Available online at
www.agrospheresmagazine.vitalbiotech.org

ISSN (E): 2582 – 7022

Agrospheres:e-Newsletter, (2022) *3*(3), 66-70

Article ID: 373

Organic Farming for Improving Soil Health & Quality Production

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Article History
Received: 7.03.2022
Revised: 16.03.2022
Accepted: 24.03.2022

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INTRODUCTION

What does organic farming means?

Organic farming is a type of farming that focuses on cultivating the land and raising crops in such a way that the soil remains alive and well by using organic wastes (crop, animal and farm wastes, aquatic wastes) and other biological materials, as well as beneficial microbes (biofertilizers), to release nutrients to crops for increased sustainable production in an environmentally friendly, pollution-free environment.

AIM of organic farming

- The aim of organic farming is to maintain optimum soil health and thus making the soil capable of supplying all essential nutrients to crop for its proper growth and development
- Organic farming aims at sustaining and increasing the productivity by improving soil health and overall improvement of agro-ecosystem
- Organic farming gives quality organic food and also helps to restore soil fertility on long term basis.

Importance of organic farming.

- Present burning issue in farming is the decline in fertility of soil and fall in productivity levels.
- Use of chemical fertilizers and synthetic pesticides have deteriorated soil health as well causing harm to our natural eco-system by polluting our environment as well as water.
- Now we have reached a situation where productivity levels in soil slowly decreasing day by day.
- Now it's time to go for organic farming and restore soil fertility and maintain soil fertility on sustainable basis so that future generations may not face problems.

Difference between Conservation agriculture

Conventional Agriculture	Conservation Agriculture
Cultivating land, using science and technology to dominate nature	Least interference with natural processes
Excessive mechanical tillage and soil erosion	No-till or drastically reduced tillage (biological tillage)
High wind and soil erosion	Low wind and soil erosion
Residue burning or removal (bare soil surface)	Surface retention of residues (permanently covered soil surface)
Water infiltration is low	Infiltration rate of water is high
Use of ex-situ FYM/composts	Use of in-situ organics/composts
Green manuring (incorporated)	Brown manuring/cover crops (surface retention)
Kills established weeds but also stimulates more weed seeds to germinate	Weeds are a problem in the early stages of adoption but decreases with time
Free-wheeling of farm machinery, increased soil compaction	Controlled traffic, no compaction in cropped area
Mono-cropping, less efficient rotations	Diversified and more efficient rotations
Heavy reliance on manual labour, uncertainty of operations	Mechanized operations, ensure timeliness of operations
Poor adaptation to stresses, yield losses more under stress conditions	More resilience to stresses, yield losses are less under stress conditions
Productivity gains in long-run are in declining order	Productivity gains in long-run are in incremental order

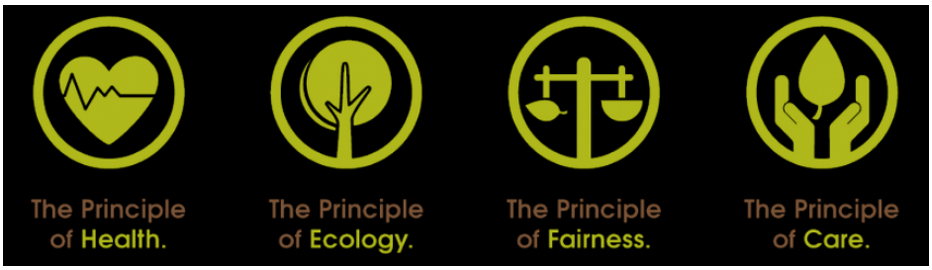
Objectives of organic farming

- To produce food of high nutritional quality in sufficient quantity.
- To work with natural system rather than seeking to dominate them.
- To encourage and enhance biological cycles within farming system-involving microorganisms, soil flora and fauna, plants and animals.
- To maintain and increase long-term fertility of soil.
- To use, as far as possible, the renewable resources. To work as much as possible, within a closed system, with regard to organic matter and nutrient elements.
- To avoid all forms of pollution that may result from agricultural techniques.
- To maintain the genetic diversity of agricultural system and its surroundings, including the plants and wild life habitats.
- To allow agricultural producers an adequate returns and satisfaction from their work including safe drinking water.

Components of organic farming

The four principles of organic agriculture are as follows:

1. Principle of health
2. Principle of ecology.
3. Principle of fairness.
4. Principle of care.



Principle of health

- Organic Agriculture should sustain and enhance the health of soil, plant, animal, human and planet as one and indivisible.
- Healthy soils produce healthy crops that foster the health of animals and people.
- Health is the wholeness and integrity of living systems.

