



DRAFT TANZANIA STANDARD

Good Agricultural Practices (GAP) for sustainable production and post-harvest handling of horticultural crops

TANZANIA BUREAU OF STANDARDS

0. Foreword

Horticultural crops are grown and harvested under a wide range of climatic and diverse geographical conditions, using various agricultural inputs and technologies, and on production sites of varying sizes. Produce contamination, environment degradation and workers' infection from microbial, chemical and physical hazards may therefore vary significantly from one type of production site to another.

In each primary production site, it is necessary to consider the particular agricultural practices that promote the production of safe horticultural crops, workers' safety and environment conservation taking into account the conditions specific to the primary production site, type of products, and methods used

This standard specifies food safety, workers safety and environmental sustainability requirements for the production, handling and distribution of horticultural crops.

This Tanzania Standard is a revision of the second version published in 2021. This third edition cancels and replaces the second edition (TZS 1743:2021) which has been technically revised.

In the preparation of this standard assistance was derived from:

CAC/RCP 53-2003, *Codex code of hygienic practice for fresh fruits and vegetables*, published by the Codex Alimentarius Commission (CAC); and

230414 GlobalG.A.P. *Integrated farm assurance guideline for fruits & vegetables version 6.0* published by Global GAP April, 2023.

1. Scope

The Standard specifies requirements for sustainable production and handling practices of horticultural crops intended for human consumption. It covers general practices from the primary production to consumption of horticultural crops in order to avail safe and wholesome produce.

This standard applies to all growers, aggregators, agents, buyers, packers, transporters, exporters and other actors undertaking activities described in this standard. The standard does not apply to ornamental plants, medicinal crops, processed horticultural products, wholesale and retail operations.

2. Normative references

The following referenced documents are indispensable for the application of this standard. For dated references, only the editions cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

TZS 109/EAS 39, *General principles of food hygiene -Code of practice*

TZS 538/EAS 38, *Labelling of pre-packaged foods - General requirements*

TZS 789/EAS 12, *Potable water — Specification*

TZS 2067, *Water for irrigation - Specification*

TZS 1003, *Guide to the pre-packaging of fresh fruits and vegetables*

Guidelines for the safe use of wastewater, excreta and greywater Volume 2 — Wastewater use in agriculture published by World Health Organization (WHO), 2006

3 Terms and definitions

For the purpose of this standard, the following terms and definitions shall apply:

3.1 agricultural chemicals

all chemicals involved in agriculture operations including inorganic fertilizers, plant protection products, plant growth regulators and disinfectants

3.2 agricultural input

any incoming material (e.g. seeds and other planting materials, water, agricultural chemicals, plant support, etc.) used for the primary production of fresh horticultural crops

3.3 agricultural worker

any person that undertakes one or more of the agricultural operations such as land preparations, cultivation, pesticide applications, harvesting and packaging

3.4 biological control

use of competing biological agents (such as insects, microorganisms and/or microbial metabolites) for the control of pests

3.5 chemical contaminant

addition or appearance of chemical substances such as plant protection products and heavy metals in soils, aquifers, horticultural crops in quantities above the legal limits

3.6 contaminants

biological, chemical, physical or radiological substances which makes horticultural crops unfit for human consumption, and can harm environment

3.7 environment

surroundings or conditions in which a person, animal or plant lives or operates

3.8 production site

any premise or establishment in which fresh horticultural crops are grown and harvested and the surroundings under the control of the same management

3.9 fertigation

application of fertilizers, soil amendments or other water-soluble products through an irrigation system

3.10 operator

person engaged in the food business including one's agent and is responsible for ensuring the requirements of food safety are met by the food business under one's control

3.11 grower

person responsible for the management of the primary production of horticultural crops

3.12 hazard

biological chemical, physical or other property that may cause a situation unsafe for workers, consumers and/or the environment

3.13 hazardous material

any compound which, at specific levels, has the potential to cause adverse health effects (e.g. garbage, manure and chemicals)

3.14 irrigation

artificial application of water to the land or soil

3.15 integrated pest management

sustainable approach to manage pests by combining biological, cultural, physical and chemical practices in a way that minimizes economic, health and environmental risk

3.16 minimum tillage

conservation agriculture technique where the grower works 10 to 15 centimeters of the topsoil using minimum tillage machinery to allow for minimum disturbance of the soil

3.17 packer

person responsible for the management of post-harvest processing and packaging of fresh horticultural crops

3.18 packaging

action of putting fresh horticultural crops in a package, this may take place in a field or in an established pack-house

3.19 package

container that is used to carry fresh horticultural crops for storage or transportation

3.20 packaging establishment/pack house

any indoor establishment in which fresh horticultural crops receive post-harvest treatment and are packaged

3.21 pest

any organism that is detrimental to horticultural crops

3.22 Plant Protection Products (PPP)

pesticides including insecticides, fungicides, herbicides, rodenticides etc.

3.23 primary production

steps involved in the growing and harvesting of horticultural crops such as planting, irrigation, application of fertilizers, and other agricultural chemicals, etc.

