

Technical guide

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20 steps to improve organic sesame production



german
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What is this guide for?

Sesame is an important crop in Ethiopia. In many regions, it is the key cash crop for farmers to generate income. The growing international demand for organically certified sesame creates a new business opportunity for Ethiopian sesame producers and their cooperatives.

This guide provides an introductory overview of organic production principles and summarises the 20 key steps in organic sesame production. The steps help producers implement practices that are essential to achieve good, high-quality sesame yields, to maintain product quality after harvest, and to guarantee that their production is in line with organic regulations.

Organic farming requires the renouncement of chemical fertilisers and pesticides, and the implementation of natural and sustainable production practices. For organic certification, all crops of the rotation must be produced according to organic rules.

This booklet is a co-production of FiBL, GIZ and Selet staff, all being part of the project 'Building an avocado and sesame value chain in Ethiopia', which is implemented by GIZ together with Tradin Organic Agriculture B.V. as part of the BMZ funded develoPPP.de programme. Much of the content was inspired by the 20-step booklet from Sesame Business Network (SBN) which, in contrast, is oriented towards conventional production.

Introduction into organic farming

What is organic farming?

The term “organic” refers to an ecological approach to farming that follows the natural laws of a living organism in which all elements (i. e. soil, plants, animals, and humans) are interconnected and in a constant dynamic balance. Along this logic, organic agriculture refers to a production method that relies on and fosters a natural balance between the elements of the organism, the environment and the natural resources in a location (i. e. water, biodiversity) and that is adapted to local climate conditions.

In this sense, organic farming is a holistic way of farming. It not only aims at producing high quality food, but also seeks to preserve the natural resources to ensure long-term productivity.

Why choose organic farming?

- Renouncing synthetic pesticides and fertilisers makes **production safer** and yields **healthier food**.
- **Lower expenses for inputs** and **potentially higher prices for producers** both help increase profit margins and result in **improved economic benefits**.
- By improving the natural fertility of the soil, protecting water from contamination, and promoting biodiversity, organic farmers contribute to the protection and promotion of natural resources and thus create a **more resilient production system**.



What does organic farming mean in practice?

Implementing a natural approach in all farm activities

- Establishing a diverse crop rotation.
- Maintaining the natural fertility of the soils with leguminous crops, green manures, cover crops, compost, animal manure, and other natural fertilisers.
- Preserving and promoting the diversity of natural habitats to maintain natural biodiversity and promote natural enemies of crop pests.
- Minimising pest and disease infestations with all available preventive measures.
- Using only natural products for direct pest and disease control.
- Maintaining the natural resources on the farm.

Renouncing conventional agricultural inputs

- Herbicides.
- Mineral nitrogen fertilisers.
- Synthetic plant protection products.
- Genetically modified and synthetically treated seeds.

Paying attention to quality assurance

- Ensuring spatial separation of organic and conventional crops during production and of products after harvest.
- Monitoring product quality in the field and after harvest.
- Preventing potential contaminations along the entire supply chain.



Conversion to organic farming can increase yield stability and contribute to the diversification of income.



Maintaining the purity of organic products along the entire supply chain requires special efforts.

Engaging in organic certification

- Finding out what the organic certification standard requirements are for marketing products in potential markets.
- Agreeing (as an individual or together with other organic farmers) to be part of an organic certification process, i. e. allowing organic inspectors to visit the farm and verify the rule compliance of the farm's production.
- Cooperating and trading with organically certified traders.

Proper land preparation

Why is proper land preparation important?

- It ensures a suitable soil structure with strong root growth, good nutrient and water uptake, and fast crop development.
- It allows for incorporating green manures and other organic materials such as compost or manures into the soil for fertilisation and soil fertility improvement.
- It is the first step to preparing a weed-free seedbed.
- It serves to push back soil-borne insects, i. e. seed bugs, termites, and ants, which can disrupt the development of the crop.
- It promotes the decomposition of diseased plant residues, fungus spores and bacterial pathogens on the soil surface.



Moist soil conditions during soil cultivation are ideal to create a crumbly soil structure.



A good soil structure fosters fast and deep root development.

