produce.</p> <p>5.12 In case there is risk from physical contamination arising from tools and equipment, preventive measures shall be provided.</p> <p>5.13 Prevent pets from entering into the operation area, particularly the sites for harvest, sorting and packing and storage. In case of risk, preventive measures shall be provided.</p> <p>5.14 In case of bait or trap is used to control pest, they shall be placed in the area that does not cause risk of contamination to produce, containers and materials. The record shall be kept.</p>
6. Holding, moving produce in planting plot, and storage	<p>6.1 Availability of hygienic management of the planting plots, moving method, holding and/or storage of produce in order to prevent contamination from hazards and foreign matters affecting safety for consumption and quality of the produce.</p> <p>6.2 Availability of floor covering material in the holding area of harvested produce in order to prevent contamination from garbage, soil and filth or other hazards from the ground.</p> <p>6.3 Vehicle used for moving or transporting pesticides, fertilizers or soil conditioners shall not be used to move or transport the produce in order to protect produce from harmful contamination. If it is unavailable, the vehicle shall be cleaned to protect such contamination and keep the record of its use.</p> <p>6.4 Select appropriate containers for moving produce from the planting plot to packing area. There shall be liner in the container to protect of produce from bumping.</p> <p>The arrangement of harvested produce in the holding area of the planting plot shall be proper and able to protect the produce from injuries due to scratching or bumping.</p> <p>6.6 Moving produce in the planting plot shall be carried out with care and able to prevent the contamination harmful to consumption.</p>

Items	Requirements
	<p>6.7 Proper care and protection shall be required before transportation for rapidly deteriorated produce.</p> <p>6.8 Transport vehicle shall be able to maintain produce quality.</p> <p>6.9 Packed produce for transport shall be handled with care and transport to the collection location immediately after harvest and/or after dressing, sorting or sizing.</p>
7. Personal hygiene	<p>7.1 Workers shall have the knowledge and understanding or receive personal hygiene training in order to work hygienically.</p> <p>7.2 Those who come directly into contact with produce, particularly after harvest shall maintain of their personal hygiene and have preventive measures from contaminating the produce.</p> <p>7.3 Personal hygiene facilities shall be sufficiently provided and ready for use and able to prevent contamination from waste to planting plot and produce.</p> <p>7.4 Any sick operator shall inform the supervisor to decide to move to duty not to cause contamination to produce.</p> <p>7.5 Operator involved in the pesticide activity shall have their health examination at least once a year.</p> <p>7.6 Availability of proper basic facilities for operators</p> <p>7.7 Provide training to educate operators appropriately in accordance with their responsibility.</p> <p>7.8 Farm owner and operators shall have adequate knowledge and understanding or receive training related to Good Agricultural Practices.</p>
8. Record keeping and traceability (1) Documents and record keeping	<p>8.1 Availability of record on water use with details such as kind of crop, date, location and water consumption or irrigation period (Sections 1.5 and 1.6)</p> <p>8.2 Availability of record on the application of chemicals for soil borne disease treatment (Section 2.4)</p> <p>8.3 Availability of record on planting plot code and information on each plot (Section 2.9)</p> <p>8.4 Availability of record on every application of hazardous agricultural substances, at least indicating kind of crop, chemicals, objectives of the application, applied date, application rate and method, harvesting date and operators' names (Section 3.1)</p> <p>8.5 Availability of record or evidence on pesticide's source of origin and list of stored pesticides. (Sections 3.4 and 3.14)</p>

Items	Requirements
	<p>8.6 Availability of record on details related to the procurement and application of fertilizer and soil conditioner such as date, kind, amount, application rate and method, period of growing which received fertilizer application and operators' name (Section 4.2).</p> <p>8.7 Availability of record on pre-harvest and post-harvest handlings at the important steps affecting produce safety (Section 5.2).</p> <p>8.8 Availability of record on pre-harvest and post-harvest handlings at the important steps affecting produce quality (Sections 5.3 and 5.10).</p> <p>8.9 Availability of record on control of pests (Section 5.14).</p> <p>8.10 Availability of record on the use of vehicles for transport (Section 6.3).</p> <p>8.11 Availability of record on training history and/or result of health examination and/or personal hygiene management (Sections 7.1, 7.5, 7.7 and 7.8).</p> <p>8.12 Update documents or record forms for each production season. Collected a complete record with very record signed by responsible operators.</p> <p>8.13 Documents and/or records shall be kept in categories separated by each production season in order to facilitate inspection and utilization.</p>
(2) Traceability and verification - Traceability	<p>8.14 Produce in holding and moving or packing for distribution shall bear lot number or tagged with code or mark of production source or harvested date for traceability.</p> <p>8.15 In case of sale, record the information on buyer or location of sale including the quantity sold.</p> <p>8.16 Keep the record of operations and important documents related to the operation for at least 2 consecutive production years, or as required by entrepreneur or trading partner countries in order to ensure the traceability and recall of goods when problems arise.</p> <p>8.17 In case where problems occurred in the planting plot affecting food safety, separate the produce and prevent it from being distributed. If the incidence is found after sale, immediately inform the buyers.</p>

