



## Step by step conversion to organic agriculture

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### Summary

This practice describes how to convert into organic agriculture step by step. The following provides introductory information on how to become an organic farmer, indicating that knowledge on the functioning and the possibilities of management of natural processes is first and foremost important. Familiarization with organic practices is also recommended such as mulching, intercropping, composting, green manuring, organic pest management, appropriate seed planting material, leguminous tree planting, farm-owned animal feed growth, and bunds. Specifications are also given on which crops to grow during conversion and criteria for this crop selection. Details on full conversation indicate how to mitigate contamination risks of pesticides and genetically modified organisms.

### Description

#### 1. How to become an organic farmer

In order to become an organic farmer, specific steps need to be followed.

- Collect information.
- Try out the most promising practices on a small-scale.

- Implement organic practices on the entire farm.

#### 1.1 Good information first

Successful organic farming requires considerable knowledge on the functioning and the possibilities of management of natural processes. Interest in learning about the possibilities to support natural processes to sustain and improve harvests is essential for successful organic farming. Farmers who are interested in adopting organic farming practices are recommended to get in contact with farmers in the area, who already practice organic farming to learn from them. Some farmers may be good at making compost, some at growing green manures, and some at making plant or manure tea. Learning from experienced farmers allows to get first-hand experience under local conditions, and thus to learn about the advantages and potential challenges related to implementing organic methods.

Farmers who are interested in converting their farm to organic agriculture, need to know specific information.

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# Crop Production

- How to improve soil fertility?  
Please check also other practices in TECA for more information, “Improve soil fertility”.
- How to keep crops healthy?
- How to best increase diversity in the farm?
- How to keep livestock healthy? Please check also other practices in TECA for more information, “Animal health”
- How to give value to organic products and how to successfully sell them?

Figure 1. How to become an organic farmer

## How to become an organic farmer



Figure 2. How to get information on organic agriculture

## Where to get information on organic agriculture



### 1.2 Getting familiar with organic practices

After having collected information about the requirements, the potentials and the main practices related to conversion, farmers should start to learn from their own experience on their farms. To minimize risks of crop failure and losses of animals,

and avoid frustrating overload, farmers are recommended to implement organic practices step-by-step to a limited extent, selecting specific practices at a time and testing them on selected plots or selected animals only. But which practices should one choose to start with? As would seem natural, farmers should start by applying practices that are of low risk and investment, require little specific knowledge, limited additional labour, and with high short term impact.

#### 1.2.1 Examples of recommended interventions

##### • Mulching

Covering the soil with dead plant material is an easy way to control weeds and protect the soil in annual crops. This practice can be implemented into most existing cropping systems. The main question may be, however, where to get appropriate plant material from.

##### • Intercropping

Growing two annual crops together, commonly a leguminous crop like beans or a green manure crop in alternating rows with maize or another cereal crop or vegetable is a common practice in organic farming to diversify production and maximize benefits from the land. In intercropping, special attention must be paid to avoid competition between the crops for light, nutrients and water. This requires knowledge on arrangements, which promote growth of at least one of the crops.

##### • Composting

Application of compost to the fields can have a major impact on crop growth and yields. To start compost production, farmers will need enough plant materials and animal manures, if such are available.



In case such materials are scarce, farmers would first have to start producing plant materials on the farm by sowing fast growing leguminous plants that build a lot of biomass, and by introducing some livestock on the farm for manure production, if this proves appropriate. To get familiar with the process of making compost, farmers should be instructed by an experienced person. Proper compost production requires some knowledge and experience and additional labour, but is low in investments.

- **Green manuring**

The practice of growing a leguminous plant species for biomass production and incorporation into the soil may be new to most farmers. Nevertheless, this practice can greatly contribute to improvement of soil fertility.

Green manures can be grown as improved fallows, as seasonal green manures in rotation with other crops, or in strips between crops. Proper green manuring first requires information on appropriate species.