The keys to good practice

- Prepare the land as early as possible.
- If no cover crop is grown, clean the field of weeds and crop residues with a disk harrow or mouldboard plough soon after harvesting the previous crop.
- Plough the soil as early as soil moisture permits in order to have enough time to prepare the seedbed and carry out the false seedbed technique with the first rains.
- Spread manure or compost on the field only shortly before incorporation to keep the organic matter from drying out.
- Before preparing the seedbed, wait for moist conditions to allow the soil to crumble, create a good structure, and become level.
- Consider deep ploughing (20 to 30 cm) once every 3 to 5 years or when the soil structure has become compact, ideally using a mouldboard or disc plough.
- Ensure that all living above-ground plant material is properly incorporated into the soil and an even soil surface is obtained.

Crop rotation planning

Why is crop rotation planning important?

- It can reduce infestations of soil-borne pests and diseases (e. g. bacterial blight, sesame gall midge, and fusarium wilt).
- It contributes to weed management by disrupting their development cycles and suppressing their growth.
- It can have a positive impact on soil health and soil fertility.
- Crop diversification reduces risks in production and income.



A well-planned crop rotation produces healthy and good yielding crops.



Sesame grows well in rotation with cereals like sorghum and after a leguminous crop or a green manure.

The keys to good practice

- Rotate sesame with other suitable crops such as sorghum, cotton, teff, maize, soybean, mung bean (green gram), cowpea, finger millet, maize, etc.
- Maintain a cultivation break of 2 to 3 years between sesame crops on the same field.
- Grow sesame after a leguminous crop or a green manure. This will result in higher grain yields.

Prevention of pesticide contamination and residues

Why is prevention of pesticide contamination and residues important?

- It allows to foresee and avoid contamination by external pesticides and other unauthorised products during production, storage and processing.
- It avoids risking the organic quality of sesame, including loss of the organic certification when contamination is detected in sesame or any other rotation crop.



Designated threshing sites that are used for organic products only strongly reduce contamination risks.

The keys to good practice

- Be aware of and avoid any potential source of pesticide contamination, including drift from neighbours, soil and water run-off in the field, and proximity to pesticides at storage, contamination through bags etc.
- The mandatory 2-year conversion period reduces pesticide residues.
- Ideally, manage the entire farm organically.
- Advise neighbours not to spray in windy or warm weather conditions to avoid pesticide drift-off onto your fields.
- If possible, maintain a distance between neighbouring conventional fields and your organic fields. Hedges to adjacent fields reduce the risk of spray drift while providing a habitat for beneficial insects and birds.
- Do not use sprayers for organic crops that are also used for conventional crops. If this is not possible, wash them perfectly clean before using them for organic crops.
- For organic sesame, use new bags only and separate threshing sites. This will greatly reduce the risk of pesticide contamination.
- Be aware of the effects of contaminations: low pesticide residues can contaminate large quantities of products leading to huge income losses and potentially the risk of reputational damage of an entire village.

Proper seedbed preparation

Why is proper seedbed preparation important?

- It provides suitable conditions for seed germination and a rapid youth development of the crop.
- It allows the sesame crop to establish in an ideally weed-free environment.
- It helps prevent losses in areas prone to waterlogging.

The keys to good practice

- Break clods with a spring-tine cultivator or a disk harrow.
- In waterlogged areas, apply deep tillage with a cultivator to improve drainage.
- Pulling a wooden beam on a field after basic soil preparation can contribute to a level seedbed.
- In case of high weed pressure, apply the 'false seedbed technique' to reduce weed pressure. Make sure that the last intervention is very shallow to conserve soil moisture.



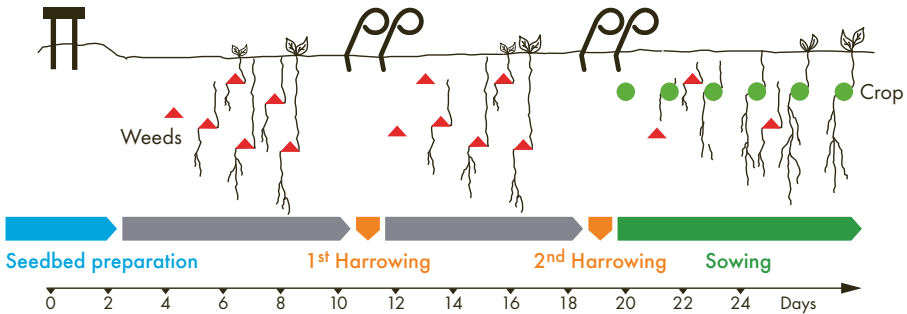
A level soil with a fine tilth results in a more uniform crop emergence and growth.

