

# Organic Farming and Good Agriculture Practices (Global GAP) to Achieve Food Safety for Crops: As a Review

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## Review Article

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### ABSTRACT

Organic farming refers to agricultural production systems used to produce food and fiber. Organic farming management relies on developing biological diversity in the field to disrupt habitat for pest organisms, and the purposeful maintenance and replenishment of soil fertility. Organic farmers are not allowed to use synthetic pesticides or fertilizers. All kinds of agricultural products are produced organically, including produce vegetable crops, grains, meat, dairy, eggs, flowers, and processed food products. Some of the essential characteristics of organic systems include: design and implementation of an "organic system plan" that describes the practices used in producing crops and livestock products; a detailed recordkeeping system that tracks all products from the field to point of sale; and maintenance of buffer zones to prevent inadvertent contamination by synthetic farm chemicals from adjacent conventional fields.

The concept of Good Agricultural Practices (GAP) has evolved in recent years in the context of a rapidly changing and globalizing food economy and as a result of the concerns and commitments of a wide range of stakeholders regarding food production and security, food safety and quality, and the environmental sustainability of agriculture. These stakeholders represent actors from the supply dimension (farmers, farmers' organizations, workers), the demand dimension (retailers, processors and consumers) and those institutions and services (education, research, extension, input supply) that support and connect demand and supply and who seek to meet specific objectives of food security, food quality, production efficiency, livelihoods and environmental conservation in both the medium and long term.

## INTRODUCTION

The increase in the use of agricultural chemicals has led to the emergence of many problems that were not previously faced by the environmental pollution in all its aspects, including the presence of these chemicals in food, which will reach the consumer levels may not be acceptable according to the standards adopted, especially when working in ways that do not meet the conditions of optimal use of agricultural chemicals. Scientific advances and the development of methods of analysis and detection of chemicals have been an important factor in highlighting the issue of residues of agrochemicals in food, prompting countries to issue strict legal legislation on food safety to ensure consumer safety. The severe fear of the residues of pollutants in food, especially in the sixties during the agricultural revolution and the increase of chemicals used in agricultural production and food processing, and to reduce this problem prompted specialists to introduce new farming systems or concepts began work on the principle of integrated pest control and developed towards the trend of organic farming and These methods of agricultural produc-

tion, which aim to reduce the use of these chemicals to the maximum extent and may be confiscated not to use as well as organic agriculture, in addition to it focuses on recycling of waste in the agricultural system.

The most important crops are organically grown vegetables (potatoes, onions, garlic, beans, peppers, cucumbers, cantaloupe, strawberries, tomatoes, carrots, pea and squash) and fruit (apricots, peaches, apples, dates) Field crops, fiber (cotton, peanuts and sesame) and also medicinal and aromatic herbs.

The aims of this study are focused and demonstrate of organic agriculture and good agriculture practices.

### **What is organic product?**

Organic production is a modern and continuous system for producing food, while maintaining long-term soil fertility as well as optimum use of limited and available land resources. Organic production is not a return to traditional farming methods but is consistent with the continuous development of environmental sciences, biochemistry, and plant physiology, Plant breeding and machine design <sup>[1]</sup>.

### **Organic production depends on**

- Develop a plan for an agricultural cycle and develop the biological system in place organic farms.
- Organic manure and compost additives.
- Maximize recycling of mineral elements.
- Maintain soil composition and fertility.
- Mechanical agriculture.
- Using natural methods to fight pests and diseases.

What are the steps of bio production in short;

If you want to switch from traditional crops to vital crops, this will pass through multiple stages and sequentially. It will take place in the system of the status of recognized international institutions as mentioned above. After the agreed period, these farms are given an international certificate that allows these products to be marketed as vital. The products are stamped with the logo of the authorizing body such as IOFAM or DEMETER and others. Certificates and permits are granted by recognized specialized committees with a variety of expertise. The certification committees are subject to monitoring and follow-up, and the farms to which they are given are always placed under the supervision of public bodies Religion in this area and needed them to renew these certificates at specified intervals.

