

ORGANIC FARMING - AN OVERVIEW

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Abstract– The increasing demand of agricultural productivity by the increasing population had led to the excessive use of chemical fertilizers and pesticides by the farmers. The use of chemicals in our fields increases the productivity but at the same time it deteriorates soil fertility and adds toxins in the products. Also, the residual chemicals are flushed away with irrigation water into large water bodies where it can be lethal to other living organisms. Thus, in order to avoid these adverse consequences of chemical farming, we need to shift our agricultural practices from chemicals to organic farming. Organic farming is a types of farming in which the nutrient needs of plants are fulfilled by organically produced products like Vermicompost, Manures, Biopesticides etc. This type of farming not only improves soil fertility but are also cost effective and less harmful. Therefore, this paper is an initiative to aware people about adverse effects of chemical farming, advantages of Organic Farming, Organic substitutes for Chemical inputs, methods of preparation of organic inputs like Vermicomposting, Neem seed kernel extract etc.

INTRODUCTION

In today's fast-paced era, the concept of farming without chemical fertilizers, pesticides are not easily acceptable to the farmers. But in present times organic farming is becoming the need of the time. Many misconceptions about organic farming are already spread in the minds of farmers. But in present time, due to increasing awareness among farmers, educated, progressive farmers are moving towards organic farming. It's a very good thing.

Our forefathers did the farming without the use of chemicals. Are we doing the same? If we ask this question to our mind, the answer to this question will definitely be no.

Basically, there were no chemical fertilizers and pesticides in the past, so was agriculture not done then? So definitely this agriculture was done then but the agriculture then was done entirely on organic materials such as cow dung. The food grains, fruits, vegetables of that time were nutritious and after eating the food the body would get all the necessary elements then our ancestors to live for a hundred years (Gopinath *et al.*, 2016).

But what caused the life expectancy to drop from 100 years to 60 to 70 years today? If we think about it, we will surely have some questions. Isn't this the result of chemicals? Have you ever thought that? So, of course, these side effects are due to chemical fertilizers and pesticides. The use of chemical fertilizers and pesticides in the fields destroys the beneficial organisms in the soil, resulting in infertile land. Productivity and nutrients are reduced. Further, the remains of these chemical things in the soil mix in the reservoir due to rain, animals, birds and go into our bodies. In today's diet, of course, people are not getting the nutrients they want from food (Alvina Gul, 2014). Many diseases are faced due to chemical foods. Now children are getting food. So how will the future youth generation become strong?? This question also arises here. So, the only solution to this is organic farming.

MATERIALS AND METHODS

The study was conducted based on a review of international, national scientific studies on organic farming. National Centre for Organic and Natural Farming, Ministry of Agriculture & Farmer's

Welfare Govt. of India. through as well the studies accessible to the authors were used based on the famous authors on the search engine "Google Scholar".

Organic Farming - Nutrient requirements of crops are met from the soil. It is therefore necessary to replenish the used nutrients in the soil. Achieving the goal of increasing production, the consumption of nutrients is also high. Mulch replenishes the nutrients used by composting and decomposing green crops such as jute. Using cow dung and compost fertilizers, as well as mixing and decomposing all other types of plant organic matter into the soil. When crops are grown in soil enriched with nutrients in this way, it is called organic farming. The grain produced from organic farming is of high quality. The main requirement in organic farming is to strictly avoid the use of all kinds of chemical fertilizers, pesticides and herbicides. The need can also be met by using biological fertilizer and insecticides for disease and pest control (S. Miller *Conserve energy*).

Side effects or disadvantage of chemical farming:

1. Due to excessive use of chemical fertilizers, the food grains and vegetables produced from them get traces of chemicals from chemical fertilizers and pesticides and those food grains, vegetables become unfit for consumption.
2. The land was barren.
3. Nutritious food grains are not available.
4. Life span expectancy decreases.
5. Production cost of crops increases.
6. The atmosphere is polluted (Chandini *et al.*, 2019).

Advantages / Benefit of organic farming:

1. A nutritious product is obtained (Alvina Gul, 2014).
2. Cost of production is reduced (Hari Prakash Meena., 2013).
3. The product fetches a higher price.
4. Atmosphere remains balanced.
5. Life expectancy increases.
6. Pollution is reduced by maintaining the balance of natural cycles.
7. Improves biological activity by increasing soil fertility, reduces erosion.
8. Improve soil texture and quality and water holding capacity increases (Chandra, 2019)
9. The temperature of the soil remains balanced and the growth of crops is vigorous as the soil

becomes soft and humus.