False seedbed technique

This technique reduces the weed seed bank in the soil and thus results in a cleaner field that requires less weeding during crop growth.

- Prepare the seedbed 2 to 4 weeks before sowing.
- Let the weeds germinate. Then, after 7 to 10 days, uproot the young plants by shallow (3 to 5 cm deep) harrowing (to avoid bringing new seeds to the surface).
- Repeat the procedure, if weed pressure is known to be high in the field and if there is enough time to sow the sesame crop after a second sequence.

Figure 1: Schematic presentation of the false seedbed technique



Repeated shallow harrowing before sowing reduces the weed pressure during crop growth.

Using proper seeds

Why is using proper seeds important?

- They result in vigorous and healthy young plants.
- Using seeds that are neither chemically treated nor genetically modified (not allowed in organic farming) ensures compliance with the organic regulation.
- Healthy and viable seeds are essential for a high germination rate and an optimal plant density (neither too high nor too low) from the start to maximise the area's yield potential.
- The selection of varieties or cultivars that are well suited to the local growth conditions usually reduces the risk of crop failures.



For an optimal performance, the seeds need to be free from weeds, pests and diseases.

The keys to good practice

- Use seeds that are free from weeds, pests, and diseases.
- Make absolutely sure that the seeds were not chemically treated nor genetically modified. Use only seeds of known origin and, ideally, of organic quality.
- Use viable seeds with a germination rate of at least 90 %. From your own seeds, make a germination test before sowing.
- Replace farm-saved seeds with certified seeds at least every 3 years.
- Select seed varieties that are adapted to your climatic conditions and are known to be resistant to predominant diseases (i. e. blight). If possible, consult your adviser for suitable varieties or cultivars.
- Also ask your buyer about the varieties demanded by the market. For instance, for the organic export market, white coloured seeds and a medium to large kernel size are preferred.

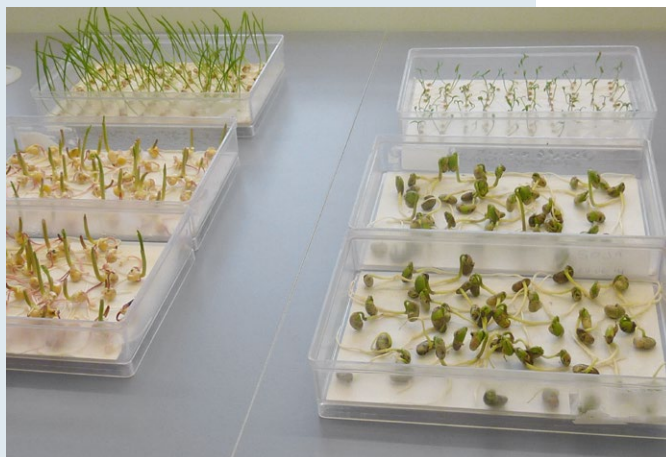


The regular replacement of your own seeds with certified seeds prevents a continuous decline of yields due to seed-borne diseases.

Germination test

It is recommended to test the germination capacity of the seed lot before sowing. This will minimise the risk of a low plant density at emergence.

- Take a representative sample of seeds from the seed lot.
- Arrange 100 seeds evenly in a pot filled with moist soil.
- Cover the seeds with 1 cm of fine soil and keep the soil humid in a dark and warm place.
- After 10 days, count the number of seedlings.



A simple germination test made in a laboratory.

Soil fertility management

Why is soil fertility management important?

- A fertile soil contributes to a balanced nutrition of the crops.
- A biologically active soil promotes natural nutrient cycling in the soil.
- Organic soil fertility management maintains a good yield potential of the soil in the long term.
- A fertile soil has better physical properties including a better soil structure, higher water infiltration, reduced surface water runoff, and higher water retention.



A good compost both builds the soil and provides a continuous nutrient supply to support healthy crops.



Feeding farm animals on crop residues speeds up nutrient cycling.