3.24 risk

likelihood of a hazard occurring in the future

3.25 surface irrigation

open channels in which water is distributed by gravity to field units and controlled by gates which are adjusted by the local irrigation system

3.26 sprinkler irrigation

overhead spray irrigation method that uses different nozzles or diffusers (travelling sprinklers, centre pivot systems, gun and boom, etc.) for the localized delivery of water to the crop

3.27. clean water

water that does not compromise food safety in the circumstances of its use

3.28 potable water

water which meets the quality standards of drinking water as described in the TZS 789

3.29 hazardous waste

waste with a chemical composition or other properties that make it capable of causing illness, death, or harm to humans and life forms when mismanaged or released into the environment

3.30 non-productive land

land that is not currently used or suitable for agricultural production

3.31 uncropped land

agricultural land that is not planted with crops during a given season

3.32 substrate

material or medium in which plants grow instead of soil (e.g., cocopeat, peat, or rock wool)

3.33 produce

fresh agricultural products such as fruits and vegetables grown for consumption

3.34 horticultural crops

crops cultivated for human consumption including fruits, vegetables and herbs

3.35 lot

an identification code assigned to a specific quantity of produces produced together under identical conditions

3.36 withdrawal

take produce out of the supply chain before it reaches the final consumer

3.37 risk assessment

systematic process of identifying potential hazards, analyzing the likelihood and severity of harm and evaluating whether adequate control measures are in place to reduce or eliminate the harm

3.38 non conformity

failure to meet a specified requirement

3.39 food grade materials

material made of substances which are safe and suitable for their intended use and in which will not impart any toxic substance or undesirable odour or flavour to the produce

4 Management system

The operator shall establish, implement and maintain a Management System consisting of policies, procedures and organization structure that ensure effective planning, operationalization, monitoring and continued improvement of activities to achieve its objectives and fulfill its responsibilities.

4.1 General

- 4.1.1** The operator shall have documented system detailing the organization management, responsibility, authority and interrelationship of all personnel who manage and perform activities in the production site.
- 4.1.2** The operator shall conduct a management system audit at least annually. The audit report shall be documented and made available to authorized personnel or institutions when required.
- 4.1.3** The operator shall implement documented procedure for addressing customer complaints. Operator shall record nonconformances and implement corrective action measures taken.
- 4.1.4** Operators shall ensure that employees are given information, instruction, training and guidance to implement this standard.

4.2 Operators' responsibilities

The operator shall:

- 4.2.1** Ensure day to day management and conformities to this standard
- 4.2.2** demonstrate a commitment to continual improvement of their management system to ensure compliance to this standard.
- 4.2.3** provide access to third parties carrying out external verification of compliance to the requirements of this standard.
- 4.2.4** ensure compliance with specific customer requirements.
- 4.2.5** establish and implement an environmental management plan to cover all aspects under this standard.
- 4.2.6** have a policy providing for procurement of inputs from registered and/or licensed suppliers.
- 4.2.7** establish, communicate and implement strictly policy prohibiting the use of Genetically Modified Organisms (GMOs).

5 Traceability

5.1 The operator shall establish a documented traceability system.

5.2 The operator shall establish and test at least annually, a documented withdrawal and recall procedure to deal with any food safety hazard and to enable complete, rapid recall of any implicated lot of produce at any stage of supply chain.

5.3 In addition, where appropriate:

5.3.1 Growers and packers should have programs to ensure effective lot identification, able to trace the sites and agricultural inputs involved in primary production and the origin of incoming material at the packing establishment in case of suspected contamination.

5.3.2 Growers' and packers' information should be linked so that the system can trace products from throughout the supply chain.

6 Documentation and record keeping

6.1 Operators shall ensure that records are accurately recorded, securely maintained, retrievable, legible and up to date.

6.2 Records of produce production and distribution shall be kept for at least two years to facilitate a recall and foodborne illness investigation, if required. This period could be much longer than the shelf life of horticultural crops. Documentation can enhance the credibility and effectiveness of the food safety control systems. The following practices are recommended: -

- a) The operator shall retain current and relevant information on agricultural activities such as site of production, suppliers' information on;
 - i) Agricultural inputs,
 - ii) Lot/ batch numbers of agricultural inputs,
 - iii) Irrigation practices,
 - iv) Use of agricultural chemicals,
 - v) Water quality data,
 - vi) Pest control,
 - vii) Cleaning schedules for indoor establishments, premises, facilities, equipment and containers
 - viii) Harvest and postharvest records,
 - ix) Workers' health, safety and welfare,
 - x) Waste management,
 - xi) Sales records.

