



**THAI AGRICULTURAL STANDARD**

**TAS 2506-2013**

**GOOD AGRICULTURAL PRACTICES  
FOR SWEET CORN**

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

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**50 Phaholyothin Road, Ladyao, Chatuchak, Bangkok 10900**

**Telephone (662) 561 2277 Facsimile (662) 561 3357**

**[www.acfs.go.th](http://www.acfs.go.th)**

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**Technical Committee on the Elaboration of the Thai Agricultural Standard for  
Sweet Corn**

- |     |   |                      |
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Sweet corn is a quality commodity of Thailand for its own potential for fresh produce distribution and food industry. The development of standard on good agricultural practices for sweet corn is therefore beneficial to farmers in the production of safe and good quality sweet corn by taking account of the environment and health, safety and welfare of workers. The Agricultural Standard Committee deems it necessary to establish the standard on Good Agricultural Practices for Sweet Corn.

This standard is based on the following document:

TAS 9001-2556. Thai Agricultural Standard. Good Agricultural Practices for Food Crop. National Bureau of Agricultural Commodity and Food Standards, Bangkok.



**NOTIFICATION OF MINISTRY OF AGRICULTURE AND COOPERATIVES**

**SUBJECT: THAI AGRICULTURAL STANDARD:**

**GOOD AGRICULTURAL PRACTICES FOR SWEET CORN**

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

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Whereas the Agricultural Standards Committee, by the decision of the fourth session dated 28 August B.E. 2556 (2013), deems it necessary to establish an agricultural standard on Good Agricultural Practices for Sweet Corn 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 5,15 and 16 of the Agricultural Standards Act B.E. 2551(2008), the Minister of Agriculture and Cooperatives hereby issues this Notification on the Establishment of Thai Agricultural Standard: Good Agricultural Practices for Sweet Corn (TAS 2506-2013) as a voluntary standard, details of which are attached herewith.

Notified on 16 October B.E. 2556 (2013)

(Mr. Yukol Limlamthong)  
Minister of Agriculture and Cooperatives

## THAI AGRICULTURAL STANDARD

### GOOD AGRICULTURAL PRACTICES FOR SWEET CORN

#### 1. SCOPE

This Thai Agricultural Standard covers good agricultural practices for sweet corn at all stages of production at farm level until transportation to the factory to obtain the quality and safety of produce by taking into account the environment and health, safety and welfare of workers. Post-harvest handlings are included in case the produce is packed and/or collected for sale.

#### 2. DEFINITIONS

For the purposes of this standard, the definitions of TAS 9001 entitled the Thai Agricultural Standard on Good Agricultural Practices for Food Crop and the following are applied:

**Sweet corn** means corn of the scientific name *Zea mays* L. in the family of Poaceae. It possesses the sweetness containing the total soluble solids of not less than 9° Brix and be distributed in whole with or without husk.

#### 3. REQUIREMENTS

Requirements for Good Agricultural Practices for Sweet Corn shall be as in Table 1.

**Table 1 Requirements**

Items	Requirements
<b>1. Water</b>  (1) Water used in planting area	<p>1.1 Water used in the production shall come from the sources where their environment does not cause contamination of hazardous substances on the produce affecting consumer safety.</p> <p>In case of risk, sample of water shall be analysed by either official or accredited laboratories for hazardous substance contamination. Analytical results shall be kept as evidence for at least 2 years.</p> <hr/> <p>1.2 Do not use untreated sewage from industrial factories or other sources, e.g. community and hospital, that can cause contamination of hazardous substances. If it is necessary to use such water, there shall be clear evidence showing that such water has been treated and it can be used in the production.</p>