- **Organic pest management**

Careful associations and management of plants and animals in order to prevent pest and disease outbreaks. Initially, bio-control agents may be applied but organic pest management is best achieved through ecological approaches that establish a pest/predator balance.

While the choice of resistant varieties of crops is paramount, other prevention methods include choosing sowing times that prevent pest outbreaks; improving soil health to resist soil pathogens; rotating crops; encouraging natural biological agents for control of disease, insects and weeds; using physical barriers for

protection from insects, birds and animals; modifying habitat to encourage pollinators and natural enemies; and trapping pests in pheromone attractants.

- **Appropriate seeds and planting material**

Use of healthy seeds and planting materials, and robust and/or improved cultivars can make a big change in crop production. This practice may require some information on selection of seeds and planting materials including availability of improved varieties and seed treatments. Generally, locally-adapted seeds are preferred because of their resilience to local conditions.

- **Planting of leguminous trees**

In perennial crop plantations such as banana, coffee or cocoa, planting of leguminous trees such as gliricidia, calliandra, and sesbania may improve the growing conditions of the fruit crop by providing shade, mulching material and nitrogen through nitrogen fixation. In addition, some leguminous trees provide good fodder for livestock. This practice requires some knowledge on shade and space requirements of the tree crops and thus on ideal planting patterns for the leguminous trees.

- **Growing farm-own animal feeds**

To improve available feeds for the livestock, farmers may grow grasses and leguminous fodder crops around, between other crops or in rotation. As animal feed must be of organic origin, feed sources are best addressed by considering farm grown feed.

- **Terraces and soil bunds**

Construction of terraces and soil bunds along the curves of hills is a key measure for soil conservation. This practice builds the foundation of further improvement



to soil fertility on slopes. It is of high relevance, but requires much labour and some specific knowledge for appropriate implementation.

### **1.2.2 Which crops to grow during conversion**

Looking at the organic farm as being 'one organism', the focus does not lie on cultivating specific crops only. Rather, the focus is on choosing crops that can easily be integrated into the existing farming system and will contribute to its improvement. But the choice also depends on the farmer's knowledge on the right management of the crops, their contribution to a diverse family diet or their demand in the market.

Besides growing crops for food, farmers may need to grow leguminous cover crops to provide high-protein feed for livestock and to be used as green manures to feed the soil. Planting trees for shade, as windbreak, for firewood, feed, mulching material or for other uses, can be recommended in most situations.

### **1.2.3 Criteria for crop selection during conversion**

- In the first place, organic farmers should grow enough food for the family. But they may also want to grow crops for the market to get money for other family needs. The farmers should also grow crops that contribute to improvement of soil fertility. Farmers who keep livestock need to grow pasture grass and legumes.
- Basically, farmers should select crops with low risk of failure. Cereals and legumes such as maize, sorghum, millet, beans and peas are especially suitable for conversion, since they cost little to produce, generally have moderate nutrient demands and are robust

against pests and diseases. In addition, many of the traditional crops can be stored and sold in domestic markets. High-value short term crops, such as most vegetables, are more delicate to grow and highly susceptible to pest and disease attack. Therefore, they should not be grown on a larger scale, unless the farmer can sustain some losses in harvest.

- The crops to grow for sale should include crops that can be sold at the farm gate, at the roadside market or can be transported directly to nearby markets in urban centres. Choosing the right crop to sell on the market may require some market information. Decision making for crops for local or export markets requires detailed information from traders or exporters on the crops, requested varieties, quantities, qualities, regularity and season.
- High-value perennial crops such as fruit trees take at least three years until the first harvest from the date of planting. This makes them appropriate crops for the conversion period. For new plantations, species and varieties must be carefully selected to suit the organic market and production requirements. For conversion of an existing orchard, it might be necessary to replace old existing varieties, if they are very susceptible to diseases and the product quality does not match with the market requirements.
- The success of a crop will also depend on provision of favourable growing conditions. The better a crop variety matches local soil and climate conditions, and is tolerant or resistant to common pests and diseases, the better it will grow.