- b) Packers shall retain current information concerning each lot/batch such as:
 - i) Information on incoming materials (e.g. information from growers, lot numbers)
 - ii) Data on the quality of processing water,
 - iii) Pest control programs,
 - iv) Cooling and storage temperatures,
 - v) Chemicals used in postharvest treatments,

- vi) Cleaning schedules for premises, facilities, equipment and containers, etc.
- vii) Workers' health, safety and welfare
- viii) Waste management

7 Primary production

7.1 Site management

7.1.1 Site selection

- a) A risk assessment shall be conducted taking into account potential contaminants, type of soil, soil erosion, quality and level of ground water, availability of sustainable water sources, land use history, and records maintained.
- b) A management plan to address the risks identified shall be in place and implemented.
- c) The site shall not be used for agricultural activities when the risk assessments identify non- controllable aspects that are critical to human health and the environment.
- d) The farm shall be divided into blocks of different purposes including production area, composting area, storage, staff housing, toilets, drinking water points, waste disposal sites, wastewater treatment points, utility stores and social facilities
- e) A recording system shall be established for each field, orchard or green house such that each is uniquely identified with a code.

7.1.2 Biodiversity Management

7.1.2.1 General

The farm shall identify significant biodiversity interactions and implement appropriate measure that protect habitat and beneficial organisms without compromising food and workers safety and legal requirements. A key aim should be the enhancement of environmental biodiversity on the farm through positive conservation management. Key elements shall be to: -

- a) assess and understand the existing animal and plant diversity on the production site.
- b) maintain a documented conservation policy that comply with the applicable national legislation governing wildlife and conservation issues.
- c) all non-cropped areas shall be managed to encourage biodiversity.
- d) create an action plan to enhance habitats and increase biodiversity on the production site.
- e) there should be a plan that is implemented to convert unproductive sites and identified areas that give priority to ecology into conservation areas where viable.

7.2. Waste Management

7.2.1 The operator shall have a waste management plan implemented and reviewed annually that consider reduce, reuse and recycling of wastes.

7.2.2 The operator shall provide separate disposal bins for different kinds of waste.

7.2.3 Holding areas for fuel and oils shall comply with the national requirements

7.2.4 Wastewater treatment and disposal systems shall comply with the national regulations.

7.2.5 Hazardous waste shall be disposed of in accordance with national regulations

7.3. Planting materials

- a) The operator shall procure/use planting materials from authorized sources.
- b) Where and when treatments are used by the grower, there shall be justifications for their use and documented.
- c) Planting material treatment products shall be registered for use on the crop.
- d) Advice on the use of planting material treatment products shall be given by a competent person.
- e) Where treatment products are used, plant protection products requirements shall apply.

7.4 Substrate management, soil health and fumigation

- a) The operator shall carry out a soil testing.
- b) Based on the results of the soil analysis, a soil management plan shall be developed
- c) The method of tillage shall conserve soil structure and minimizes soil erosion and compaction.
- d) The operator shall implement measures and practices that prevent or minimize soil loss from the production site
- e) The operator shall employ practices that improve soil drainage.
- f) Where soil fumigation is required, only chemicals registered by a competent authority shall be used in accordance with the manufacturer instructions. The operator also shall understand chemical requirements for the market destination.
- g) Records shall be kept wherever soil and or substrate fumigant are applied;
- h) Substrates used shall be from authorized sources.

8 Irrigation and fertigation

8.1 General

8.1.1 The operator shall conduct and document water safety analysis for irrigation/fertigation.

8.1.2 There shall be a documented irrigation/fertigation plan based on the risk assessment.

8.1.2 The operator shall maintain irrigation/fertigation records.

8.1.4 Irrigation/fertigation water shall be obtained from sustainable sources.

8.1.5 Irrigation/fertigation personnel shall be trained and competent.

8.1.6 The operator shall undertake water conservation measures.

8.1.7 The operator shall be able to determine irrigation requirement for their crops

8.1.8 The operator shall have a valid permit/license for water use issued by relevant Authorities

8.2 Quality of irrigation water

8.2.1 Water used for irrigation shall comply with the specifications given in TZS 2067 and be analyzed based on the risk assessment at least once per year. Analysis results shall be documented.

8.2.2 Untreated sewage water and raw effluent shall not be used for irrigation of grain for human consumption.

9 Plant nutrition and fertilizer use

9.1 General

9.1.1 The operator shall develop a fertilizer use plan based on soil analysis and plant growth stage. 9.1.2 The plan shall be based on integrated soil fertility management and fertilizer use risk assessment.

There shall be no direct drainage to any water source of runoff water from land where fertilizer has been applied.

9.1.3 The person in charge of fertilizer application shall be competent.

9.2 Records of application

9.2.2 Records of fertilizer application shall be kept.

9.2.3 A work instruction for the fertilizer application shall be clearly written and signed by a competent person able to interpret the crop soil analysis. The instruction shall indicate who, when, where and how to apply.

9.3 Application equipment

Fertilizer application equipment shall be well maintained, routinely verified and where applicable, calibrated to ensure accurate delivery.

9.4 Nutrient requirements

9.4.1 The operator shall conduct fertilizer risk assessment.

9.4.2 Fertilizer application shall be based on the risk assessment, soil analysis and calculation of the nutrient requirements of the crop.

