

Organic Farming: Simple Step Towards Big Change

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ABSTRACT

Modern or synthetic agriculture is completely based upon the use of chemical fertilizers and pesticides and various modern techniques which not only deteriorate soil but also adversely affect the health of living organisms. The use of chemical fertilizers and pesticides not only adverse effect the environment and ecology, but also so manifest various problems like soil erosion, increasing soil salinity, water shortage, soil contamination, genetic erosion etc.

To tackle these problems the whole world is shifting towards sustainable agriculture. Organic agriculture is very beneficial in terms of protecting and sustaining the environment and ecology, and also protect the health of living organisms and decomposers. Organic products are healthier than those products that are produced by synthetic agriculture. Organic agriculture has numerous advantages for the environment and ecology.

KEYWORDS: Organic Farming, Sustainable agriculture, Principles of Organic Farming, Organic Fertilizers, Organic Pesticides, Organic Insecticide, Organic Fungicide, Green Revolution

1. INTRODUCTION

Sustainable farming is necessary to attain the goal of sustainable development. Sustainable agriculture emphasis on maintaining agricultural growth, which can fill the demand of food for all living beings without draining basic resources. Organic farming is one of the various techniques which fulfil the objective of sustainable agriculture.

Organic farming refers to the production of crops and livestock without using any chemical fertilizers, pesticides, genetically altered organisms, antibiotics and growth hormones.

The main goal that is involved in organic farming is to develop productions that are sustainable and harmonious with the society and the environment. Organic farming is completely based upon the usage of organic and chemical free material. Organic farming prohibits the usage of genetically modified organisms, chemical based fertilizers, pesticides, herbicides, and growth hormone. Organic farming helps in the production of good quality food products and also helps in sustaining the environment.

2. Principles of Organic Farming

There are four main principles on which the organic farming is completely based upon-

- A. Health
- B. Care
- C. Ecology
- D. Fairness

A. Principle of Health

Organic agriculture should sustain and enhance the help of the whole ecosystem, which includes soil, plants, animals,

humans and planet by keeping in mind that these all are indivisible.

This principle mainly focus on the health of individuals, which automatically make the society healthy. The health of society and the individual cannot be separated from the health of the ecosystem. Healthy soil produces healthy crops that promote the health of animals and humans. Health does not only means being disease free, but it comprises physical, social, mental and ecological well being.

The role of organic farming is to sustain and enhance the health of organisms at various levels that is from microorganisms present in the soil to the higher level animals and humans. In particular organic agriculture is intended to produce high quality and nutritious food that helps keep the ecosystem healthy. In conventional or synthetic agricultural products are produced with the use of chemical fertilizers, pesticides, growth hormones, etc. Which not only have an adverse effect on human and animal health but also deteriorate the soil.

B. Principle of Care

Organic agriculture should be managed in such a way that it protects the health of current and future generation and also conserve the environment.

This principle explains that responsibilities and precautionary measures are to be taken in order to maintain the health of individuals and also to conserve environment and natural resources. Technologies, management and development should be insured before using them, that they

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do not cause any harm. Science plays an important role in it, but the only experimental knowledge is not enough practical knowledge help better in taking right decisions. Organic farming should prevent the significant risk of adopting various technologies and rejecting the ones that cause harm in one or another way to the human, animals or the environment.

C. Principle of Ecology

Organic agriculture should be used on living ecological systems and cycles, work with them and help to sustain them.

This principle explains that the production of organic farming is based on ecological systems and recycling processes. Organic farming should fit the cycles and ecological balance in nature. Organic farming should adapt to the local conditions, culture, scale and ecology. The input must be reduced to reuse, recycle and management of various resources in order to conserve resources.

Those who produce and sell products should maintain the ecological balance including the site of production habitat, biodiversity, air and water.

D. Principle of Fairness

This principle explains that those who are involved in organic farming should have a fair human relationships with each other including producer, seller and consumer. It should benefit all levels from producers to consumers. Organic farming should provide better quality food and other products to all at reasonable prices so that it can be reached to all and ensure better living that will be healthy.

Natural environment and resources that are used for organic farming should be used in such a way that they are socially and ecologically stable and conserved for future generation.

3. Advantages of organic farming

Since, organic products are not loaded with toxins such as fungicides, herbicides, fertilizers and pesticides. Therefore, they are more healthy than those products produced by synthetic or conventional farming.

Organic products are of superior quality in terms of vitamins and minerals as they are grown or produced all naturally.

Organic farming supports pollinators as in synthetic agriculture and conventional agriculture, there are chemicals like Glyphosate and Neonicotinoids, present in the soil or on the surface of plants, which possesses a great threat to certain pollinator populations. Whereas, in organic farming there are no traces of such harmful chemicals.

Farmers who are involved in synthetic or conventional farming are exposed to potentially dangerous chemicals that are present in pesticides and fertilizers. They have to manage their fields on a regular basis due to which they are exposed to these chemicals constantly and develop the risk of various neurological diseases. Whereas, on the other hands on organic farming there are no chemicals used. Hence, the working conditions for farmers are also safe.

