



ARMENIA TREE PROJECT

Organic Farming

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Following is a list of suggested topics for discussion:

1. What is organic farming?
2. What makes organic farming different from other farming methods which are used today? What goals does organic farming promote?
3. What are the primary tasks that need be addressed in order to switch to organic farming?
4. What are the expectations?

Introduction

Farming is part of any national economy. For Armenia farming constitutes a main and important branch of economic activity, ensuring production of goods of plant and animal origin, as well as important raw material supplies for the processing industry (milk, wool, leather, vegetables etc).

From the day of creation humans have used nutrients of animal and plant origin naturally obtained from the environment. Gradually they switched to organized production of these goods using the resources that were available in the nature. In order to achieve higher crop yields and forage production, humans used natural fertilizers, including manure, bird manure, food leftovers, clean water of rivers and springs. To combat plant diseases and harmful insects affecting them, they used naturally occurring substances, mechanical methods (including manual collection and removal of insects from orchards), territorial isolation and quarantine measures. All these were safe measures. Their moderate and above moderate usage did not harm the surrounding nature and, at the end of the day, the health of the humans.

However, a number of artificial (synthetic) fertilizers and pesticides were invented parallel to the development and growth of the chemical industry in the XIX century. During this period chemical, metallurgical and nuclear power plants were built. The environment got polluted because of the emissions of these plants. Meanwhile, humans started using artificial fertilizers and pesticides. Unlike natural fertilizers and pesticides, the excessive quantities of these substances and, in certain cases, even their smallest quantities, are stored in the form of residues in the food products. After these substances are conveyed to the humans, they cause a number of negative consequences.

Thus, what does organic farming imply and what are the steps that are needed for switching to organic farming methods?

Organic farming consists of methods of field and animal husbandry that are based on natural food and nutrients' usage, the preservation of soil and its fertilization with organic and mineral substances. It implies:

- Moderate usage of naturally obtained organic and mineral fertilizers and pesticides for purposes of producing goods of plant (vegetables, grain, cereals) and animal (milk, cheese, butter, margarine etc) origin that are healthy and do not contain residue nutrients;
- Fertilization of pastures and other soil types with organic fertilizers, as well as their protection through safe measures. As far as protection is concerned, a special attention should be given to agro-technical, physical, mechanical measures and the quarantine and gene measures which are absolutely safe and secure;
- Composting of plant leftovers and their further usage for purposes of plant enhancement;
- Avoidance of the cultivation of genetically modified fruits and vegetables and hybrid varieties. This is true also insofar as it concerns the production of forage and other crops, including tobacco, lawn/decorative varieties, forest plantings etc.;
- Protection of soil from contamination with the chemical industry's waste which, as a result of circulation, eventually gets into the human bodies;
- Avoidance of chemical substances in combating weed growth; inclusion of agro-technical and mechanical measures;
- Laboratory testing and assessment (certification) of the produced organic products;
- Establishment of a market of organic products;
- Teaching of organic farming foundations and scientific principles; organization and consulting works.

As has already become known, the existing differences between organic farming and presently used farming methods do not mean that switching to organic farming will require full transformation of economic organization of agricultural production. Rather, what will be required to do is to avoid using artificial fertilizers and pesticides that pose danger to the health of humans and to switch to using natural and harmless fertilizers, as well as to adopt treatment methods that involve mechanical, physical, biological measures and territorial isolation. All these measures are absolutely safe and do not exert harmful impact on the humans and the environment. Organic farming also includes methods of preservation and exploitation of soil.

The primary tasks are to be viewed in the light of the basic differences between organic and non-organic farming which include:

- Replacement of synthetic chemical fertilizers with locally obtained organic and mineral fertilizers (manure, bird manure, pig dung, ashes);
- Composting of plant and animal waste products and their further usage for farming purposes;
- Replacement of pesticides with other measures, including:
- **Agro-technical method:** This method is based on interactions characterizing the behavior of plants, pests and the external environment. The agro-technical measures help create unfavorable conditions for the

spread of pests and plant diseases. At the same time, they provide favorable conditions for the growth and expansion of plants and useful insects.

