

Module 18: Good Agricultural Practices for Indoor Farming of Plant Products

18.1 Premises – Exterior, Buildings, and Interior

18.1.1 Premises Exterior

18.1.1.1 The location and construction of the premises and building shall ensure that:

- i. Adjacent and adjoining buildings, operations, and land use do not interfere with safe and hygienic operations; and
- ii. Relevant regulatory authority approval has been obtained and is on file.

18.1.1.2 The methods and responsibilities to maintain a suitable exterior environment shall be documented and implemented. These include:

- i. Effective, periodic monitoring and/or inspection of the premises, the surrounding areas, storage facilities, machinery, and equipment;
- ii. Controls to ensure that the exterior is kept free of waste and/or accumulated debris to prevent the attraction of pests and vermin;
- iii. Paths, roadways, loading and unloading areas are adequately drained and maintained; and
- iv. Records of inspections and correction actions are maintained.

18.1.2 Growing Areas

18.1.2.1 Walkways and floors shall be constructed of smooth, dense, impact-resistant material that can be effectively graded, drained, easily cleaned, and is impervious to liquid. Floors shall be suitably sloped toward the drains at gradients to allow the effective removal of all overflow or wastewater under normal working conditions. Where floor drainage is not possible, plumbed options or other control measures shall be in place to handle overflow or wastewater.

18.1.2.2 Drains and waste/material trap systems shall be constructed and located so they can be easily cleaned and not present a hazard to harvested products.

18.1.2.3 Walls, partitions, ceilings, and doors shall be of durable construction and/or easily replaced. Internal surfaces shall have even, light-colored finishes, be impervious to liquids, and shall be kept clean (refer to 18.3.3).

Wall-to-wall and wall-to-floor junctions shall be designed to be easily cleaned and sealed to prevent the accumulation of harvested product waste.

Drop ceilings, where present, shall be constructed to enable monitoring for pest activity, facilitate cleaning, and provide access to utilities.

Greenhouse glass or plastic for roof or wall construction shall be kept in good repair, clean, and designed and installed for effective pest management.

- 18.1.2.4 Ducting, conduit, and pipes that convey products or services, such as air, steam, water, sanitary waste, or wastewater, shall be designed and constructed to prevent the contamination of food, ingredients, and food contact surfaces, and allow ease of cleaning (refer to 18.3.3).
- 18.1.2.5 Adequate ventilation shall be provided in enclosed product handling and storage areas and meet commodity-specific regulations where applicable. All ventilation equipment and devices shall be adequately cleaned per 18.3.3.
- 18.1.2.6 Pipes carrying sanitary waste or wastewater that are located directly over product lines or storage areas shall be designed and constructed to prevent the contamination of food, inputs, and food contact surfaces, and shall allow ease of cleaning.
- 18.1.2.7 Doors, hatches, and windows and their frames in food handling or storage areas shall be of a material and construction that meets the same functional requirements as for internal walls and partitions. Doors and hatches shall be of solid construction, and windows shall be made of shatterproof glass or similar material.
- 18.1.2.8 Stairs, catwalks, and platforms in food handling areas shall be designed, constructed, and cleaned so they do not present a product contamination risk, and have no open grates directly above exposed food product surfaces.
- 18.1.2.9 The inspection/quality control area shall be provided with facilities that are suitable for examination and testing of the type of product being handled/packed (refer to 2.4.4 for internal lab requirements). The inspection area shall:
 - i. Have easy access to handwashing facilities;
 - ii. Have appropriate waste handling and removal; and
 - iii. Be kept clean to prevent product contamination.
- 18.1.2.10 Lighting and light fixtures in product handling areas, inspection stations, ingredient/ input and packaging storage areas, and all areas where the product is exposed shall be:
 - i. Of appropriate intensity to enable personnel to carry out tasks efficiently and effectively; and
 - ii. Shatterproof, manufactured with a shatterproof covering, or fitted with protective covers. Where fixtures cannot be recessed, including in warehouses, structures must be protected from accidental breakage, manufactured from cleanable materials, and addressed in the cleaning and sanitation program.

18.1.3 Insect and Pest Proofing

- 18.1.3.1 All external windows, ventilation openings, doors, and other openings shall be effectively sealed when closed and proofed against dust, vermin, and other pests.

External personnel access doors shall be provided. They shall be effectively insect-proofed and fitted with a self-closing device and proper seals to protect against ingress of dust, vermin, and other pests.