10. Tasty food obtained (Hari Prakash Meena, 2014).

Organic fertilizers alternative to chemical fertilizers

"Manure made from the remains of plants and animals is called organic manure."

- They mainly include cow dung, vermicompost, compost etc.

Vermicompost

Vermicompost is one of the best organic fertilizers available today. There is a need to emphasize on it in the future. Considering the growing population of the country, it is imperative for the farmers to grow more crops to meet their food needs as well as to increase the production per hectare of the same land. But despite this, the way in which the excessive use of chemical fertilizers has increased, the adverse effect is being seen on the environment. Day by day the fertility of the land is decreasing. The number of microorganisms in the soil has decreased and they are almost dead. Physical, chemical and biological damage to agricultural land is immense. The production cost of the farmer has increased to a great extent and he is becoming indebted. The same crop is cultivated in the same land for years. Due to this, the use of water in the soil has increased. The amount of farm land is decreasing day by day and the need for food grains is increasing. To meet this requirement, the available land will have to be used more and more. For that, it is our moral responsibility to keep this land alive and fertile for a long times (Shahram Sharafzadeh *et al.*, 2011).

What is vermicompost?

"An earthworm is an animal that lives in the soil. It eats the organic matter of the soil. After eating it, it leaves the part it needs for its body and excretes the rest as excrement, which is called vermicompost" (Vikas Singh Sengar *et al.*, 2021).

The earthworm keeps only ten percent of the food it eats for its own body and expels the remaining ninety percent from the body. Earthworms contain nutrients, hormones, useful bacteria required for plant growth and increase the plant's resistance to disease. Vermicompost is a granular organic fertilizer rich in nutrients, hormones and enhances biological properties. Vermicomposting is an important ingredient in

organic farming.

Types of earthworms

Epigeic

These earthworms live near the soil surface (Amir Hossein Asgari Safdar *et al.*, 2014). 80 percent of our food comes from organic matter, while 20 percent comes from soil and other materials. Their reproductive rate is higher. Their size is small.

Anecic

These earthworms usually live up to one meter deep in the soil and feed on organic matter and soil. Their size is medium (Amir Hossein Asgari Safdar *et al.*, 2014).

Endogeic

These earthworms live in the soil up to a depth of three meters or more. They are long in size, pale in color and have a very low reproductive rate (Amir Hossein Asgari Safdar *et al.*, 2014). They mostly eat soil. Epigeic and anecic earthworms are used for composting based on the characteristics and properties of these three types. Among them, four species namely *Eisenia fetida*, *Perionics*, *Eudrilus* and *Lampito* are more useful. They eat their own weight in food every day.

Methods of vermicomposting

Vermicomposting can be done by both pile and pit methods. But both methods require artificial shade. A roof shed should be made to protect them from sunlight and rain. The length of this shed should be 4.25 meters for two piles and 7.50 meters for four piles. Both sides of the shelter shed should be sloped. The height of the side pillars should be 1.25 to 1.50 meters and the height of the middle pillars should be 2.25 to 2.50 meters. Grass, paddy straw, coconut husks, cotton or bamboo sticks, sorghum plates, thick plastic paper or cement or iron sheets should be used for roofing. Choose the right species of earthworms for making vermicompost.

Piling method

- Generally, 2.5 to 3.0 m for vermicomposting in pile method. in length and 90 cm. Wide piles should be prepared.
- First wet the land by adding water. 3 to 5 cm of non-perishable materials like coconut husks, grass, rice husks are placed at the bottom of the pile. Make a thick layer, sprinkle enough water on it and make it wet.

- 3 to 5 cm on this layer. Apply a thick layer of partially rotted dung, compost or sifted soil from the garden. Full-grown earthworms should be gently released onto this layer.
- Generally, 7,000 adult earthworms should be released to produce vermicompost from 1 kg of organic matter.
- On the second layer, crop residues, animal excrement, grain bran, field weeds, leaves of two-leaved green plants such as Giripushpa Shevari, fish manure, chicken droppings etc. should be used.
- It is best to use these organic materials in finely chopped and partially decomposed form. Its curb: nitrogen ratio should be between 30 and 40. Care should be taken that the height of the entire pile does not exceed 60.
- Decomposing organic matter should contain 40 to 50% water. For this, the pile should be covered with sackcloth and sprinkled with water every day.
- Care should be taken to ensure that the temperature of the organic material in the pile remains between 25 and 30 degrees Celsius.