- Planting of hedges other crops and/or agroforestry trees can be valuable to help establish a diverse farming system.
- Growing leguminous green manures provides nutrients to the soil. Green manures do not provide immediate income, but in the long-term, they make the soil fertile and productive for the future.

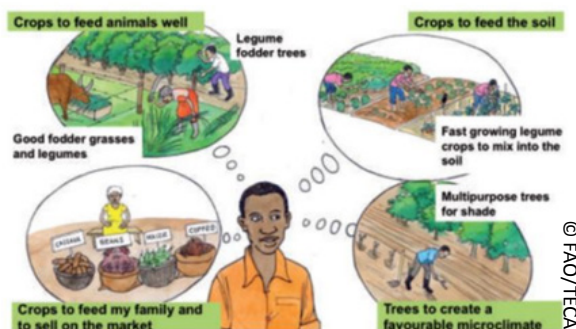
Figure 3. How to start implementing organic practices

### How to start implementing organic practices



Figure 4. Which crops should I grow

### Which crops should I grow?



## 2.2 Full conversion to organic farming

In a third step, implementation of organic practices throughout the entire farm should be considered, once sufficient experience with different practices has been gained. As soon as organic practices are implemented throughout the entire farm, a farmer can claim to be an organic farmer. Commonly, consistent application of organic practices marks the beginning of a long process of

improving the production system.

- Improving soil fertility based on the recycling of farm own organic materials and enhancement of farm own biomass production.
- Encouraging positive interactions between all parts of the production system (the farm ecosystem) to enhance self-regulation of pests and diseases.
- Optimizing the balance between feed production and livestock.

Farming organically also means continuously learning from personal observation, from outside experiences, sharing experiences with other organic farmers and implementing new information on the your farm, making it increasingly more sustainable.

### 2.2.1 Mitigating contamination risks

- Pesticides

Organic farmers are responsible to protect the organic fields from being sprayed with synthetic pesticides. Even if the neighbour is not farming organically, an organic farmer can grow organic foods and fibres. To avoid pesticide drift from neighbouring fields onto the crops, organic farmers should safeguard the organic fields by using any of the following measures. The first is planting of natural hedges on the boundary to neighbouring fields. This can avoid the risk of pesticide spray drift through wind or run-off water. The wider the border area around the fields, the better.

A second measure is to avoid runoff from upstream fields, organic farmers should divert the water away or talk to the farmers upstream about how to work together to minimize the risk of contamination through water. Organic



farmers, who are interested in saving nature, should share their knowledge and experiences with neighbours with the aim of helping them to either adopt organic farming practices or to minimize the risk of contaminating nature.

- Genetically modified organisms (GMO) Genetically modified seeds and planting materials are produced by transferring isolated genes from plants, animals or microorganisms into the crop genome, by using methods different from pollination and crossing natural barriers. Genetically modified products should, therefore, not be used in organic farming, and organic farmers should protect their production against any GMO contamination.

However, with the increased use of GM crops in the conventional farming systems, the risk of GMO contamination is expected to increase. Species which cross-pollinate, such as rapeseed or maize, or insect pollinated crops, such as soybean or cotton, are at a higher risk of being contaminated by a nearby genetically modified crop. Species that are mainly vegetative pollinated such as potatoes, cassava or banana are at lower risk of GMO contamination.

Besides the genetic contamination, there is also a risk of physical contamination caused by GMO residues along the production and market chain, if GMO and organic products are not properly separated during storage and transportation.

#### **Recommendations to farmers for reducing the GMO contamination risk**

- Use either personally selected seeds or get organic or untreated seeds. Verify the origin of the seeds, making sure that

they do not come from neighbouring farmers where GM crops are grown, or from farms surrounded by GM crops (minimum distance of at least 1 km).

