TRAINING NOTEBOOK

- AGRICULTURAL PRODUCTION AND PROCESSING -

ORGANIC PRODUCTION

COLEACP

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- AGRICULTURAL PRODUCTION AND PROCESSING -

ORGANIC PRODUCTION

LEAFLET 1

Organic agriculture: principles and definition

EDUCATIONAL OBJECTIVES

At the end of this training sequence, the participant must be able to:

- Plot the history of organic agriculture.
- List and explain briefly the various agricultural systems included in organic agriculture.
- Define organic agriculture.
- Explain the four principles of organic agriculture.
- Characterise the organic agriculture market.

KEY MESSAGES

1) Organic agriculture origins

- The movement can date its origins to the 1920s when a new concept in agriculture called Biodynamic Agriculture was created by Rudolf Steiner.
- Organisations like the Soil Association that were concerned by the link between soil health and human health saw the light of day during the 1930s and 1940s.
- Other agricultural systems that fitted within the broad organic agriculture paradigm emerged in the late 1920s, including the Natural Farming, defined by Fukuoka, permaculture, coined by Mollison and Holmgren, and agroecology.
- The formal movement, the International Federation of Organic Agricultural Movements (IFOAM), was founded in 1972. This is the umbrella organisation that has the role of both leading and uniting the organic sector throughout the world.

2) Organic agriculture principles and definition

- The four principles of organic agriculture are found in its definition: organic agriculture is a production system that maintains and improves the health of soils, ecosystems and individuals (health). It is based on ecological processes, biodiversity and cycles that suit local conditions (ecology) rather than on the use of inputs with harmful effects. It combines tradition, innovation and science (care) for the benefit of the common environment and promotes fair relations (fairness) and a good quality of life for everyone involved it.

3) An opportunity for development

- The organic agriculture sector is the fastest growing of all agricultural sectors worldwide. Its two main markets are the USA and Europe.
- The aim of organic agriculture is first and foremost to feed small farmers and their families. Once this has been achieved, local and export markets are sought.
- Many areas of the organic sector relate to niche markets handling small high-value vol-

umes.

- Organic agriculture outlets are highly diverse (purchasing groups, direct selling, restaurants, farmers' markets, supermarkets, export, etc.).

PERSONAL NOTES AND REFERENCE MATERIAL

LEAFLET 2

Soil fertility in organic agriculture

EDUCATIONAL OBJECTIVES

At the end of this training sequence, the participant must be able to:

- Define the origin and composition of the soil organic matter.
- List and explain the functions of the soil organic matter.
- Describe the three soil fertility components.
- Explain the principles of soil fertility management.

KEY MESSAGES

1) Soil in organic agriculture

- Soil organic matter, the key to productive agriculture, is a complex blend of organic compounds from plant and animal residues, formed via decomposition reactions.
- It includes a labile fraction (decaying organic matter) and a non-labile or stable fraction (humus, glomalin and carbon).
- The humus improves the availability of nutrients and the soil structure. It also improves the relationship between soil and water by making more effective use of the water.

2) Soil fertility components

- The physical fertility is based on the composition and texture of the three main soil horizons (A, B and C). The conditions in which the products are fabricated are of increasing concern to consumers. Businesses are therefore introducing these soft laws to respond to these new demands from society.
- The mineral fertility is based on a full range of nutrients. These include the three major nutrients (O, H, C), the primary macronutrients (N, P, K), the secondary macronutrients (Ca, Mg, S) and numerous micronutrients like zinc and selenium.
- The soil biology (biological fertility) is multi-functional and has strong links to the other two components. It renders the nutrients available (mineral fertility), improves the soil structure (physical fertility) and acts as a buffer.

3) Soil fertility management in organic agriculture

- The rule in organic agriculture is to nourish the soil, which will then nourish the plant.
- A soil must have all the minerals in the correct quantity according to balanced ratios and adequate organic matter content.
- The carbon/nitrogen ratio (between 9:1 and 11:1) is the key to nitrogen-based fertilisation.
- Maintaining the soil organic matter is the basis for good fertility. Techniques that destroy

this must be avoided at all costs (using poor tillage techniques, leaving the soil bare, burning crop residues, etc.).

