



DRAFT TANZANIA STANDARD

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

TANZANIA BUREAU OF STANDARDS

0. Foreword

Pulses are among agricultural crops that play an important role in Tanzania's agricultural economy, food security and nutrition. The crops are grown in a wide area covering many hectares. Inadequate production and post-harvest practices may adversely affect soil health, the environment, food safety and work safety.

Population growth demands an increase in sustainable productivity.

The need to ensure sustainable pulses production necessitate development of sustainable agronomic practices. This standard shall provide guidance to all production and post-harvest handling of pulses to attain sustainable production requirements. Following this standard, all cultivation practices should consider sustainability aspects and all inputs should be used judiciously while paying attention to food safety, quality and workers health. Therefore, this standard provides guidelines to promote sustainable, climate-resilient and environmentally sound production of quality and safe pulses.

1. Scope

This Tanzania standard provides guidelines for Good Agricultural Practices for sustainable production and post-harvest handling of common pulses including common bean (*Phaseolus vulgaris* L.), Pigeon pea (*Cajanus cajan* (L.) Millsp.), Chick peas (*Cicer arietinum* L.), Green gram (*Vigna radiata* (L.) R. Wilczek), Soybean (*Glycine max* L.).

It applies to all pre and post production steps from land selection, preparation to post-harvest handling and storage. This standard does not apply to pulses produced for animal feed and seed production.

2. Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies:

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

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

TZS 875/EAS 46, *Dry beans - Specification*

TZS 1084/EAS 756, *Dry pigeon peas - Specification*

TZS 1667/EAS 754, *Dry Chickpeas - Specification*

TZS 1666/EAS 331, *Green grams - Specification*

TZS 1083/ EAS 762, *Dry soybeans - Specification*

3. Terms and definitions

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

3.1 pulses

dried seeds of legume plants, such as common beans, pigeon peas, green grams, chickpeas, soybean

3.2 Good Agricultural Practices

a set of principles, standards and technical recommendations applied during crop production and post-harvest handling to ensure food safety, produce quality, environmental sustainability, and the health and welfare of workers

3.3 audit

systematic, independent and documented process for obtaining objective evidence and evaluating it objectively to determine the extent to which the audit criteria are fulfilled

3.4 biodiversity

assemblage of living organisms from all sources including terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part

3.5 biostimulants

substances or microorganisms that, when applied to plants or the soil, improve nutrient efficiency, enhance tolerance to abiotic stress, and boost quality traits

3.6 compost

product of controlled biological decomposition of organic material in the presence of air to form a humus-like material.

3.7 crop rotation

farming system in which dissimilar types of crops are successively cultivated on the same plot according to a predefined plan.

3.8 fumigant

pesticides that act in a gaseous state to control pests in enclosed commodities, structure, soil as authorized by the competent authorities.

3.9 food defense

the protection of food products from intentional contamination or adulteration that could cause public health harm or economic disruption

3.10 food fraud

the intentional and deceptive manipulation of food, its ingredients, or packaging for economic gain

3.11 ground water

all water that is below the surface of the ground in the saturation zone

3.12 hazard

biological, chemical, physical agent or any other property with the potential to cause a product to be unsafe for handling and/or consumption

3.13 internal audit

assessment carried out by a producer on its own Management Systems

3.14 manure

decomposed materials of animal and or plant origin used to enhance the physical, chemical and biological activities of the soil to maintain or improve plant nutrition

3.15 agrochemicals

chemicals applied throughout the production chain to maintain / enhance produce quality; it includes detergents and pesticides, synthetic fertilizers and other chemical growth agents

3.16 location

production unit or group of production units, covered by the same ownership, operational procedures and farm management

3.17 product

mature dried beans, chick peas, green gram, soybean, pigeon peas.

