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MINISTRY OF AGRICULTURE



# Good agricultural and handling practices guideline for improving the quality and safety of sesame seeds

RAISE-FS Guideline #002



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Ethiopian Agricultural Authority

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#### Summary of document

This document outlines measures to reduce losses and safeguard sesame seeds and their products by implementing Good Agricultural Practices (GAPs). These practices aim to enhance productivity, reduce costs, prevent contamination, maintain quality, and meet safety and market requirements. To accomplish these objectives, the guideline is intended to be used in conjunction with extension manuals, relevant national and international standards, and established codes of practice, ensuring contamination risks are controlled until the seeds are securely in the farmers' possession.

Keywords: Sesame, Good Agricultural Practice, Good Handling Practice

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# Preface

Sesame is one of Ethiopia's key oilseed crops. It supports millions of smallholder farmers, generates significant export income, and helps with food and nutrition security. However, productivity and quality have often been limited by issues with farming methods, postharvest handling, storage, and marketing. To address these issues, this guideline has been developed as a practical resource for sesame value chain actors.

This manual, developed with the lead of the Ethiopian Agriculture Authority (EAA), focuses on farm-level actions like site and land selection, seedbed preparation, seedling raising, transplanting, soil, water and integrated pest management, and harvesting techniques. The Good Handling Practice (GHP) section deals with contamination prevention practices such as observing sanitation and hygiene during production, harvesting, drying, transporting, cleaning, sorting, packaging, labelling, and storing. Additionally, the guideline emphasises the need for certification, sustaining traceability, a trustworthy marketing system that boosts product quality, ensures food safety, and improves the competitiveness of the sector.

The guidelines are outcomes of a collaborative effort involving various stakeholders, including government institutions, researchers, academia, and development partners. It supports the national food safety strategy and regulatory framework, designed to strengthen certification systems, build capabilities, and improve traceability and market access. By following these recommendations, farmers and others in the value chain can boost productivity, lower postharvest losses, maintain quality and safety, and enhance the competitiveness of the Ethiopian sesame sector in both local and international markets.

The guides are expected to provide practical advice and serve as reference material for farmers, cooperatives, extension workers, transporters, regulatory bodies, and others involved in the sesame value chain. By implementing the step-by-step outlined practices, stakeholders at all levels could make the sesame subsector more sustainable, safer, and competitive.

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Signature: 

Date: 05/01/2026

# List of abbreviations and acronyms

CAB	Conformity Assessment Body
DAP	Diammonium Phosphate fertiliser
EAA	Ethiopian Agricultural Authority
ECX	Ethiopia Commodity Exchange
EFDA	Ethiopian Food and Drug Authority
EU	European Union
FIFO	First-in-First-out
FSMS	Food Safety Management System
GAP	Good Agricultural Practices
GHP	Good Handling Practices
HACCP	Hazard Analysis Critical Control Point
IDM	Integrated Disease management
IES	Institute of Ethiopian Standards
IPM	Integrated Pest Management
Max	Maximum
Min	Minimum
MoA	Ministry of Agriculture
MoTRI	Ministry of Trade and Regional Integration
MRL	Maximum Residue Limit
NPS	Nitrogen-Phosphorous-Sulphur-containing fertiliser
PC	Phytosanitary Certificate
PQC	Product Quality Certificate
PSC	Product Safety Certificate
QMS	Quality Management System





**PART 1**

**GOOD AGRICULTURAL PRACTICES  
(GAP)**

## Terms and definitions

Terminology	Definition
<b>Gap filling</b>	In this guide, gap filling refers to the practice of re-sowing sesame seeds in fields where plants failed to germinate, grow, or survive.
<b>Good Agricultural Practices (GAP)</b>	GAP refers to a set of principles, standards, and technical recommendations designed to ensure that farming activities are conducted sustainably, responsibly, and safely.
<b>Good Handling Practices (GHP)</b>	GHP refers to a set of principles, procedures, and techniques designed to ensure the proper handling, storage, and transportation of sesame seeds to maintain their quality and safety, while ensuring compliance with national and international standards and minimising health, food safety, and environmental risks.
<b>Farm-to-fork traceability</b>	This is a process of adopting uniform standards, record keeping tools, and information-sharing mechanisms through the bilateral agreements between parties (sesame seed buyers and sellers).
<b>Food Safety Management System (FSMS)</b>	The certificate is issued by the Conformity Assessment Body (CAB), ensuring that sesame products are processed and handled according to HACCP principles demonstrating that the food is safe to eat, meets the required quality standards, and is legally compliant.
<b>Fumigation certificate</b>	It is issued by the EAA, ensuring that all products, including containers in the consignment and pallets, have been chemically disinfected for any specific organisms. The certificate should contain details such as the purpose, fumigant used, duration, and temperature range during fumigation.
<b>GAP certificate</b>	This is issued by the EAA or an accredited private company that monitors the farm and ensures that sesame seeds are produced following GAP procedures and meet national and international standards.
<b>GLOBAL GAP Certificate:</b>	This is issued by an internationally accredited third-party institution. It certifies that sesame seeds are produced using safer and more sustainable farming practices.
<b>Hazard Analysis Critical Control Point (HACCP)</b>	This certificate is issued by the Conformity Assessment Body (CAB), ensuring that sesame seeds are free from biological, chemical, and physical hazards.
<b>NON-GMO certificate</b>	This is issued by the Environmental Protection Authority (EPA), ensuring that the sesame seeds are produced under natural production conditions and systems, using conventionally bred sesame varieties.
<b>Organic certificate</b>	It is issued by the EAA to verify that the farm or handling facility complies with organic regulations. It gives the right to label, represent, and sell sesame products as organic.
<b>Phytosanitary Certificate (PC)</b>	Issued by Ethiopian Agricultural Authority (EAA), this certificate ensures that the consignment meets the specified phytosanitary import requirements and doesn't contain harmful organisms or quarantine pests.
<b>Product Safety Certificate (PSC)</b>	This is a certificate issued by the EAA to ensure that risks are managed according to the required quality standards and that the product is safe for consumption.
<b>Product Quality Certificate (PQC)</b>	This is issued by the EAA to ensure that food safety and quality standards and regulations are met during sesame seed handling.
<b>Quality Management System (QMS)</b>	The Conformity Assessment Body (CAB) issues this certificate, ensuring that sesame seeds are processed in accordance with HACCP protocols.
<b>Sowing seeds</b>	Refers to sesame seeds that are cleaned, packed and stored for planting (sowing) in the soil to allow them to germinate and grow into new plants.
<b>Seed Testa</b>	These are dark brown sesame seeds, with the colour of the testa ranging from light reddish to dark brown.
<b>Reddish sesame seeds</b>	These are dark brown sesame seeds, with the colour of the testa ranging
<b>White sesame seeds</b>	The colour of the testa of these seeds' ranges from cream to white.
<b>Mixed sesame seeds</b>	The mixture of the white and reddish-brown seeds.

<b>Sesame type</b>	Refers to sesame seeds that are grown in certain geographic areas of the country and have various colours (ES 1082:2012).
<b>Humera type</b>	<i>Refers to sesame seeds obtained from Humera and the surrounding areas, regardless of varietal differences</i>
<b>Gonder type</b>	<i>Refers to sesame seeds obtained from Western Gonder zone and the surrounding areas with similar agro-ecologies, regardless of varietal differences.</i>
<b>Wollega type</b>	<i>Refers to sesame seeds obtained from Oromia and Wollega zones and the surrounding areas with similar agro-ecologies, regardless of varietal differences.</i>
Thinning	In this guide, thinning refers to the practice of removing some sesame seedlings or plants to provide optimal space to the remaining ones, allowing them to grow healthily and give higher yields by reducing competition for resources such as sunlight, water, and nutrients.
Tracing	Keeping records and passing necessary information to trace the origin, attributes and history of sesame seeds as they move along the supply chain.
Tracking	The ability to follow the path of a set of sesame seeds passing through the supply chain. Sesame seeds can be tracked back through the supply chain, all the way to the site of production, including the inputs used and operations undertaken (i.e., processing, transporting and storage).

# 1 Good Agricultural Practices

## 1.1 Introduction

Sesame seeds are prone to both quantitative and qualitative losses, as well as contamination, along the value chain. Initial contamination starts in the field during production, and continues through harvesting, drying, threshing, transporting, and primary storage. Knowledge-based management of the production process is crucial for reducing quantitative and qualitative losses, and safeguarding consumer safety. Sesame seed loss is estimated to be between 13% and 17%. Major causes are rainfall, windstorms, pests, and shattering during harvesting, drying and threshing.