18.1.3.2 External doors, including overhead dock doors in food handling areas used for product, pedestrian, or truck access, shall be designed and maintained to prevent pest entry by at least one or a combination of the following methods:

- i. A self-closing device;
- ii. An effective air curtain;
- iii. A pest-proof screen;
- iv. A pest-proof annex; and
- v. Adequate sealing around trucks in docking areas.

18.1.3.3 Electric insect control devices, pheromone, or other traps and baits shall be located and operated so they do not present a contamination risk to the product, packaging, containers, or operating equipment. Poison rodenticide bait shall not be used inside growing rooms, product storage areas, or other food handling areas.

18.2 Equipment and Maintenance

18.2.1 Product Handling Equipment and Utensils

18.2.1.1 The methods and responsibility for purchasing and specifications development for equipment and utensils shall be documented and implemented. The methods shall ensure that equipment and utensils:

- i. Are designed, constructed, installed, and operated so as not to pose a threat to products; and
- ii. Meet any applicable regulatory requirements.

18.2.1.2 Product contact surfaces and those surfaces not in direct contact with product in product handling areas, raw material storage, packaging material storage, and cold storage areas shall be constructed of materials that will not contribute a food safety risk.

Paint used in a food handling or contact zone shall be suitable for use, in good condition, and shall not be used on any product contact surface.

18.2.1.3 Benches, tables, conveyors, packers, and other mechanical equipment shall be hygienically designed and located for appropriate cleaning. Equipment surfaces shall be smooth, impervious, and free from cracks or crevices.

18.2.1.4 Product containers, tubs, and bins used for edible and inedible material shall be constructed of materials that are non-toxic, smooth, impervious, and readily cleaned per the cleaning and sanitation program. Bins used for inedible material shall be clearly identified.

18.2.1.5 All equipment and utensils shall be cleaned after use (refer to the cleaning and sanitation program) and be stored in a clean and serviceable condition to prevent microbiological or cross-contact allergen contamination.

18.2.1.6 Vehicles and/or other devices used to transport and move products in food contact, handling, or processing zones, or cold storage rooms shall be designed and operated so as not to present a food safety hazard.

Site-owned and operated shipping vehicles shall be maintained and clean so they do not impact the safety of shipped products.

18.2.2 Equipment Maintenance and Repair

18.2.2.1 The methods and responsibility for the maintenance and repair of equipment and buildings and facilities shall be documented, planned, and implemented in a manner that minimizes the risk of product, packaging, or equipment contamination. The methods shall ensure:

- i. Routine preventive maintenance of facilities and equipment in any food handling or storage area is performed according to a maintenance control schedule;
- ii. Preventive maintenance and repair of items identified as impacting food safety controls and practices are prioritized for completion according to defined schedules or immediately when they are not properly functioning; and
- iii. Records are maintained for all preventive maintenance and equipment failure/immediate repair activities and corrective actions.

The maintenance schedule shall cover buildings, equipment, and other areas of the premises critical to product safety and quality.

18.2.2.2 The maintenance supervisor and/or site supervisor shall be informed when repairs or maintenance are undertaken in product handling or storage areas and when the activities pose a potential threat to product safety (e.g., pieces of electrical wire, damaged light fittings, and loose overhead fittings). When possible, maintenance is to be conducted outside operating times.

18.2.2.3 Temporary repairs, where required, shall not pose a food safety risk and shall be included in the cleaning program and/or routine inspections. There shall be a plan in place to address the completion of temporary repairs to ensure they do not become permanent solutions.

18.2.2.4 Equipment located over product or product conveyors shall be lubricated with food-grade lubricants, and its use shall be controlled to minimize the contamination of the product.

18.2.2.5 Compressed air systems, and systems used to store or dispense other gases used in the operational process that come into contact with food or food contact surfaces, shall be maintained and regularly monitored for quality and applicable food safety hazards.

18.2.3 Maintenance Personnel and Contractors

18.2.3.1 Maintenance personnel and contractors shall comply with the site’s personnel and operational hygiene requirements (refer to 18.5).

18.2.3.2 All maintenance and other engineering contractors required to work on-site shall be trained in the site’s food safety and hygiene procedures or shall be escorted at all times until their work is completed.

18.2.3.3 Maintenance personnel and contractors shall remove all tools and debris from any maintenance activity, once it has been completed, and inform the area supervisor and maintenance supervisor, so appropriate hygiene and sanitation can be conducted and a pre-operational inspection completed prior to restarting site operations. Maintenance, operations, and/or sanitation shall sign-off on communications.

