

Guidance note to the poster:

How to manage weeds in organic fields

This note provides guidance for using the poster in a training set up. It leads through the different aspects presented on the poster and offers extended information for their presentation, as well as suggestions for the didactical implementation. For further reading, see the suggested list at the end of the guidance note.

Objectives of the poster

- Clarify the difference between annual and perennial weeds.
- Outline the organic approach to weed management.
- Explain and discuss strategies and methods for managing weeds in organic crops.

Introduction



What is organic farming?

Organic farming is the way of producing good quality farm products in harmony with nature. Organic farmers optimise the growing conditions of crops by enhancing the natural fertility of the soil to ensure good nutrient and water supply, creating diverse cropping systems and promoting natural enemies of pests, recycling organic materials and manures and using natural inputs while renouncing chemical pesticides and fertilisers.



Exchange on organic farming principles

Ask the participants about their understanding of organic farming. What do organic farmers do with respect to selection of crop cultivars and animal breeds, soil fertility management, pest and disease management, animal husbandry and other aspects? Inform the participants which methods are acceptable in organic farming and which are prohibited.



Distinguishing between annual and perennial weeds

In crop production, weeds are plants that compete with crops for light, water and nutrients. Weeds can be grouped into annual and perennial species:

- **Annual weeds** are plants that normally take advantage of temporarily bare soil to produce seeds. They complete their lifecycle within a crop season and grow from seeds with every crop, if they are given the opportunity. Annual weeds can build up a large seed stock in the soil over the years if they are not hindered from producing seeds.
- **Perennial weeds** are plants with an underground root or stolon system that survives the dry seasons and stores energy for regrowth. Perennial weeds also propagate by seeds. These weeds are very difficult to control as the roots grow deep and small pieces of root or stem can regrow after weeding and create a dense network rapidly.



Assessment of local weeds and control measures

Brainstorm with the participants about the major weeds they have in their fields and the measures they have used to control them.

- Which weeds predominate in the fields? Are they annual or perennial?
- What are their characteristics (e.g. growth habit)? Do the weeds have positive values (e.g. use as mulch, feed, promotion of beneficial insects)?



How are weeds managed in organic farming?

Organic farmers refrain from using chemical synthetic herbicides. Instead, they rely on a number of preventive practices and selected tools for direct control. Weed management strategies in organic farming can be categorized into three groups:

- **Crop management strategies:** These strategies aim at limiting the introduction and multiplication of weeds.
- **Habitat management strategies:** These strategies aim at reducing the impact of weeds on the growing crops.
- **Direct control strategies:** Where preventive methods are not sufficient to prevent weeds from competing with crops at critical crop stages, mainly mechanical methods are applied to eliminate weeds.

The more effective the preventive strategies (and the more consistently their implementation), the less mechanical and manual weed control is necessary, and thus the higher the profitability of the crop.



Exchange on weed management

Ask the participants which measures they apply in their fields to control the weeds.

- Which measures have been used so far to prevent growth and spreading of weeds?
- Which strategies are crop management strategies, which strategies are habitat management strategies?
- How are grown weeds controlled directly?
- Have the measures proved effective and efficient? If not, what could be the reason for it?
- What do they do with the weeds after weeding?

Step 1: Crop management and hygiene strategies to limit weed introduction and multiplication



Limiting weed introduction

Minimising weed introduction is essential to regulate weeds effectively. Weeds are mainly introduced to a farm with animal manure, infested crop seeds, planting material and machines.

The following measures limit the introduction of weeds to a farm or a field:

- Clean the tools and machines before using them in a field.
- Make compost from animal manures and crop residues.
- Prevent seed production of weeds around the fields.
- Properly dry removed weeds before using them as mulch to avoid their regrowth.
- Make compost from removed (annual) weeds that contain seeds.
- Ensure that the crop seeds are not contaminated by weed seeds.
- Use ripe compost for seedling production.



Exchange on limiting introduction and distribution of weeds

Ask the participants the following questions and discuss, which measures are appropriate in their context:

- Which are the most critical sources of introduction of new weeds to their farms?
- Do the farmers practice any of the mentioned measures?
- Which measures may be applicable in the farm context?



Giving crops a head start

A fast growing crop can out-compete the weeds better. The following measures improve the crops' competitiveness:

- A well-prepared and weed-free seedbed and healthy seeds encourage a quick emergence of the crop.
- Planting of seedlings in some vegetable crops shortens the crop's weed sensitive youth period.
- In small seedbeds, germinating weed seeds and soil-borne diseases can be killed by covering the beds with a black plastic before planting.