The processes of production, drying, threshing, cleaning, bagging, loading, transporting, unloading and storing until marketing predispose the seed to contamination, mainly due to a lack of information on safety requirements and a lack of knowledge on the standards and guidelines for Good Agricultural Practices (GAP). Thus, this guideline is designed to raise awareness among farmers and extension workers on GAP, provide information on national and international food safety requirements and standards; and indicate stepwise procedures and practices to minimise contamination along the production process. Timely, stepwise and correct application of the advice given in the GAP guideline is anticipated to minimise contamination, improve food safety, and marketing performance, as well as increase the income of sesame producers.

**Objective:** These guidelines are developed to reduce losses and maintain the safety of sesame seeds and subsequent products by employing GAPs. They aim to increase productivity, reduce production costs, minimise contamination, maintaining quality, and promote adherence to safety standards and market requirements.

**Scope:** These guidelines are intended to address the quality and food safety issues of whole-grain sesame and seeds of improved varieties used for sowing. By following the advice given in the guidelines, producers can enhance productivity, improve food safety and quality of sesame seeds, and ultimately contribute to consumer confidence and market competitiveness.

**Use:** These guidelines should be used in combination with extension manuals, national and international standards, and codes of practice to improve production and productivity, enhance food safety and minimise contamination until the seed is in the farmers' custody. Specific recommendations for compliance are given in each chapter, taking into consideration the technical and knowledge capacity, and the applicability of recommended practices.

## 1.2 Good Agricultural Practices

Good Agricultural Practices are recommended mainly to reduce the risk of physical, chemical and microbial contaminations to animals, human beings, and the environment during production and post-harvest handling, and to improve productivity and quality of sesame seeds.

## 1.3 Capacity building

- Increase awareness among sesame value chain actors on GAP, Good Handling Practices (GHP), food safety, and quality standards to improve competitiveness and marketing efficiency.
- Train producers and agricultural experts on GAP and GHP.
- Train transporters on the use of clean and safe wagons, as well as hygienic and sanitation measures.
- Train traders on grading, traceability, bagging, labelling, storing, and marketing.
- Train processors on hygiene and sanitation, food safety, quality standards, traceability, cleaning, sorting, grading, packaging, labelling, storing, and store management.

- Raise awareness among exporters about marketing intelligence, market trends, pricing mechanisms and export regulations of importing countries.
- Inform stakeholders about the need for collaboration and action to improve value chain development, competitive marketing, and establish consultative platforms.

## 1.4 Site selection

- The slope of fields allotted for sesame production should not exceed 10%. If the slope is greater than 10%, build terraces or furrows along the contour and sow the seeds.
- The farm should be free from pesticide residues or other hazardous contaminants.
- Collect soil samples according to standard procedures and send them to an accredited laboratory for analysis and quality confirmation.
- Construct latrines away from sesame fields and supply them with wash basins and soap.
- When required, request technical support from the nearby agricultural office.

## 1.5 Land preparation

- Clean the land designated for sesame production immediately after the previous crop harvest.
- Chop stalks, scatter them over the field, and plough them under during land preparation to improve soil physical and chemical properties and reduce pest build-up.
- **DO NOT BURN** crop residues before preparation, as this causes loss of soil organic matter and kills beneficial organisms.
- Plough to a depth of 25-35 cm once every 3 to 5 years, using a mouldboard plough to minimise weed infestation and pest build-up, improve aeration, and organic matter content, and increase the moisture-holding capacity of soils.
- Second ploughing: Clean the remains of weeds and crop residues, plough deeply when soil is moist using a disk harrow or oxen plough to pulverise soil clods and kill early flushing weeds.
- Perform third ploughing at planting using a disc harrow or oxen plough.
- Use Broad Bed Maker (BBM) to create drainage furrows for waterlogged fields.
- Collect all organic and inorganic waste materials in the farm separately and place in a garbage disposal pit.
- Clean farm implements and equipment after all operations to prevent contamination from chemical or hazardous materials.



## 1.6 Seed preparation

- Prepare quality seed to produce a healthy crop, minimise pest build-up, harvest high yields with good quality by responding to applied fertilisers.
- Transport and store planting seeds in a clean and dry place to prevent contamination.

## 1.7 Variety selection

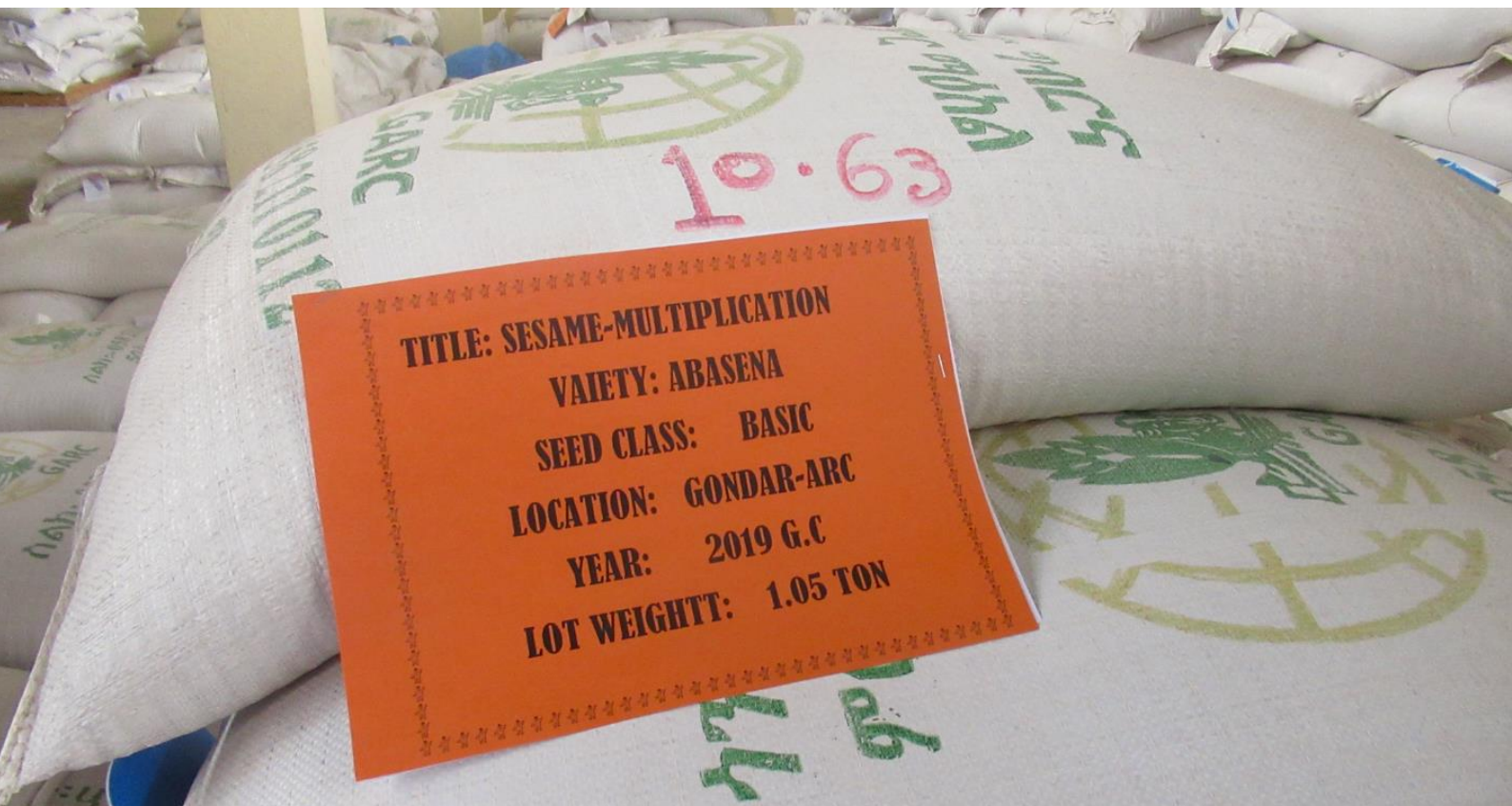
- Sesame varieties should be selected based on their adaptability, productivity, seed colour, oil content, biotic and abiotic stress tolerance.
- Sowing seeds should be of good quality, obtained from reliable sources, and conform to the characteristics of the variety and established standards.
- Use sesame varieties such as Hagelo, Hachalu, Dicho, Abasena, and Obsa in areas with optimum rainfall and where bacterial blight infection is a challenge.
- In Humera and Mirab Armachiho areas, use Setit-1, Setit-2, Gondera-1, and Gonder-2 varieties.
- Metema and areas with similar agroecologies, use Humera-1 and Abasena varieties.
- Select and save seeds from your own fields when certified seed supply is limited.