Items	Requirements
	1.3 Take sample of water at least once prior to entering the production system and during the period that the environmental setting is likely to cause contamination. The sample of water shall be analysed by official or accredited laboratories for contamination. Analytical results shall be kept as evidence for at least 2 years.
	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 appropriate irrigation method according to water requirement of sweet corn and soil moisture level
	1.6 Availability of appropriate irrigation method to minimise wastage of water and risk affecting the environment of such planting area and its surroundings
	1.7 Availability of wastewater management, e.g. water from toilets and drainage systems, in order to minimise risk affecting the environment of such planting area and its surroundings.
	1.8 Regularly maintain the effectiveness of irrigation system.
	1.9 Water source for agriculture should not be of the environmental destruction.
	1.10 Availability of conservation of water source and its environment
	1.11 Select production site with sufficient water supply for the production of quality sweet corn.
(2) Water used for post-harvest practices	1.12 If it is necessary to use water for post-harvest practices, water quality shall be of potable water standard or equivalent.
<b>2. Planting area</b>	<p>2.1 Planting area shall not be located in the environment causing contamination of hazardous substances on produce affecting consumer safety.</p> <p>In case of risk, sample of soil shall be analysed by either official or accredited laboratories for contamination. Analytical results shall be kept as evidence for at least 2 years.</p>
	2.2 If it is necessary to use such risk area, there shall be clear evidence of treatment method to minimise the contamination to the safety level.

Items	Requirements
	2.3 Take sample of soil at least once prior to entering the production system and during the period that the environmental setting is likely to cause contamination. The sample of soil shall be analysed by official or accredited laboratories for contamination. Analytical results shall be kept as evidence for at least 2 years.
	2.4 If soil or planting material is fumigated or treated with chemicals, chemical type, date, rate and method of application as well as worker's name shall be recorded and kept as evidence for at least 2 years.
	2.5 New planting area shall not cause adversely affect to the environment. If it does, mitigation or prevention measures shall be in place.
	2.6 Plot layout, plot setting or layout adjusting shall be taken into consideration the impacts on food safety, environment, produce quality as well as health, safety and welfare of workers.
	2.7 Maintain the planting area in order to prevent soil degradation.
	2.8 Sweet corn shall be cultivated on suitable soil type and with proper planting practices that do not cause any risk to the environmental deterioration.
	2.9 Plot code and information shall be made available specifying name and address of farm owner, name and address of plot responsible person (if any), farm location and map, plot layout and sweet corn variety.
	2.10 Provide land use history for at least the past 2 years.
	2.11 Area for planting shall comply with relevant laws and regulations.



Items	Requirements
<b>3. Pesticides</b>	<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.</p> <p>Stop applying pesticide before harvest in accordance with the withholding period indicated on the label of each pesticide or the official recommendations.</p> <p>In case there is evidence or doubt of improper use, the sample of produce shall be analysed for pesticide residues by either official or accredited laboratories for pesticide residues analysis. Record shall be kept as evidence for at least 2 years.</p> <p>In case the result of pesticide residue analysis is higher than the maximum residue limit according to the relevant standards or laws, investigate the cause and corrective action or preventive measure shall be taken to avoid the reoccurrence of incidences. Such record shall be kept as evidence.</p>
	<p>3.2 Do not use or own pesticides that are prohibited under the Hazardous Substances Act B.E. 2535 (1992) and its amendments on manufacturing, import, export or possession of pesticides.</p>
	<p>3.3 In case of export produce, do not use pesticides prohibited by importing countries or follow their regulations.</p>
	<p>3.4 Availability of information on permitted and/or prohibited pesticides of both domestic and trading partner countries</p>
	<p>3.5 Properly select chemical sprayers, equipment and spray nozzles, including spraying methods. The sprayers shall be regularly checked so that they are maintained in working condition for effective operation.</p>
	<p>3.6 The mixing of more than two pesticides is avoided, unless recommended by relevant competent authorities or supported by scientific information.</p>
	<p>3.7 Integrated Pest Management system is appropriately implemented to reduce the use of pesticides.</p>
	<p>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.</p> <p>If the pesticide is transferred to another container, the new container shall be identified with complete information as shown by its original label.</p>