- If you use seeds from a trader, make sure that they are registered and can confirm where the seed is derived from. Check that he is not involved in GM production and multiplication. Ask your trader for a certificate confirming GM free seeds and inquire about the trader's involvement in the GM-seed market.
- Check for the breeding habits of the specific crops you are interested in. Most cross breeding species such as maize can disperse by wind or bees to distances of up to 1 to 3 km.
- Seeds of some crops can survive for 5 to 20 years in the soil. Therefore, precautions must be taken that no GM crops have been planted on land that shall be used for organic production.
- Create protective safety (buffer) zones around your fields to reduce the risk of GMO pollen dispersal, if GM crops are cultivated in this region. Isolation distances between GM crops and organic fields should be established, about two to three times larger than those required for seed production for a given species. For dispersal of critical GM crops such as maize, the isolation distance should probably not be less than 2 to 3 km. This will reduce GMO dispersal by pollen to a great extent. For wind pollinated crops, like maize, borders or hedges with taller plant species, such as sugarcane or trees, can additionally prevent cross-pollination with GM crops.
- Avoid any physical GM contamination by using sowing and harvesting machines, transporters, processing and storage facilities not used by GM farmers. In case



you have to use the same machines, thorough cleaning is necessary. Do not store organic products next to GM products.

- GMO free regions should be encouraged wherever possible, especially for own seed production.

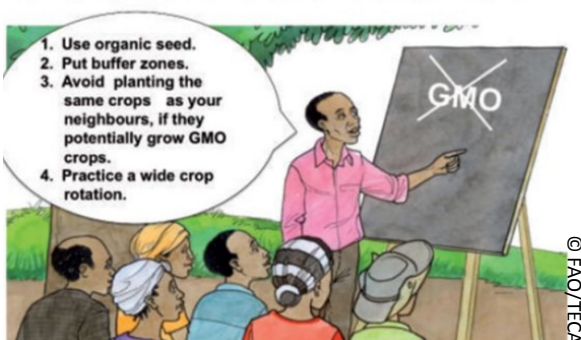
Figure 5. How to protect crops from pesticide drift

#### How to protect crops from pesticide drift



Figure 6. How to reduce the risk of GMO contamination

#### How to reduce the risk of GMO contamination



### 3. Further reading

- IFOAM. 2003. Training Manual for Organic Agriculture in the Tropics. Edited by Frank Eyhorn, Marlene Heeb, Gilles Weidmann, p 214, 219-224
- FiBL 2011. African Organic Agriculture Training Manual – Conversion. Version 1.0 June 2011. Edited by Gilles Weidmann and Lukas Kilcher. Research Institute of Organic Agriculture FiBL, Frick
- Agricultura Ecológica, Manual y Guía Didáctica. Javier Flórez Serrano, IRMA

S.L. (Instituto de Restauración y Medio Ambiente, León-España)

- Oxfam. 1991. Looking after our land: Soil and Water Conservation in Dryland Africa, Will Critchley, Published by Oxfam on behalf of the Arid Lands Information Network and the International Institute for Environment and Development., 1991, Part 3, Kenya, [URL](#)

### 4. Related/associated technologies

- Introduction to organic agriculture: 8359
- Considerations for conversion to organic agriculture: 8363
- Mulching in organic agriculture: 8365
- Water management in organic agriculture: 8366
- Crop planning and management in organic agriculture: 8367
- Nutrient management in organic agriculture: 8368
- Pest and disease management in organic agriculture: 8372
- Weed management in organic agriculture: 8375
- Soil cultivation and tillage in organic agriculture: 8376
- Plant propagation in organic agriculture: 8377
- Animal husbandry in organic agriculture: 8378

### 5. Agro-ecological zones

- Tropics, warm

### 6. Objectives fulfilled by the project

#### 6.1 Women-friendly

The diversity of organic cropping techniques makes them accessible and easy to you.

#### 6.2 Resource use efficiency

Improvement of crop and livestock management whilst being environmentally conscious



### **6.3 Pro-poor technology**

Increased knowledge, improved soil and more diversity of crops leads to more yield income and food source.