## 1.8 Cleaning sowing seed

- Sesame seeds can carry weed seeds and also transmit bacterial, fungal, and viral diseases to the newly developing plants.
- Seeds for sowing should be homogeneous in size, cleaned to 99% purity and have a germination rate of more than 90%.

## 1.9 Seed treatment

- Cleaned seeds can be treated with dressing chemicals such as Cruiser or Gaucho at the rate of 300ml per 100kg before planting, to prevent early-season pest build-up.



- Use personal protective equipment when handling treated seeds to minimise the health risks to workers, especially during hand sowing.
- Unless it's necessary, DO NOT USE seed dressing chemicals to minimise negative impacts on human health, beneficial organisms, soil, and water resources contamination.

## 1.10 Packing sowing seed

- Bagging materials must be waterproof, strong, and resistant to tearing (ES-73).
- Cleaned seeds should be packed in clean, airtight, and moisture-proof bags or containers.
- Bags containing certified seeds must be tagged with a label indicating the variety, quantity, year of production, and the name and address of the producer.

## 1.11 Seed storing

- The seeds should be dried to a moisture content of 7-8% before transporting and storage.
- Store the bags with sowing seeds in a ventilated, cool, and dry place.
- Stores and their vicinity should be free from insect pests, disease-forming units, rodents, bats, bird nests, and domestic animals.
- DO NOT store seeds together with pesticides, fertilisers, or other hazardous substances.

## 1.12 Seed sowing

- Use high quality seeds (germination rate of more than 85%) and respect planting distances (40cm between rows and 10cm between plants) to maintain 250,000 plants per hectare for high yield, quality and safety.
- Perform thinning if plant density is too high, and gap filling if the plant population is too low.

## 1.13 Sowing time and method

- Use wider spacing and machine sowing to maintain uniform spacing, crop stand, and improved aeration.
- Adjust sowing dates with methods of sowing to mitigate pest infestations and reduce the negative impacts of pesticide use.
- Before sowing sesame, consider the onset of rainfall, soil moisture accumulation, maturity period of selected varieties, and disease pressure.
- Select the sowing method based on availability of planters or labour.
- In areas with short rainy periods and moisture stress, use early-maturing varieties. For areas with a long rainfall season and adequate moisture, use medium- to late-maturing varieties.

## 1.14 Time of sowing for rain-grown sesame

- For areas with adequate rainfall, the sowing time is end of May to end of June.
- For moisture-stressed areas with a short rainfall window, the sowing time is from the second week of June to the second week of July.

## 1.15 Time of sowing for irrigated sesame

- At the middle Awash and areas with similar agro ecologies the sowing time for irrigated sesame is mid-May to mid-June.
- In Somali region: first week of November up to the second week of December.
- In Humera and Metema areas: second week of January up to the first week of February.

## 1.16 Method of sowing

- Sesame seeds can be sown in two ways: row sowing or broadcasting.
- Broadcast seeds uniformly over the field by hand.

Perform row sowing using a planter or by hand drilling.

- 

### Row sowing

- Measure the field length and divide it by 40cm to get a total number of rows.
- Using tractor-mounted row makers or drill straight rows by hand, spaced 40cm apart.
- When opening furrows by hand, use string or rope to make straight lines and make sure that the distance between rows is exactly 40cm.
- Use 2-3 kg of seed per hectare for row planter sowing.
- For hand drilling in rows, use 3-4 kg of seed per hectare, mixed with fine soil or ash.
- When using planters, adjust the furrow openers and seed-sowing disc at 40cm distance to maintain a spacing of 40cm between rows and 10cm between plants (40 x 10cm).
- Fill the tanker with seeds stored for sowing and add fertiliser (100kg NPS mixed with 25kg Urea). Check for correct placement of seeds and fertiliser within and between rows as required and readjust if needed.
- Ensure that the soil has enough moisture to support optimum germination.
- Drop seeds 3-5cm deep and 10cm apart in the furrows and cover them lightly with soil to ensure good soil contact.
- After a week, check the field for germination and ensure that the number of plants per hectare is not less than 250,000.

### Broadcast sowing

- In broadcast sowing, use a seed rate of 3 to 4 kg per hectare.
- Mix the seed with fine soil or ash at a 1:5 ratio (1kg of seed to 5kg of soil/ash) to ensure full coverage of the prepared sowing area.
- Cover the seeds with a shallow layer of soil using an oxen plough.
- **AVOID DEEP HARROWING** to minimise uneven seed germination.



## 1.17 Managing soil fertility

- Manage soil fertility to reduce erosion and water loss through runoff, improve water and nutrient availability, support healthy crop growth, reduce pesticide contamination, and improve safety to consumers.

### Crop rotation

- Rotate crops in a predetermined sequence on the same field to reduce infestations of soil-borne insect pests, pathogens, and weeds, and to increase soil fertility, yield, quality, and food safety.
- Diversify crops to reduce production and marketing risks; minimise costs related to chemical fertiliser purchase and pesticide application, increase nutritional diversity and food security, improving household income, as well as food and environmental safety.
- Rotate sesame with pulses (soya bean, mung bean, cowpea), cereals (sorghum, tef, maize, or finger millet), or cotton depending on the area and farmers' preferences.
- Maintain a cultivation break of three years between sesame crops on the same field.
- **DO NOT PLANT SESAME AFTER SESAME!**

### Organic fertiliser application

- Apply green manure, cover crops, or farm-yard manure to improve soil fertility following research-based recommendations.
- Grow legumes like soya bean, mung bean, lablab, crotalaria, or Leucaena trees on degraded land to promote nitrogen fixation, improve soil structure, prevent erosion, suppress weed growth, and reduce the build-up of crop specific pests, thereby minimising pesticide use.
- Plough under the legume crops when plants have accumulated a higher biomass, or at the start of flowering, while still green.
- **DO NOT** completely remove or burn crop residues. Instead make compost from the residual organic materials and apply about 30 tons per hectare.
- Oil cakes, chicken manure, brewery by-products, fruit peels, coffee husks, sow dust, and plant ash, can be used as organic fertiliser, following research-recommended application rates.
- Use 5-20 tons per hectare of farmyard manure to improve soil fertility.
- Apply raw farmyard manure 9-12 months before sesame planting, to minimise Salmonella contamination.

### Synthetic fertiliser application

- Apply fertilisers to degraded soils where nutrient supply to plants is limited and soil fertility improvement is essential.
- Apply the recommended type and amount of fertilisers to enhance crop growth and improve quality and productivity.
- Use, DAP or NPS and Urea fertilisers to improve sesame yield.
- Avoid applying excessive amounts of synthetic fertilisers to minimise their impact on the environment, as well as on human and animal health. Consider the levels of macro- and trace elements present in the soil and plants to minimise food and environmental safety risks.



- **Synthetic fertiliser application methods**

- Use hand or machine drilling for row sowing of sesame seeds.
- For broadcast sowing, use experienced hands to ensure uniform seed distribution.
- Apply Urea fertiliser in splits: half at sowing and half at the start of flowering.
- At sowing, mix 100kg DAP or NPS with 25kg Urea, apply the mixture 5cm away from the seed, and cover with a light layer of soil immediately.
- For machine or hand broadcasting use a disc harrow or oxen plough to lightly cover both seeds and the fertilisers with soil.
- Apply the remaining 25kg of urea at the start of flowering (35-45 days after sowing) or during the second-hand weeding.
- DO NOT apply fertiliser when soil is dry or too wet to minimise washout by runoff and contamination of water bodies.

**Soil amendments**

- Apply soil amendments (organic and inorganic) to improve soil acidity in drier areas and salinity under irrigated conditions, support healthy crop growth and increase crop productivity.
- Check soils before applying any amendments, to assess trace element levels and minimise their impact on food safety, human and animal health, and the natural resource base.
- In sodic soils apply 4-5 tons per hectare gypsum.
- Leach soils and grow salt-tolerant crops like Rhodes or Panicum grasses for reclamation.
- DO NOT apply excess gypsum or inorganic fertilisers to reduce chemical contamination of the soil and the produce.
- Apply organic amendments like manure, compost, bone, blood and feather meals to improve soil fertility and reduce contamination.
- Avoid using raw manure and other untreated animal-based fertilisers or products as they may contain pathogenic microorganisms that pose food safety risks.