PERSONAL NOTES AND REFERENCE MATERIAL

LEAFLET 3

Phytosanitary protection

EDUCATIONAL OBJECTIVES

At the end of this training sequence, the participant must be able to:

- Define eco-functional Intensification.
- Name and explain the two key prevention components in phytosanitary protection.
- List the main biological control methods.
- List the main mechanical control methods.
- List the products used in physical control.

KEY MESSAGES

1) Prevention

- Managing pests and diseases does not mean replacing a synthetic chemical with a biological equivalent.
- Organic agriculture adopts a whole-system approach that results in a resilient farm.
- This approach is based on using biodiversity and the optimum use of ecosystem services. This optimum use is also called eco-functional Intensification.
- A well-balanced soil and setting up of natural systems that give great biological complexity are the two key components in preventing biological pests in organic agriculture.
- Integrated pest management can be used as a starting point leading to eco-functional Intensification. Some aspects of this control (monitoring tools, definition of intervention thresholds, etc.) are useful in controlling pests and diseases.

2) Curative methods

- Curative methods can be classified into three categories: biological control, physical control and mechanical control.
- The methods used in biological control – insectaries, trap crops, repellent species, barriers, etc. – are excellent examples of eco-functional Intensification.
- Physical control based on treatments (mainly spraying) should be considered as a last resort in organic systems. The treatments can be based on simple chemicals like sodium bicarbonate, natural products like plant extracts (e.g. neem extracts) or diatomaceous earth.
- Mechanical control involves, among other things, tilling at strategic moments such as the burying of trap plants, crop rotation (control method for pest and disease development cycles), pruning the diseased parts, etc.
- Total eradication is not the aim, as reduced levels of pests are useful in balanced ecological systems in maintaining the population of beneficial predator species.

PERSONAL NOTES AND REFERENCE MATERIAL

LEAFLET 4

Weed and vegetation management

EDUCATIONAL OBJECTIVES

At the end of this training sequence, the participant must be able to:

- List the advantages of the presence of weeds.
- Explain the 'Carbon Gift' principle.
- List the four criteria to be taken into account in controlling weeds.
- Name and describe briefly each type of curative method.

KEY MESSAGES

1) Prevention

- Adventive plants have many advantages. They can prevent soil erosion, fix nitrogen, store nutrients and act as insectaries and carbon inputs ('Carbon Gift').
- Weed control must be planned in terms of 'Carbon Gift'. Well-controlled weeds can add more nutrients to the soil than they take out and can increase the organic matter content. It is not a question of eradicating the weeds but of controlling their development.
- Four criteria must be considered in weed control, with the first two taking priority – competition for light, competition for the water in the soil, competition for the soil nutrients and shelter for the crop pests and diseases.
- Various agricultural systems use the 'Carbon Gift' principle, like direct cover sowings, cultivation as grassland or perennial fruit tree growing.

2) Curative methods

- A wide range of mechanical control techniques can be used, such as tillage, thermal weeding, leaflet weeding, etc.
- Physical control involves dealing with the weeds by introducing cover crops, mulch, surface compositing or by spraying with biological herbicides.
- In biological control, sound and biodiversity-rich farming ensures that the weeds also have their own natural control agents. Grazing and replacing weeds with beneficial plants are two methods of biological weed control.

3) Using a whole-farm approach

- An organic farmer must introduce a series of short- and long-term management strategies that minimise the negative aspects of weeds and promote the positive aspects so that they play a part in the productivity of the agricultural system.

PERSONAL NOTES AND REFERENCE MATERIAL

LEAFLET 5

Organic seed and plant production

EDUCATIONAL OBJECTIVES

At the end of this training sequence, the participant must be able to:

- List and explain briefly the variety-breeding principles suitable for organic agriculture.
- Explain the difference between hybrid varieties and open-pollinated varieties.
- List the techniques used to produce quality plants.
- Name the essential traits used during variety breeding.

KEY MESSAGES

1) Variety characteristics

- One of the key components in producing good yields in organic agriculture is the breeding of high-performance varieties that suit the unique conditions inherent to the organic systems.
- Open-pollinated varieties are encouraged, as organic farmers can store the seed and obtain stable crops, unlike hybrid varieties.
- Industrial agriculture has triggered a huge decline in the biodiversity on the farms. It is therefore important that farming communities continue to preserve their numerous varieties.
- Genetically-modified plants and animals are prohibited in organic agriculture.

