Guidance note to the poster:

How to manage vegetable pests the organic way

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 suggested sources at the end of the guidance note.

Objectives of the poster

- Outline the approach to managing pests in organic vegetable farming.
- Highlight recommended strategies for managing pests in organic vegetables.
- Discuss appropriate regulation methods for pest control in local 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 refraining 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.

Pest management – a major challenge

From an ecological perspective, all organisms are part of nature, irrespective of what they do. However, organisms that reduce the yields of crops or product quality are considered pests. Farmers, who wait until they notice a damage in the field or at storage, often tend to depend on aggressive and very harmful products to limit the damage. Some smallholder farmers may not have access to the required products for pest control.

Considerable information is necessary to know e. g., which measures are effective against which pest, how and when to apply the methods correctly, how to avoid negative impacts on natural enemies of pests, humans and product quality. This makes the management of pests very challenging. Appropriate methods and products for organic pest control should be readily available at low cost, easy to apply, safe to handle, and with minimal or no residual effect on the organic products and the environment.

Assessment of local challenges and practices in pest management

Enquire among the participants what the major challenges related to pest management are by asking the following questions:

- What are the predominant vegetable pests? Can you identify them? Which vegetable crops do they damage? What kind of damage do they cause?
- Do you apply preventive measures to avoid or limit infestations? Do you monitor your vegetable crops regularly?
- Have you tried farm-made or commercial natural products and/or physical methods for direct control?
- Are there any challenges that you face applying pest control?

The three-step approach to organic pest management

Applying a sustainable approach

To minimise costly direct control measures, and to reduce harm to humans and the environment, pest management strategies were developed in organic farming that rely on multiple preventive measures. In general, organic pest management can be seen as a three-step approach, where each step builds the foundation for the next one:

- Step 1: Soil and crop management strategies
- Step 2: Habitat management strategies
- Step 3: Direct control methods

Relying fully on biopesticides may prove efficient if the choice of the pesticide, the timing of the application, the dosage and the application mode are correct. But biopesticides may not be affordable, or the product may kill the natural enemies too (such as pyrethrum, derris or tobacco, and oils) and, as a result, could encourage unhindered re-emergence of the pest. Biopesticides can also lose their efficacy, if their application is not regulated and pests can develop resistance.

Step 1: Managing the soil and the crops well

In the first step, organic farmers aim at enhancing plant health and preventing introduction and spreading of pests. They do it by implementing the following practices:

- Improving soil fertility continuously to encourage strong and vigorous plants
- Ensuring proper soil preparation to promote a fast germination and juvenile development of the crop
- Choosing varieties and cultivars that are well adapted to the local climate and soils
- Using seeds and planting materials that are free from pests to avoid introduction of new pests to the field
- Maintaining a planned crop rotation to limit build-up of mainly soil-borne pests
- Ensuring timely planting, and intercropping different crops to reduce potential coincidence of the crops with the pests
- Applying good crop management practices during crop growth such as appropriate fertilisation and timely harvest

Exchange on soil and crop management

Discuss with the participants, how the presented measures of step 1 apply to the local situation. The following questions may be helpful:

- What attention have you paid to these measures?
- What experiences have you made?
- Where do you see potential for improvement?

Step 2: Promoting natural control mechanisms and ensuring good hygiene

In the second step, organic farmers aim at enhancing a diversity of organisms, including natural enemies, in and around the crop fields. Pests have natural enemies such as ladybird beetles, parasitoids or birds. Natural enemies can be promoted around and within the crop fields by:

- Planting hedges of indigenous plant species around fields to host natural enemies
- Allowing flowering plant species to grow within crops to provide nectar and pollen for natural enemies such as ladybird beetles, hoverflies and parasitoids
- Making use of trap cropping to attract pests to non-crops or push them away from the crops (push-pull strategy)
- Maintaining a good hygiene in the field by ensuring timely weeding to remove alternative hosts, by removing and destroying infested plants and plant parts, and by disinfecting tools and other equipment that were used on infected plants

Exchange on natural control mechanisms

Invite the participants to share their observations or experiences with natural control mechanisms by asking the following questions:

- Have you observed natural enemies like ladybird beetles in the fields?
- Have you heard about push-pull strategies or already applied such a strategy?
- Have you observed reduced pest problems in diversified cropping systems?