- Introduce minimum tillage, mulching, reduced crop residue removal, and introduce salt-tolerant crops in the rotation system.
- Test water quality before using it as a source for irrigation.
- Develop and maintain irrigation and drainage canals; drain excess water.
- Avoid excess irrigation to prevent salinity development.

## 1.18 Gap filling

- Gap filling is the re-sowing of seeds in open spaces in the fields to replace the non-germinated seeds or dead seedlings.
- Check sesame fields for uniform germination after a week.
- Re-sow with clean seeds if significant gaps are observed in the field to reduce weed proliferation, insect pest and disease multiplication.
- DO the gap filling within a week for uniform crop maturity.
- Place 1-2 seeds per hole at 10cm intervals within the row.

## 1.19 Thinning

- Remove or thin out densely populated plants within and between rows to reduce competition for resources and prevent pest build-up that may require pesticide application.
- Thinning must be done when 2-3 true leaves have emerged or when plant reach a height of 10-15cm, or during the first weeding.
- Thin out to 10 cm distance between plants by removing the weaker ones.



## 1.20 Water management

- Provide enough water for healthy crop development and good yields.
- Avoid excessive moisture and water shortages until the crop reaches maturity.

### Rain-fed sesame

- Avoid excessive water in the field to reduce bacterial and fungal disease outbreaks that may require pesticide application.
- Give supplementary irrigation during dry spells to minimise wilting and reduce the crop's susceptibility to pest attack.

### Irrigated sesame

- Ensure water quality before using it as a source for irrigation.
- Design and develop irrigation and drainage structures before starting irrigation.
- Maintain irrigation and drainage canals and remove excess water from crop fields.
- Provide 75-100mm irrigation water at intervals of 14 to 15 days.
- Avoid overwatering and remove standing water from the root zone after 6 hours in the field if temperatures are very low.

## 1.21 Crop protection

- Protect sesame plants and seeds from domestic and wild animals, insects and mites, weeds, diseases, rodent pests, and other infestations to minimise pesticide use.

### Pest scouting

- Frequently scout or monitor fields and stores for pests and manage weeds, insects, and disease pests early to reduce both qualitative and quantitative losses and minimise pesticide contamination using non-chemical methods throughout the growing cycle.
- Check fields weekly or biweekly moving diagonally or in a zigzag pattern within each field.
- Inspect for insects early in the morning or in the evening when they are less active.
- Check at least 100 plants per hectare across more than 20 checkpoints.
- At seedling stage, check for webworm infestation by looking for webbed leaves containing small greenish-yellow larvae inside the webs.
- Check for shrivelled or twisted leaves which are damage symptoms caused by thrips and aphids.
- Check sesame plants for flower drop and gall formation (small, ball-like, irregularly shaped structures) during flowering.
- Look for seed bug (*Setayto/ሰታይቶ* or *Mettach/መታቅ*) which is a late-season, field and storage pest that sucks out seed contents, causing changes in colour and odour that reduce marketability.
- Monitor stacks or *hillas* for termite soiling, seed bug and cricket infestations, and damage caused by animals or wind during drying.
- Frequently exchange information with neighbouring farmers or agricultural experts.

### Weed management

- Remove any unwanted plants from sesame fields to reduce crop and weed competition for water, minerals, nutrients, sunshine, and to minimise the build-up of the weed seed bank.
- Perform hand weeding at least three times during the season following the critical weeding period for healthy plant growth and development, and to reduce pest pressure and minimise contamination.
- Perform the first weeding 7-14 days after germination.

- Conduct the second weeding 30-35 days after emergence.
- The third weeding should take place 55-65 days after emergence.
- Perform a fourth weeding as necessary to remove weeds that obstruct a clean harvest.

### **Insect management**

- Use Integrated Pest Management (IPM) methods (cultural, biological, botanical and chemical) to control webworm, gall midge, thrips, seed bug, and termites.
- Minimize the use of synthetic pesticides unless high pest pressure forces their application or other methods prove less effective.
- Spray *Bacillus thuringiensis* (*Bt*) pesticide for the control of webworm when five or more webbed leaves with larvae inside the web are found in one hectare.
- Mix 2 litres of *Bt* pesticide with 200 litres of water for spraying one hectare.
- For thrips, aphids, gall midge, and seed bugs, spray the following botanicals:
  - Spray about 200-300 litres of 10% neem seed kernel extract or neem oil extract (Nimex 0.03%) over one-hectare infested area.
- Minimise pest infestation through cultural measures such as crop rotation, promoting natural enemies, using resistant varieties, timely sowing, proper fertilisation, and sanitation.
- Unless absolutely necessary, avoid using synthetic insecticides to minimise risks to food safety and human health.
- Minimise drift by not spraying during windy or warm weather conditions.
- Purchase pesticides from authorised chemical suppliers.
- Use personal protective equipment during mixing and pesticide application.
- Application of chemical pesticides should be carried out only by trained personal.

### **Disease management**

- Use Integrated Disease Management (IDM) methods (cultural, biological, botanical and chemical) to control bacterial blight, phyllody and wilt diseases.
- Use measures such as resistant varieties, seed cleaning, crop rotation, maintaining optimum plant population, improving plant nutrition, and good hygiene practices.
- Use seed dressing chemicals to manage early-season insect and disease pests of sesame.
- For phyllody control, uproot and remove infected plants from the field.
- Avoid waterlogging by preventing excess water from standing in sesame fields for more than six hours.
- Minimise disease infections through crop rotation, timely sowing, proper fertilisation, and by observing sanitation and crop hygiene.
- Prevent domestic and wild animals from entering sesame fields at all times.

### **Maturity checking**

- Observe that sesame capsules mature from the bottom up, causing lower capsules to open early, while upper ones remain green.
- Uneven pod maturity leads to high pre-harvest seed losses due to shattering.
- Look for indicators of sesame maturity to minimise seed and quality losses.
- Early types mature within 90 days, medium types 120 days, and late types take more than 150 days to reach maturity for harvesting.
- Scout the fields frequently for signs of maturity, as the process can progress rapidly.
- Harvest plants when two-thirds of the plant parts and pods turn a lemon-yellow colour.
- Mature seeds change from white to greyish brown: a reliable sign that the crop is ready for harvesting.

## 1.22 Sanitation and hygiene

- Take maximum care to minimise contamination during land preparation, crop growth, harvesting, drying, threshing, winnowing, bagging, transporting, storing, and processing.
- Observe proper sanitation and personal hygiene practices. Wear protective clothing, clean and sanitise equipment, and maintain the overall cleanliness of the surrounding environment.
- Display written instructions on sanitation and personal hygiene practices in prominent locations for workers to implement.

## 1.23 Harvesting

- Prepare hand tools, equipment, strings, and labour force required for harvesting.
- Remove weeds and unwanted plants from sesame fields and field edges to minimise contaminations and ease the harvesting process.
- Harvest manually or using self-propelled or tractor-mounted harvesters when sesame fields turn lemon-yellow in colour, or dark brown in the case of the *Abasena* variety.

### Manual harvesting

- Clean and sanitise sickles and cutter units before harvesting starts, to prevent cross-contamination.
- Train workers on the safe handling of cutting tools, observing personal hygiene practices and protecting themselves from accidents and injuries.
- Harvest sesame plants on clear days, either early in the morning or late in the afternoon, to protect workers from sunburn and heat exposure.
- Cut sesame plants close to ground level using a sharp sickle.
- Minimise seed shattering during harvesting.
- Bundle a handful of harvested plants by tying them together and leave along the row until stacking.

### Machine harvesting

- Use tractor-mounted cutters to harvest mature sesame plants.
- Check tractors to ensure proper functioning of the three-link points and the hydraulic system.
- Train operators on machine manoeuvring and maintenance.
- Adjust the harvesting equipment to suit the specific characteristics of the sesame variety (plant height, stem thickness), the landscape, and bundle size.
- Start harvesting when two-thirds of the plants change from green to light yellow.
- Operate the harvester machine at 5km per hour speed.
- Minimise losses and damage to plants during the process.
- Ensure machine operators wear personal protective equipment (PPE) and observe safety precautions.
- Ensure availability of tools for adjusting machines whenever required.
- Acquire all consumables of the required quality, especially strings.