Items	Requirements
	3.9 Pesticides shall be kept in the specified secure storage and the application of pesticides shall be controlled in order to prevent contamination amongst pesticides and not to pose a risk of contamination to the produce and harm to personnel.
	3.10 Other chemicals such as fuel, cleaning agents, and other non-agrochemicals shall be stored in good order to prevent contamination to the produce and environment.
	3.11 Clean chemical sprayer and equipment after each use and dispose the rinsed water by the method that does not cause contamination to the environment.
	3.12 The empty pesticide container shall be destroyed to prevent reuse or disposed by proper method.
	3.13 The deteriorated or expired pesticide container shall be kept in the secured area, and destroyed in order to prevent reuse or disposed by proper method.
	3.14 Make a list of pesticides by identifying sources of supply, specification details of pesticides, including quantity, dates of purchase and kept as the records.
	3.15 Workers and/or supervisors shall have proper knowledge on the correct application of pesticides. They shall be able to identify pests, select types of pesticides and rates of application including sprayers and related equipment.
	3.16 Workers shall have knowledge and understand how to protect themselves from hazard on the use of pesticides and how to apply first aids.
	3.17 During pesticide application, the workers 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 pesticides.
	3.18 The workers shall always be on the windward side and spray chemicals according to wind direction. Care shall be taken that the spray droplets shall not contaminate the adjacent plots and environment.
	3.19 The workers 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.

Items	Requirements
	3.20 Availability of first aid kit and complete set of accidental protective equipment such as eyewash solution, clean water and sand
	3.21 Availability of instruction on accident or emergency visibly displayed in the chemical storage area
<b>4. Pre-harvest quality management</b>  (1) Production control plan	4.1 Availability of production control plan to obtain desired produce based on Good Agricultural Practices or information from recognized research, government agencies, experts on sweet corn 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 health, safety and welfare of workers
(2) Production Inputs  - Seeds	4.2 True to type seeds of the appropriate varieties for sweet corn production shall be selected. They shall be free from pests, meet the seed quality standard and come from reliable sources. Keep the record.
	4.3 In case fungicides and insecticides are additionally applied for seeds, follow the instruction and rate of application as recommended on the label of registered pesticide. Keep the record.
	4.4 Test seed germination in sand prior to planting. If the germination rate is less than 85%, do not use as seeds for planting. Keep the record of test results.
- Fertilizers and soil Conditioners	4.5 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.
	4.6 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.
	4.7 Do not use human sewage as fertilizer.

Items	Requirements
	4.8 Storage, mixing, and handling fertilizer and soil conditioner areas or composting area shall be separated and located in the area that does not pose any contamination to planting areas and water sources.
	4.9 Apply proper fertilizers at the rate recommended on the label.
	4.10 Make a list of fertilizers and soil conditioners identifying sources, quantity and dates of purchase and kept the records.
- Agricultural tools and equipment	4.11 Provide sufficient and appropriate agricultural tools and equipment for operations.
	4.12 Provide separated, secured and easy to access storage for agricultural tools and equipment.
	4.13 Check the effectiveness of tools and equipment before use and check the electrical appliances regularly in order to prevent any accident and harm to the workers.
	4.14 Calibrate tools and equipment that require accuracy in the operation at least once a year. Keep the record. In case of deviation, adjust, repair or change so that it functions effectively according to the standard.
	4.15 Clean tools and equipment including containers which are used in packing and transporting the produce each time before and after use.
- Management of production steps	4.16 Availability of production management in order to obtain produce that meets trading partners' requirements
	4.17 Use appropriate plant spacing as recommended for each variety.
	4.18 Do not plant the sweet corn nearby other types of corn or different varieties of sweet corn. If necessary, a time interval of 3 weeks is required.
	4.19 Supply water to sweet corn in case of insufficient of soil moisture, particularly during the flowering and prior to harvest.
	4.20 Regularly survey the disease and pest status in the planting plot and kept as record.