3.18 record

document that contains objective evidence which shows how activities are being performed and what kind of results are being achieved

3.19 sewage sludge

accumulated settled solids separated from various types of waste water either moist or mixed with liquid component as a result of natural or artificial processes

3.20 sewage water

water mixed with waste matter

3.21 traceability

ability to track the history, use or location of a product by means of recorded identification

3.22 grower/ farmer

person responsible for the management of primary production and handling of food crops

3.23 potable water

water that complies with TZS 789

3.24 Restricted Entry Interval (REI)

minimum amount of time that should lapse between the moment a pesticide is applied to an area or crop and the moment that people can enter that area without protective equipment or according to the product label

3.25 preharvest interval

time between the last application of a pesticide to the first day of harvest of the treated crop

3.26 quality seed material

seed having required standards of purity, germination and other attributes and approved by relevant National Authority

3.27 Integrated Pest Management (IPM)

an ecosystem approach to crop production and protection that combines different management strategies and practices to grow healthy crops and minimize the use of pesticides

3.28 worker

individual engaged in various functions for an organization, whether as an employee, contractor, trainee, or volunteer.

3.29 legumes

plants in the family Fabaceae (or Leguminosae) such as beans, pigeon peas, chick peas, soybeans, green grams

3.30 Personal Protective Equipment (PPE)

protective gear worn by a person to protect him /her from risks of injury, illness, or other hazards

3.31 risk

the probability of occurrence of unpredictable events in agriculture that have adverse effects on farm income, yield or physical assets and health and safety of workers

3.32 crop residue

plant parts left in a field/farm after harvest

3.33 recall

removes unsafe produce from consumers and the supply chain due to serious health or safety risks

3.34 withdrawal

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

3.35 agricultural inputs

materials, resources and products used in agricultural production

3.36 farm

an area used for growing crops

4.0 SUSTAINABLE AGRICULTURAL PRACTICES

4.1 SITE MANAGEMENT

Site Management should include the following;

4.1.1 The farmer shall have a documented risk assessment completed for all registered sites.

4.1.2 The farmer shall have a management plan that establishes strategies for minimizing the risks identified.

4.1.3 The production area and adjoining sites or farms shall be evaluated for their suitability of agricultural land use.

4.1.4 The land used for cultivation shall not have been previously used as a landfill and/or for industrial dumping.

4.1.5 The farmer shall recognize that the farm is an agricultural ecosystem that interacts with neighboring landscapes.

4.1.6 The farmer shall identify potential hazards and provide corresponding preventive or mitigating measures.

4.2 LAND USE PLANNING

4.2.1 The farm shall be divided into blocks of different purposes including production area, composting area, storage.

4.2.2 The farmer shall identify high-risk areas (erosion zones, flood-prone areas).

4.2.3 The farmer shall mark all farm boundaries clearly.

4.2.4 The farmer shall provide designated walkways and emergency exits.

4.3 SOIL MANAGEMENT

4.3.1 Soil Analysis

4.3.1.1 Soil analysis shall be done at least after every two years by competent personnel.

4.3.1.2 Soil sampling shall be done according to appropriate sampling technique

4.3.1.3 Soil testing shall be conducted in according to the appropriate method of tests.

4.3.1.4 The farmer shall analyze the soil samples for heavy metals, pH, nutrient status for appropriate use of fertilizer.