Organic farms help in improving soil fertility and quality because in organic farming various methods like crop

rotation, green manual, worm farming, etc. are used which replenishes soil fertility and quality naturally.

4. History of Organic Farming in India

India has been practiced organic farming from over thousands of years. Traditional agriculture in Great Indian Civilizations till the time of British rule were completely based upon organic techniques of farming. Earlier cows were raised not only for milk purpose but also for ploughing field and Fertilizer purpose.

But during the 1950s and 1960s the population of India was increasing and there were various natural calamities that were happening. This caused food scarcity due to which the government was forced to import food grains from foreign countries. India became one of the biggest food importer during that period. This imported food grains were not enough due to which people started dying due to hunger. To increase the food security of the country government it had to drastically increase the food production. As a result of which in the 1960s, 'Green Revolution' came in India under the leadership of M.S. Swaminathan. With the effect of the Green Revolution large amount of land was brought under cultivation, organic fertilizers and pesticides were replaced by chemical based organic fertilizers and pesticides, various advanced technologies came into force and genetically modified organisms and hybrid seeds were introduced. This increased the production in India and around 1990s, India became one of the largest exporter of food grains.

As the time went by, synthetic agriculture or chemical based agriculture started showing its dark side. The land is losing its fertility due to the extensive use of chemical fertilizers and pesticides. Many insects and pests have become resistant to these chemical pesticides and insecticides. This excessive use of chemical fertilizers and pesticides also effect on the quality crop products.

Now, both consumers and producers are shifting back to organic agriculture. Organic products contain high nutritive values due to which organic products are in higher demand nationally and internationally. According to the International Fund for Agriculture and Development (IFAD), about 2.5 million hectares of land were under organic farming in India in 2004 and there are over 15,000 certified organic farms in India.

5. Organic Fertilizers

Organic fertilizers are those fertilizers that are produced to fulfil soil's and plant's requirements. It provides various micronutrients and macronutrients to the soil. This nutrients and fertility replenishment is fulfilled by using organic matter like animal matter, animal excreta, vegetable and fruit matter.

Procedure to prepare organic fertilizer or manure

- Take 100 kg cow dung and dry it well for 5 to 7 days, so that all moisture can be removed.
- After drying convert the dry dung into smaller particles. This can be done by using hands, machine or any traditional method.
- In one container collect cow's urine and add 20 kg of jaggery.
- Mix this mixture of urine and jaggery well until they both get mixed together completely

- Then add 100 kg of predried cow dung into the mixture of urine and jaggery. Mix them all well.
- After mixing them, add 2 kg of gram flour into the same container and mix it well.
- Then collect around 10 kg of soil either from the base of the lake or the pond, or soil from under the Peepal tree. Dry the soil well.
- Mix the dried soil to the above prepared mixture.
- The organic fertilizer is ready-to-use. This organic manure can substitute DAP (Diammonium Phosphate) i.e. A chemical fertilizer.

In the above prepared organic fertilizer we have used organic matter such as cow dung, jaggery, cow urine and pond or Peepal tree soil. These organic matter provides various nutrients and benefits to the soil due to which they can be used in organic fertilizers.

Cow dung manual and vermicompost increase soil organic matter content and displayed to improve water infiltration and water holding capacity as well as an increase cation exchange capacity. Cow dung also it is a good source of nitrogen, phosphorus, potassium and ammonia. It is a very effective alternative to chemical fertilizers by enhancing productivity in long-term with maintaining the soil health enhance the microbial population of the soil.

Cow urine is used in the production of organic fertilizer or manure because it provides nutrients like sodium, urea, potassium and phosphorus to the soil. It contains 95% water comma 2.5 % urea and remaining 2.5% contain mineral salts, hormones and enzymes. In organic farming, cow urine is used for preparation of a number of growth promoters and biopesticides, which are effective in improving soil fertility and management of the large number of pest and disease in varied groups.

Jaggery is used because it has the ability to increase the number of microbes that are present in soil. It also acts as a good source of calcium, zinc, phosphorus and copper (4).

Soil from the base of the pond or Peepal tree if use above because it contain various kinds of bacteria that helps in increasing yield.

Method of preparation of organic solution to supply urea, DAP and other nutrients

- Take 30kg spill of Neem and make a paste of it. With 10 kg gram flour and 10 kg jaggery.
- Mix above-mentioned materials with waste decomposers in an airtight container.
- Keep it closed in airtight container for 30 days.
- After 30 days the solution will be prepared which will contain all the micronutrients that are needed for the crop production. This also helps in soil replenishment without the use of any chemical fertilizer.

In the above organic solution, Neem spills are used because it fosters the life of the soil. Neem leaves have also been used to enrich the soil. In India it is widely used to fertilize cash crops. It promotes the organic acids in the soil and reduce the alkalinity of soil.