9.5 Fertilizer storage

9.5.1 Fertilizers shall be stored in structures which meet minimum requirements and conditions provided by relevant national regulatory Authority.

9.5.2 The fertilizer shall not be placed directly on the floor.

9.5.3 The store shall be located away from water source.

9.5.4 An up-to-date fertilizer stock inventory shall be maintained, including incoming quantities, batch numbers, expiry dates, used quantities, and remaining stock.

9.5.5 Fertilizers shall be stored separately from pest control products, acids, produce, food and feedstuffs, planting materials and any living quarters.

9.6 Organic fertilizers

9.6.1 The operator shall have in place a documented risk assessment for use of organic fertilizer

- 9.6.2 Organic fertilizer shall be stored in an appropriate manner to control the risk of contamination to the environment.
- 9.6.3 Organic fertilizer application records shall be maintained.
- 9.6.4 Based on risk assessment, analysis shall be carried out by an accredited laboratory
- 9.6.5 Human sludge (sewage sludge) shall not be used on farms under any circumstances

10 Crop protection

10.1 Pest and disease management

The operator shall have a documented plant protection plan based on the plant protection products risk assessment.

10.2 Integrated Pest Management (IPM)

10.2.1 The operator shall be trained and demonstrate competence on IPM

10.2.2 The operator shall have a documented IPM plan and procedures.

10.2.3 The operator shall demonstrate knowledge on pests and diseases of the crop.

10.2.4 The operator shall demonstrate implementation of the IPM plan.

10.2.5 The operator shall monitor the pests and diseases in the production site.

10.2.6 Tools and equipment used shall be disinfected as per the plant protection products risk assessment.

10.2.7 Water used in mixing of crop protection products, shall be free from physical, microbial and chemical contaminants.

10.2.8 Each operator involved in crop protection, shall use appropriate personal protective equipment (PPE).

10.3 Plant Protection Products (PPP) use

a) The operator shall conduct and document a plant protection products risk assessment and demonstrate an understanding of the associated risks.

b) The advice on type of PPP should be the responsibility of technical person/Extension officers.

c) Where the PPP choice and use is made by the producer or designated employee, experience should be complemented by technical knowledge that can be demonstrated via technical documentation (e.g. product technical literature, specific training course attendance, etc.).

10.4 Selection of plant protection products

10.4.1 Plant protection products used shall comply with the relevant national regulations.

10.4.2 The operator shall consult regularly and be aware of any restrictions on Plant protection products used and shall maintain documentations on such restrictions.

10.4.3 The technical person responsible for pesticide choice and application shall be competent by training.

10.4.4 There shall be a justification to show that the choice of pesticide is appropriate for the intended purpose.

10.4.5 Over reliance on pesticides with similar mode of action shall be avoided where repetitive applications are required to eliminate pest resistance.

10.4.6 The application rate of pesticides per given area and the dilution rates shall comply with recommendations on the product label. Where a choice exists, a product that is safer to handle and has less environmental impact shall be chosen.

10.5 Biological control

10.5.1 Environment and consumer safety shall be considered when using competing biological organisms and/or their metabolites.

10.5.2 The Operator shall use biological controls which are authorized by national regulatory Authority.

10.5.3 Biological control shall be used according to the manufacturer's instructions for the intended purpose.

10.6 Procurement of Plant Protection Products (PPP)

10.6.1 Purchasing and use of plant protection products shall only be done for products that are:

- a) Registered for use on the crop,
- b) From licensed distributors

10.6.2 Purchase receipts of all PPP shall be maintained for at least 12 months

10.6.3 Records of all plant protection products used on the production site shall be maintained

11 Storage of pest control products.

11.1 Pest control product shall be stored in suitably constructed and maintained stores

11.2 Only approved pesticides in original labelled containers shall be stored. No other commodities shall be stored with pesticides.

11.3 Pesticides shall be stored in a secure, dedicated room or store that is inaccessible to unauthorized personnel, children, and animals.

11.4 Where cupboards are used, shelves shall be fitted with front retaining lips to prevent containers from falling when doors are opened. Access shall be restricted to trained and authorized personnel only

11.5 Appropriate warning signs shall be displayed prominently on the outside of the pesticide store in the language that is understood by the users. Safety warnings and hazard symbols, including "NO SMOKING," "NO NAKED FLAMES," and other relevant notices, shall be displayed both inside and outside the store

11.6 Stock shall be inspected regularly and records maintained.

11.7 Storekeepers and other personnel responsible for pesticide management shall receive training on pesticide hazards, safe storage, handling, dispensing, emergency response, and waste management.

11.8 Written procedures shall be established and maintained for responding to emergencies, including fire, spills, leaks, accidents, and pesticide poisoning. Such procedures shall be visibly displayed in locations accessible to users and in languages understood by personnel

11.9 Pesticide stores shall be equipped with adequate and appropriate firefighting equipment.

11.10 Firefighting equipment shall be routinely inspected, maintained, and records documented.

11.11 Shelves in stores shall be made of non-absorbent and non-flammable material.

Materials to deal with leakage and spillage shall be available in the store. These may include sand, shovel, broom and empty disposal bin.