Items	Requirements
	8.18 In case where problems in the planting plot affecting food safety, investigate the cause and find the solution in order to prevent the recurrence of the problem, and keep the record.
- Verification	8.19 Verify of Good Agricultural Practices or the record at least once a year to assure the production process, and improve operating steps in accordance with their objectives, as well as keep verification and corrective action.
	8.20 Availability of action to resolve relevant complaint, and keep the record of action to the complaint.

## APPENDIX A

**Table A.1**  
**Relationship between Requirements on**  
**Good Agricultural Practices for Food Crop and Modules of Food Safety,**  
**Produce Quality, Environmental and**  
**Worker Health, Safety, Welfare.**

Items	Requirements	Modules			
		Food Safety (FS)	Produce Quality (PQ)	Environmental Management (EN)	Worker Health, Safety, Welfare (WHSW)
1. Water	1.1	√			
	1.2	√			
	1.3	√			
	1.4	√			
	1.5		√		
	1.6			√	
	1.7			√	
	1.8			√	
	1.9			√	
	1.10			√	
	1.11		√		
	1.12	√			
	1.13	√			
	1.14	√			
2. Planting area	2.1	√			
	2.2	√			
	2.3	√			
	2.4			√	
	2.5			√	
	2.6	√	√	√	√
	2.7			√	
	2.8			√	
	2.9	√			
	2.10	√			
	2.11			√	
3. Pesticides	3.1	√			
	3.2	√			
	3.3	√			
	3.4	√			
	3.5	√			

Items	Requirements	Modules			
		Food Safety (FS)	Produce Quality (PQ)	Environmental Management (EN)	Worker Health, Safety, Welfare (WHSW)
	3.6	√			
	3.7	√		√	
	3.8	√			
	3.9	√			√
	3.10	√		√	
	3.11			√	
	3.12	√			√
	3.13	√			
	3.14	√			
	3.15	√			√
	3.16				√
	3.17				√
	3.18			√	√
	3.19				√
	3.20				√
	3.21				√
4. Pre-harvest quality management	4.1	√	√	√	√
	4.2	√			
	4.3		√		
	4.4	√			
	4.5	√	√	√	√
	4.6	√			
	4.7	√			
	4.8	√			
	4.9	√			
	4.10		√		
	4.11	√		√	
	4.12				√
	4.13				√
	4.14				√
	4.15	√			
	4.16	√			
	4.17	√	√	√	√
	4.18			√	
	4.19			√	
5. Harvest and postharvest handlings	5.1		√		
	5.2	√			
	5.3		√		
	5.4		√		
	5.5	√			

Items	Requirements	Modules			
		Food Safety (FS)	Produce Quality (PQ)	Environmental Management (EN)	Worker Health, Safety, Welfare (WHSW)
	5.6	√			
	5.7	√			
	5.8	√			
	5.9	√			
	5.10		√		
	5.11	√			
	5.12	√			
	5.13	√			
	5.14	√			
6. Holding, moving produce in planting plot, and storage	6.1	√	√		
	6.2	√			
	6.3	√			
	6.4	√			
	6.5		√		
	6.6	√			
	6.7		√		
	6.8		√		
	6.9	√			
7. Personal hygiene	7.1	√			√
	7.2	√			
	7.3	√			√
	7.4	√			
	7.5				√
	7.6				√
	7.7				√
	7.8				√
8. Record keeping and traceability	8.1		√	√	
	8.2			√	
	8.3	√			
	8.4	√			
	8.5	√			
	8.6	√			
	8.7	√			
	8.8		√		
	8.9	√			
	8.10	√			
	8.11	√	√		
	8.12	√	√	√	√
	8.13	√	√	√	√
	8.14	√			

Items	Requirements	Modules			
		Food Safety (FS)	Produce Quality (PQ)	Environmental Management (EN)	Worker Health, Safety, Welfare (WHSW)
	8.15	√			
	8.16	√			
	8.17	√			
	8.18	√			
	8.19	√	√	√	√
	8.20	√	√	√	√

- Note:
1. FS is an abbreviation for Food Safety
  2. PQ is an abbreviation for Produce Quality
  3. EN is an abbreviation for Environmental Management
  4. WHSW is an abbreviation for Worker Health, Safety and Welfare