The possible period of granting the certificate committee a license for a vital farm is 3 years where the farm obligation is required to follow and comply with all the conditions demanded by these international organizations through its members and offices in countries where some institutions wish to shift from traditional production to biological production. Which have been planted in a vital way and then made in one form or another that are not completed and described as "Bio" unless the rest of the manufacturing stages are completed on the same biological basis, for example: Cotton, which is grown in a vital way, must be stamped, painted or printed with material and dyes that are vital and so that the final product can be marketed with a "vital" label and license.

The transformation from traditional agriculture to biomedical (organic - bio) agriculture and its implications for reducing environmental pollution resulting from non-agricultural activities, Principles, thought and strategy of biological agriculture Summary of practical, laboratory and environmental experiments that have been on the last 70 years. They provide the foundations, rules and rules of the global movement of vital crops. If units and institutions adhere to these principles, they receive international certificates from recognized bodies of specialized international institutions. These certificates bear the hallmarks of recognized and recognized, including DEMETER or Biodyn or IOFAM.

### **Quality and nutritional value of organic products**

A number of studies have been conducted to study the quality and nutritional value of the fruits produced under the conditions of organic agriculture compared to traditional crops. The increase in some foodstuffs has been shown for organic products. Studies on apples found that the fruits produced in traditional agriculture also found that the content of flavones in the fruit produced organically it was top.

Another study showed that the fruit of organically grown tomatoes was sweeter and that the organically produced carrots had better taste and flavor characteristics than the traditional product.

Some studies have shown that organic agricultural products had higher storage capacity than traditional products due to

the high quality of organically grown crops. It was found that the percentage of losses during storage due to fungal infection in the islands was organically less than those produced by traditional agriculture. They were more conservative in storage.

In studies on many vegetable crops such as tomatoes, cabbage, lettuce, spinach and carrots in organic farming conditions compared with traditional agriculture, there was an increase in iron, magnesium, phosphorus and vitamin C content in organically grown crops compared with crops grown by regular methods. Positive effect in reducing the chemical residues in fruits and reducing the content of nitrates. However, further studies are needed to explain how plants respond to and interact with different soil conditions, which can be explained by increasing the nutritional value of organic products compared to conventional farming methods <sup>[2]</sup>.

### **Other factors of organic product quality**

In addition, organic agriculture has a significant role in improving the environment, improving water quality and reducing environmental pollution.

Organic agriculture has a positive role in promoting genetic diversity, including organisms living in soil, plants, wild animals and cultivated crops. Organic agriculture is used for the highest quality of plant varieties.

Seed and plants derived from genetic modification using genetic engineering are not desirable in the world's organic farming systems. This is related to the potential negative effects of these genetically modified plants on the environment and human and animal health, although there is insufficient empirical evidence of these effects.

Under organic agriculture standards, the use of genetically modified plants is not limited to the use of inorganic farming systems. In this case, this should be clarified to consumers.

There are many ways in which the distinction between organic and non-organic product is used. Practical methods are used. These methods include morphological analysis (product form), taste and color specifications, chemical analysis, and other analyzes of chromatographic analysis, germination ability, Storage.

Organic agriculture is a production system that sustains the health of soils, ecosystems and people. It relies on ecological processes, biodiversity and cycles adapted to local conditions, rather than the use of inputs with adverse effects. Organic agriculture combines tradition, innovation and science to benefit the shared environment and promote fair relationships and a good quality of life for all involved <sup>[3]</sup>. The phenomenon of organic agriculture has started in the 1930s and 1940s in the developed countries as a consequence of the raised dangerous effects of using synthetic fertilizers and pesticides in agriculture on both health and environment. In other words, they were looking for safe food that is free of pesticides and additives <sup>[4]</sup>.