18.2.4 Calibration

18.2.4.1 The methods and responsibility for calibration and re-calibration of chemical application, measuring, testing, and inspection equipment used in growing and harvesting processes or to demonstrate compliance with customer specifications shall be documented and implemented. The methods shall ensure:

- i. Calibration is performed according to regulatory requirements and/or the equipment manufacturer’s recommended schedule;
- ii. Calibrated measuring, testing, and inspection equipment is protected from damage and unauthorized adjustment;
- iii. Affected product is handled per non-conforming product procedures when equipment is found to be out of calibration;
- iv. Software used for calibration activities is effective and appropriate; and
- v. Records of calibration activities are maintained.

18.2.4.2 Equipment shall be calibrated against manufacturer, national or international reference standards, methods, and schedules. In cases where such standards are not available, the site shall provide evidence to support the calibration reference method applied.

18.3 Cleaning and Pest Prevention

18.3.1 Pest Prevention

18.3.1.1 The methods and responsibility for pest prevention shall be documented and effectively implemented. The pest prevention program shall:

- i. Describe the methods and responsibility for the development, implementation, and maintenance of the pest prevention program;
- ii. Record pest sightings and trend the frequency of pest activity to target pesticide applications;
- iii. Outline the methods used to prevent pest problems;

- iv. Outline the pest elimination methods and the appropriate documentation for each inspection;
- v. Outline the frequency with which pest status is to be checked;
- vi. Include the identification, location, number, and type of bait stations set on a site map;
- vii. List the chemicals used. They are required to be approved by the relevant authority, and their Safety Data Sheets (SDS) made available;
- viii. Outline the methods used to make personnel aware of the bait control program and the measures to take when they come into contact with a bait station;
- ix. Outline the requirements for personnel awareness and training in the use of pest and vermin control chemicals and baits; and
- x. Measure the effectiveness of the program to verify the elimination of applicable pests and to identify trends.

18.3.1.2 Pest contractors and/or internal pest controllers shall:

- i. Be licensed and approved by the local relevant authority;
- ii. Use only trained and qualified operators who comply with regulatory requirements;
- iii. Use only approved chemicals;
- iv. Maintain a site map indicating the location of bait stations, traps, and other applicable pest control/monitoring devices; and
- v. Report to a responsible authorized person on entering the premises and after the completion of inspections or treatments.

18.3.1.3 Inspections for pest activity shall be conducted on a regular basis by trained personnel and the appropriate action taken if pests are present. Identified pest activity shall not present a risk of contamination to food products, raw materials, or packaging.

Records of pest activity inspections and pest control devices shall be maintained.

18.3.1.4 Food products, raw materials, or packaging that are found to be contaminated by pest activity shall be effectively disposed of, and the source of pest infestation shall be investigated and resolved. Records shall be kept of the disposal, investigation, and resolution.

18.3.1.5 No domestic animals shall be permitted on the site in food handling or storage areas.

18.3.2 Cleaning

18.3.2.1 The methods and responsibility for cleaning of the product handling equipment and environment shall be documented and implemented. Cleaning procedures and schedules shall include:

- i. A list of equipment, utensils, and storage areas that require periodic cleaning;
- ii. Instructions on how cleaning is performed for the various areas and equipment;
- iii. The frequency of when cleaning is to be completed;

- iv. Personnel responsible and the methods used to verify the effectiveness of the cleaning and sanitation program (e.g., validation of procedures, concentration of detergents and sanitizers); and
- v. Records of cleaning activities and effectiveness reviews/inspections are maintained.

18.3.2.2 Detergents and sanitizers shall be suitable for use in a food handling environment, labeled according to regulatory requirements, and purchased in accordance with applicable legislation. The organization shall ensure:

- i. The site maintains a list of chemicals approved for use;
- ii. An inventory of all purchased and used chemicals is maintained;
- iii. Detergents and sanitizers are properly stored per the storage program;
- iv. Safety Data Sheets (SDS) are provided for all detergents and sanitizers purchased; and
- v. Only trained personnel handle sanitizers and detergents.

18.3.2.3 Detergents and sanitizers that are mixed for use shall be correctly mixed according to the manufacturer's instructions, stored in containers that are suitable for use, and clearly identified.

Mix concentrations shall be verified and records maintained.

18.3.2.4 Suitably equipped areas shall be designated for cleaning product containers, knives, cutting boards, and other utensils. Racks and containers for storing cleaned utensils and protective clothing shall be clearly identified and maintained in a manner that prevents contamination of products, equipment, or storage areas.