The keys to good practice

- Grow leguminous green manure and cover crops (e.g. peas, lablab, mucuna, crotalaria) to promote nitrogen fixation in the soil. Leguminous trees (e.g. Albizia, Leucaena) can also help improve nitrogen availability and increase soil fertility.
- Avoid deep tillage (with exception to loosen compacted soil).
- Do not burn crop residues, but use them to feed the soil organisms ('Grain is for men, straw is for the soil.').
- If you have farm animals, let them graze on harvested fields. With their dung, they will fertilise the soil and contribute to an accelerated nutrient cycling.
- Make compost from residual organic materials from the farm and apply it to the plots. Compost is a highly valuable soil amendment that improves the soil's physical properties
- When using commercial organic fertilisers, make sure that they do not contain chemical residues. Apply reasonable amounts only. Promising organic fertilisers consist of seed oil cakes, pelleted chicken manure, brewery by-products, fruit peels, coffee husks, wood shavings and dust, rice husks, plant ashes, etc.

How to make good compost

1. Collect sufficient dry and green material (manure, crop residues, grass, hay, leaves, small branches, organic household residues, ashes, etc.). Cover the piled manure and the green materials before use.
2. Chop the plant materials into small pieces of about 10 cm.
3. Mix and water the dry and green materials separately.
4. Mix one part comprising of fresh plant materials and manure to two parts of medium rough dry materials.
5. Make a heap about 2 m wide, 4 m long and about 1.2 m high. In dry climate, dig a 0.5 m deep pit. Cover the heap with straw and/or leaves. Covering the heap with plastic is not recommended.
6. Check the temperature after 2 to 3 days with a metal stick. A cool stick indicates that the heap is too dry or lacks green material or manure. A hot stick indicates that the material is decomposing well.
7. When the temperature in the heap has declined, turn the heap (ideally at least three times, e. g. after about 10, 20 and 40 days). Remove the straw cover before turning the heap.
8. Water the compost, if it is dry. After turning, cover the heap again.
9. After 3 to 6 weeks, the compost should be ready for use.

Throughout the process, ensure that the compost is protected from direct sunlight and kept moist at all times (water it frequently).

Careful sowing

Why is careful sowing important?

- An appropriate seed rate and plant density contribute to optimum crop yields. Both too high and too low a seed density has a negative effect on yield.
- Sowing in rows facilitates mechanical hoeing (including with farm-made equipment) and thus reduces labour costs for weeding.
- A too high plant density encourages tall and weak plants and promotes plant diseases due to poor aeration. A too low plant density on the other hand encourages competition by weeds.

The keys to good practice

- If the seed is broadcasted, an appropriate seed rate is 3 to 4 kg per hectare (without the need of mixing soil or ash to the seed).
- If the seed is sown in rows, an appropriate seed rate is 1 to 2 kg per hectare. When sown in rows, the seed is mixed with soil and ash at a ratio of one kg of seeds to five kg of soil/ash.
- Sesame is usually sown after the rainy season has started. Only consider sowing sesame under dry conditions if the land is very well prepared (ploughed, harrowed, and levelled).
- The seed is sown at a depth of 2 to 3 cm and lightly covered with soil. For germination, the seed requires a good contact to the surrounding humid soil.
- For sowing in rows, a distance of 40 cm between rows and 10 cm between the plants in the rows is common. This results in 250,000 plants per hectare.

Mixing the seed with soil or ash increases sowing accuracy and uniformity, especially in case of low seed rates.



- Sowing in rows is also recommended in case of manual sowing. To get straight lines, a string can be stretched.
- For sowing, different types of row planters (man-driven, animal-drawn or tractor-mounted) can be used. For sowing sesame with a cereal drill, the seeds must be mixed with sand of the same size to ensure an even distribution of the seeds.

Seed rates and sowing distances

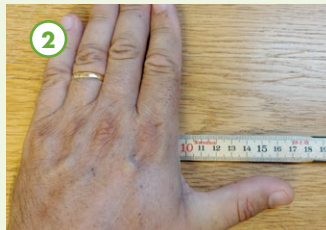
Seed rates

- Broadcasting: 3 to 4 kg per ha
- Sowing in rows: 1 to 2 kg per ha

Distances and depth

- Between rows: ideally 40 to 45 cm
- Within the rows: 8 to 10 cm
- Depth: 2 to 3 cm

Estimating distances without a measuring tape



1. Together, the index and middle fingers are 3 to 4 cm thick (sowing depth).
2. The hand without the thumb is about 10 cm wide (distance between plants at thinning).
3. Two hands with spread fingers placed side-by-side measure about 40 cm (ideal distance between rows).

Sowing in rows has many advantages, including better plant development and the possibility of mechanical weeding.