4.3.1.5 Soil mapping shall be established to plan crop rotation and/or production programs.

4.3.2 Substrate management, soil health and fumigation

4.3.2.1 In the event of substrates, the farmer should participate in substrate recycling.

4.3.2.2 Records of chemicals used to sterilize substrates for reuse shall be kept.

4.3.2.3 The farmer shall ensure that substrates of natural origins do not come into the designated conservation areas.

4.3.2.4 The farmer shall have a soil management plan to improve and optimize soil health

4.3.2.5 Crop rotation for annual crops should be implemented, where feasible.

4.3.2.6 The farmer should use techniques to improve or maintain soil structure and avoid soil compaction.

4.3.2.7 Organic matter (compost, manure, mulch) shall be incorporated to enhance soil health.

4.3.2.8 The farmer shall use techniques to reduce the possibility of soil erosion

4.3.2.9 The farmer shall have a documented justification for the use of soil fumigants.

4.3.2.10 The pre-planting interval shall be complied with.

4.4 BIODIVERSITY AND HABITATS

4.4.1 Management of biodiversity and habitats

4.4.1.1 The farmer shall have a documented biodiversity plan implemented to manage biodiversity.

4.4.1.2 The farmer shall ensure enhancement of biodiversity through recommended

practices

4.4.2 Ecological upgrading of unproductive sites

4.4.2.1 The farmer should use unproductive sites as ecological focus areas to protect and enhance biodiversity.

4.4.3 Natural ecosystems and habitats

4.4.3.1 The farmer shall not convert areas with legally recognized conservation value into agriculture or other uses.

4.4.3.2 The farmer shall identify and protect native plant and tree species within and around the farm.

4.4.3.3 The farmer should establish hedgerows, grass strips and small woodlots as micro-habitats.

4.4.3.4 The farmer shall reduce unnecessary tree cutting.

4.4.3.5 The farmer shall have a risk-based microbial environmental monitoring program for produce handling areas.

4.5 FARM STRUCTURE AND FACILITY MAINTENANCE

4.5.1 Farm structures should be appropriately designed for the intended purpose.

4.5.2 All farm structures and equipment shall be kept clean at all times for optimal operating conditions.

4.5.3 Sewage, waste disposal and drainage system shall be appropriately constructed to minimize the risk of contamination.

4.5.4 Irrigation system should be maintained to provide effective delivery of water.

4.6 LAND PREPARATION

- 4.6.1 The farmer should use minimum tillage where possible to protect soil structure.
- 4.6.2 Land levelling should allow proper drainage and water conservation.
- 4.6.3 The farmer may apply organic matter before planting to enhance soil fertility.
- 4.6.4 Crop residues shall not be burnt, rather be incorporated into the field to enhance soil organic matter
- 4.6.5 Drainage structures shall be established in areas prone to waterlogging

4.7 PLANT PROPAGATION MATERIALS

- 4.7.1 The farmer shall use plant propagation materials registered and authorized for use in the country by the recognized Authority.
- 4.7.2 Information on chemical treatments shall be available for purchased planting materials
- 4.7.3 The farmer should use high-yielding varieties that are adaptable to the locality.
- 4.7.4 The farmer shall keep record of the sources of seed materials including product identity (i.e., company name, lot number, variety, germination percentage, date tested).
- 4.7.5 The farmer shall apply appropriate planting spacing and seeding rate.

4.8 PLANT PROTECTION PRODUCTS

4.8.1 Management of Plant Protection Products

- 4.8.1.1 The farmer shall use plant protection products registered and authorized for use in the country by the recognized Authority.
- 4.8.1.2 Pest management programme shall be put in place taking into account historical data, trends, and current conditions.
- 4.8.1.3 The farmer shall practice Integrated Pest Management (IPM) approach to manage crop pest incidences.
- 4.8.1.4 Pesticides shall be used only when necessary and under guidance by the qualified person.
- 4.8.1.5 Only trained/certified pesticide applicators shall carry out pesticide applications.
- 4.8.1.6 The farmer shall observe pre-harvest interval and entry intervals for pesticide application.
- 4.8.1.7 Plant protection products and other treatments shall be applied appropriately and as recommended on the product label.
- 4.8.1.8 The farmer shall take appropriate measures to prevent plant protection product drift to neighboring plots.
- 4.8.1.9 Spraying shall not be done during windy conditions to reduce drift
- 4.8.1.10 Agrochemicals shall be clearly labelled and stored in the original container and kept under lock.
- 4.8.1.11 The farmer shall have documented procedures addressing re-entry times after plant protection product application
- 4.8.1.12 The farmer shall put a warning sign visibly displayed in the storage area;
- 4.8.1.13 Agrochemical containers and residues shall be disposed of according to instructions included on the manufacturer's label.

4.8.1.14 Records of purchase of agrochemicals shall be kept securely.

4.8.1.15 Spraying equipment shall be regularly maintained for their efficient operations;

4.8.1.16 Farm personnel involved in the use of agrochemicals shall wear appropriate protective clothing and safety gadgets.

4.8.1.17 Invoices and/or procurement documentation of all plant protection products and postharvest treatments shall be kept securely.

