

Organic Farming

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Organic farming is a system that avoids or largely excludes the use of synthetic inputs (such as fertilizers, pesticides, hormones, feed additives etc.) and to the maximum extent, feasible rely upon crop rotations, crop residues, animal manures, off-farm organic waste.





In harmony with nature rather than against it. This involves using techniques to achieve good crop yields without harming the natural environment or the people who live and work in it. The methods and materials that organic farmers use are summarised as follows:

To keep and build good soil structure and fertility:

- Recycled and composted crop wastes and animal Matters
- The right soil cultivation at the right time
- Crop rotation
- Green Matters and legumes
- Mulching on the soil surface To control pests, diseases and weeds:
- Careful planning and crop choice
- The use of resistant crops
- Good cultivation practice
- Crop rotation
- Encouraging useful predators that eat pests
- Increasing genetic diversity
- Using natural pesticides Organic farming also involves:
- Careful use of water resources
- good animal husbandry

Need of Organic Farming

- An increase in population makes compulsion to stabilize agricultural production.
- A natural balance needs to be maintained at all costs for the existence of life and property.



- Agrochemicals are produced from fossil fuels and are not renewable and are diminishing in availability. It may also cost heavily on our foreign exchange in future.

A modern approach to farming

Organic farming does not mean going 'back' to traditional methods. Many of the farming methods used in the past are still useful today. Organic farming takes the best of these and combines them with modern scientific knowledge. Organic farmers do not leave their farms to be taken over by nature; they use all the knowledge, techniques and materials available to work with nature. In this way, the farmer creates a healthy balance between nature and farming, where crops and animals can grow and thrive. To be a successful organic farmer, the farmer must not see every insect as a pest, every plant out of place as a weed and the solution to every problem in an artificial chemical spray. The aim is not to eradicate all pests and weeds, but to keep them down to an acceptable level and make the most of the benefits that they may provide. Combined techniques on an organic farm, each technique would not normally be used on its own. The farmer would use a range of organic methods at the same time to allow them to work together for the maximum benefit. For example, the use of green matters and careful cultivation, together provide better control of weeds than if the techniques were used on their own.

Types of Organic Matter

1. Matters

Matters are plant and animal wastes that are used as sources of plant nutrients. They release nutrients after their decomposition. The art of collecting and using wastes from animal, human and vegetable sources for improving crop productivity is as old as agriculture. Matters are the organic materials derived from animal, human and plant residues that contain plant nutrients in complex organic forms. Naturally occurring or synthetic chemicals containing plant nutrients are called fertilizers. Matters with low nutrient, content per unit quantity have a longer residual effect besides improving soil physical properties compared to fertilizer with high nutrient content. Major sources of Matters are:

- Cattle shed wastes-dung, urine and slurry from biogas plants



- Human habitation wastes-night soil, human urine, town refuse, sewage, sludge and sullage
- Poultry Jitter, droppings of sheep and goat
- Slaughterhouse wastes-bone meal, meat meal, blood meal, horn and hoof meal, Fish wastes
- Byproducts of agro industries-oil cakes, bagasse and press mud, fruit and vegetable processing wastes etc
- Crop wastes-sugarcane trash, stubbles and other related material
- Water hyacinth, weeds and tank silt, and
- Green Matter crops and green leaf manuring material

Matters can also be grouped, into bulky organic Matters and concentrated organic Matters based on the concentration of the nutrients.

2. Bulky organic matter

Bulky organic Matters contain a small percentage of nutrients and they are applied in large quantities. Farmyard Matter (FYM), compost and green-Matter are the most important and widely used bulky organic matter. It is almost unable to fix atmospheric nitrogen symbiotically, hence responds well to nitrogen application. Bulky organic Matters increase the organic matter content and improve the soil physical properties of soils. This is very much effective in arable land and provides food for soil micro-organisms. This increases activity of microbes in turn helps to convert unavailable plant nutrients into available forms. Neem is decomposed slowly, leading to a slower release of nutrients contained in it. In India, FYM is the most common source of organic Matter increases the crop yield and causeimprovement in soil quality of vertisols.

Bulky Organic Matter:

Type 1. Farmyard Matter:Farmyard Matter refers to the decomposed mixture of dung and urine of farm animals along with litter and leftover material from roughages or fodder fed to the cattle.