18.3.2.5 Pre-operational inspections shall be conducted following cleaning and sanitation operations to ensure food handling areas, product contact surfaces, equipment, personnel amenities, sanitary facilities, and other essential areas are clean before the start of operations.

Pre-operational inspections shall be conducted by qualified personnel and records maintained.

18.4 Personal Practices, Hygiene, and Welfare

18.4.1 Personnel Practices

18.4.1.1 A documented and implemented procedure for personal hygiene and personnel practices shall ensure that personnel engaged in the handling of product use appropriate personal hygiene practices. The procedure shall include instructions that:

- i. Jewelry and other loose objects that pose a threat to the safety of the product are not worn or taken onto any growing, product handling, or storage operations.
- ii. Fingernail polish, artificial nails, and long nails are not permitted where product is handled with bare hands;
- iii. False eyelashes and eyelash extensions are not permitted;
- iv. Hair restraints are used where product is exposed; and

- v. Smoking, chewing, eating, drinking (except for water which shall be available to all personnel), or spitting is not permitted in any growing areas, during harvesting, and in packing operations.

Personnel and visitor practices, including those listed in 18.4, shall be routinely monitored for compliance, and any resulting corrective actions implemented and recorded for personnel who violate food safety practices.

Note: The wearing of plain bands with no stones or jewelry accepted for religious or cultural reasons and prescribed medical alert bracelets can be permitted; however, the site will need to consider its customer requirements and the applicable food legislation.

- 18.4.1.2 Personnel who are known to be carriers of infectious diseases that present a health risk to others through the packing or storage processes shall not engage in growing, product handling, or harvesting and packaging operations.
- 18.4.1.3 Procedures and responsibilities shall be in place that specify the handling of product and/or product contact surfaces that have been in contact with or exposed to blood or other bodily fluids.
- 18.4.1.4 Personnel with exposed cuts, sores, or lesions shall not be engaged in handling product or product contact surfaces. Minor cuts or abrasions on exposed parts of the body shall be covered with a suitable waterproof and colored dressing.

18.4.2 Sanitary Facilities and Handwashing

- 18.4.2.1 Toilet and handwashing facilities shall be provided and designed, constructed, and located in a manner that minimizes the potential risk for product contamination. The following shall be considered:
 - i. There shall be sufficient toilet facilities for the maximum number of personnel, and they shall be constructed so that they can be easily cleaned and maintained;
 - ii. Handwash basins with clean and potable water, hand soap, disposable towels or effective hand drying devices, waste bins, and a tank that captures used handwash water for disposal (if not connected to drains) shall be provided inside or adjacent to toilet facilities and in accessible locations throughout food handling areas as required;
 - iii. Signage in appropriate languages shall be provided adjacent to handwash basins instructing personnel to wash their hands after each toilet visit;
 - iv. Racks for protective clothing used by personnel and visitors shall be provided; and
 - v. Toilet and wash stations shall be maintained in clean and sanitary conditions. Tools/equipment used for cleaning toilet rooms shall not be used to clean operational areas.
- 18.4.2.2 Personnel shall have clean hands, and hands shall be washed by all personnel, contractors, and visitors:
 - i. On entering food handling areas and before putting on gloves;
 - ii. After each visit to a toilet;
 - iii. After using a handkerchief;
 - iv. After smoking, eating, or drinking; and

- v. After handling wash down hoses, cleaning materials, dropped products, or contaminated material.

18.4.2.3 Sanitary drainage shall not be connected to any other drains within the premises and shall be directed to a septic tank or a sewerage system as per regulations.

18.4.3 Protective Clothing

18.4.3.1 Protective clothing (e.g., uniforms and smocks) shall be effectively maintained, stored, laundered, and worn to protect products from the risk of contamination.

18.4.3.2 Where applicable, clothing (i.e., any outer garment), including footwear, shall be in good condition, cleaned, and worn to protect product from the risk of contamination.

18.4.3.3 Disposable gloves and aprons shall be changed after each break, upon re-entry into the processing area, and when damaged.

Non-disposable aprons and gloves shall be cleaned and sanitized as required and when not in use stored on racks provided in the processing area or designated sealed containers in personnel lockers and not on packaging, ingredients, product, or equipment.