The majority of certified organic produce is destined for export markets, with the large majority being exported to the European Union. The African market for organic products is still small. Certified organic products are currently recognized in only a few domestic markets, including Egypt, South Africa, Uganda, Kenya and Tanzania. For exports, most African countries rely upon foreign standards. To date, the majority of organic production that is certified in Africa has been certified according to the EU regulation for organic products As for Egypt, although there is an augmented supply market for organic food gained from its significance as a safety production, high quality food and its positive environmental influences. The supply market is growing at much quicker rate than organic food consumption does <sup>[5,6]</sup>. The logic interpretation for this situation is that organic agriculture is grown mainly for export market. As a result, the share of organic agricultural land has increased and has represented about 0.01% of the total agricultural land. It ranked third between African countries after Uganda and Tunisia <sup>[7,8]</sup>.

Another very important point about organic agriculture is pesticides, indeed, in organic agriculture rules it is forbidden use any chemical pesticides in organic farming. The effect of pesticide residues on human health is a worldwide problem, as human exposure to pesticides can occur through many ways such as ingestion, inhalation, and dermal contact. Moreover, pesticides are broadly applied in numerous agricultural section, residential, and industrial applications to combat and kill pests. They help society fight disease and increase agricultural productivity; however, pesticides can be transported into the air, water, soil, and biomass after numerous applications and can cause risks to the ecosystem and to human health. Pesticides are widely applied to control pests and diseases worldwide. There are approximately 8000 species of weeds, 50,000 plant diseases, and 9000 species of insects in the world <sup>[9]</sup>. Without pesticides, significant economic losses would occur <sup>[10]</sup> and crop yields would decrease <sup>[11]</sup>. It is estimated that approximately 13% of crop losses are attributable to weeds, 13% to plant diseases, and 14% to insects <sup>[12]</sup>. Indeed, using organic agriculture laws and rules can help to production of agriculture fruits without risks and pesticides too.

### **PROCEDURES OF GETTING ORGANIC CERTIFICATES**

The owner/operator of the farm fills in an application form to join the organic agriculture to the certification body. The certification body will send an inspector to the farm and write the "First Visit Evaluation Report". The certification body studies the report and decides to accept or refuse the farm. If the farm is accepted, the farm is given a code number and operator/owner is requested to sign a contract between the certification body and the farm and pays the fees.

Once the contract is signed, the farm becomes at zero time for conversion into organic. The conversion period is decided by

the certification body and usually lies between 12 and 36 months depending on crops and previous history of the farm.

### Procedures of Farm Registration

The farm owner/ operator fills an application to the certification body with his interest to deal with organic production



Registration Form



Inspection and Certification Body



Farm First Visit Evaluation Report - Content of the report



Basic precautions of organic farm source and nature of irrigation water, livestock

Name, date of last chemical fertilizers - Name, date of last chemical pesticide

Provision of drift avoidance

Area mentioned in the map, Stores, Soil samples

Provision to avoid parallel production

Suggested conversion plan



Refuse (Registration Stop) ← Inspection and Certification Body → Acceptance (Registration Continues) → Code No. → Inform owners with results → Signing contract between operator and inspection body

The owner/operator of the firm fills in an application form to join the organic agriculture to the certification body. The certification bodies will send an inspector to the firm and write the “Firm Visit Evaluation Report”. The certification body studies the report and decides to accept or refuse the firm. If the firm is accepted, the firm is given a code number and operator/owner is requested to sign a contract between the certification body and the firm and pays the fees. Once the contract is signed, the firm becomes legible to handle organic products, processing and exporting. The firm can start immediately.