4.8.2 Application records

4.8.2.1 The farmer shall keep securely the records of agrochemical applications.

4.8.2.2 Weather conditions at time of application shall be recorded.

4.8.2.3 The farmer shall put a warning sign visibly displayed in the fields treated with pesticides

4.8.2.4 Management of plant protection products shall be supported with metrics

4.8.3 Empty containers and Obsolete plant protection products

4.8.3.1 Empty plant protection product containers shall be triple rinsed with water before storage and disposal, the rinsate shall be disposed of in such a way as to mitigate the risk to the environment.

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

4.8.3.3 Empty containers shall be kept secure until disposal is possible.

4.8.3.4 Empty plant protection product containers shall be disposed of in such a way as to mitigate the risk to humans and the environment.

4.8.3.5 Official collection and disposal systems when available shall be used, and the empty containers shall then be adequately stored, labelled, and handled according to the rules of that collection system.

4.8.3.6 Regulations on disposal or destruction of plant protection product containers shall be complied with

4.8.3.7 Obsolete plant protection products shall be securely maintained, identified, and disposed of via authorized or approved channels.

4.8.4 Disposal of surplus application mix

4.8.4.1 Surplus application mixes or tank washings shall be disposed of responsibly in a manner that does not pose a risk to the environment.

4.8.4.2 Applying surplus spray and tank washings to the crop shall be the first method of disposal, providing that the overall label dose rate is not exceeded.

4.8.4.3 No pesticides waste water shall be released into the open environment.

4.8.4.4 Records of surplus application shall be kept

4.8.5 Residue analysis

4.8.5.1 Information on maximum residue levels (MRLs) for human consumption shall be available.

4.8.5.2 The farmer shall complete risk assessment to ensure MRL requirements for human consumption are met.

4.8.5.3 The correct MRL sampling and testing procedures shall be followed.

4.8.5.4 A documented action plan shall be available that describes the steps to be taken if an unauthorized plant protection product is detected or exceeded in the MRL

4.8.6 Plant protection product and postharvest treatment product storage

4.8.6.1 Plant protection products, biocontrol agents, and any other treatment products shall be stored in a manner that ensures the associated risks are managed.

4.8.6.2 The plant protection product storage shall structurally be sound and robust.

4.8.6.3 Plant protection product storage shall not pose a risk to workers or create opportunities for cross contamination.

4.8.6.4 Plant protection products shall be stored at an appropriate temperature.

4.8.6.5 Plant protection product store shall be illuminated.

4.8.6.6 The plant protection product storage shall be able to retain and manage spillage.

4.8.7 Mixing and handling

4.8.7.1 Plant protection products shall be mixed and handled according to manufacturer's instructions.

4.8.7.2 Access to health checks shall be available to workers with exposure to plant protection products.

4.8.7.3 Emergency preparedness procedure shall be available near the plant protection product store.

4.8.7.4 Facilities shall be available to deal with operator exposure to contamination.

4.8.7.5 Plant protection products shall be transported between production sites in a safe and secure manner.

4.9 FERTILIZERS, FERTILIZER SUPPLEMENT AND BIOSTIMULANTS MANAGEMENT

4.9.1 A farmer shall use fertilizers registered and authorized for use in the country by a recognized Authority.

4.9.2 Fertilizer Storage and Records

4.9.2.1 Fertilizers and biostimulants shall be stored in an appropriate manner that does not compromise food safety.

4.9.2.2 Fertilizers and biostimulants shall be stored in an appropriate manner that reduces the risk of environmental contamination.

4.9.2.3 Farmer shall maintain detailed records of fertilizer use.

4.9.2.4 Farmer shall follow storage and expiry instructions precisely.

4.9.3 Organic fertilizers

4.9.3.1 A risk assessment for organic fertilizer should be conducted as per intended use.

4.9.3.2 The interval between the application of organic fertilizer and harvest shall not compromise food safety.

4.9.3.3 The use of human sewage sludge shall be prohibited on the farm

4.9.3.4 The farmer shall use well-decomposed compost or manure

4.9.3.5 The farmer shall locate composting sites away from water sources to prevent contamination.

4.9.4 Inorganic Fertilizers

4.9.4.1 A risk assessment for inorganic fertilizer should be conducted as per intended use.

4.9.4.2 The farmer shall apply fertilizers according to soil test results and as recommended;

4.9.4.3 The content of major nutrients (nitrogen, phosphorus, potassium) applied fertilizers shall be known.

4.9.4.4 The purchased inorganic fertilizers shall be accompanied by documented evidence of chemical composition, including heavy metals.