18.4.4 Visitors

18.4.4.1 All visitors, including management personnel, shall be required to adhere to site personnel practices and specifically:

- i. Remove jewelry and other loose objects as per 18.4.1.1;
- ii. Wash hands as per 18.4.2.2;
- iii. Wear suitable clothing and footwear when entering growing and packing areas; and
- iv. Enter and exit operational areas through the proper personnel entrance points.

18.4.4.2 Visitors who are exhibiting visible signs of illness or have been in recent direct contact with other sites, animals, or produce shall be prohibited from entering any growing, product handling, or harvesting operation.

18.4.5 Personnel Amenities (change rooms, toilets, lunchrooms/breakrooms)

18.4.5.1 Personnel facilities shall be supplied with appropriate lighting and ventilation and provided to enable personnel and visitors to:

- i. Change into and out of protective clothing, if applicable;
- ii. Store street clothing, footwear, and personal items separate from food handling, packing, and storage areas.

18.4.5.2 Areas for meal breaks shall be designated and located away from food contact/handling zones and harvesting equipment. These areas shall be:

- i. Ventilated and well lit;
- ii. Provided with adequate tables and seating to accommodate the maximum number of personnel at one sitting;

- iii. Equipped with a sink serviced with hot and cold potable water for washing utensils;
- iv. Equipped with signage in appropriate languages instructing personnel to wash their hands before entering the growing or food handling areas;
- v. Equipped with refrigeration and heating facilities, enabling personnel to store or heat food and prepare non-alcoholic beverages if required; and
- vi. Kept clean and free from waste materials and pests.

18.4.5.3 Where outside eating areas are provided, they should be kept clean and free from waste materials and maintained in a manner that minimizes the potential for the introduction of contamination, including pests, to the site.

18.5 Harvesting and Packaging Practices

18.5.1 Growing and Harvesting Operations

18.5.1.1 All personnel engaged in any food handling operations shall ensure that products and materials are handled and stored to prevent damage or product contamination. They shall comply with the following operational practices:

- i. No eating or tasting any product in the food handling/contact zone, except as noted in element 18.5.1.2;
- ii. Entry to operational areas is only through the personnel access doors;
- iii. All doors are kept closed. Doors are not open for extended periods when access is required for waste removal, or receiving and/or shipping of products, ingredient, or packaging;
- iv. Packaging material, product, and ingredients are kept in appropriate containers as required and off the floor;
- v. Waste is contained in the bins identified for this purpose, removed from operational areas regularly, and not left to accumulate; and
- vi. All wash down and compressed air hoses are stored on hose racks after use and not left on the floor.

18.5.1.2 Personnel conducting harvesting and packaging activities shall ensure that utensils, personal effects, and inputs/materials used do not pose a food safety risk to products. These can include procedures that:

- i. Aprons and gloves are kept clean and not left on product, work surfaces, equipment, or packaging material but hung on apron and glove racks provided;
- ii. Harvest containers, if used, are inspected prior to use to ensure they are clean and free of physical debris or materials;
- iii. Knives and cutting instruments, where used, are approved for use, controlled, and kept clean and well maintained;
- iv. Cloths, towels, or other cleaning materials that pose a risk of cross-contamination are not used to wipe products or product containers;
- v. All packaging materials are appropriate for their intended use and kept off the floor; and

- vi. Non-food waste is contained in the bins identified for this purpose. Waste does not come into contact with produce, is removed regularly, and not left to accumulate (refer to 18.8).

18.5.1.3 Personnel conducting harvesting activities shall ensure product is not contaminated during the harvesting process. Work instructions and training shall include the following practices:

- i. Commodity-specific handling and harvesting instructions;
- ii. Employee access and controls on movement;
- iii. Damaged or decayed product is not harvested or culled; and
- iv. Product that contacts the ground or floor is not harvested.

18.5.1.4 Employee practices and activities, including those listed in 18.5, shall be routinely monitored for compliance, and any resulting corrective actions implemented and recorded for personnel who violate food safety practices.

18.5.2 Foreign Material, Glass, and Other Hazard Control

18.5.2.1 The methods and responsibility for prevention of foreign matter and glass contamination shall be documented and implemented. Procedures and resulting records shall ensure:

- i. Containers, equipment, and other utensils made of glass, porcelain, ceramics, brittle plastic, or similar materials are not permitted where exposed product is handled unless clearly identified, required for effective operational control, and regularly inspected;
- ii. Regular inspections are conducted to ensure food handling/contact zones areas are free of glass and brittle plastic and any items made from the previously identified materials are in good repair;
- iii. Wooden pallets and other wooden utensils or tools used in food handling/contact zones are dedicated for that purpose. Their condition is subject to regular inspection, and they are kept clean and maintained in good order;
- iv. Product harvesting and handling areas are routinely inspected to remove risks from foreign materials, such as debris, wood, stones, metal, and other physical hazards; and
- v. Personnel are made aware of their responsibility to adhere to the site's foreign matter and glass controls.