Exchange on weed management

Discuss with participants what a well-prepared and weed-free seedbed is and reflect on the following points:

- How can rapid crop development be promoted?
- How can a weed-free seedbed be prepared?

Discuss as well how farmers manage weeds under minimum tillage if any of them are practicing this.

Good crop habitat management to limit weed impacts



Suppressing the weeds

If weeds do not receive light, they cannot germinate and grow. The faster a crop covers the soil surface, and the higher and denser the crop's canopy, the better weed suppression.

These measures contribute to effective weed suppression:

- Use varieties/ cultivars with rapid juvenile growth and large leaves.
- Ensure proper spacing of the crop to minimise the period of uncovered soil.
- Cover the soil surface with mulch using dry plant material (or plastic).
- Sow cover crops underneath (perennial) crops to prevent weed germination (especially in late crop development in case of annual crops).
- Integrate weed suppressive crops and green manures in the rotation.



Discussion on preventive strategies

Discuss with the participants, how the presented preventive strategies apply to the local situation.

- Which strategies can be easily applied?
- How can new strategies be introduced in the fields?

Direct control to eliminate weeds and avoid dispersion



Controlling weeds timely and effectively

Removing weeds as soon as they emerge is easier and quicker, and minimises the negative impact of weeds on the crop.

The following measures facilitate direct weed control:

- When using machines, it is obligatory to sow and plant the crops in straight rows as this allows the machines to weed closer to the plants.
- Remove the weeds soon after emergence, when they are most vulnerable.
- Use appropriate tools and machines where available.
- Carry out mechanical weed control when the soil is dry to avoid smearing of the tools and to allow fast drying of the removed weeds.



Discussion on direct control

Discuss with the participants possible options for direct weed control:

- Are improved hand-held tools for mechanical weeding available? If yes, how useful are they?
 - If not, present such improved tools.
- Are any machines used for weed control? If yes, which ones have proved effective? What are their advantages and inconveniences?
- How and when are the machines used?



Avoiding weed dispersion

Annual and perennial weeds produce large amounts of seeds and other propagules (for perennial weeds) to ensure their survival. Most of these seeds remain viable in the ground for many years until they get an opportunity to germinate. The following measures limit weed dispersion:

- Remove the weeds before they flower and produce seeds. This greatly reduces their dispersion.
- Properly dry removed weeds or kill them by composting them (while ensuring a proper heat phase!).
- In fields with perennial weeds, avoid using rototillers as they cut the stolons of the weeds into many small viable pieces (resulting in a multiplication of the weeds).



Discussion on limiting weed dispersion

Ask the participants the following questions:

- What attention do they pay to weed dispersion?
- How could they limit weed dispersion in their fields more effectively?

Covering the soil in perennial crops to suppress weeds



Using living or dead soil cover?

In perennial crops, a different approach to weed control is required than in annual crops. As most perennial crops grow high above the ground, specific weed control strategies are possible in these crops:

- **Perennial cover crops:** Cover crops are low-growing crops that cover the soil well and thus suppress weeds to some extent. Leguminous cover crops fix nitrogen that is partly made available to the crop when trimmed. Perennial cover crops can also be used as pastures and fodder for livestock.
- **Mulching:** Where weeds are trimmed close to the ground, the residues can be left to cover the ground as mulch. This practise is also highly advisable in sloping areas to reduce soil disturbance and limit soil erosion.
- **Green manures:** Green manures that build a dense cover are very effective in suppressing weeds and building soil fertility.

Leguminous green manures fix a lot of atmospheric nitrogen that is partly made available to the crop when slashed or worked into the soil. Some green manures can also be used as fodder for livestock.



Sharing experiences with ground covers

Invite the participants to share their experiences with different ground covers in perennial crops.

- Have green manures proved useful?
- Which green manure species are suitable in the local context?
- How are green manures best managed?
- How effective and useful are mulches and cover crops?
- Do you easily find seed for the perennial cover crops and/or green manures? From where do you get the seed? Do you also produce the seed locally?



Further readings

Organic farming definition

- www.ifoam.bio > Why Organic?
- www.organic-africa.net > Training manual > Module 1

Weed management

- www.organic-africa.net > Training manual > Module 4

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