### Procedures of Firm Registration

Firm owner fills in an application to the certification body with his interest to deal with organic production



Registration Form



Inspection and Certification Body



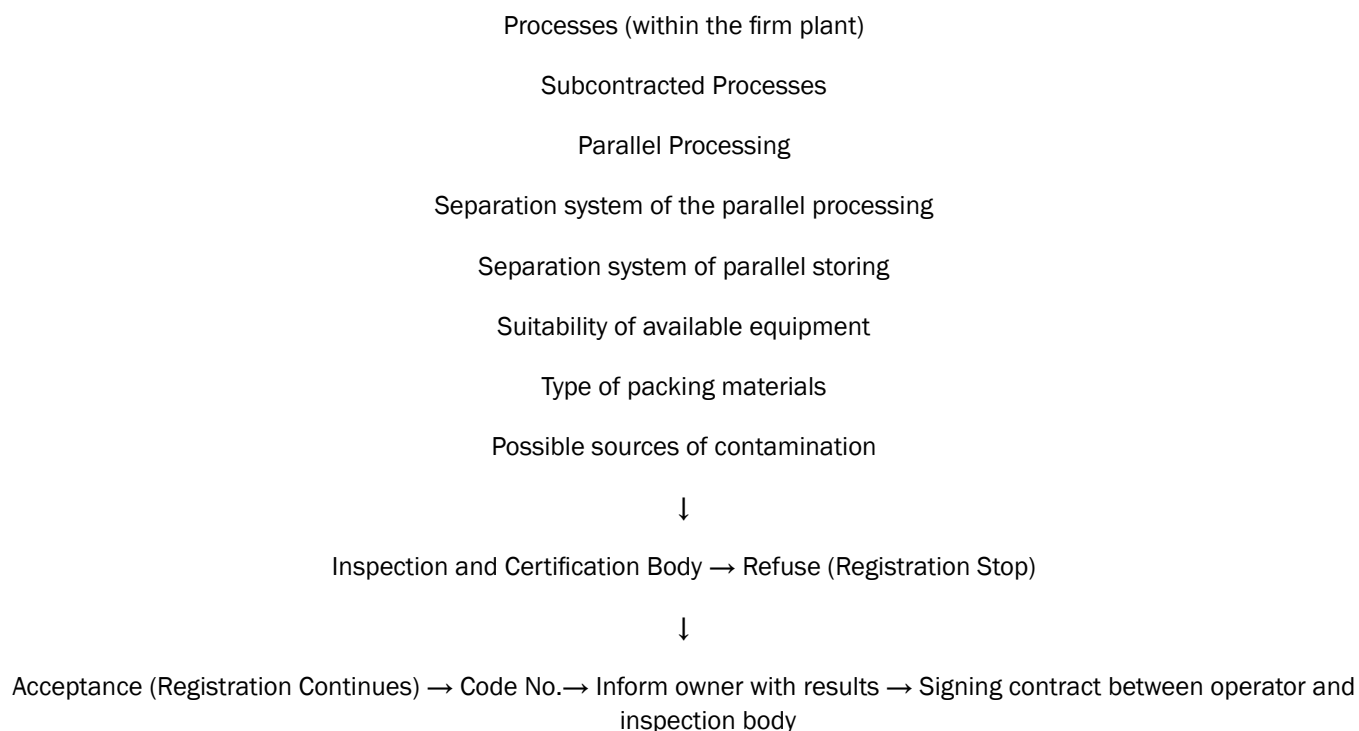
Firm First Visit Evaluation Report

Content of the report



Application No.- Date of Visit- Firm Name

Stores (within the firm plant)



According to quality management system, the inspection and certification bodies inspect farms at least twice a year. One inspection is done in winter crops and the other during summer crops. This depends certainly on cropping system. The firm or processor is inspected once a year.

During inspection of the farm, the following items are checked:

Production unit and effect of neighbours.

Documents and cultivation plan.

Fertilizers source.

Plant protection materials.

Source of irrigation.

Source of seeds and seedlings.

1. Stores and stored materials.
2. Purchase and sales documents.
3. Animal husbandry.

By the end of the inspection visit, the inspector meets with the responsible person to discuss with him the outcome of the visit.

During Inspection of Firm the following documents are inspected:

Registration form.

Raw material record

Operating record

Export record

Request for certification

Information about storage outside firm

Contract with other companies for special work.