An Organic solution to fulfil the need of micronutrients into the soil

- Take a container, add 250 gram iron, 250 gram copper and 250 gram zinc.
- Then fill this container, with waste decomposers and water.
- Leave it for 15 to 20 days
- Once it is ready. The liquid which is formed is separated from the solid present in the mixture and it is transferred in the spray tanks.

This organic mixture fulfil needs of various micronutrients like iron, copper and zinc effectively.

6. An Organic way to tackle the termite problem in the field

On synthetic and conventional farming, farmers use various kinds of chemical pesticides in order to kill termites. These chemicals sweep inside the soil and decreases the fertility of the soil and somehow decrease the quality of crops and its products. In organic farming these chemical pesticides are replaced with organic pesticides that is completely prepared from organic material which tackle the termite problem, but, does not harm the quality of soil and crops.

Procedure for preparation of pesticides that kills termite

- First step is to prepare waste decomposers. For that cow dung is mixed with jaggery and water in a plastic drum. Cow dung contains various microorganisms that are essential for waste decomposers.
- Mix it properly with wooden sticks for uniform distribution of the waste composer in a drum.
- Cover the drum with a paper or cardboard and stir it every day once or twice. Repeat this process for 5 to 6 days until the solution of the drum become creamy.
- Then take a container and put 20 to 40 kg of tobacco powder in it and add pre-prepared waste decomposer solution.
- Mix it well and leave it for 15 to 20 days.
- Once it is ready, mix it with water and spray it to the field.

Tobacco leaves are used as an organic insecticide because the main ingredient of tobacco is nicotine it is neurotoxic for most insects.

This organic pesticide tackles with the problem of the termite without harming crops and its products. This pesticide does not harm the fertility of the soil, even on long term.

7. Organic Insecticides

Organic insecticides kill insects without the use of harmful chemicals, which can hamper the quality of soil and crops. Organic insecticides contain natural products like oils which suffocate insects, resulting in their death, some insecticides contain various bacteria that are lethal to a specific insect and some have specific natural substance that interfere with insect functioning and interrupts the life cycle.

Procedure of preparing organic insecticide

- Take Neem stem and leaf, Hemp stem and leaf, and Mulberry stem and leaf.
- Wash them properly to remove all the dust from them.

- Immerse them in water and boil it for around a day. (Fire should be burning continuously so that all oils and components can come out of the leaves and stems)
- Using a sieve separate the solid from the liquid.
- The liquid that has been separated above is the organic insecticide which kills various insects that are present in crops.

This organic insecticide cannot be used directly to the farm because it has a high concentration of poison which can hamper the growth of plants. It should be used in the diluted form by adding approximately 250ml of insecticide with 15 to 16 litres of water. This diluted insecticide can be sprayed with spray tanks.

Neem stems and leaves are used in organic insecticides because neem has special compounds that work on the insect hormonal system, not on the digestive or nervous system and therefore does not lead to the development of resistance in future generation. The limonoids that are present in Neem block the growth of insects, it sterilizes adults and also block the development of the larva into adult. When Neem cake is ploughed into the soil, it also protects plant roots from nematodes and white ants.

8. Organic Fungicides

Organic fungicides insure the effective treatment that can be applied to plants at the first signs of disease. It helps in the treatment of various fungal diseases in crops by killing the fungus without causing any harm to crops and those will consume them.

Method of preparation for organic fungicides

- Take one earthen pot or dig a pit, fill it with buttermilk.
- Add a small piece of copper in buttermilk.
- Leave it for 40 days
- Once it is prepared, add 250 ml of prepared Fungicide in 15 litres of water.
- This diluted mixture of above prepared fungicide can be sprayed on crops.

Buttermilk contains lactic acid. When lactic acid reacts with copper it forms copper lactate which becomes potent and act as a fungicide.

9. Status of Organic Farming in India

India is home to 30% of total organic producers in the world. India holds 172nd position among countries that all are practicing organic farming with 6.5 Lakh organic producers, 699 processors, 699 exporters and 7.2 lakh hectares land, this land is 0.4 % of total agricultural land under organic cultivation. India produces around 1.35 million MT (2015-16) of certified Organic products, these Organic products does not include only edible products, but also products like organic cotton fibre, functional food products etc.

India rank first in number of organic producers among 170 countries. India also holds 9th position in terms of area and 11th position in organic product exports in 2015.

Madhya Pradesh is the leading and organic farming state in India with 1.48 lakh hectares organic farming land. In January 2016, Sikkim became India's first 100% organic state. Today, complete farming in Sikkim is done without the use of any chemical fertilizers and pesticides, providing access to safe food and making environment more Eco friendly.

CONCLUSION

Organic agriculture has many benefits over synthetic or modern agriculture. In organic agriculture only natural and organic inputs are used which provide fertility to the soil without deteriorating it, and also kills pests and insects without causing harm to the crop and crop products. Organic farming is healthy environment and ecology. It provides benefit to all levels of organisms starting from the microorganisms that are present in the soil to the human beings. Organic products are of great nutritive values which facilitate better food supply and healthy society. After realising the numerous benefits of organic farming, the whole world is shifting towards organic farming leaving the synthetic agriculture behind.

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