2) Seed and seedling production

- Potting compost based on good quality ingredients produces high-quality plants.
- Different techniques, such as hardening off when planting, lead to successful plantings.
- Seed production meets quality standards such as physical purity, germination rate, varietal purity, etc.

3) Variety breeding

- The best plants produced under organic cultivation conditions must always be bred. However, few organisations carry out variety breeding specifically for organic agriculture.
- ‘Beneficial neglect’ is a breeding method suitable for the organic system, as it tests the varieties under conditions of restricted inputs and/or major pressure from pests and weeds.
- There are many essential traits used during variety breeding. Resistance to pests and diseases, colour and taste, yields and use of water are just a few examples.
- Crossing high-yield conventional varieties with local, resistant varieties may produce good-quality varieties for organic agriculture.

PERSONAL NOTES AND REFERENCE MATERIAL

LEAFLET 6

Organic conversion

EDUCATIONAL OBJECTIVES

At the end of this training sequence, the participant must be able to:

- Name the main reasons for conversion.
- List the main feasibility indicators for the conversion.
- List and explain the four conversion phases.

KEY MESSAGES

1) Principles and objectives

- Conversion to organic agriculture is the transition phase between conventional agriculture and organic agriculture.
- Conversion to organic agriculture is as much agronomic as economic and administrative and a change in mentality.
- Anyone can convert, from the smallholder to the manager of an industrial farm.
- Conversion can be for economic reasons (premium price for organic products, growth niche markets), political, personal (health of farmers), environmental or ethical reasons.

2) Feasibility indicators and pre-conversion considerations

- Knowledge, among other things through training, planning and strategy, is a major factor influencing conversion feasibility.
- There must be a market for all productions.
- The organic product should be priced higher than the conventional product.
- The certification requirements for the different markets must be known.

3) Conversion phases

- Organic production often demands greater knowledge than traditional production of a given crop. The knowledge acquisition phase is therefore fundamental in starting the conversion.
- A conversion objective for the farm is set out, based on acquired knowledge (surface area, type of speculation, types of rotation, etc.) during the objective description phase.
- The objective is achieved by setting up conversion strategies (fertilisation strategies, choice of conversion rate, etc.). The conversion plan is finalised during this strategic conversion phase.
- Finally, the execution phase is reached. This involves applying the conversion plan and adapting it if necessary.

PERSONAL NOTES AND REFERENCE MATERIAL

LEAFLET 7

Regulations and certification

EDUCATIONAL OBJECTIVES

At the end of this training sequence, the participant must be able to:

- List and describe briefly the different international regulations and standards.
- Describe the links between the different regulations, international and private standards.
- Explain the construction and application of the two regional standards.
- List and describe briefly the major private standards.
- Define an internal control system and a participatory guarantee system.

KEY MESSAGES

1) International regulations and standards

- The basic IFOAM standards for organic production and processing were the first to be established in 1980 and have been used as a reference for many regulations and standards.
- In 1999, FAO and WHO adopted the *Codex Alimentarius* directives for the production, processing, marketing and labelling of organically-produced foods.
- Regulation (EC) No. 834/2007 is the main European regulation (production mode, labelling) applied in the 27 EU Member States.

2) Regional standards

- Private standards – the first was developed in 1967 by the English Soil Association – sprang from a need by organic farmers to have a common definition of the term 'organic'.
- East Africa was the first region to introduce an organic product standard, followed by the Pacific region.
- Total eradication is not the aim, as reduced levels of pests are useful in balanced ecological systems in maintaining the population of beneficial predator species.

3) Private standards

- Regional standards, following the example of the European regulations, were created to adapt to local realities, facilitate regional trade and acquire increased negotiating power.
- Numerous standards exist worldwide. This can cause certain problems, like mutual recognition, but they take account of local crops and ecosystems and can adapt quickly to new developments or new markets.
- The trade and association between organic agriculture and fair or ethical trade are increasing.

4) Certifications

- Certification in organic agriculture covers the product and the production systems.
- One farm, one inspector, one certification is the general rule. But the traditional certification system has had to move on for small-scale producer groups, and internal control systems have been introduced.
- Participatory guarantee systems have been created for the local markets in response to third-party certification. These systems involve numerous stakeholders like the consumers, farmers, local NGOs, etc.