- 11.12 Adequate handwashing and decontamination facilities, including clean water and soap, shall be provided in close proximity to the pesticide store.
- 11.13 The store shall be bunded to contain any spillages and contaminated water used for cleaning or firefighting.
- 11.14 Drainage shall be directed to a sump or an adequate wastewater area, which shall be located far from all water sources and shall not discharge into riparian land. All such facilities shall be adequately marked or labelled.
- 11.15 All personnel working in pesticide stores shall have access to suitable Personal Protective Equipment (PPEs).
- 11.16 All pesticides and fertilizers shall be stored separately, and away from detergents or disinfectants.
- 11.17 A Pesticide store shall be located at least 60m away from water sources.
- 11.18 The principle of "First-In, First-Out (FIFO)" shall be applied to ensure that older stock is used before newer stock and to minimize the accumulation of expired pesticides.

12 Soil fumigation

- 12.1 Use of fumigants shall be justified and documented.
- 12.2 Only fumigants registered and approved by the competent authority shall be used for soil fumigation.
- 12.3 Fumigants shall be used in accordance with the manufacturer's instructions.
- 12.4 Operators shall keep up to date with the most current list of acceptable plant protection products locally and internationally as applicable.
- 12.5 Soil fumigation shall be carried out only by trained and authorized personnel using appropriate equipment and personal protective equipment (PPE)

13 PPP application and resistance management

Plant protection products shall be chosen to avoid over reliance or continued use of the same active ingredient, thus reducing the emergence of pesticide resistance.

13.1 Application conditions

- 13.1.1 Pesticides shall not be applied in adverse weather conditions such as wind, rain or during overhead irrigation.
- 13.1.2 Spraying during high mid-day temperatures should be avoided.

13.2 Dispensing of pesticides and hazardous chemicals

- 13.2.1 A designated area shall be allocated for dispensing, measuring, and mixing of pesticides and other hazardous chemicals.
- 13.2.2 The dispensing area shall be equipped with:
 - a) A work bench.
 - b) Running water supply shall be within at least 5 meters from the dispensing areas.
 - c) Wash basin and eyewash station.
 - d) Accurate measuring equipment.
 - e) Suitable containers for pre-mixing of pesticides/chemicals; and
 - f) Clear marking on all equipment to indicate they are for

use with pesticides/chemicals only.

- g) Personnel handling hazardous chemicals shall wear appropriate personal protective clothing and equipment.

13.2.3 The dispensing area shall be maintained in a clean and orderly condition and shall be designed to prevent spills, contamination, and unauthorized access.

13.2.4 Materials and equipment for managing accidental spills and leaks shall be readily available within or near the dispensing area.

13.2.5 Dispensing area should not be used for storage of food, beverages, animal feed, and personal items.

13.3 Application of plant protection products and protection of workers

13.3.1 Operator shall ensure that workers receive adequate information, instruction, training and supervision to carry out their work safely and understand the health risks associated to plant protection products exposure and the precautions to be taken.

13.3.2 Warning signs to restrict personnel access to area under plant protection products application or treated with plant protection products shall be displayed.

13.3.3 All spray workers and supervisors shall be suitably trained on the application and risks of plant protection products by a recognized institution or body. A training Schedule for the workers and supervisors shall be established and periodically reviewed.

13.3.4 All spray workers shall wear personal protective clothing and equipment suitable for the task. Such personal protective equipments shall be provided by the operator at no cost to the workers.

13.3.5 Secure, well-ventilated storage facilities shall be provided for personal clothing.

13.3.6 Designated area shall be provided for washing, drying and storage of the personal protective equipment (PPE). Appropriate changing rooms and double lockers for each worker shall be provided.

13.3.7 All personnel protective equipments (PPEs) shall be properly cleaned after use.

13.3.8 Application equipment shall be dedicated for use on horticultural crops only and shall be properly cleaned immediately after use. Chemical wastewater shall be collected, treated or disposed of in manner that minimizes environmental contamination.

13.3.9 Protective overalls when used shall be laundered after use and kept separately from other wears/clothing.

13.3.10 All workers involved in the handling and application of plant protection products shall undergo medical check-up at least twice per year.

13.3.11 All equipment used for spraying shall be regularly inspected and well maintained and be verified by a competent person. Records of inspection shall be maintained

13.3.12 Each application shall be accompanied by clear instructions specifying crop location, product to be applied, application rate and application technique signed by the authorizing officer.

13.3.13 All workers in or near areas being sprayed who are not wearing appropriate personal protective equipment (PPE) shall vacate the area before plant protection products application begins.

13.3.14 Safety Data Sheets (SDS) of all plant protection products used shall be kept on file and readily accessible to relevant personnel.

13.3.15 The mixing and application of PPP shall only be carried out by trained personnel.

13.3.16 Documented re-entry policy and procedure shall be established and implemented as

- preventive measure to protect workers from pesticide exposure risks.
- 13.3.17 Plant protection products application method shall ensure that non target organisms and beneficial organism are not adversely affected.
- 13.3.18 The pre harvest interval shall be documented for all plant protection products applied.