18.5.2.2 The methods and responsibility for conducting inspections to assess biological, chemical, and physical hazards and their risks to products being harvested shall be documented and implemented. Inspections shall occur before and during harvesting and through to the transport of product to its next destination (refer to 2.5.4.3).

18.5.3 Receiving and Shipping

18.5.3.1 Personnel conducting receiving activities shall ensure agricultural inputs, packaging materials, and product are not contaminated during the unloading process. Work instructions and training shall include the following:

- i. Vehicles are clean, in good repair, suitable for the purpose, and free from odors or other conditions that may impact negatively on the agricultural input, packaging, or product;
- ii. Vehicles (e.g., trucks/vans/containers) are secured from tampering using a seal or other agreed-upon and acceptable device or system; and
- iii. Where temperature control is required, the refrigeration unit's storage temperature settings and operating temperature are checked and recorded before opening the doors. Unloading is completed efficiently, and product temperatures are recorded at the start of unloading and at regular intervals during unloading.

Records for vehicle inspection, identification of approved suppliers, and temperature checks shall be maintained.

18.5.3.2 Personnel conducting loading and transporting of harvested product shall ensure that product integrity is maintained. Work instructions and training shall include the following:

- i. Inspections for ensuring vehicles are clean, in good repair, suitable for the purpose, and free from odors or other conditions that may impact negatively on products;
- ii. Securing vehicles (e.g., trucks/vans/containers) from tampering using a seal or other agreed-upon and acceptable device or system;
- iii. Verification that appropriate storage conditions are maintained during transportation to final destinations;
- iv. Prevention of cross-contamination with other hazards and potential spoilage;
- v. Use of appropriate stock rotation practices; and
- vi. Recording and maintaining documents for vehicle inspection, transport conditions, and stock rotation.

18.6 Water Management

18.6.1 Water Supply

18.6.1.1 A water supply plan shall be prepared that describes the water sources and the operational areas they serve, and shall include the location of water sources, permanent fixtures, and the flow of the water system. The plan shall be kept current and revised when changes occur.

Contingency plans shall be in place for instances when the potable water supply is deemed to be contaminated or otherwise inappropriate for use.

18.6.1.2 Adequate supplies of potable water drawn from a known clean source shall be provided for use during operations, cleaning the premises and equipment, and handwashing.

18.6.1.3 Supplies of hot and cold water shall be provided, as required, to enable the effective cleaning of the premises and equipment.

18.6.1.4 The use of non-potable water shall be controlled so that:

- i. There is no cross-contamination between potable and non-potable water lines;
- ii. Non-potable water piping and outlets are clearly identified;
- iii. Hoses, taps, and other similar sources of possible contamination are designed to prevent backflow or back siphonage; and
- iv. Testing of the backflow system, where possible, is conducted at least annually, and records are maintained.

18.6.1.5 Where water is stored on-site, storage facilities shall be adequately designed, constructed, and routinely cleaned to prevent contamination.

18.6.2 Water Management Plan

18.6.2.1 The water system plan described in 18.6.1.1 shall have a documented hazard analysis conducted annually and whenever changes occur to its sources, storage, methods of transportation, storage conditions, or environmental conditions (refer to 2.4.3). Control methods applied to minimize risks associated with the hazards shall be included in the water management plan (refer to 18.6.2.2).

18.6.2.2 A water management plan describing the methods and responsibilities for managing the different types and uses of water at the site shall be documented and implemented. The plan shall include:

- i. Description of where and how water is used (e.g., washing and treating products, irrigation, re-circulation, pesticide application, etc.);
- ii. Maintenance and cleaning of the water system (refer to 18.3.1 and 18.3.2);
- iii. The hazard analysis and preventive controls that are to be applied for the use of water during growing and harvesting, including monitoring, corrective action, and verification for each control measure that ensures water is safe and of adequate sanitary quality; and
- iv. Documentation and records referenced.

Control measures may include:

- i. Water treatment and/or testing;
- ii. Water temperature;
- iii. Re-circulation, aeration;
- iv. Spent irrigation water;
- v. Source alteration or change scheduling; and
- vi. Timing of use or application.