4.10 HARVESTING AND POST HARVEST HANDLING PRACTICES

4.10.1 Harvesting practices

4.10.1.1 A farmer shall harvest the product at a full stage of maturity.

4.10.1.2 A farmer shall use clean and well maintained equipment and tools for harvesting and post-harvest operations

4.10.1.3 A farmer shall sort out and discard products that show visible signs and symptoms of insect or microbial damage and infestation.

4.10.2 Post harvest handling practices

4.10.2.1 Hauling, Threshing, Drying

4.10.2.1.1 A farmer shall haul newly harvested produce immediately after harvest.

4.10.2.1.2 A farmer shall ensure that hauling facilities used for collecting and transporting the harvested produce from the farm are clean and dry.

4.10.2.1.3 Before threshing, a farmer shall dry the produce within a range of recommended moisture content.

4.10.2.1.4 Clean, dry and properly calibrated mechanical threshers shall be used where applicable.

4.10.2.1.5 Clean and dry containers for the threshed produce shall be used.

4.10.2.1.6 The produce shall be dried immediately to the required moisture content

4.10.2.1.7. If immediate drying is not possible, produce shall be temporarily kept in structures with good ventilation.

4.10.3. Packing and storage areas (in-field or facility)

4.10.3.1. Clean and suitable containers shall be used for packing the dried produce.

4.10.3.2 Packed produce shall be stored properly to minimize food safety risks.

4.10.3.3 Packaging materials shall be appropriate for the intended use and stored under conditions that protect the materials from contamination.

4.10.4 Transport

4.10.4.1 The produce shall be transported to a suitable storage or processing area as soon as possible after drying.

4.10.4.2 The farmer shall avoid grain moisture accumulation during transport by using appropriate measures.

4.10.4.3 The produce shall be properly stacked inside the transport vehicle and adequately protected against pests.

4.10.4.4 Containers and vehicles to be used for collecting and transporting the products shall be clean, dry and free from infestation.

4.10.5 Storage

4.10.5.1 Storage facilities shall be properly designed to meet the recommended requirements

4.10.5.2 The farm/warehouse operator shall adhere to good storage practices

4.10.5.3 A system shall be in place to ensure that foreign materials do not contaminate the produce.

4.10.5.4 A system for handling foreign material contaminated produce shall be in place

4.10.5.5 Storage conditions shall be controlled and maintained

4.10.5.6 Pest management plan shall be in place and implemented.

4.10.5.7 Store records shall be kept appropriately

4.11 TRACEABILITY, PARALLEL OWNERSHIP AND SEGREGATION

4.11.1 The producer shall have a documented identification and traceability system that allow registered products to be traced back to the registered farm or supplier.

4.11.2 All registered products shall be traceable back to and from the registered farm where they were produced and handled.

4.11.3 All produce originating from a registered farm shall be identifiable and segregated with produce originating from a non-registered farm.

4.11.4 A farmer shall have procedures in place for products that are purchased from different sources to be identified and segregated

4.11.5 A farmer shall have a final verification step to ensure correct dispatch of produce originating from registered and non-registered production processes.

4.12 RECALL AND WITHDRAWAL

4.12.1 The farmer shall have a documented procedure to manage the recall and withdrawal of product from the market place. The procedure shall identify:

4.12.1.1 The events that may result in a recall and withdrawal

- 4.12.1.2 The persons responsible for making decisions on the possible recall and withdrawal
- 4.12.1.3 The mechanism for notifying the next step in the supply chain
- 4.12.1.4 The notification of relevant authorities when required
- 4.12.1.5 Records of recall and withdrawal shall be kept