### **SWOT ANALYSIS OF ORGANIC AGRICULTURE IN EGYPT**

An analysis was conducted to reveal Strengths, Weaknesses, Opportunities and Threats (SWOT). Major findings were:

#### **Strengths**

1. Availability of international standards to govern all organic operations.
2. High demand of organic products in the international markets.
3. High demand of quality and safe food for consumption.
4. Positive impacts of organic agriculture practices on health and environment.
5. Positive impacts on socioeconomic systems on producers and exporters
6. Maintain and increase long term fertility and biological activity of the soils.
7. Maintain and encourage agriculture and natural biodiversity.
8. Decrease health hazards associated with pesticide pollution.

#### **Weaknesses**

1. Lack of local agriculture policies supporting organic farming.
2. Absence of skilled personnel to manage organic farming.
3. Lack of local control bodies and high cost of foreign ones.
4. Lack of awareness of the socioeconomic and health impact of organic farming.
5. High rate of illiteracy. Which hampers keeping records of organic farming?
6. Lack of market information causes difficulty in exporting.
7. Lack of research base for integrated plant nutrition and protection in organic farming.
8. Reduced organic yields compared to conventional agriculture especially in the conversion period.
9. High retail price of organic commodities for consumers than conventional products.
10. Differences in international standards with relation to certain issues and inability of certain countries to accommodate these differences.
11. Inability to apply the principal of fair trade in some cases.
12. Absence of good relations dominating in importers and exporters in developing countries.
13. Bureaucratic regulations dominating in importing countries.
14. Absence of sound and good practices of post-harvest in developing countries.
15. Absence of system for presenting organic products in stores and supermarkets.
16. Lack of effective role of mass media in promotion of organic agriculture through public awareness.
17. Lack of an effective role of NGOs and private sector in aggregating and networking of organic production dissemination.
18. Lack of transparency among all partners in the marketing channels.

#### **Opportunities**

1. Organic farming is internationally recognized in more than 110 countries and cultivation area and more production increase progressively.
2. Premium prices of organic products in the local or international markets.
3. Increased demand driven by the consumers interest in safe and good quality food.
4. Movement of new countries into organic production.
5. Organic farming activates partnership among certain countries.
6. Effective communication through mass media services.

#### **Threats**

1. Reduced price associated with the increase of availability than demand.
2. Tight regulations imposed by importing markets, e.g. requirement of GAP certificates.
3. Local production of organic products in the importing countries may cover the local needs.
4. Political relations may interfere with trade.

### RECOMMENDATIONS ABOUT ORGANIC FARMING

The Government of Egypt, Scientific Research Institute, NGOs and private sector should be adopting policies to enhance organic farming. In order to overcome the problems and weaknesses identified earlier, the following measures should be taken:

1. Legislation for national laws for organic farming should be developed.
2. International recognition of an Egyptian Standard Specifications (ESS) should be obtained.
3. Encouragement of the Central Lab for Organic Agriculture (CLOA) to control and coordinate the organic movement and disseminate the knowledge and the concept of organic farming among farmers and extension staff in addition to monitoring local markets.
4. Prepare short and long-term plans for organic agriculture movement and identification of problems and proposed solutions.
5. Present a support plan for producers and exporters in kind or money.
6. Encourage and support establishment of organic associations specialized in production and/or marketing.
7. Development of processes of post-harvest, e.g. dehydration, grading, packing and cooling.
8. Encouragement of production of organic seeds and seedlings.
9. Establishment of database and information centers for organic farming.
10. Establish a market information center for organic products and making it accessible to exporters.
11. Encourage exports to international markets.
12. Enhance organization of an international organic fair in Egypt.
13. Increase public awareness on organic farming and the need for safe food.
14. Preparing a new level of extension staff specialized in organic agriculture and assist them in promotion of the organic movement through producing brochures, holding field training and increasing the extension services.
15. Establish more directorates for organic farming within the entire governorate as well as train the officials who are in charge of the organic agriculture.

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