18.6.2.3 Water used for washing and treating product, cleaning of product contact surfaces, and handwashing shall be monitored to ensure it complies with potable water microbiological and chemical standards or criteria established in the country of production and destination. The monitoring procedures shall include:

- i. A schedule indicating the location and frequency of monitoring (refer to 18.6.2.2), which shall be decided by the risk assessment, best practices within the country of production, or applicable legislation;
- ii. Reference to the potable water criteria or standards;
- iii. List of microbiological and/or chemical testing being conducted;
- iv. Reference to the approved laboratory that is accredited to ISO 17025 or equivalent;
- v. Corrective actions that will be taken if water and/or ice does not meet established criteria or standards, including further water treatment, other source possibilities, non-conforming products that might be affected, or other alternative actions; and
- vi. Records maintained for monitoring and/or corrective actions.

Water testing and monitoring for uses such as irrigating (before and spent), fluming, and flooding shall comply with the items above and the water quality criteria defined by regulations in the country of production and destination.

18.6.2.4 The producer shall verify that any ice used is made from water that meets the microbiological and quality standards as specified in element 18.6.2.3.

18.7 Storage

18.7.1 Ambient/Dry Storage

18.7.1.1 The responsibility and methods for ensuring proper storage of inputs, packaging, and finished product shall be documented and implemented. The methods shall ensure:

- i. Effective stock rotation;
- ii. Utilization of inputs, work-in-progress, and finished product within their shelf life;
- iii. Risks to temporarily stored materials and/or products are analyzed, and controls are applied if necessary; and
- iv. Rooms used for the storage of inputs, packaging, and other dry goods shall be located away from wet/growing areas (refer to 18.1.2 for construction requirements).

Records to control storage and stock rotation shall be maintained.

18.7.1.2 Inputs and packaging shall be received and stored separately from indoor farmed grown products or chilled materials to ensure there is no cross-contamination. When sourced externally, products shall be received and segregated to ensure there is no cross-contamination.

18.7.1.3 Racks provided for the storage of packaging shall be constructed of impervious materials and designed to enable cleaning and inspection of the floors and areas behind the racks. Storage areas shall be cleaned at a predetermined frequency (refer to 18.3.2) and designed and constructed to prevent packaging from becoming a harborage for pests or vermin.

18.7.2 Controlled Temperature and Atmosphere Storage

18.7.2.1 The producer/grower shall ensure any chilling, cold storage, and controlled atmosphere facility is of suitable size, design, and construction, and is capable of effective operational performance, which includes sufficient refrigeration and controlled atmosphere capacity for chilling or storing the maximum anticipated throughput of products with allowance for periodic cleaning of storage.

18.7.2.2 Chilling, cold storage, and controlled atmosphere storage facilities shall ensure the following design and construction standards are maintained:

- i. Storage facility meets the requirements of 18.2.1;
- ii. Discharge from defrosting and condensate lines is controlled and discharged to the drainage system; and
- iii. Loading dock areas in controlled temperature areas are appropriately sealed, drained, and graded.

18.7.2.3 Chilling, cold storage, and controlled atmosphere facilities shall be fitted with temperature monitoring equipment or a suitable temperature monitoring device that is properly located to monitor the warmest part of the room and is fitted with a temperature gauge that is easily read and accessible.

18.8 Fertilizers, Agriculture and Hazardous Chemicals, and Soil Amendments

18.8.1 Storage of Agricultural Chemicals, Soil Amendments, and Toxic Substances

18.8.1.1 Agriculture chemicals, fertilizers, soil amendments, and other toxic substances shall be stored so as not to present a hazard to personnel, product, product handling equipment, or areas in which product is handled, stored, or transported. Specifically, they shall not be stored inside food handling areas and product and packaging storage rooms.

18.8.1.2 Chemical storage locations shall:

- i. Be compliant with national and local legislation;
- ii. Be designed to ensure there is no cross-contamination between chemicals, proper ventilation to the exterior, and spill control or containment (including tank capacity);
- iii. Be equipped with details of purchase, appropriate and compliant labels, vendor approval, and an up-to-date inventory of all chemicals contained within and removed from the storage location; and
- iv. Be equipped with employee health and safety requirements, such as signage, safety data sheets, instruction, emergency wash facilities, and other labor law requirements.

18.8.1.3 Hazardous chemicals and toxic substances shall be handled and applied by properly trained personnel. These materials shall be used by or under the direct supervision of trained personnel who have a thorough understanding of the hazards involved, including the potential for the contamination of food and food contact surfaces.