## 1.24 Stacking harvested sesame plants

- Stack cut sesame plants (*hilla*) upright in an open space and dry for about two weeks to harvest quality seeds.

### Preparing stacking and drying sites

- DO NOT** select areas that are partly shaded or sheltered from the sun.
- Select sites with good sunlight exposure and no risk of pesticide drift contamination.
- Ensure drying sites are away from termite mounds and areas prone to water logging.
- Destroy nearby termite mounds by digging out and removing the queen.
- Clean, level, and cover the ground with water-permeable polyethylene sheets before stacking the cut and bundled sesame plants.

### Stacking under smallholder conditions (except in the north-west)

- Install a strong peg in an open space in the field and cover the surrounding ground surface with plastic sheets or canvas; alternatively, ensure the surface is very clean to facilitate recovery of fallen seeds.
- Stack 4-6 bundles upright in shocks around each peg and secure them with string tied around the peg to protect against wind or animal damage.
- After a week of drying, rotate the bundles by half a turn to ensure even drying for another week until fully dry.

### Stacking under commercial production systems in the north-west

- Place multiple *hillas* next to each other on the lined plastic sheet or clean ground.
- Stack about 400 small handful bundles in four rows to form one *hilla*.
- Align the *hillas* along a north-to-south axis to maximise sun exposure.

## 1.25 Drying stack /*hilla*/

- Avoid domestic and wild animals from entering the field to minimise stack damage, salmonella contamination, and seed loss.
- Monitor the *hillas* frequently for seed bug, termite, or cricket infestation.
- NEVER APPLY** pesticides on or near drying *hillas*, as this is likely to cause cross-contamination and lead to decertification of the produce.
- For seed bug management, treat the *hillas* with potassium salt at a 2% dilution rate (1 litre of salt to 50 litres of water) using a clean knapsack sprayer.
- If seed bug infestation is very high, thresh *hillas* within 10-12 days.



- DO NOT dry *hillas* for more than two weeks to reduce seed loss caused by insects, wind, and damage from domestic or wild animals.
- Dry the stack of sesame plants for two weeks, until all capsules fully open.

## 1.26 Threshing

- Check seeds for dryness (about 8% moisture content) before starting threshing.
- Set up the threshing and winnowing sites close to *hillas* or stacks.
- Prepare the site by cutting and removing stalks and weeds, then roughly level the ground.
- Cover the labelled area with clean, uncontaminated plastic sheeting.
- DO NOT CARRY dry plants over a long distance for threshing as this may cause grain loss due to cracked or fully opened capsules.
- DO NOT FORGET to remove soil stuck to the stalks that were in direct contact with the soil before starting threshing.
- Lift up the dried plants and invert the heads upside down over the plastic sheet.
- Hold the plants slightly above the plastic sheet and shake well or beat repeatedly by hand until all seeds in the capsules fall onto the plastic sheet or canvas.
- Remove chaff, pods, plant debris or any other dirt by hand before winnowing.
- Ensure product safety by using protective equipment, washing hands after using the toilet or before handling the crop.
- Clean tools used during threshing to avoid further contamination.

## 1.27 Winnowing and primary cleaning

- Wash hands before winnowing and cleaning sesame seeds.
- Use new or clean canvas or plastic sheeting, and sieves.
- Winnow repeatedly to separate sesame seeds from husk, broken stalks and pods.
- Clean seeds to at least 95% purity (if possible).
- Use new, clean and uncontaminated bagging materials to store clean seeds.
- Keep cleaned seeds separately in a dry and safe place until marketing.

## 1.28 Cleaning and drying seeds

- Clean seeds to 98% purity for Grade 1; 96% for Grade 2, and 94% for Grade 3 to improve grain quality, safety, and marketability.
- Sun-dry seeds by spreading them thinly on clean canvas, plastic sheets, or on a concrete floor.
- Dry seeds to a moisture level of 7-8% to prevent spoilage, prolong self-life and minimise food safety risks under ideal storage conditions.
- NEVER dry sesame seeds on the bare ground or on contaminated sheets or canvas.
- Keep animals away from the drying site to avoid contamination and seed loss.
- Observe safety precautions (clean hands and tools) to avoid contamination during drying.



- Monitor moisture content to 7-8% using a moisture meter or by pouring dry grains that make a distinctive clicking sound and form fairly flatter piles.

## 1.29 Bagging and labelling at farm

- Use appropriate packaging materials to protect against contamination, pest damage and weight losses during loading, transporting, and storing.
- Use new, clean, safe and biodegradable bags that preserve seed quality for longer periods and are attractive and easy to handle.
- Make sure that bags are free from chemical residues and unpleasant odours.
- DO NOT REUSE BAGS to minimise the risk of contamination.
- Avoid overfilling of bags beyond the standard weights (25, 50 or 100 kg) to facilitate carrying and to minimise the risk of accidents. Affix a label on each bag.
- Tightly close the bags to avoid loss, mixing, or access by insects and birds.
- Label bags with the following information: crop name, origin, variety, quantity, production year and expiry, village or farm site, and type of production practices used (organic, GAP, conventional) to ensure food safety and traceability.

## 1.30 Transporting from field to primary stores

- Avoid contamination of the hygienically threshed, cleaned and bagged sesame seeds while transporting from field to store or to primary market centres.
- Use smooth-surfaced and clean transportation facilities to avoid contamination from fungi, bacteria, oil, grease or pesticides.
- Carefully load and unload bags of produce to avoid tearing and seed loss.
- Check bags for labels and remove bags that are torn, loosely tied, or contaminated.
- Cover bags with clean canvas or plastic sheets to protect grain from rain, moisture, excessive heat and dust.
- Use appropriate hooks to take samples, and forklifts to load or unload bags containing sesame seeds.
- Avoid exposure to sun, rain, insect and rodent damage, and minimise contamination from birds, as well as domestic and wild animals while storing.


## 1.31 Storing produce

- Use clean and uncontaminated bagging materials to store cleaned seeds.
- Store cleaned and labelled seeds in a dry and clean place until marketing.
- Protect seed bags from insect pests, rodents, birds, and other animal damage.
- Blend planting seeds with neem kernel powder before storage to repel or kill storage insects.
- DO NOT spray pesticides on stored seeds or inside the storage area to avoid contamination.
- Maintain temperatures below 14 C° and humidity below 60% by avoiding moisture build-up.
- Leave a 2-meter space between piles to allow easy movement and stock monitoring.
- NEVER STORE sesame seeds together with pesticides, fertiliser, oil, or aromatic solvents.
- Observe all safety measures while cleaning the store containing seeds.
- Carry out regular inspections for pest infestations during storing.
- Carefully record stock inventory, pests identified, and control measures taken.

## 1.32 Marketing

- Acquire all certificates of compliance.
- Ensure that sesame seed are traceable, free from microbiological (e.g., *Salmonella*, *Escherichia coli*), and pesticide contamination, and meet food safety and quality standards.
- Collect enough market information before selling the produce.





**PART 2**  
**GOOD HANDLING PRACTICES**  
**(GHP)**

## 2 Good Handling Practices

### 2.1 Introduction

Sesame seed is prone to losses and contamination along the value chain. Careful handling is crucial in reducing quantitative and qualitative losses and safeguarding consumer safety. During the movement of the product along the supply chain, multiple handlers and implements come into contact with the seeds. Poor food safety knowledge, lack of personal hygiene standards and practices, and improper product handling practices are major reasons for the poor performance of Ethiopian sesame in the Japanese and EU markets. Therefore, this guide on handling practices aims to help producers, transporters, traders, processors, and exporters reduce losses and minimise the risk of microbial contamination. This can be achieved by employing practices such as monitoring water activity and temperature regimes, maintaining sanitation of cleaning and packing houses and materials, observing personal hygiene, conducting pest control programs and ensuring sanitation of storage structures.

#### **Scope**

These Good Handling Practices (GHP) guide includes steps and practices to be applied at all stages of the sesame seed value chain, from primary cleaning at the farm level, through transporting, storing, drying, and marketing; processing (cleaning and sorting, roasting, dehulling, tahini making, bagging and labelling); distribution; to exporting or consumption to ensure grain quality and food safety.