13.4 Harvesting of produce

- 13.4.1 The operator shall take into account pre-harvest intervals before harvesting.
- 13.4.2 Harvesting procedures shall be documented and implemented to ensure that required pre-harvest intervals are observed.
- 13.4.3 Regular audits and training shall be conducted to ensure consistency in the process of harvesting practice.

13.5 Records of application

- 13.5.1 Records of PPPs application shall be maintained
- 13.5.2 Spray workers' training records shall be maintained.
- 13.5.3 Accidents and incidents and the remedial actions taken shall be documented. .
- 13.5.4 Emergency notices shall be visibly displayed providing procedures and contact persons..
- 13.5.5 Records of the appointed first aider and training records are available
- 13.5.6 Records of obsolete or expired PPP and empty containers shall be maintained.
- 13.5.7 Additional records and documentation to be kept in addition to those required by applicable legislation shall include:
- a) PPPs stock records;
 - b) A list of all the PPP used in the production site; and
 - c) A record of disposal of expired plant protection products, surplus PPP, empty PPP containers shall be maintained.

13.6 Disposal of surplus PPP

- 13.6.1 Documented procedures for safe disposal of dilute PPP and empty containers shall be developed, approved and communicated to all those handling such products. The procedures shall include fail-safe measures to prevent pollution of ground water and soil from leakage or spillage.
- 13.6.2 Obsolete and expired pest control products shall be clearly segregated and marked "obsolete and expired pest control products".
- 13.6.3 Disposal of obsolete and expired pest control products shall be done as per the national regulations and records kept.
- 13.6.4 Surplus spraying mix and tank washings shall be disposed as per the national regulations
- 13.6.5 Disposal sites shall be securely fenced, locked and labelled with warning signs.
- 13.6.6 Where disposal services are outsourced, the appointed disposal agent shall be approved by relevant authorities and records of all activities shall be kept.

13.7 Management of Empty PPP containers

- 13.7.1 The reuse of empty plant protection product containers for purposes other than containing and transporting identical products shall be avoided.

- 13.7.2 A designated and secure storage area shall be provided for empty PPP containers.
- 13.7.3 The disposal of empty containers shall be carried out in compliance with applicable legislation and regulatory requirements.

13.8 Obsolete PPP

- 13.8.1 There shall be a documented policy regarding obsolete PPP.
- 13.8.2 Obsolete PPP shall be clearly labelled, secured and stored separately from products intended for use.

13.9 Pesticide residue monitoring

- 13.9.1 The operator shall ensure the produce comply with the Maximum Residue Limits (MRLs) established in the national produce standards.
- 13.9.2 MRLs monitoring shall be conducted based on the MRL risk assessment.
- 13.9.3 Operators shall be aware of and have access of up-to-date market Maximum Residue Limits (MRLs) requirements.
- 13.9.4 The operator shall provide evidence/records of residue testing done by an accredited laboratory.
- 13.9.5 The operator shall establish a written action plan in the event of the MRLs being exceeded.

14 Harvesting and postharvest handling of produce

14.1 Harvesting and post- harvest hygiene

- 14.1.1 A documented risk assessment for harvest and post-harvest hygiene shall be in place.
- 14.1.2 There shall be a documented hygiene procedure based on the risk assessment.
- 14.1.3 All personnel shall receive hygiene training
- 14.1.4 Basic hygiene instructions shall be displayed within the produce handling areas.
- 14.1.5 Surfaces in contact with the produce shall be hygienically clean.
- 14.1.6 Smoking, eating, chewing and drinking shall not be allowed in produce handling areas.
- 14.1.7 Sneezing or coughing over unprotected produce shall not be allowed.
- 14.1.8 Personal effects such as jewellery, watches, pins or other items shall not be worn or brought into produce handling areas.
- 14.1.9 Clean toilets and handwashing facilities shall be provided to all personnel, visitors and sub-contractors in the vicinity of their work
- 14.1.10 Animals and children shall not be allowed in produce handling areas
- 14.1.11 Equipment used for produce handling shall be cleaned, maintained and appropriate for use.
- 14.1.12 Produce handling facilities shall comply with relevant national regulations.
- 14.1.13 The produce handling facilities shall not be used for activities not related to handling of produce.
- 14.1.14 Produce handling facilities shall be registered by the relevant government authority
- 14.1.15 Access to produce handling facilities shall be restricted to authorized personnel only.
- 14.1.16 The produce handling facilities shall;
- a) prevent entry of domestic animals, insects, birds and rodents
 - b) have floors, doors and wall surfaces that are non-absorbent, non-toxic, washable and

easy to clean and disinfect.

- c) have floors that are durable and allow easy drainage.
- d) have ceiling and overhead fixtures designed to prevent the accumulation of dirt, moulds, shedding of paint flakes or particles and prevent condensation.
- e) have adequate lighting to allow effective inspection of produce.
- f) Have glass lighting covered to prevent contamination of produce in case of shattering
- g) have adequate ventilation
- h) have a separate storage area for non-food items away from produce.