Farmyard Matter

Properties

- i. On an average well decomposed farmyard Matter contains 0.5 per cent N, 0.2 per cent P_2O_5 and 0.5 per cent Kp.
- ii. Gypsum and superphosphate are commonly used chemicals that help in reducing nutrient losses in FYM and also increases phosphorus content.
- iii. Vegetable crops like potato, tomato, sweetpotato, carrot, radish, onion etc., respond well to the farmyard Matter. The other responsive crops are sugarcane, rice, Napier grass and orchard crops like oranges, banana, mango and plantation crops like coconut.
- iv. The entire amount of nutrients present in farmyard Matter is not available immediately. About 30 per cent of nitrogen, 60 to 70 per cent phosphorous and 70 per cent of potassium are available to the first crop

Bulky Organic Matter: Type 2. Compost: A mass of rotted organic matter made from waste is called compost.

Properties

- i. The compost made from farm waste like sugarcane trash, paddy straw, weeds and other plants and other waste is called farm compost.



- ii. The average nutrient contents of farm compost are 0.5 per cent N, 0.15 per cent P₂O₅ and 0.5 per cent K₂O.
- iii. The nutrient value of farm compost can be increased by the application of superphosphate or rock phosphate at 10 to 15 kg/t of raw material at the initial stage of filling the compost pit.

The compost made from town refuses like night soil. Street sweepings and dustbin refuse is railed town compost. It contains 1.4 per cent N, 1.00 per cent P₂O₅ and 1.4 per cent K₂O.

Bulky Organic Matter: Type 3. Night Soil: Night soil is human excreta, both solid and liquid

Properties

- i. It is richer in N, P and K than farmyard Matter and compost.
- ii. Night soil contains on an average 5.5 per cent N, 4.0 per cent P₂O₅ and 2.0 per cent K₂O

Bulky Organic Matter: Type 4. Sewage and Sludge: In the modern system of sanitation adopted in cities and towns, human excreta are flushed out with water which is called sewage. The solid portion in the sewage is called sludge and the liquid portion is sewage water. Both the components of sewage are separated and are given preliminary fermentation and oxidation treatments to reduce bacterial contamination and offensive smell.

Bulky Organic Matter: Type 5. Vermi-Culture Technology:

In Vermiculture technology, the potential of earthworms as natural bio-degraders of non-toxic organic wastes for soil improvement and nutrient mobilization is being exploited.

Properties

- i. Earthworm population in organic matter rich soils act as natural bioreactors, harness beneficial soil microflora, destroy soil pathogens and convert organic wastes into valuable products such as biofertilizers, vitamins, enzymes, antibiotics, growth hormones and pertinacious worm biomass.

- ii. Earthworms after having properly established in the soil modify soil physicochemical-biological characters of the soil and enhance nutrient cycling by ingestion of soil and humus and converting it into a nutrient-rich cast.
- iii. The early availability of various nutrients such as P, Ca, Na, Mg, K etc. are much higher in earthworm cast than in the surrounding soil.
- iv. The biologically degradable and decomposable non-toxic organic matter is used in Vermicomposting. Commonly used composting materials are animal dung, agricultural waste, forestry waste, leaf litter, waste papers, cotton cloth, city refuse, biogas slurry and non-toxic industrial waste of organic nature.
- v. A ideal population of about 2-4 lakh worms per ha can make permanent Structurally stable burrows in the soil, which allow water infiltration up to a depth of 120 mm.
- vi. Each burrow acts as a micro-dam and prevents runoff losses and enables the soil to sustain moisture for a longer period.
- vii. The earthworm casting are stable and do not break into smaller pieces, preventing soil erosion by wind and runoff water.
- viii. Vermi-culture technology is being harnessed to set up units for cost-effective treatment of various non-toxic solid and liquid wastes from industries, agricultural operations and households. The product of such a unit known as vermicompost is a very high-quality nutrient-rich source and is being increasingly exploited for sustainable organic farming.

Green Manuring Green manuring can be defined as a practice of pouching or turning into the soil un-decomposed fresh green plant tissue to improve fertility status and the physical structure of the soil.

Properties

- i. Capable of establishing and growing quickly
- ii. Tolerant to adverse climatic conditions such as drought, waterlogging, high and low temperatures etc. and tolerant to pests and diseases.



iii. Should possess adequate Rhizobium nodulation potential and must be effective nitrogen fixer

iv. Should be capable of growing very fast and capable of accumulating sufficient fixed N in 4-6 weeks, easy to incorporate and quickly decompose.