4.13 WORKERS' HYGIENE, HEALTH, SAFETY AND WELFARE

4.13.1 Risk assessment and training

- 4.13.1.1 The farmer shall have a documented risk assessment for workers' hygiene, health and safety.
- 4.13.1.2 The farmer shall have hygiene, health and safety procedures to minimize food safety risks.
- 4.13.1.3 All workers shall receive hygiene, health and safety training according to the risk assessment.
- 4.13.1.4 Farm workers shall be trained and follow recommended personal hygienic and sanitary practices

4.13.2 Sanitary Facilities:

- 4.13.2.1 Adequate and accessible toilet and hand-washing facilities shall be provided and maintained in a sanitary condition near fields and handling areas.
- 4.13.2.2 Field sanitation practices shall always be tidy and clean.

4.13.3 Handwashing:

- 4.13.3.1 Personnel shall wash their hands before handling produce, after using the toilet and after handling any contaminated materials.

4.13.4 Health and Illness:

- 4.13.4.1 Workers who are ill or show symptoms of illness shall not handle produce.
- 4.13.4.2 Workers who have cuts and/or wounds shall be covered with waterproof dressings.

4.13.5 Personal behavior and Attire:

- 4.13.5.1 Workers shall refrain from behaviors that could contaminate produce
- 4.13.5.2 Smoking, eating, chewing, and drinking shall be confined to designated areas.
- 4.13.5.3 Clean clothing shall be worn, and personal effects like jewelry shall be removed

4.13.6 Hazards and first aid

- 4.13.6.1 Accident and emergency procedures shall be visibly displayed and communicated to workers.

4.13.6.2 Safety advice for substances hazardous to workers' health and safety shall be immediately available and accessible.

4.13.6.3 First aid kits shall be accessible at all permanent sites and fields near the work.

4.13.6.4 The farmer shall have at least one person trained in first aid.

4.13.7 Personal protective equipment

4.13.7.1 Workers, visitors, and subcontractors shall be equipped with suitable personal protective equipment.

4.13.7.2 Personal protective equipment shall be maintained in clean conditions and stored appropriately

4.13.8 Workers' welfare

4.13.8.1 There shall be communication between management and workers on issues related to their hygiene, health, safety, and welfare.

4.13.8.2 Workers shall have access to potable water, food storage, and areas to eat and rest.

4.14 COMPLAINTS

4.14.1 The farmer shall have a complaints handling procedure for internal and external issues that is implemented.

4.14.2 The farm workers shall be informed of their rights, and there is a grievance mechanism implemented where workers can file complaints without fear.

4.15 DOCUMENTATION

4.15.1 The farmer shall have a procedure to manage and control documents and records.

4.15.2 Sales records of all registered and sold produce quantities shall be available

4.15.3 Quantities (produced, stored, and/or purchased) shall be recorded and summarized.

4.15.4 Copies of laboratory analysis and certificates that verify compliance with the relevant Regulatory Authorities shall be filed.

4.15.5 Records for auditing purposes shall be up-to-date.

4.15.6 Records shall be kept for a minimum period of two years, unless a longer period is required

4.15.7 The farmer shall complete a minimum of one self-assessment/internal audit annually.

4.15.8 The farmer shall take effective corrective actions to address non-conformities detected during the self-assessments/internal audits.

4.15.9 The farmer shall maintain detailed records of inputs and resources for accuracy and traceability.

4.15.10 The farm shall have maps of farm blocks, irrigation lines, and production zones.

4.15.11 The farmer shall have records for recall and withdrawal of products from the market

4.16 CONTINUOUS IMPROVEMENT PLAN

4.16.1 The farmer shall evaluate the farming operation and identify improvements to be

undertaken as assessed by the standard.

4.16.2 The farmer shall have a continuous improvement plan with self-defined targets describing how progress toward each target will be monitored.

4.16.3 The farmer shall have evidence that a continuous improvement plan is implemented.

4.17 HUMAN RESOURCE MANAGEMENT AND TRAINING

4.17.1 The workers whose jobs, duties and responsibilities have an impact on the implementation of farm activities should be clearly defined.