Monitoring pests

Regular monitoring of the pests through scouting, for example, is essential at this stage to ensure timely direct control. Monitoring also improves the knowledge on behaviour and development of pests, as well as on influencing factors.
The following questions may help to better understand pest behaviour and development:

- At what stage of the lifecycle is the animal a pest: as a larva, a caterpillar or an adult?
- When does the pest attack the plant: at seedling stage, during growth, at flowering or during maturation?
- Which part of the plant does it attack: seeds, roots, stems, leaves, flowers, fruits, or the entire plant?
- What kind of damage does it cause: chewing, sucking, wilting or a secondary damage?
- When does it attack: in the dry season or in the wet season?

The earlier pests are detected, and the better their behaviour and influencing factors are known, the more successfully direct control measures can be applied and crop damages limited.
Proper identification of the pathogen helps to choose the right control method.

Associating damages and pests

Request farmers to bring damaged plants or plant parts (or photos) to the meetings for joint analysis, or visit a nearby farm. Let the participants describe typical damages and try to assign them to pest types, such as:

- Leaves with holes or missing parts: caterpillars or weevils
- Curled leaves: aphids sucking sap (often ants and/or sooty mould can be be seen on the leaves)
- Woven tissue on yellowish leaves: spider mites
- Damaged or rotten fruit: larvae of fruit flies
- Withering plants: larvae of noctuids or stem borer
- Yellowish, withering and dying plants: nematodes on plant roots
- Missing young plants: birds like sparrows, starlings and crows

Instruction on pest monitoring

Explain to the participants how to monitor pests properly and how to apply the concept of an economic threshold level. Undertake together with the participants a pest scouting exercise in a nearby field and analyse the findings in relation to pest threshold levels where the participants think that direct control will be required. This requires advance planning by the trainer.

Step 3: Controlling pests with direct measures

In situations of heavy infestations, direct measures are necessary to prevent economic crop losses. These practices are, however, only fully effective, if the measures in the first and second steps have been applied well.

The following measures can be used for the direct control of pests:

- Bait, light and colour traps for mass-trapping of insect pests
- Insect pheromone traps to disrupt mating of insect pests
- Fine-meshed nets to cover the vegetable crops and prevent insects from damaging the plants and laying eggs on the plants
- Commercial biocontrol agents using living insect and mite predators, and insect parasitoids
- Commercial products using viruses and bacteria that antagonise or destroy harmful pests
- Insecticides of biological or mineral origin including plant extracts, plant oils, mineral oil (e.g. Neem, Chili, Mexican and African marigold)

Exchange on direct control measures

Share experiences with the participants on direct pest control measures. You may ask the following questions:

- What experiences have you made with physical, biological and/or mineral method for pest control?
- Which methods have proven to be effective and are affordable?
- Which pest problems have remained unsolved?

Discuss the three-step approach for the control of selected pests in specific crops. If possible, provide detailed information on the pests' lifecycles, their distinguishing characteristics, harmful development stages, threshold levels, and effective measures.
If available, present some products for direct control. Explain their range of action and their correct application.

Further readings

Organic farming definition

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

Pest management

- www.organic-africa.net › Training manual › Module 4
- www.infonet-biovision.org › Plant Health Crops › Pests and Diseases

The guidance note and the corresponding poster were developed by the Research Institute of Organic Agriculture FiBL in 2020 supported by the Green Innovation Centres for the Agriculture and Food Sector (GIC) implemented by the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) under the framework of the special initiative "ONE WORLD – No Hunger" on behalf of the German Federal Ministry for Economic Cooperation and Development (BMZ).

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