Items	Requirements
	4.21 When the economic threshold level of pests is met, appropriate disease and pest control measures and methods are applied and keep the record.
	4.22 Availability of weed control management in the planting plot by keeping weed at a level not causing damage to the growth of sweet corn
- Disposal of waste and unused or irrelevant materials to production	4.23 Infected parts of sweet corn shall be burnt outside the planting plot, taking into account its impact on the environment.
	4.24 Clearly separate types of waste and unused or irrelevant materials to production. Provide sufficient garbage bins or clearly specify disposal area. In addition, practices to minimize waste should be used during the production process.
<b>5. Harvest and postharvest handlings</b>	5.1 Harvest sweet corn ears at the suitable stage for consumption <sup>1/</sup> or as required by trading partners.
	5.2 Segregate the unqualified produce. If the produce is sorted by class and size prior to distribution, follow the requirements in the TAS 1512 entitled the Thai Agricultural Standard for Sweet Corn or as required by the trading partners.
	5.3 Prevent contamination of produce which is already sorted or packed at the planting area from hazardous substances.
	5.4 The equipment and containers used for harvest shall not cause damage to the quality of ears, and contamination from hazardous substances and foreign matters affecting the consumer safety. Harvested produce shall not contact directly with the ground.
	5.5 Clearly separate waste and chemical containers from those used for harvest and transport of produce in order to prevent contamination.
	5.6 Do not use tools, containers and materials that cause direct contamination to the produce.
	5.7 Maintain the cleanliness of tools and containers in order to prevent contamination to produce and have them ready to use.

<sup>1/</sup> Sweet corn at the suitable stage for consumption contains the total soluble solids of not less than 9 °Brix. Silk tips turn dry. The kernel, when squeezed, opaque milk-like liquid will seep out. The kernel is soft and crunchy suitable for consumption. In addition, the harvesting period varies depending on the variety, planting location, seasons and/or climatic conditions.

Items	Requirements
	5.8 Availability of separate storage for tools, containers and materials from chemicals, fertilizers and soil conditioners. Availability of preventive measure against contamination from pests.
	5.9 Availability of plan to utilize unqualified produce as well as the check of unqualified produce commingled with the qualified ones.
	5.10 Prevent harvested sweet corn from deterioration.
	5.11 Area for postharvest handlings shall have structure that is able to prevent risk of contamination to the produce.
	5.12 In case contamination risk of physical hazards from tools and equipment is found, preventive measures shall be provided.
	5.13 Prevent pets and pests from entering into the operation area, particularly the planting plots and the areas for packing and storage. In case of risk, preventive measures shall be provided.
	5.14 In case of bait or trap is used to control pests, they shall be placed in the area that does not cause risk of contamination to the produce, containers and materials supplied and keep the record.
<b>6. Holding and moving produce within the planting area</b>	6.1 Availability of hygienic management of the area, moving method and/or holding in order to prevent contamination from hazards and foreign matters affecting safety for consumption and quality of the produce
	6.2 Availability of clean floor covering materials in the holding area of harvested produce in order to prevent contamination from soil and filth or other hazards from the ground
	6.3 Appropriately handle the harvested produce in the holding area within the planting area to avoid friction among the produce and deterioration of the produce due to the heat and sunlight.
	6.4 Select appropriate containers for moving the produce within the planting area to the packing area.
	6.5 Do not use the same vehicle for pesticides or fertilizers to transfer or transport the produce in order to prevent contamination causing produce unsafe for consumption. In case the same vehicle is used, the vehicle shall be cleaned in order to prevent such contamination and keep the record.