Gap filling

Why is filling gaps important?

- Even if the maturity of the re-sown plants will be delayed, filling gaps will help reach good yields and prevent weeds from developing in the gaps.

The keys to good practice

- Healthy seeds with a high germination rate, a well-prepared seedbed, and timely sowing with regular rains are important to ensure good emergence of the crop with minimal gaps.
- Seven days after the first sesame plants emerged, fill larger gaps between plants by re-sowing seeds at the requested density.



Filling gaps at early stages of the crop prevents bare soil that could otherwise easily be invaded by weeds.

Timely weeding and thinning

Why is timely weeding and thinning important?

- Young sesame plants are sensitive to weed competition. Timely weeding helps minimise competition for light, water and nutrients, and thus improves crop development.
- Preventing weed growth minimises the weed seed bank in the soil and thus future need to intervene against weeds.
- A weed-free crop is easier to harvest and winnow.
- Sesame stands that are too dense need to be thinned to obtain optimal plant density, which promotes good growth and aeration in the stand to reduce disease pressure.



Weeding at early crop stages is crucial to reach good sesame yields.



A weed-free seedbed offers the sesame crop an advance in time.

The keys to good practice

- A well-prepared, clod-free seedbed makes effective mechanical weed control easier.
- Ensure a minimum of three weeding interventions:
 - First weeding: 7 to 14 days after emergence, together with thinning (if needed).
 - Second weeding: 30 to 35 days after emergence.
 - Third weeding: 55 to 65 days after emergence.
- Thin-out to 10 cm plant distance in the rows by removing the weakest plants.
- Sowing in rows allows for mechanical and manual hoeing that considerably facilitate weeding.
- Weeding is never done too early, but often too late. Weeding small weeds with 2 to 4 leaves is easier, faster and more effective than weeding large weeds.
- Waiting for more weeds to appear is useless, because working the soil with a hoe also eliminates germinating weeds that are still underground.
- Plan the time of weeding a week in advance to ensure sufficient workforce for timely intervention.
- Practice weeding during dry weather and ideally in dry soil. This will increase the efficiency of the intervention, as the uprooted weeds will dry off easily in the sun or in warm wind. Weeding before a rainy period will reduce the efficiency of the intervention.

Regular scouting for pests and diseases

Why is regular scouting important?

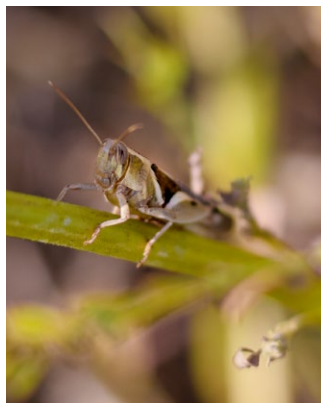
- Detecting pests early allows for a timely intervention that can prevent masses of pests from developing and causing serious yield losses.
- Most organic insecticides are more effective against early development stages of pests.
- Organic fungicides mainly have a protective effect. Therefore, they will only protect plants and plant parts that have not yet been infected.



Regular scouting allows to detect the presence of pests and diseases at an early stage.



Uncontrolled infestations by pests can cause serious damage to the crop.



Scouting the ripening crop is important, as it helps to detect infestations in this critical stage.

The keys to good practice

- Check the fields weekly, from emergence to harvest.
- Frequently exchange information with other farmers or local technicians on present and potential pest and disease infestations in the area. This will tell you which pests and diseases you must scout for with major attention.
- Scout for insect pests early in the morning and/or in the evening when they are most active.
- Scout the fields diagonally or in zigzag for representative results.
- Check minimum 100 plants per hectare in more than 20 spots.
- Effective webworm control requires weekly checking the crop for webbed leaves.
- Once the sesame is harvested, monitor the hillas daily for seed bug, termite and cricket infestation.

Timely pest and disease control

Why is timely pest and disease control important?

- Preventive or indirect control measures are essential for successfully controlling pests and diseases in organic agriculture. Effective pests and disease prevention reduces the need for direct control.
- Thorough implementation of preventive measures minimises the costs for pesticides and other direct control measures, and increases their effectiveness.
- Timely and appropriate preventive and direct pest and disease control minimises damages and thus yield losses.
- Pest and disease control is essential to mitigate the spread of pests and diseases into neighbouring fields or their build-up for future invasions.