**Use:** These guidelines can be used in combination with national and international standards and codes of practice. The GHP guidelines contain six main sections and approximately twenty-two sub-sections introducing practices to be applied at each stage of the seed value chain. These interlinked activities follow their chronological sequence in the value chain and are presented in easy-to-follow steps. Detailed activities are outlined in the subsections of the document, mostly in the form of '**DOs** and '**DON'Ts**'.

In the section on product development and differentiation, details are provided on drying, cleaning, branding, packaging and labelling, transporting, required storage conditions, storing and storage pest management practices. Product tracing and tracking along the value chain or back to the origin is covered in the second section. In the third, activities for improving sanitation and hygiene are presented. The fourth section briefly addresses the available regulations, inspection and certification procedures. The fifth section focuses on improving the marketing systems, while the sixth deals with capacity building of stakeholders.

### 2.2 Seed drying

- Thinly spread seeds on a clean sheet and sun-dry them to a moisture content of 7%.
- Monitor moisture content throughout the drying process using a moisture meter for accurate readings or by using weight measurement methods.
- NEVER dry sesame seeds on the bare ground.
- Keep animals away from the drying site to avoid contamination.

### 2.3 Seed cleaning

- Sesame seed cleaning mostly takes place at three levels: at farm, at primary trade centres, and in processing plants.
- Repeatedly clean the seeds to achieve a purity level of more than 99.5%.



#### **Cleaning at primary market centres**

- Clean seeds with more than 6% impurities again at the market centre to fetch a better price.
- Reduce impurity levels to 2% for Grade 1, 4% for Grade 2, and 6% for Grade 3 sesame seeds.
- Clean again if webworm infestation is high.
- DO NOT mix seeds from different farms as this makes traceability difficult.

#### **Cleaning in processing plants**

- Use mechanical cleaners, de-stoners, and colour sorters to meet international quality standards for purity, seed colour, and size.
- Use dry cleaning methods, such as air lifting, to remove impurities (heavy, medium, small), soil, as well as shrunk, damaged and immature seeds at various steps.
- For wet cleaning, wash sesame seeds with water to remove impurities before further processing or cooking.

#### **Air separation**

- Subject the seeds to air streams to remove lighter impurities such as dust, chaff and hulls.
- Keep cleaned seeds and impurities separately.

#### **Sieving**

- Pass the seeds through a series of screens and air classifiers to remove large impurities such as stones, stems, and other foreign materials.
- Clean seeds to more than 99% purity using dry or wet methods.

#### **De-stoning**

- Remove stones from the cleaned sesame seeds using a special machine (de-stoner) specifically designed for this purpose.

#### **Magnetic separation**

- In dry cleaning use a special machine with magnets attached to the cleaner to remove any metallic materials that may be present in cleaned sesame seeds.
- Ensure all kinds of metallic impurities are removed from the finely sorted seeds.

**Sorting**

- Using a colour sorter machine to remove seeds that do not have the characteristic white, brown, or black colours, or are partially discoloured.
- Perform colour sorting according to the buyer's order, usually after a contract is awarded.
- Separate seeds into different size groups (normal, immature, shrivelled) through fine sorting.

## 2.4 Product differentiation

- Promote the superiority of sesame products by highlighting their distinguishing features, qualities, and added value for improved marketability.

**Grading**

- Conduct a final inspection to ensure that the cleaned and sorted seeds meet the required quality standards before packing, further processing, or marketing at competitive prices.
- Make sure that sesame seeds destined for export are cleaned to 99.5% purity.
- Grade cleaned and colour-sorted seeds based on the level of impurity level, seed colour, and seed size according to the Ethiopian standards (ES 1073:2012; ES 1082:2012), and the buyer's quality requirements (Annex 1).

**Branding**

- Diversify sesame products (raw or de-hulled seed, roasted seed, oil, tahini, halvah, sesame balls and cookies) to expand market opportunities, increase product shelf life, reach more markets, and command higher prices.
- Differentiate seeds based on their unique qualities such as organic certification, pesticide-free status, nutrient content or specific production methods.
- Develop new sesame brands with compelling brand stories and quality traits that differentiate the Ethiopian sesame from competitors entering the elite European, American and Asian markets.
- Build a strong reputation and create more demand for Ethiopian sesame brands.
- Maintain the brand qualities of Humera, Gonder and Wollega sesame types.

## 2.5 Packaging and labelling

- Use new, strong, clean, moisture- and tear-resistant, food grade, biodegradable, and airtight packaging materials that extend shelf life, minimise unexpected losses, protect the produce from contamination, and have good visual appeal.
- AVOID USING containers made of porous materials like paper or cardboard, as they can allow moisture to seep in and spoil the seeds.
- NEVER USE bags that are chemically contaminated, have unpleasant odours, or are torn.
- Use opaque or dark-coloured containers to protect the seeds from direct sunlight and to avoid seed deterioration caused by oxidation.
- AVOID USING oversized containers with excess air inside, as this reduces product freshness.
- In humid climates use moisture-absorbing packets or silica gel packs inside the storage containers to help absorb excess moisture.
- Avoid overfilling the bags (pack bags in 25, 50, 100 kg sizes) depending on buyers' preferences.
- Tightly close the bags to avoid any loss, mixing of grains or insect entry.
- Package the sorted and differentiated seeds separately.
- Label packages with the name of the exporting company or producer; variety and seed class or grade, year of production, net weight (kg), purity level (%), batch identification number, name of the certifying agency, and handling instructions according to Ethiopian standards (ES 439 sesame seed specifications).
- Properly label and put a quality mark on the packaging to enhance market access and build consumer trust



## 2.6 Transporting

- Prevent contamination during the multiple handling and transportation of the seed (from field to farmhouse, spot market, cooperative store, ECX centre, processing plant, exporter's store, or directly to port of loading) to minimise qualitative and quantitative losses.
- Use transporting facilities (such as animal pulled carts, vehicles, trucks, and containers) that are clean, smooth surfaced, and lined with canvas or plastic sheets to minimise contamination by fungi, bacteria, oil, grease or pesticides.
- During loading and unloading check bags for tearing, loose ties, proper labelling, and contamination with mud, dust, oil, grease or chemicals.
- Do not transport sesame seeds alongside pesticides, fertilisers, acids, or other aromatic materials.
- DO NOT expose grain bags to rain, moisture, excessive heat or dust.
- Use appropriate hooks to collect samples from bags on trucks or unloaded bags.
- Contract trustworthy transporters in advance and move seeds to storage to avoid exposure to sun, rain, insects, rodents, and contamination.

## 2.7 Storing

- Construct stores on a raised and well-drained site; maintain structures, fumigate and clean facilities periodically.
- Keep cleaned and sorted seeds in jut bags, metal silos, polypropylene, or hermetic bags and place on wooden crates, pallets or bamboo mats and cover with polythene sheets to prevent moisture absorption.
- Store in a smooth-surfaced, clean, well-ventilated, cool and dry place at temperatures between 4°C and 15°C, with humidity below 60%, until transported to the processing plant or exported.
- DO NOT expose seeds to moisture, insects, rodents, bird damage, or microbial infestation to avoid mycotoxin contamination.
- Close openings with fine-mesh wire to prevent the entry of insects, rodents, and birds.
- Storage areas and their surroundings should be free from insect pests, disease-causing agents, rodents, bats, bird nests, domestic animals, and unusual odours, and take necessary control measures.
- Store differentiated or branded products (conventional, organic, colour sorted) separately.
- Leave two-metre-wide passages between piles, and a 50cm gap between the wall and the pile of bags, to facilitate inspection and periodic stocking or de-stocking.
- DO NOT stack bags all the way to the roof.
- DO NOT store sesame with pesticides, sprayers, fertilisers, food and non-food items, organic solvents, other hazardous substances, and farm implements.
- NEVER SPRAY chemical pesticides inside the warehouse where sesame seed is stored.
- Keep accurate stock records and follow the First-In, First-Out (FIFO) method.

- Periodically monitor the seed for quality and safety standards by conducting visual inspections or taking samples and testing them in the laboratory.
- NEVER LEAVE the warehouse unattended.

### Essential storage conditions

- Install a humidifier and temperature regulator and air circulation system.
- Keep seeds clean in intact bags to protect them from moisture, pest infestation, organic and chemical contaminants and physical damage.
- Avoid seed exposure to direct sunlight.
- Maintain the store temperature at 4-5°C, and humidity at 35-40%.
- Periodically check the temperature and humidity levels to ensure consistency.