18.8.1.4 The site shall dispose of unused chemicals and empty containers in accordance with regulatory requirements and ensure that:

- i. Empty chemical containers are not reused;
- ii. Empty containers are labeled, isolated, and securely stored while awaiting collection; and
- iii. Unused and obsolete chemicals are stored under secure conditions while awaiting authorized disposal by an approved vendor.

18.8.2 Purchasing Chemicals

18.8.2.1 Purchased fertilizers, agricultural chemicals, and soil amendments shall be approved for use in the country of production (site location), the country of destination, and for the specific commodity. Purchased chemicals, where required by regulation, shall be labeled with the active ingredient(s), applicable dosage rates, and application instructions. Where no regulations or partial regulations govern the use of chemicals, the grower/producer shall have a documented risk assessment on the justification for use of non-regulated chemicals.

18.8.2.2 Chemicals that are specifically banned for use in the country of production or the country of destination shall not be purchased or stored.

18.8.2.3 Suppliers of chemicals shall be included in the approved supplier program (refer to 2.3.4), and a current inventory of all chemicals purchased and used shall be maintained.

18.8.3 Soil Amendments

18.8.3.1 The methods and responsibilities for soil amendment preparation and/or treatment shall be documented, implemented, and designed to prevent contamination of product. The procedures or work instructions shall outline how to treat manure and other untreated organic fertilizers ensuring:

- i. Treatments and application methods are verified as being in compliance with the approved or recommended methods applied and do not pose a hazard to the soil amendments;
- ii. Treatment methods applied are validated as being appropriate and effective at inactivating pathogens in organic soil amendments;
- iii. No raw untreated manure is used; and
- iv. Records of the approvals, validation, and verification, of organic soil amendment treatments are maintained.

18.8.3.2 The methods and responsibility for soil amendment applications shall be documented and implemented to ensure organic soil amendment applications are timed to pose minimum risk to product safety including:

- i. All applications of soil amendments are in accordance with national or local guidelines, best practices, and codes of Good Agricultural Practice;
- ii. Equipment used for soil amendment application is maintained in good condition and calibrated to ensure accurate application (refer to 18.2.2);

- iii. Records of all equipment maintenance and calibration are maintained;
- iv. Signage complies with national and local codes of practice; and
- v. Sufficient data is recorded to provide a detailed record of soil amendment applications.

18.8.4 Agricultural Chemicals

18.8.4.1 The methods and responsibility for the spray or crop protection program, indicating the applications used for a target pest or disease and the threshold levels that initiate the application, shall be documented and implemented.

18.8.4.2 The person making decisions on chemical applications shall:

- i. Demonstrate knowledge of and access to information regarding chemical applications and the maximum residue limits allowable in destination markets;
- ii. Use only chemicals approved for cultivation of the specified products and approved for use in the intended market; and
- iii. Demonstrate competence and knowledge of chemical applications and crop withholding periods.

18.8.4.3 Records of all chemical applications shall be maintained and include:

- i. The chemicals used;
- ii. Crop information;
- iii. Date, method, concentration, and frequency of application; and
- iv. Evidence that the timing between chemical application and harvest complies with the approved harvest interval for the chemical application.

18.8.4.4 Biological controls that are approved for the cultivation of the specified products shall be used according to instructions or per expert recommendations.

18.9 Waste Disposal

18.9.1 Waste Management

18.9.1.1 The methods and responsibility for the effective and efficient disposal of all solid waste, such as inedible material, unusable packaging including trademarked material, and liquid and unsanitary waste from the farm, shall be documented and implemented.

Reviews of the effectiveness of waste management shall be part of the site's daily inspections, and the results of these inspections shall be included in the relevant reports.

18.9.1.2 Waste systems shall be designed and constructed and waste shall be regularly removed from the growing areas and packing facility so they do not become food safety risks to finished product, growing, harvesting, and packing operations.

18.9.1.3 Waste and overflow water from tubs, tanks, and other equipment shall be discharged directly to the floor drainage system and meet local regulatory requirements.

- 18.9.1.4 Trolleys, vehicles, waste disposal equipment, collection bins, and storage areas shall be maintained in a serviceable condition and cleaned and sanitized regularly so they do not attract pests and other vermin.
- 18.9.1.5 Inedible waste designated for animal feed shall be stored and handled so it does not cause a risk to the animal or further processing for human consumption.