14.1.17 There shall be a glass and hard plastics handling policy to govern their use within the premises whenever they are used.

14.1.18 Floor layout shall allow for a smooth flow of produce from reception to finishing area.

14.1.19 A loading and dispatch areas shall be roofed and proofed to prevent contamination of produce

14.2 Inspection

14.2.1 Personnel handling the produce shall be competent and trained to carry out inspection.

14.2.2 Produce shall be clearly labelled to maintain traceability and integrity.

14.2.3 The receiving area for the produce shall be adequately lit and equipped with facilities for produce inspection.

14.2.4 Produce inspection shall be carried out at;

- a. reception at the pack house
- b. quality-control during processing;
- c. final quality check when ready for dispatch;
- d. loading area

14.3 Quality control

14.3.1 The operator shall have a quality assurance system

14.3.2 All equipment used for weighing, sizing, temperature monitoring or any other measuring devices shall be maintained and records kept.

14.4 Produce handling

14.4.1 Produce at different stages of preparation shall be kept separate.

14.4.2 Produce shall normally be handled on a "First In, First Out" (FIFO).

14.5 Health status

14.5.1 Personnel working in a produce handling facilities shall undergo medical tests for food handlers at least every six months.

14.5.2 Where personnel are permitted to continue working, cuts and wounds shall be covered by suitable waterproof dressings.

14.6 Personal cleanliness

Personnel shall always wash their hands;

- a) At the start of produce handling activities.

- b) Immediately after using the toilet; and
- c) After handling raw produce or any contaminated material

14.7 Post-harvest washing

- 14.7.1 Water for washing produce shall be potable water complying with TZS 789.
- 14.7.2 Based on risk assessments, water for post-harvest washing shall be analyzed.
- 14.7.3 Wastewater shall be disposed as per the national regulations.

14.8 Post-harvest treatments

- 14.8.1 Use of post-harvest treatments shall be justified and documented.
- 14.8.2 All post-harvest treatment products used shall be approved by a competent authority.
- 14.8.3 The personnel responsible for post-harvest treatments shall be competent.
- 14.8.4 The batch/lot of treated produce shall be appropriately documented.

14.9 Handling of rejected produce

- 14.9.1 The operator shall demonstrate on;
 - a) the procedure used to minimize wastage
 - b) dealing with any raw material or horticultural produce that is rejected.
- 14.9.2 The produce shall be disposed of safely to minimize negative impacts on human, animal and environment.

14.10 Cold chain management

- 14.10.1 Where available, cold chain facilities shall be of satisfactory structural conditions.
- 14.10.2 Produce should be maintained under recommended temperature and relative humidity at all times.

14.11 Produce transport

- 14.11.1 The transport vessel shall be built and equipped to ensure maintenance of optimal temperatures and hygiene to prevent damage, contamination and spoilage of produce.
- 14.11.2 Vessels shall maintain the temperature and humidity levels specific to the produce .

14.12 Temperature monitoring

Produce temperature shall be monitored based on recommended temperatures and records shall be kept.

14.13 Packaging

The packages should comply with the requirements set under the TZS 538 and TZS 1003

- 14.13.1 The operator shall have a documented packaging risk assessment
- 14.13.2 There shall be procedures of storage, handling and stock control of packaging materials.
- 14.13.3 Packaging material for produce shall be of food grade quality and of such a design as to protect the produce from any contamination.
- 14.13.4 Staples shall not be used in produce packaging.
- 14.13.5 Where required, fumigation or heat treatment of pallets and containers shall be done in accordance with the relevant legislation.

14.13.6 The operator shall be committed to the use of environmentally friendly packaging materials.

14.14 Cleaning materials

- 14.14.1 Potable water shall be used in handling of the produce.
- 14.14.2 Materials used for cleaning shall be stored and maintained in a designated secure area away from produce and other non-cleaning chemicals.
- 14.14.3 Adequate facilities shall be provided for cleaning and disinfecting of work tools and equipment.
- 14.14.4 All post-harvest cleaning materials shall be approved by the competent authority

14.15 Marking and labelling

14.15.1 Prepackaged horticultural produce shall be labelled with clear instructions to enable the next person in the food chain to handle, display, store and use the produce safely.