4.17.2 At least one competent person shall be designated for workers' health, safety, and welfare.

4.17.3 Individuals responsible for technical decision-making on agricultural inputs shall demonstrate competence.

4.17.4 Worker training, skills and competencies shall be supported by records and made available during inspection.

4.18 OUTSOURCED ACTIVITIES (SUBCONTRACTORS)

4.18.1 The grower shall ensure that outsourced activities comply with the principles and criteria to the services provided.

4.18.2 The farmer shall have specifications for materials and services relevant to food safety.

4.18.3 The grower shall oversee the activities undertaken by the subcontractors.

4.19 SPECIFICATIONS, SUPPLIERS, NON-CONFORMING PRODUCTS AND STOCK MANAGEMENT

4.19.1 Specifications supporting the implementation of farm activities and customer compliance shall be available.

4.19.2 Specifications should be reviewed annually or when changes occur,

4.19.3 Descriptions of how alternate suppliers will be evaluated in the event of emergency or supply chain disruptions should be available.

4.19.4 The farmer shall have procedures in place to manage and handle non-conforming products

4.19.5 The documented procedures, including a hold-and-release process, shall be in place to prevent unintended use or delivery of non-conforming products.

~~4.19.6~~ The products shall be classified non-conforming when they fail applicable, safety and quality requirements

4.19.7 An inventory management procedure shall be in place to manage stock on site.

4.20 EQUIPMENT AND DEVICES

4.20.1 The farmer shall ensure that equipment, tools, and devices are fit for purpose and maintained.

4.20.2 The farmer shall store the equipment in such a way as to prevent product contamination.

4.20.3 The farmer shall have in place procedures for cleaning, maintaining, and appropriate use of vehicles and equipment used for loading, transport, or storage of harvested products.

4.21 FOOD SAFETY POLICY, FOOD DEFENSE AND FOOD FRAUD

- 4.21.1 The farmer shall put in place and sign the food safety policy declaration.
- 4.21.2 The farmer shall have a food defense system in place to address risks associated with malicious attack or contamination.
- 4.21.3 The farmer shall have a system in place to address risks associated with food fraud.

4.22 ENERGY EFFICIENCY

- 4.22.1 The farmer should monitor the on-farm energy use. There should be records of on-farm energy use (e.g., invoices detailing energy consumption).
- 4.22.2 Based on the results of the monitoring, there should be a plan to improve energy efficiency on the farm.
- 4.22.3 The plan to improve energy efficiency should consider minimizing the use of non-renewable energy.
- 4.22.4 The farmer should consider reducing the use of non-renewable energy to the lowest possible and using renewable energy instead.

4.23 WASTE MANAGEMENT

- 4.23.1 The farmer shall have a working waste management system.
- 4.23.2 The farmer shall identify waste products and sources of pollution in all areas of the farm.
- 4.23.3 All forklifts and other driven transport trolleys shall be maintained well and cleaned to avoid contamination through emissions.
- 4.23.4 Areas for holding diesel and other fuel tanks shall be environmentally safe.
- 4.23.5 Organic waste shall be managed in an appropriate manner to reduce the risk of contamination of the environment.
- 4.23.6 The water used for washing and cleaning purposes shall be disposed of in a manner that minimizes the environmental, health, and safety impact.
- 4.23.7 Fragments and small pieces of packaging material and other non-product waste shall be removed from the field.
- 4.23.8 The food waste (food that is not channeled for human consumption, animal feed, or bio-based materials) shall be properly managed.
- 4.23.9 The farmer shall separate waste into organic, recyclable, and hazardous categories.
- 4.23.10 A farmer shall dispose of pesticide containers and obsolete pesticide according to the relevant laws and legislation.
- 4.23.11 The farmer should compost all biodegradable waste; where applicable

4.24 INTEGRATED PEST MANAGEMENT (IPM)

- 4.24.1 The farmer shall develop a long-term pest management plan based on historical data and field scouting