Principle of ecology

- Organic Agriculture should be based on living ecological systems and cycles, work with them, emulate them and help sustain them.
- This principle roots organic agriculture within living ecological systems.

Principle of fairness

- Organic Agriculture should build on relationships that ensure fairness with regard to the common environment and life opportunities.
- Fairness is characterized by equity, respect, justice and stewardship of the shared world, both among people and in their relations to other living beings

Principle of care

- Organic Agriculture should be managed in a precautionary and

responsible manner to protect the health and well-being of current and future generations and the environment.

- This principle states that precaution and responsibility are the key concerns in management, development and technology choices in organic agriculture.

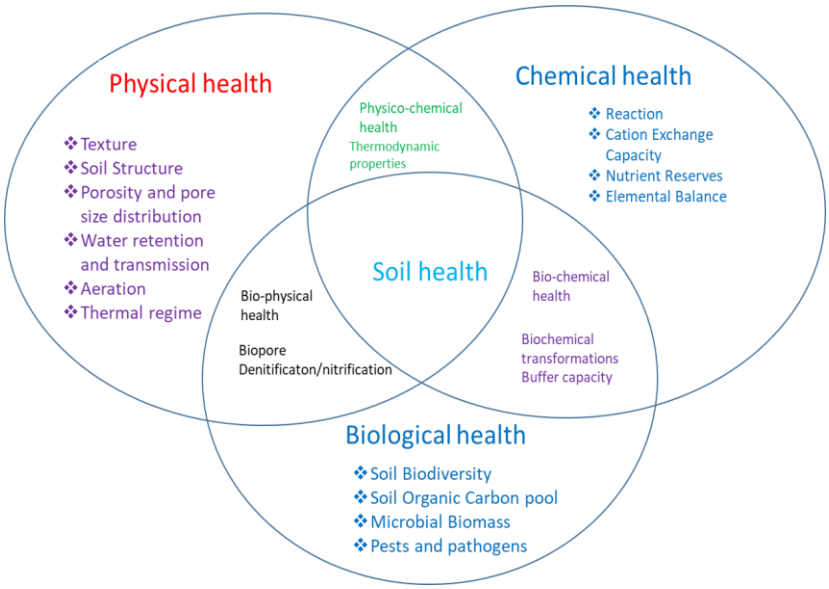
Soil Health

- Capacity of a soil to function within ecosystem boundaries to sustain biological productivity, maintain environmental quality and promote plant and animal health.
- In the context of agriculture, it may refer to its ability to sustain productivity.
- A healthy soil would ensure proper retention and release of water and nutrients, promote and sustain root growth, maintain soil biotic habitat, respond to management and resist degradation.

Components of soil health

Characteristics of a Healthy soil

- Good soil tilth
- Sufficient depth
- Sufficient but not excess supply of nutrients
- Good soil drainage
- Large population of beneficial organisms
- Resistant to degradation



Managing soil fertility in organic farming systems

- Complex relationship exit between different components of organic farm and the quantity and quality of end products depend on the functioning of the whole system.
- As such, it's very difficult to isolate soil fertility from production and environmental aspects of the system.
- Crop rotation is the central tool that integrates the maintenance and development of soil fertility with different aspects of crop and livestock production in organic systems.
- Nutrient supply to crops depends on the use of legumes to add nitrogen to the system and limited inputs of supplementary nutrients, added in acceptable forms.

ISSN: 2582 - 7022

- Manures and crop residues are carefully managed to recycle nutrients around the farm.

Solutions for soil and food quality improvements

- Mulching and recycling organic residues
- improve soil structure and quality
- Water conservation and water use efficiency
- Adoption of diversified cropping systems
- Agro-forestry and mixed farming
- No-till agriculture
- On-farm experimentation and adaptation
- Inoculating soils for improved Biological Nitrogen Fixation
- Microbial processes to increase P-uptake

CONCLUSION

- Organic farming practiced as climate resilient supplementary or substitute for conventional farming.
- Use of organic sources of nutrients increases the sustainable crop productivity, profitability, NUE and quality of crops.
- A wide array of choices are available for efficient nutrient and pest management under organic farming.
- Soil health maintain or improved by application of organic sources of nutrients.
- Organic farming helps in preventing the degradation of natural resources, reduces pollution and maintain biodiversity

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