The keys to good practice

- Prevent infestations with diseases through properly implementing cultural measures such as crop rotation, the use of robust varieties, appropriate plant spacing, crop hygiene, and plant nutrition.
- Minimise pest infestations through cultural measures like crop rotation, promoting natural enemies, using robust varieties, timely sowing, and crop hygiene.
- In pest control, organic production does not practice a zero-tolerance strategy, but aims to keep infestations below the economic threshold while allowing beneficial insects to contribute to natural pest control.



Neem tree leaves, seeds and seed oil provide natural insecticides against sesame gall midges, aphids and sesame seed bugs. Neem products generally do not harm natural enemies of pests like wasps, ladybird beetles, etc. However, neem products with a high oil content can harm certain beneficial organisms and have phytotoxic effects on some plants.

- If a treatment with an organic pesticide is required, give first priority to pesticides with a narrow spectrum of activity, as this will cause minimal damage to beneficial organisms.
- If during weekly checks of the crop 5 webbed leaves with webworm larvae inside are found in a single field, spray the crop with an allowed organic product (see table below).
- For effective phyllody control, remove diseased plants and destroy them immediately.

Allowed products for pest control in sesame production

Pest	Organic pesticide	Dosage for large fields	Dosage for small fields (knapsack sprayer)
Sesame seed bugs	• 10 % neem seed kernel extract or formulated neem oil (Nimex 0.03 %)	See product instructions	See product instructions
	• Flipper (Potassium salt)	For 1 ha: 4 litres of Flipper with 200 litres of water	0.2 litres of Flipper for 10 litres of water
	• Pyrethrum extract (<i>Tanacetum cinerariifolium</i>)	For 1 ha: 4 kg of dried flowers into 200 litres of water	20 grams of dried flowers for 10 litres of water
Web-worm	• <i>Bacillus thuringiensis</i> SC	For 1 ha: 2 litres with 200 litres of water	
Sesame gall midge	• 10 % neem seed kernel extract or formulated neem oil (Nimex 0.03 %)	See product instructions	See product instructions
Aphids	• Flipper (Potassium salt)	For 1 ha: 4 litres of Flipper with 200 litres of water	0.2 litres of Flipper for 10 litres of water
	• Maize flour	For 1 ha: 6 kg of flour with 300 litres of water (better coverage)	200 gr of flour (10 tablespoons) for 10 litres
	• 10 % neem seed kernel extract or formulated neem oil (Nimex 0.03 %)	See product instructions	See product instructions
Termites	• Water extract of Tephrosia leaves (extraction time of 2 hours)	-	2 kg of crushed fresh leaves for 10 litres of water

For optimal results, follow the recommendations regarding volumes and concentrations provided in the product instructions and in the table. Always use a clean knapsack sprayer to avoid chemical contamination!

Timely harvesting

Why is timely harvesting important?

- Early or late harvesting can result in considerable losses in quantity and quality.

The keys to good practice

- Because of the indeterminate growth of sesame, defining the ideal maturity stage is challenging. One needs to find a good balance between mature and immature grains.
- When the crop reaches maturity, scout the field frequently, as the maturing process can progress very fast.
- Avoid harvesting too early, as this may result in 20 % yield loss.
- As a general rule, harvest the plants when $\frac{2}{3}$ of the plants and pods turn from green to yellow; this happens generally between 90 and 120 days after sowing, depending on the variety.
- Do not allow the bottom capsules to shatter, as this results in considerable losses.



Harvesting before the optimum maturity stage can lead to considerable yield reductions.



Optimum harvesting time is reached, when $\frac{2}{3}$ of the pods are turning yellow and the bottom pods tend to open.



When bottom capsules start to shatter, yield losses become significant.

Thoroughly preparing drying sites

Why is thoroughly preparing drying sites important?

- Safe, well-located and well-prepared sites minimise losses in quality and quantity, and save time on post-harvest operations.
- Using the same site for establishing the hillas, threshing, winnowing and drying the grains minimises product handling and contributes to an efficient and safe procedure.