Pit method

- In this method cement pits are 3 meters long, 2 meters wide and 60 cm deep should be kept (Jagdish, 2020)
- 3 to 5 cm of coconut shell, grass, rice bran, wheat bran at the bottom of the pits. Apply a thick layer of partially rotted dung, compost or sifted garden soil.
- Wet both the layers thoroughly with water and cover them with approximately 7,000 earthworms are released to produce vermicompost from of 100 kg organic matter.
- A maximum of 50 cm of partially decomposed organic matter should be placed on it. Create a thick layer.
- Always keep it wet by covering it with sackcloth.
- Aeration of the organic matter in the pit is essential for the growth of earthworms. For that, if the layers of organic matter become thick, they should be loosened by hand. So, the temperature in the pit will be controlled.
- The vermicompost made in this way should be piled in a cone shape. Separate the manure from the upper part of the heap and sift it in the shade.
- The separated earthworms should use to make vermicompost again (Jagdish, 2020)

Time taken to produce vermicompost

It takes about 35 to 50 days to produce compost using vermicompost.

Benefits of vermicomposting for agriculture

- 1) Vermicompost contains essential and micronutrients required for crop growth. This is not usually the case with other fertilizers.
- 2) Vermicomposting maintains the physical fertility of the soil (Anjana Thakur *et al.*, 2021).
- 3) Nutrients in vermicompost are available in the form required by the crop. So, the roots of the trees can take it easily.
- 4) There are many microorganisms in the digestive system of an earthworm. They are mixed with food and come with feces. They include actinomycetes, siderophores Streptomyces, Azotobacter bacteria and fungi. These microorganisms destroy the disease-causing microorganisms and reduce the disease on the crop. This reduces the cost of pesticides.
- 5) The use of Earthworm in Vermicomposting helps in maintaining the humus of soil thus allowing air and water to circulate in the soil which helps healthy growth of crops (Lim *et al.*, 2015).
- 6) Vermicompost leads to proper drainage of water and increases the water holding capacity of the soil.
- 7) The high water holding capacity of the Vermicompost helps in retaining moisture in soil this support Crop growth during water stress condition which is also sometime saves the cost of irrigation (Ashiya and Rai, 2015).
- 8) Vermicompost has granular structure so it holds soil particles and reduces soil erosion due to wind and water (Mark Risse, 2015)
- 9) Earthworm eats more organic matter and converts it into manure. The farmer often throws away and burns the huge piles of garbage and mulch that he has. It can produce vermicompost. Vermicompost is wealth created from waste.
- 10) Every farmer can produce vermicompost as per his requirement. Therefore, its cost of production is reduced and profit is increased.

Organic pesticides alternative to chemical pesticides

It's mainly included Neem Seed Kernal Extract, Dashaparni ark, Jeevamrut etc.

Neem Seed Kernal Extract

i.e., the extract obtained from the seeds of the neem tree, called nimboli (or nimbonya). 'Azadirachtin' present in neem plant acts as an insect repellent. The amount of this component is high in its seeds, while it is low in the leaves. The extract prepared from these lemons has a beneficial effect on many crop pests.

It has an effect on many insects such as aphid, Jassids, pod borer, leaf-eating caterpillar, larvae, fruit flies, caterpillars etc (Md.Shafiqul Islam *et al.*, 2013).

How to prepare Neem Seed Kernal Extract at home: - (5% Representational format)

Grind 5 kg of Neem seed and tie it in a cloth and keep it in a bucket full of water for about 12 hours. Then take it out and add 100 to 200 g of soap powder as required or make soap paste in it. Stir it well. Then add enough water to make this mixture 100 liters (vikaspedia). By spraying it, pod borer, aphid, jassid and other insects can be controlled. The solution prepared in this way is called 5% solution.

Benefits of neem seed kernal extract-

1. Can be sprayed on any crops.
2. Can be manufactured at low cost.
3. Immediate effect.
4. There is no adverse effect to the environment (Md.Shafiqul Islam *et al.*, 2013). Useful for maintaining the balance of the atmosphere.