Agro-technical measures include the crop rotation method. This method implies an appropriate [and timely] organization of fertilization procedures, field husbandry, fight against weeds, cultivation of enduring/hardy plant varieties; appropriate timing for the harvest; territorial isolation of plants and animals. (For example, the appropriate [timing] and usage of fertilizers on the cabbage plantations result in the change of chemical composition of the cabbage plants, thus, making them a less desired food for rodents, at the same time, negatively affecting the fertility of the latter or alternatively increasing the plant resistance abilities).

- **Biological method:** This method is based on the use of natural enemies of pests, their transport and breeding in the areas of the disease spread, as well as the use of sexual attractants or pheromones or hormone substances. For example, several varieties of Trichogramma insect (Trichogramma evanescens West, Trichogramma euroctidis Gir. And Trichogramma embryophagum Htg.) are hostile toward harmful pests. These insects are effective means in the fight against a number of pests (winter crop and cabbage caterpillar, apple seedworm and others). Previously predatory ticks of Phitoseiulus variety (Phitoseiulus persimilis Ath.-Henr.) were widely used in the fight against harmful pumpkin ticks.

Not only do sexual attractants or pheromones allow determining the active flight periods of harmful pests. They also can be used to destroy the latter through pheromone traps. Pheromone traps are used for attracting male insects seeking partners for copulation. After reaching the trap, the male insects stick to the special adhesive layer attached on the bottom of the trap and die. The use of pheromones in the farming for purposes of combating harmful pests may reduce the usage of pesticides in the farming from 4.8- to 1.3- fold.

Sex hormones have a different impact mechanism. They are applied to the egg laying areas of the pests in the form of a spray in order to kill the embryos of pests, The great part of the sex hormone preparations belongs to the juvenile group of the hormone class.

- **Mechanical method:** This method is quite costly but, at the same time, it is absolutely harmless to the environment and the humans. In order to combat harmful pests and diseases, different types of resistances are created (such as deep canals covered with a polyethylene layer on the bottom, which are used as traps for weevils or other mature insects or their worms). Tarpaulin, cellulose and wood are used in the orchards. When temperature is below 10⁰C, insects, rodents and other vermin gather there and die. In other cases special hunting belts are made for destroying apple seedworms. These belts consist of two to three layers and are made of thick and coarse cloth, such as gunny, or from several layers of paper which are wrapped around the bottom parts of the tree trunks. The seedworm caterpillars enter there for pupation purposes. Staying there, they die, after which they can be removed and destroyed.
- **Physical method:** This method is used predominantly for fighting insects in product warehouses and in the course of processing. It involves freezing procedures when temperature is kept at -10..-11⁰C for 12 and more hours.

This method also includes drying of seeds for prophylactic and insecticide purposes, as well as using of phyto-traps for attracting butterflies.

- **Quarantine method:** This method creates barriers for the import of infected seeds, saplings, animals, birds and forage. An example is the complex of measures against bird flu prevention. Besides, the RA legislation provides punitive measures for the import into the Republic or its separate provinces of raw material under quarantine.
- **Usage of plant preparations.** Plant diseases and pests could be treated with plant preparations. There are many different types of plants that can be used to make solutions effective on different harmful pests. For example, the solution made of potato scum can be used to fight fruit phylloxera, ticks and white cabbage butterflies. The usage of such substances does not pose danger to the human health and the surrounding environment.

It should also be noted that the fight against plant diseases and pests would be even more efficient if several methods or, if possible, all methods are used in combination.

Expectations

Switching to organic farming may entail a number of positive consequences which will have a significant impact on the human life and the surrounding environment. These include:

- Producing of healthy agricultural goods that do not contain excessive and dangerous quantities of pesticides and nutrients;
- Improvement of the human health and prolongation of the average life span;
- Preservation of the surrounding environment;
- Restoration of natural balance in biocenoses (lakes, rivers, forests, steppes);
- Decrease of the air pollution and other negative factors pertinent to it (such as restoration of the ozone layer, falling greenhouse effect etc);
- Revival of selection works and their development in order to obtain valuable varieties of agricultural crops and animal varieties, as well as to obtain new cultures of useful insects;
- Improvement of regional and global climate factors;
- Increase of income of farmers engaged in organic farming.

References

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