Items	Requirements
	<p>6.6 Transport the sweet corn out of the planting area to the collection center or buyers as soon as possible. Such sweet corn shall be in whole with husks or as required by trading partners. In case of long journey, heat and air ventilation tools such as PVC perforated duct shall be provided, where appropriate.</p>
<b>7. Personal hygiene</b>	<p>7.1 Workers shall have knowledge, understanding or receive personal hygiene training in order to work hygienically.</p>
	<p>7.2 Those who contact directly with the produce, particularly after the harvest, shall maintain their personal hygiene and means to prevent contamination to 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 area and the produce.</p>
	<p>7.4 In case of illness, workers shall inform the supervisor for making decision not to cause any contamination to produce.</p>
	<p>7.5 Workers involved in the pesticide operations shall have their health check at least once a year.</p>
	<p>7.6 Farm owner shall provide proper basic facilities to workers.</p>
	<p>7.7 Farm owner shall provide proper training to workers according to their designated duty.</p>
	<p>7.8 Farm owner and workers shall have adequate knowledge or receive training related to Good Agricultural Practices.</p>
<b>8. Record</b>  (1) Documents and records	<p>8.1 In case of hazardous substance contamination risks in water and soil, the records on analytical results shall be provided. (Sections 1.1 and 2.1)</p>
	<p>8.2 Availability of records on analytical results of contamination in water and soil prior to entering the production system and during the period that the environmental setting is likely to cause contamination (Sections 1.3 and 2.3)</p>
	<p>8.3 Availability of record on details of seed sources (Section 4.2)</p>
	<p>8.4 Availability of record on seed germination test result (Section 4.4)</p>

Items	Requirements
	8.5 Availability of record or evidence on the procurement of pesticides (Section 3.14)
	8.6 Availability of record on each application of pesticides including chemicals used for soil fumigation or treatment, indicating at least types of chemicals, purposes of the applications, applied date, rate and method of application, harvesting date and worker's name (Sections 2.4, 3.1 and 4.3)
	8.7 Availability of record on details related to the procurement of fertilizers and soil conditioners (Section 4.10)
	8.8 Availability of record on the production of organic fertilizer indicating method, date and period of production (Section 4.6)
	8.9 Availability of records and information on each plot code (Section 2.9)
	8.10 Availability of records on the infestation of diseases and insect pests (Section 4.20)
	8.11 Availability of records on the control measures of diseases and insect pests. (Section 4.21)
	8.12 Availability of records on the pest control (Section 5.14)
	8.13 Availability of records and/or evidence of health check (Section 7.5)
	8.14 Availability of training records on personal hygienic practices for the workers (Section 7.1)
	8.15 Availability of training record of workers according to their assigned duty and/or knowledge on good agricultural practices for the farm owner and workers (Section 7.7 and 7.8)
	8.16 Update documents or record forms for each production season with complete record and signed by responsible workers.
	8.17 Documents and/or records shall be kept in categories separated for each production season in order to facilitate inspection and use.
(2) Traceability and review - Traceability	8.18 The produce during moving or packing for distribution shall be identified with lot number or tagged code or mark



Items	Requirements
	<p>showing production sites or harvesting dates for traceability.</p> <p>In case of sale, record the production of the crop and information of buyers or locations of sale of such crop.</p>
	<p>8.19 The record of operations and important documents related to the operation shall be kept for at least 2 consecutive production years, or as required by entrepreneur or trading partners in order to ensure the traceability and recall of the produce when problems arise.</p>
	<p>8.20 In case where problems occurred in the planting area affecting consumer safety, separate the produce in question and prevent it from being distributed for food consumption. If the incidence is found after sale, immediately inform the buyers.</p>
	<p>8.21 In case where problems occurred in the planting area affecting safety, investigate the cause and find the solution in order to prevent the recurrence of the problem and keep the record.</p>
- Review of practices	<p>8.22 All practices or records are reviewed at least once each year to ensure that the production process is done correctly and actions are taken to improve such deficiencies to fulfill the purposes of good practices. A record of such review and corrective actions taken is kept.</p>
	<p>8.23 Actions are taken in response to the complaints, and a record is kept.</p>