14.15.2 The labelling shall be in Swahili/English including the following particulars

- a) Name of the produce by common name; including variety/cultivar,
- b) Name, postal and physical address of the packer and/or dispatcher,
- c) Lot/batch identification,
- d) Country of origin,
- e) Commercial specification, i.e. type, class, size expressed as minimum and maximum diameter,
- f) Net weight,
- g) Brand or trade mark, if any
- h) Storage instructions,
- i) Pack date and
- j) How to dispose used package

15 Worker's health, safety and welfare

15.1 Health

- 15.1.1 Health requirements shall be followed to ensure that personnel who come directly into contact with produce are not likely to contaminate them.
- 15.1.2 Potable water shall be available to staff at all times. Containers or outlets of water unsuitable for drinking shall be appropriately marked.
- 15.1.3 The workstation shall be provided with first aid kits and have personnel trained
- 15.1.4 Written accident and emergency procedures on how to deal with serious injuries requiring medical attention shall be visually displayed indicating contact person telephone number or institution
- 15.1.5 Workers changing rooms, eating and resting areas together with sufficient clean toilets, hand washing facilities, and food grade soap shall be provided.
- 15.1.6 The operator shall undertake a survey of health conditions of the personnel in accordance with the operator health policy.
- 15.1.7 The operator shall promote safe and hygienic work culture that establishes controls to address and minimize risks identified.
- 15.1.8 Operator should ensure workers have health checks at least twice a year

15.2 Safety measures

- 15.2.1 The operator shall document the worker's health and safety risk assessment.
- 15.2.2 The operator shall document an occupational health and safety policy
- 15.2.3 Machinery used shall be suitable for its purpose and equipped with operational safety devices
- 15.2.4 Machinery with internal combustion engines shall not be used in confined areas.
- 15.2.5 Only trained operators shall operate machinery.
- 15.2.6 Personnel operating equipment shall be trained on the safe use of the equipment
- 15.2.7 Fire extinguishers and other appropriate firefighting equipment shall be available, easily accessible and regularly maintained.
- 15.2.8 Fire alarms shall be fitted to each floor above the exit and there shall be evidence of evacuation drills.
- 15.2.9 There shall be clearly marked emergency exits, which shall be fitted with fire safety break locks or remain unlocked during working hours.
- 15.2.10 Relevant safety rules and precautionary safety measures shall be clearly displayed.
- 15.2.11 The emergency plan and accident procedures shall be availed to all employees and displayed in common notice boards.

15.3 Worker's welfare

- 15.3.1 The operator shall implement worker's welfare. Documentation related to this action should be available and should clearly identify names of the members of management who are responsible for ensuring its compliance.
- 15.3.2 Health and Safety Risk Assessment shall be conducted and documented.
- 15.3.3 Facilities at the production site shall be appropriate for the comfort of the workers.
- 15.3.4 The operator shall ensure that food provided to workers meets public health requirements.
- 15.3.5 The operator shall provide suitable resting areas. The eating and storage facilities, if available, shall be separated from the working areas.
- 15.3.6 Employees whose work entails standing for long periods shall be provided with facilities for sitting to enable them to take periods of rest.
- 15.3.7 Operators shall provide occupational health & safety, first aid and hygiene training to the workers.
- 15.3.8 The expectant and nursing mothers should be exempted from heavy duty and work related to pesticide handling.
- 15.3.9 Maternity leaves, return to work arrangements and breast feeding breaks shall comply with applicable national Labours laws and regulations.
- 15.3.10 In case worker housing is provided, it shall be safe, habitable, and hygienic, with access to drinking water, toilets, and drainage.

16 Labour, employment and social issues

- 16.1 Worker employment conditions shall comply with national legislation with regard to wages, workers age, working hours, conditions, job security, unions, pensions, and all

other legal and health requirements.

16.2 All labour, employment and social issues shall at a minimum meet the requirements of the national labour and employment legislations including but not limited to; staff recruitment & promotions, induction & training, work contracts, work hours & leave days, expectant & nursing mothers, termination, workman's compensation, freedom of association & participation, grievance and disciplinary procedures, forced labour, discrimination/harassment, child labour.

16.3 The operator shall maintain labor, employment and social records

16.4 Where a collective bargaining is negotiated, it shall be in accordance with national labour regulations.

17. Environmental management

17.1 The operator shall have a documented environmental risk assessment.

17.2 An environmental management plan shall be developed based on the risk assessment.

17.3 The environmental management plan shall be reviewed as per relevant regulations.

18. Energy management

18.1 The operator should have an energy management policy.

18.2 The operator should have written an energy management plan in place

18.3 The operator should monitor energy use to optimize energy efficiency.

19 Waste management

19.1 The operator shall have a waste management plan.

19.2 The operator shall provide separate disposal bins for different kinds of waste.

19.3 Holding areas for fuel and oils shall comply with the national requirements

19.4 Wastewater treatment and disposal systems shall comply with the national regulations.

19.5 Hazardous waste shall be disposed of in accordance with national requirements

20 Legal and contractual obligations

20.1 Legal compliance

The operators shall comply with applicable national laws and regulations and with applicable international treaties and agreements.

20.2 Contractual obligations

20.2.1 Operators in contract farming (outgrower schemes) shall provide written contracts in Swahili/English specifying seed variety, input credit (seed, fertilizer, pesticide), technical support, purchase price (with minimum guaranteed price), quality parameters, and payment terms.

20.2.2 Compliance with specific buyer requirements

20.3 Non-compliance

Non-compliance with legal or contractual obligations shall be recorded, and corrective actions shall be implemented within applicable specified timeframe.