PERSONAL NOTES AND REFERENCE MATERIAL

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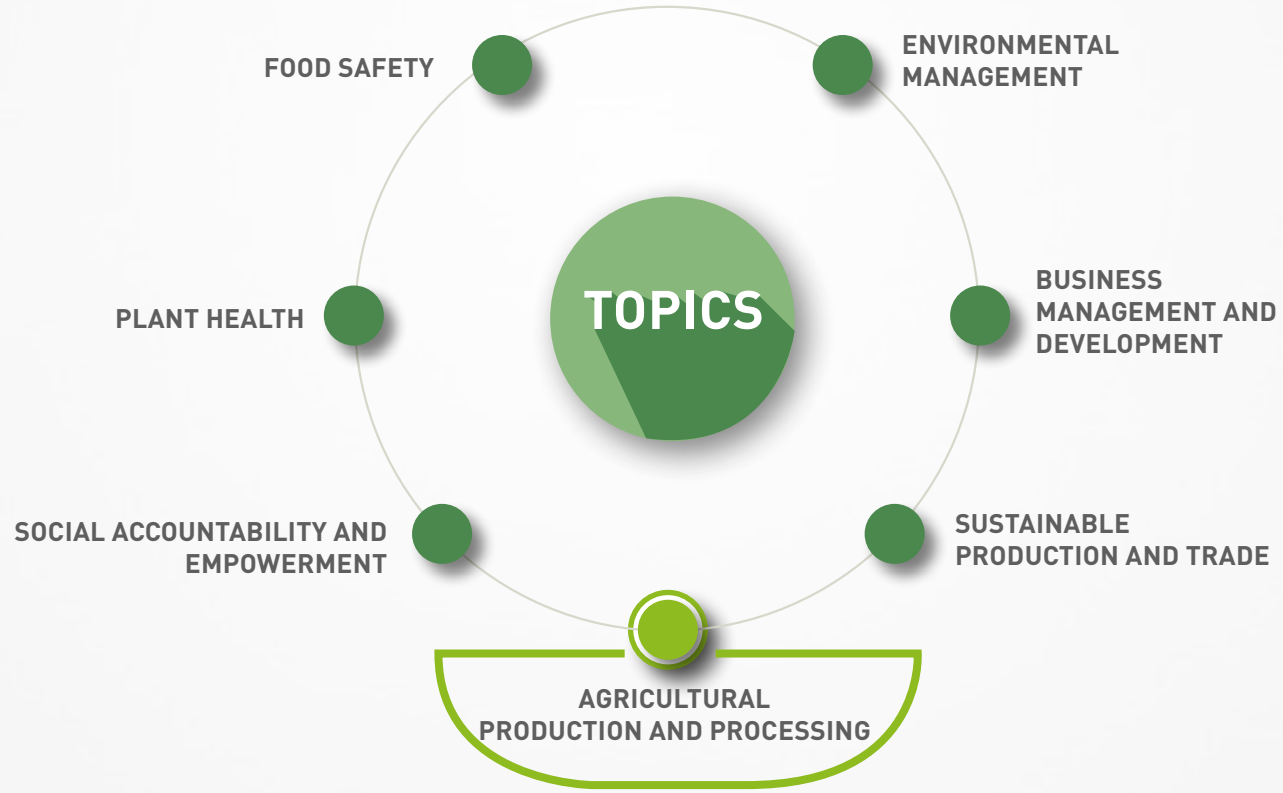

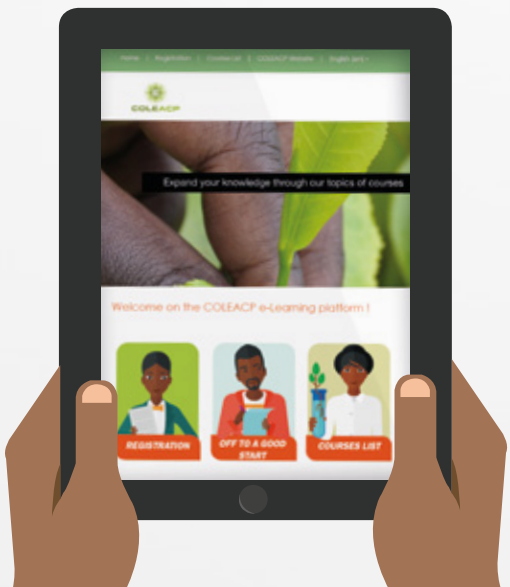

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SUSTAINABLE PRODUCTION AND TRADE

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