## 2.8 Storage pest management

- On a weekly or biweekly basis, inspect storage areas and their surroundings for pest presence and record the findings on a record-keeping sheet.
- For seed bugs (ሰታይቶ/መጣጣታ), start scouting outside of the storage areas (where waste, trash, scrap wood and corrugated iron garbage has accumulated), and in wall and floor cracks, as well as on seed bags.
- Look for rodents around or inside the storage areas.
- For webworms, randomly select and carefully open the bags to check for webbed seeds.
- Take action immediately to minimise qualitative and quantitative losses.
  - Leave 2-meter space between piles to allow easy movement and pest monitoring.
  - If infestation is high, spray a 10% neem seed kernel extract on seed bug breeding sites.
  - Mix 1 kg of neem seed powder in 10 litres of water and leave it for 24 hours. Filter the mixture and apply to infested areas using knapsack sprayers.
  - Wear personal protective equipment before handling, mixing, or applying pesticides.
  - NEVER SPRAY pesticides (synthetic or neem extracts) on stored sesame seeds.
  - Use mechanical traps, rat cages, or baits for rodent control. Take maximum care to prevent accidental poisoning to domestic animals and children (keep these materials out of their reach).
  - Seal-off all openings around storage areas to prevent rodent entry.
  - Use an anti-coagulant pesticide such as Zinc Phosphide mixed with bread or other foodstuff and leave the bait in place for a week.
  - Put Aluminium Phosphide tablets in each rat hole or burrow and block the hole with a mud mixture to make it airtight before fumigating.
  - Application of pesticides or fumigation of storage areas and stored products must be done only by trained, authorised personnel.
  - Observe food and personal safety measures while handling pesticides and storing seeds (see details in production and the extension manuals).

## 2.9 Traceability

- Document all practices applied during sesame production, including each step the seed passed through (processing, transporting, storage, and distribution) to facilitate tracking and ensure traceability.
- Provide all necessary documentation for tracking to ensure the sesame seed consignment is traceable, the produce is quality-certified and complies with safety standards, and the exporter is accountable.
- Key component of traceability: Strengthen the documentation system for data recording and information sharing from farm to consumer.
- Train personnel in data collection, processing, sharing and storing.
- Audit the system periodically to prevent deviations and non-conformances within the supply chain.

## 2.10 Sanitation and hygiene

- Carefully implement sanitation and hygiene measures during land preparation, crop growth, harvesting, drying, threshing, winnowing, cleaning, bagging, transporting, processing, storing to minimise pre- and post-harvest contamination, and to maintain the quality and safety of sesame seeds.
- Regularly wash hands, wear protective clothing and maintain overall cleanliness of workers and surrounding areas to prevent potential contamination of sesame seeds with fungal and Salmonella species.
- Clean and sanitise equipment and facilities to prevent microorganism build-up; minimise product contamination and ensure food safety.
- Display written instructions on sanitation and personal hygiene practices in prominent locations.

## 2.11 Regulation

- The Ethiopian Commodity Exchange (ECX) is responsible for setting commodity grades, quality certification, market trend surveillance and managing the transactions by proclamation (No. 471/2005 and No. 550/2007, article (31/2)).
- The Ethiopian Agricultural Authority (EAA) is established under proclamation No. 1263.2021 and by the Council of Ministers Regulation No. 509/2022 to regulate and inspect unprocessed and semi-processed sesame seeds along the value chain.

## 2.12 Inspection

- The EAA is authorized to inspect the implementation of quality standards, phytosanitary measures, and food safety protocols during production, transportation, storage, and on vehicles or vessels, facilities, and handling procedures, to certify that seeds comply with national and international standards.
- Submit an application letter to the EAA requesting product inspection through on-site visits, to assess production practices during the growing season and facilitate the issuance of phytosanitary and safety certificates.
- Obtain the following documents from the EAA to qualify for production, semi-processing, and marketing/exporting sesame seeds that meet safety standards for consumption.
  - Phytosanitary, food safety and quality, organic, Global GAP, traceability, and product compliance certificates.
  - Inspection and audit reports; and
  - Environmental impact assessment reports.
- Register with the Ethiopian Food and Drug Authority (EFDA) to obtain a competency certificate for processing sesame products.
- Obtain EFDA approval that your food processing establishment, raw materials and packaging meet national and international standards and operate under established procedures.
- Apply to the Ministry of Trade and Regional Integration (MoTRI) to obtain a trade license for exporting raw and processed sesame products (roasted or de-hauled seed, oil, and tahini).

## 2.13 Quality and safety control

- Request the EAA, EFDA and other accredited inspection bodies for field or site inspections and certification on seed quality and food safety according to national and international quality and safety standards, and buyers' requirements.
- Producers and raw sesame seed marketers should apply to the EAA for a certificate of competence.

- Processors and exporters must request testing and certification from EFDA for processed sesame products to ensure quality and safety compliance.
- Prepare sesame seeds to meet ECX standards and quality parameters (Whitish Humera type, Whitish Gonder type, and Brownish Wollega types) (Annex 2).

## 2.14 Certification

- Request the EAA, EFDA, MoTRI and other accredited inspection bodies for field or site inspections and issuance of quality and food safety certificates.
- Producers and raw sesame seed marketers should apply to the EAA for a certificate of competence.
- Processed sesame product marketers should obtain certification on product quality, safety, establishments, and procedures from the EFDA or Conformity Assessment Body (CAB).
- If necessary, quality control certificates can be obtained from an independent authority or body to increase consumer confidence.
- Forward all compliance certificates (phytosanitary, food safety and quality, organic or non-organic, Global GAP) to buyers, traders, and consumers to verify that the seeds meet national and international safety and quality standards.

## 2.15 Marketing

- Implementing good handling practices and creating awareness among farmers, cooperatives, unions, traders, processors, and exporters, is essential to meet quality standards, comply with food safety requirements, build sustainable marketing relationships and access high-value markets.

### Market linkages (Local and International)

- Facilitate contract farming agreements between producers and processors or exporters to secure markets for the agreed product quantities and quality, ensuring better pricing, timely delivery and marketing.
- Assess market demand and quality requirements to meet standards and connect producers to buyers.
- Adhere to agreed quantities and quality on time to maintain long-term relationships.



## 2.16 Product promotion

- Develop brand-based promotional materials (videos, posters, leaflets, samples) for raising awareness of differentiated sesame products.
- Package products in attractively designed holders tailored to different categories of buyers.
- Participate in trade shows and create attractive point-of-sale displays.
- Advertise the products through TV, radio, and leaflets.
- Promote the marketing materials through digital platforms, social media, email and traditional marketing channels to reach a wider audience.
- Promote sustainable farming practices used (e.g., minimum tillage, crop rotation, low use of inorganic fertilisers and pesticides, and water conservation) to gain consumer buy-in.

## 2.17 Traceability compliance

- Attach the necessary documents and clearly indicate on the package where and by whom the product was produced, processed, and packaged.

## 2.18 Quality and safety standard compliance

- Adhere to local and international quality and food safety standards to ensure consumer confidence and facilitate access to premium markets.
- Meet the quality and food safety requirements of the Korean, Japanese, and European markets to reduce dependence on a few buyers.

## 2.19 Supply chain management

- Optimise the supply chain by strengthening the linkages and interface between producers, aggregators, processors, transporters, exporters, and storage service providers.
- Modernise the logistics system to improve food safety and quality within the supply chain.

## 2.20 Information sharing and communication

- Obtain up-to-date information on local, ECX centres, and international market prices, price factors and market trends to support decision-making.
- Design communication channels to share market and price information with stakeholders via different platforms.

## 2.21 Monitoring and evaluation

- Apply GHP and food safety standards throughout production, processing and marketing to reduce harvest losses, minimise contamination and increase food safety.
- Build a strong monitoring and evaluation system to ensure product safety and quality throughout the value chain to regain the competitive position of the country in the international market.
- Gather sufficient feedback from stakeholders and foreign buyers for timely action and design mitigation strategies for any identified challenges and areas where adjustments are needed.