Jeevamrut

Materials required to prepare Jeevamrut: -

- 200-liter capacity plastic barrel.
- 10 kg of fresh cow dung
- 10 kg cow urine of native cow
- 2 kg jaggery
- 2 kg flour of gram (besan)
- 2 kg of bacterial soil (sludge) under a tree or on a farm bund.
- 100 g each of bacterial culture like Rhizobium, PSB (if available) (Amit Kumar *et al.*, 2021).

How to prepare jeevamrut at home

Procedure

- To prepare jeevamrut, take 170 liters of clean water in a 200-liter capacity plastic barrel or cement tank.

- 10 kg cow dung, 10 liters cow urine, 2 kg jaggery, 2 kg gram flour, 2 kg bacterial soil and

- 100 grams of available bacterial culture should be mixed in it
- Stir from left to right 2 to 3 times daily for 10 to 15 minutes (Ashmeet Kaur, 2020).
- Jeevamrut is ready for application to crops in 7 days. 200 liters per acre is sufficient. If there is more area then the number of barrels should be increased. Or prepare the mixture by adding five times the above quantity in a thousand-liter capacity tank.
- If the availability of cow urine is high, the amount of water should be reduced. Farmers use different amounts of ingredients to prepare Jeevamrut. The days of keeping that solution are also different. However, the above materials are minimum and in proper quantity.

Properties of jeevamrut

1. The color of excellent jeevamrut is reddish to black.
2. The nitrogen content of jeevamrut ranges from 3 to 6 percent.
3. The surface of Jeevamrut is almost acidic.
4. It is an excellent food source for the growth of various species of beneficial microorganisms (Devakumar *et al.*, 2014).
5. Microorganisms in dead bodies absorb nitrogen from the air. The ratio of carb and nitrogen in it decreases.
6. Since the dead body is in liquid form, the number and survival time of the bacteria increases.
7. Jeevamrut should be used within a maximum of 30 days.

Benefits of Jeevamrut

- Although the soil has an abundant supply of nutrients required by all crops, it is not available to the crops. If there are bacteria in the soil, they make their life cycle available to the crop from the soil or the environment at the right time. As a result, the number and size of white roots increases. The number of bacteria in the soil can be greatly increased by the application of jeevamrut (Ashmeet Kaur, 2020).
- As their number increases, the rate of absorption of nitrogen from the air increases. Nitrogen and other supplementary nutrients are abundantly available to crops. Therefore, vegetable growth becomes vigorous. The crop appears vigorous, and healthy (Amit Kumar *et al.*, 2021).

- In organic farming system, increasing the use of organic matter provides food for the bacteria. It decomposes rapidly. Increases the amount of organic carbon in the soil.
- Increasing the number of earthworms in the field increases the water holding capacity
- Organic matter helps retain moisture in the soil. Plants can survive even during periods of heavy rainfall.
- Vegetables and fruits from the farm where jeevamrut are used are the best. Apart from that, the taste was great. The experience of the farmers is that the storage capacity remains good.
- The jeevamrit also act as a insect repellent in case of some insect pest
- The use of jeevamrut helps in getting better production at lower cost (Amit Kumar *et al.*, 2021).

CONCLUSION

Farmers should reduce the use of chemicals and switch to organic farming. How can we get maximum production at low cost? Looking at the current inflation, the cost of chemical farming is increasing but the price is not getting. Many questions that the income is reduced if the price is received? Grievances are being heard frequently from farmers.

That's why if we do organic farming, its cost is reduced, due to increase in quality of soil due to dung, production also increases a lot and due to quality product, it fetches good price in the market.

The most important thing is that your family will get nutritious (toxic free) food (Hari Prakash Meena, 2014).

At present, there is a lot of awareness about organic farming in the society. People are also willing to pay more for food grains, fruits and vegetables produced from organic farming. Socially minded people know that a toxin-free diet is always better.

A toxin-free diet can only be obtained from toxin-free farming, of course organic farming. And we too can meet the growing demand for toxin-free food through organic farming. We are also currently moving towards organic farming by creating a large amount of awareness. Soon all over India this concept will be understood and affordable by the farmers. The legacy of agricultural will surely be preserved through organic farming.

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