The keys to good practice

- Select uncontaminated drying sites with no risk of pesticide drift. Avoid areas that are partly shaded or sheltered from the wind (i.e. not to hamper drying).
- Use levelled, clean, high-sited spots without risk of water logging during drying to maintain product quality and avoid infestation by termites and seed bugs.
- Cover the sites with permeable (porous) polyethylene sheets (11 × 8 m) on which 10 hillas will be placed after harvest.
- If infestation of the grains by sesame seed bugs is very likely and cannot be avoided, treat the ground of the sites with Flipper.
- Avoid proximity to termite housings. If there is a significant termite presence, destroy the nearby nests, dig out the queen, and surround the drying site with a cordon of dry ash.

- Place hillas next to each other and in proximity to the threshing site (if you do not plan to thresh on hillas sheet) to minimise shattering losses occurring while carrying dried sesame plants to the threshing site.



A well-prepared drying and threshing site is essential to minimise pest damages in post-harvest management.

Proper stacking and drying

Why is proper stacking and drying important?

- Proper drying reduces the drying time and thus limits exposure of the grains to contamination and infestation, and minimises the risk of losses.
- Proper post-harvest handling also reduces the time that is needed for daily checking the hillas.

The keys to good practice

- Stack 6 to 8 bundles upright in shocks.
- Peg the shocks by tightening them with strings to protect them against wind damage. Do this for 10 hillas, which are placed next to each other on the previously prepared sites (covered with permeable polyethylene sheets).
- Align the hillas on a north-south axis to maximise sun exposure.
- After a few days of drying, rotate the bundles by half a turn to ensure even drying.
- Never apply any synthetic pesticides on or near the drying hillas, as this is likely to cause contamination and will lead to decertification of all the products.
- If infestation by sesame seed bugs is a risk, a treatment with Flipper (potassium salt) at a 2 % dilution rate (1 litre of Flipper for 50 litre of water) can be applied to the hillas using a clean knapsack sprayer.

- Monitor the hillas frequently for any damage to determine the optimum time for threshing.
- Avoid drying the hillas for more than 2 weeks to avoid losses by insect infestation, or damage or shattering by wind.



Thresh the grains rather early to minimise grain losses.

Careful threshing

Why is careful threshing important?

- Careful threshing minimises grain contamination and losses during the threshing process.

The keys to good practice

- Use separate threshing sites for organically grown sesame.
- Set up the threshing sites close to the hillas to avoid carrying dry plants over a long distance as this causes significant grain losses.
- Cover the threshing sites with a canvas or plastic sheet of reasonable size. Make sure that the sheet is free of soil, gravel, dust, chemicals, and other inert materials.
- Keep the threshing sites clean. Especially sesame seed bugs are attracted when grains are left behind.
- Keep the threshed grains separately, safe and clean. Use uncontaminated sheets or bags that are exclusively used for organic products.



Ideally, the drying plots are also used for threshing.

Proper winnowing, cleaning and drying

Why is proper winnowing, cleaning and drying important?

- Proper winnowing, cleaning and drying turn the harvested grains into a high-quality marketable product with the right moisture content and few impurities.
- Careful processing post-harvest avoids qualitative and quantitative losses.

The keys to good practice

- When handling farm products after harvest, always remember that you are handling food!
- Use a separate site and separate equipment for threshing, cleaning and winnowing organic grains. Ideally, use the same tarpaulin for all actions.
- Be aware of potential external sources of contamination. Avoid especially contamination with soil, gravel stone or other inert materials. Also, poorly cleaned tools and hands may be a source of contamination.
- Winnow the grains repeatedly to obtain a degree of purity of 98 to 99 %. This corresponds to 2 or 3 small impurities in a handful of grain.
- Dry the grains to a moisture content of 7 % or less before bagging. For this, lay out the grains on a plastic sheet, a cloth or clean concrete floor, and expose them to the sun during the day. Protect them from insects and moisture at night.

- Dry grains do not leave moisture in the palm of the closed hand full of grains. When poured, dry grains make a distinctive clicking sound and form fairly flatter piles compared to uncleaned, moist grains.



The grains are cleaned with a screen until the percentage of impurities is below 2%.

Proper bagging

Why is proper bagging important?

- Proper bagging safeguards the quality of the product during transport, i.e. avoiding contamination that may result in downgrading or derecognition of the organic product. Both have major financial consequences.