- 4.24.2 Implementation of integrated pest management (IPM) shall be assisted through training or advice.
- 4.24.3 The farmer shall be informed about the relevant pests, diseases, and weeds that affect their registered crops.
- 4.24.4 The farmer shall have an integrated pest management (IPM) plan describing measures used to manage pests, diseases, and weeds that affect the crop(s).
- 4.24.5 The farmer shall practice monitoring of pests and diseases.
- 4.24.6 The farmer shall make interventions to manage pests.
- 4.24.7 The farmer shall follow anti-resistance recommendations to maintain the effectiveness of available plant protection products (PPPs).
- 4.24.8 The farmer shall use the results of integrated pest management (IPM) to learn and to improve the IPM plan
- 4.24.9 The farmer shall adopt crop rotation to reduce buildup of soil-borne pathogens.
- 4.24.10 The farmer shall use a combination of cultural, mechanical and chemical weed control;
- 4.24.11 The farmer shall practice appropriate weed control measures.
- 4.24.12 The farmer shall conduct timely weeding as recommended;
- 4.24.13 The farmer shall encourage mulching and cover cropping to suppress weeds
- 4.24.14 The farmer shall use herbicides registered and authorized for use in the country by the recognized authority.

4.25 WATER MANAGEMENT

4.25.1 Water Risk assessment and Water Use plan

- 4.25.1.1 The farmer shall undertake risk assessment to evaluate environmental issues for water management on the farm.
- 4.25.1.2 The farmer shall undertake a risk assessment to assess food safety risks for pre-and postharvest water used.
- 4.25.1.3 The farmer shall have a water management plan in place.
- 4.25.1.4 The farmer shall apply water use efficient technologies and cultural practices to maximize production

4.25.2 Water sources and Use on the Farm

- 4.25.2.1 Water use at farm level shall have a valid permits/license where legally required.
- 4.25.2.2 Restrictions indicated in water permits/licenses shall be complied with.
- 4.25.2.3 Measures should be implemented to collect water and, where appropriate, to recycle.
- 4.25.2.4 The farmer shall ensure adequate soil moisture during flowering and pod filling to avoid stress

4.25.3 Water quality and storage

4.25.3.1 Water shall be analyzed for food safety hazards, in accordance with the risk assessment.

4.25.3.2 Corrective actions shall be taken based on results from the risk assessment and results of the water analysis.

4.25.3.3 The use of treated sewage water shall comply with relevant national standard and shall not pose a food safety risk

4.25.3.4 Water that comes into contact with products during harvest and postharvest meets the microbial standard for potable water.

4.25.3.5 Recirculated water used during production, harvest, and postharvest shall be changed or replenished at an appropriate frequency.

4.25.3.6 Water storage facilities shall be present and well maintained to take advantage of periods of maximum water availability. Storage of water should not pose any food safety risks.

4.26 PRODUCE QUALITY, PACKAGING, MARKING AND LABELLING

4.26.1 Produce Quality Requirement

The produce shall comply to the relevant product standard (including TZS 875, TZS 1084, TZS 1667, TZS 1666, TZS 1083).

In addition to the mentioned product standards; the product shall comply to the following requirements:

4.26.1.1 be mature, dry seeds obtained from the designated crop;

4.26.1.2 be well-filled, clean, wholesome, uniform in size, and shape;

4.26.1.3 be free from substances which render them unfit for human consumption or processing into or utilization thereof as food;

4.26.1.4 be free from foreign, rancid odour & taste abnormal flavors, musty, sour or other undesirable odour, obnoxious smell and discoloration;

4.26.1.5 have colour characteristic of designated product;

4.26.1.6 shall be clear and free from adulterants, sediments, suspended or foreign matter and separated water and;

4.26.1.7 The produce shall be packaged, marked and labelled in accordance with TZS 538.

4.26.2 Packaging

4.26.2.1 Produce shall be packaged in food grade containers and sealed in manner to ensure the safety and quality requirements are maintained throughout the shelf life of the produce.

4.26.3 Marking and labelling

In addition, each container of product shall be legibly and indelibly marked in Swahili/English with the following information:

a) Name of the produce

b) Name, physical and postal address of the farmer and/or packer

c) Crop year

- d) Language be Swahili/English
- e) Net weight
- f) Country/place of origin
- g) Storage condition
- h) Batch/ lot number
- i) Pack date and
- j) How to dispose used package