## Annex I Sesame seed parameters, grades, symbols, and physical & chemical requirements

Sesame seed type and symbol	Grades (1-3)		
	1	2	3
Humera type (HSS)	HSS1	HSS2	HSS3
Damaged, slightly damaged, weevil-infested, shrivelled, webbed, immature seeds, % by mass, max.	1	2	3
Foreign matter (% max.)	1	3	5
Moisture and volatile matter content, % by mass	7	7	7
Acidity of extracted oil/as oleic acid/, % by mass, max.	1.0	1.5	2.0
Contrasting class	1	1	1
Colour classification	Cream to white, with a mixture of 3% reddish seeds	Cream to white, with a mixture of 3% reddish seeds	Cream to white, with a mixture of 5-6% reddish seeds
Gondar (GSS)	GSS1	GSS2	GSS3
Damaged, shrivelled, webworm-infested (% max.)	1	3	6
Foreign matter (% max.)	3	4	7
Moisture and volatile matter content, % by mass	7	7	7
Oil content/on moisture free basis/% by mass	52	48	45
Acidity of extracted oil/as oleic acid/, % by mass, max.	1.0	1.5	2.0
Contrasting class	1	1	1
Colour classification	Cream to white, with a mixture of 1% reddish seeds	Cream to white, with a mixture of 3% reddish seeds	Cream to white, with a mixture of 6% reddish seeds
Wollega (WSS)	WSS1	WSS2	WSS3
Damaged, shrivelled, webworm-infested (% max.)	1	2	3
Foreign matter (% max.)	3	5	7
Moisture and volatile matter content, % by mass	7	7	7
Oil content/on moisture free basis/% by mass	52	48	45
Contrasting class	1	1	1
Acidity of extracted oil/as oleic acid/, % by mass, max.	1.0	1.5	2.0

Note: Parameters are taken from Ethiopian Standards (ES 1073:2012; ES 1082:2012)



## Annex II Standards for the three sesame seed types in Ethiopia

Quality parameters	Whitish Humera type	Whitish Gonder type	Wollega type
Purity (minimum)	99%	99%	98.5%
Impurities (less than)	3%	3%	3%
Admixture (maximum)	1%	1%	1.5%
Moisture (maximum)	7-8%	7-8%	10%
Oil content	50%	50%	52%
Iodine value (maximum)	115	115	115
Acidity (maximum)	1.4	1.4	1.4
Peroxide value (mq/kg)	3.0 Max	3.0 Max	3.0 Max
Saponification	186 – 195	186 – 195	186 – 195
Free Fatty Acid (FFA) content (maximum)	2%	2%	2%
Colour	White	White	Brown
Infestation	Free from disease and live insects	Free from disease and live insects	Free from disease and live insects
Food safety	Fit for human consumption	Fit for human consumption	Fit for human consumption

# Annex III Data recorded for traceability tracking

Actor within the value chain stage		Data requirements
<b>Producer/farm level</b>		<ul style="list-style-type: none"> <li>✓ Production year</li> <li>✓ Physical address: Region ....., Zone ....., <i>Woreda...</i> <i>Kebele</i> ..... Locality .....GPS-----</li> <li>✓ Farm or Cooperative name</li> <li>✓ Land cleaning date/s</li> <li>✓ Ploughing dates &amp; equipment used</li> <li>✓ Seed (source, variety, type)</li> <li>✓ Date of sowing</li> <li>✓ Type, rate, and time of fertiliser application</li> <li>✓ Weeding dates (1-4 times)</li> <li>✓ Field monitoring dates</li> <li>✓ Pest occurrence</li> <li>✓ Insecticide(s) used</li> <li>✓ Date harvested</li> <li>✓ Date threshed</li> <li>✓ Date cleaned &amp; bagged</li> </ul>
		<p><b>Bagging &amp; Tagging</b> (print/write on the bag or tag)</p> <ul style="list-style-type: none"> <li>✓ Farm / Company name</li> <li>✓ Unique ID /Batch No.</li> <li>✓ Variety</li> <li>✓ Net and/or Gross weight</li> <li>✓ Year of production</li> </ul>
<b>Transporting</b>	From field to home, cooperative, traders stores or market	<ul style="list-style-type: none"> <li>✓ Date</li> <li>✓ Amount (quintal/ton) transported</li> <li>✓ Type of transport used</li> <li>✓ Level of cleanliness</li> </ul>
	To cleaning facilities	<ul style="list-style-type: none"> <li>✓ Date of transporting:               <ul style="list-style-type: none"> <li>○ Start date .....</li> <li>○ Truck No. ....</li> <li>○ Date delivered</li> </ul> </li> <li>✓ Owner of the product</li> <li>✓ Product type &amp; Grade</li> <li>✓ Gross weight</li> <li>✓ Truck type &amp; Plate number</li> <li>✓ Destination:               <ul style="list-style-type: none"> <li>○ From .....</li> <li>○ To .....</li> </ul> </li> <li>✓ Name and signature of the driver</li> </ul>
	Cleaning, sorting, grading & packing	<ul style="list-style-type: none"> <li>✓ Date received</li> <li>✓ Quantity received (quintal/ton)</li> <li>✓ Owner, farm or Company name</li> <li>✓ Variety name</li> <li>✓ Batch No</li> <li>✓ Production year</li> <li>✓ Date cleaned, sorted, graded &amp; re-bagged</li> <li>✓ Amount cleaned by grade               <ul style="list-style-type: none"> <li>○ Grade 1 .....</li> <li>○ Grade 2 .....</li> </ul> </li> </ul>

	<ul style="list-style-type: none"> <li>○ Grade 3 .....</li> <li>○ Grade 4 .....</li> <li>○ Under grade (UG) .....</li> </ul>
Cleaned & graded products to central stores	<ul style="list-style-type: none"> <li>✓ Date</li> <li>✓ Product owner</li> <li>✓ Product type</li> <li>✓ Product grade</li> <li>✓ Number of bags per truck</li> <li>✓ Net and/or gross weight of the product</li> <li>✓ Truck plate No.</li> <li>✓ Driver's name &amp; signature</li> <li>✓ Delivery address               <ul style="list-style-type: none"> <li>○ Recipient name .....</li> <li>○ Region ....., Zone .....</li> <li>○ Woreda ....., Kebele .....</li> <li>○ Road ....., H. No. ....</li> <li>○ Telephone No. ....</li> <li>○ Remarks .....</li> </ul> </li> </ul>
Storing	<ul style="list-style-type: none"> <li>✓ Type of storage facility</li> <li>✓ Fumigation treatment</li> <li>✓ Product owner (farm or company)</li> <li>✓ Product type &amp; grade</li> <li>✓ Year of production</li> <li>✓ Quantity received (quintal/ton)</li> <li>✓ Date received</li> <li>✓ Pests identified &amp; action taken</li> <li>✓ Certificate of compliance (tag/batch number)</li> <li>✓ Storage period (Number of days/ months)</li> <li>✓ Date of transportation to market (local/export)</li> <li>✓ Amount discharged</li> <li>✓ Destination</li> </ul>
To port of loading	<ul style="list-style-type: none"> <li>✓ Date of departure</li> <li>✓ Transporting company name               <ul style="list-style-type: none"> <li>○ Type &amp; Plate No. of vehicle</li> <li>○ Container type</li> <li>○ Bagging material used</li> </ul> </li> <li>✓ Year of production</li> <li>✓ Expiry date</li> <li>✓ Batch No.</li> <li>✓ Gross weight of consignment</li> <li>✓ Net weight</li> <li>✓ Country of origin</li> <li>✓ Port of loading</li> <li>✓ Country of destination</li> <li>✓ Port of destination</li> <li>✓ Tracking No.</li> <li>✓ Certificate of compliance (phytosanitary, GAP/GHP)</li> <li>✓ Buyer's contact address               <ul style="list-style-type: none"> <li>○ Company name</li> <li>○ Physical address</li> <li>○ Contact person's name</li> <li>○ Telephone No.</li> <li>○ Fax No.</li> <li>○ Other particulars (if necessary)</li> </ul> </li> </ul>



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Resilient Agriculture for  
Inclusive and Sustainable  
Ethiopian Food Systems  
(RAISE FS)

[www.raise-fs.org](http://www.raise-fs.org)

Stichting Wageningen  
Research Ethiopia

[www.wur.eu](http://www.wur.eu)

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Resilient Agriculture for Inclusive and Sustainable  
Ethiopian Food Systems (RAISE-FS) is a four-year  
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based in Addis Ababa, to bring about transformation in  
the Ethiopian food system. RAISE-FS will develop and  
implement a demand-driven and interdisciplinary  
approach to Research for Food System Transformation  
(R4FST) and as such contribute to the Government of  
Ethiopia's transformational agenda.

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