The keys to good practice

- Never use chemically contaminated bags or bags that are torn.
- Ideally, use new or cleaned bags that have only been used for organic products before. Used bags always carry a certain risk of contamination.
- Avoid overfilling the bags, as it complicates handling and can increase the risk of accidents. The bags should be easy to carry and should not weigh more than 100 kg.
- Make sure that the bags are tightly closed to avoid any loss, mixing of grains or access to insects.
- Each bag must be labelled with at least the following information for exact identification: product (sesame), producer, village, year of production, and organic quality.
- Bags that are not traded (e.g. farm seeds) can be blended with Neem leaves to repel and kill seed bugs.



If possible, always use new, clean bags to prevent any contamination of the product.

Careful and safe transport

Why is careful and safe transport important?

- Careful loading, transport and unloading prevents contamination and ensures a 'safe' product.
- Exposing grains to unfavourable conditions (especially to moist conditions increasing the moisture content of the product above 7 %) for too long must be avoided. Therefore, delays in transport which may lead to quality losses should be avoided.

The keys to good practice

- Lift and put down the bags carefully during loading and unloading. Avoid tearing bags as it can result in grain loss and contact with contaminated surfaces.
- Transport the bagged grains on trucks with a smooth loading surface and in well-cleaned (e.g. not contaminated with chemicals or oil) carts or wheelbarrows.
- Arrange transport in advance to ensure timely transportation avoiding exposing the filled bags to the sun, any source of contamination and the risk of theft.
- As far as possible, collaborate with trustworthy transporters only. This will guarantee that loading, transportation and unloading are in good hands. If this is not possible, supervise all the actions and make sure that the loading surface is well cleaned prior to transportation and that the product is well protected during transport.



Contamination can also occur during handling and transport. To avoid contamination, special attention is also necessary during these actions.

Proper storage

Why is proper storage important?

- Stored products are less likely to be stolen.
- Proper storage minimises the risk of contamination from pesticides, insects, conventional grains, and other sources.
- Appropriate storage prevents the loss of marketable product between reception and processing.
- Good storage conditions maintain the quality of the grain for a longer period.
- An extended storage period allows the products to be sold at a time when they fetch higher sales prices.

The keys to good practice

- When sesame is stored for more than one year (not more than 5 years), storage temperature must be below 20 °C, as higher temperatures affect above all the germination capacity of the seed.
- On-farm storage involves higher contamination risks than storage in a warehouse. Therefore, storage in a warehouse is recommended. However, attention must be paid to separating the organic grains from conventional products.
- Before storing a new crop, clean the room well and ensure that the room is well ventilated. A concrete floor facilitates cleaning. Close openings with fine mesh-wire (to insure ventilation) to prevent insects, rodents and birds to enter.



Also during short-term storage of the products on the farm make sure to avoid contact of the products with the soil and ensure good ventilation of the bags.



Good storage conditions include storage on pallets and ensuring good ventilation.

- In the warehouse, leave a two-metre-wide passage between the products from different producers to facilitate inspection and make it easier to deliver and remove products.
- Ideally, store the bags on clean wooden pallets with some distance to other pallets to allow the air to circulate around them.
- Keep the warehouse meticulously clean to avoid contamination.
- Never leave the warehouse unattended. Regularly inspect all areas for the presence of insects or unusual smells.
- Do not store pesticides or used sprayers in the warehouse.
- Never use chemical pesticides inside the warehouse!

Monitoring and evaluation

Why are monitoring and evaluation important?

- For the organic control process, organic farmers must record all technical data.
- Detailed record keeping allows to analyse the entire cultivation, harvest and post-harvest process and identify areas of improvement when reflecting alone or with others.
- Good documentation can be useful to showcase good practice when approaching new buyers or helping other farmers to implement good practice.

The keys to good practice

- Understand that all collected data needs to be analysed by organic inspectors in order to guarantee the organic quality of the produce and justify a higher sales price.
- Exchange with other farmers on the experiences of data collection on paper or on a computer. Learn from each other how to further improve monitoring and record keeping.
- Use a separate notebook for every season. Structure it into sections corresponding to the collected data:
 - Used varieties, seed supplier, seed rates, and plant density at the first crop stages.
 - Dates and types of field operations.



In order to obtain organic certification for the crops, the farmer must record all data and actions on his farm, especially those that relate to the commercialised crop and the crops in the rotation.

- Results of pest scouting and carried out control measures.
- Yields registered after harvest.
- Dates of field visits of development agents and advisers, and their advices.
- Use a waterproof pen to prevent water damage.
- Keep the record book in a dry and safe place, and store it for many years to allow comparison of data from different seasons.

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