

Organic Farming, Its Influence on Soil Health and Production

Rishikesh Tiwari^{1*} and
Pavan Para²

¹Department of Soil Science and
Agricultural Chemistry,
J. N. Krishi Vishwa Vidyalaya,
Jabalpur -482 004 (M.P.), India

²Department of Agronomy,
RVSKVV, Gwalior (M.P.), India



*Corresponding Author

Rishikesh Tiwari*

E-mail: rktiwari0761@gmail.com

Article History

Received: 25. 05.2021

Revised: 12. 06.2021

Accepted: 18. 06.2021

This article is published under the
terms of the [Creative Commons
Attribution License 4.0](https://creativecommons.org/licenses/by/4.0/).

INTRODUCTION

Organic agriculture is “ecological production management system that promotes and enhances bio-diversity, biological cycles, and soil biological activity approaches based on minimal use of off-farm inputs ecological harmony” Organic farming is “a production system, which avoids or largely excludes the use of inorganic fertilizers, pesticides, growth regulators and livestock feed additives”.

Why it is necessary?

With the development of high yielding varieties coupled with improved specified inputs such as fertilizers, pesticides, irrigation, etc., lead to environmental problems.

The soils become sick mainly due to the exploitation through:

- ▶ Use of selected and highly pure fertilizers.
- ▶ Use of irrigation without proper drainage.
- ▶ Employing poor quality waters and
- ▶ Dumping of industrial toxic effluents in to natural water courses.

Due to adverse effect of pollution of pesticide and fertilizer shown below organic farming is necessary.

Table 1:

Type of Pollution	Adverse effects of Pollution
Pesticides Related	Ground water contamination
	Residual effects in grains
	Accumulation into body tissue
	Causes cancer in human being
Fertilizer Related	Rise in concentration of nitrate in drinking which causes blue baby Syndrome and stomach cancer in human beings Rise in concentration of heavy elements into soil, Water and food.

Characteristics of organic farming:

- 1) Maximal but sustainable use of local resources
- 2) Minimal use of purchased inputs, only as complementary to local resources
- 3) Maintaining a diversity of plant and animal species
- 4) Ensuring the basic biological functions of soil-water-nutrients-humus continuum
- 5) Creating an attractive overall landscape, this gives satisfaction of the local people
- 6) Increasing crop and animal diversity in the form of polycultures, agro forestry systems, integrated crop/livestock systems, etc.

Objective of Organic farming:

- 1) To maintain high nutritional quality
- 2) To work with natural system rather than seeking to dominate them
- 3) To encourage and enhance the biological cycles with framing system
- 4) To maintain and increase the long term fertility of soils
- 5) To worked as a closed system with regard to organic matter and nutrient elements
- 6) To give all livestock, conditions of life allows them to perform all aspects of their innate behavior
- 7) To avoid all forms of pollution
- 8) To maintain the genetic diversity of the agricultural system
- 9) Allow agricultural producers an adequate return and satisfaction from their work including a safe working environment
- 10) To consider the wider social and ecological impact of the farming system.

Advantages of Organic farming:

- 1) Optimal conditions in the soil for high yields and good quality crops.
- 2) Improve soil physical properties such as aeration, root penetration and WHC.
- 3) Improve soil chemical properties and promote favorable chemical reactions.
- 4) Improve plant growth and physiological activities of plants
- 5) Reduce the need for purchased inputs.
- 6) Prevent environmental degradation and can be used to regenerate degraded areas.
- 7) Minimized the pollution
- 8) Provide healthier and nutritionally superior food.
- 9) Organic fertilizers are considered as complete plant food.

Why Do People Choose Organic Food:

1. **Better Taste** - Organic food tastes better; this is the simple message given by many people who eat organic.
2. **Healthier** - Organic foods have far less residues of pesticides, growth promoters and antibiotics. It has been shown in a number of studies that organic food contains more vitamins, nutrients and cancer-fighting antioxidants than non-organic food.
3. **Animal Friendly** - Organic farming places great emphasis on animal welfare and is more animal friendly, where animals are not treated with synthetic growth hormones or drugs.
4. **GMO Free** - Genetically Modified Organisms are not allowed in organic agriculture.

(1) International Standards

- Codex Alimentations Commission
- International Federation of Organic Movement (IFOAM). NGO

(2) Regional Standards

- European Union's Council Regulations EEC No.2092/91

(3) National Standards

USDA organic standards, Canadian organic standards, Australian organic standards, Tea Board, Coffee board, NOP in USA, Food safety Authority of Ireland, National Dairy Farm Assured Scheme (NDFAS) and Canadian sustainable Forestry certification coalition.

(4) Certification Standards

- Organic standards of Soil Association
- Organic Production standards of Netherlands and
- Organic standards of CCOF

Accreditation Agencies of Organic farming:

- APEDA
- Coffee Board
- Spices Board
- Tea Board
- Coconut Development Board
- Directorate of Cashew and Cocoa Development

Certifying Agencies in India

- ECOCERT International (Germany) - (IIRD, Aurangabad)
- SKAL International (Netherlands) - SKAL I & CA Bangalore, Mumbai
- SGS India Pvt. Ltd. - Gurgaon, Delhi.

- Association for Promotion of organic farming - Bangalore
 - INDOCERT (India) - Aluva, Kerala
- IMO India Pvt. Ltd. (Switzerland) – Bangalore

Table 2: Total Area under Organic Farming (Rank wise)

Rank	Country	Total area (Hectare)
1	Australia	1,21,26,333
2	China	34,66,570
3	Argentina	28,00,000
4	Italy	9,54,361
5	USA	8,89,048
6	Brazil	8,87,637
7	Germany	7,67,891
8	Uruguay	7,59,000
9	Spain	7,33,182
10	UK	6,90,270
31	India	1,14,132

www.fibl.org

Among all countries Australia rank first with area of 1, 21, 26, 333 hectares and India rank 31st with area of 1, 14, 132 hectares.

Components of Organic farming:

- (1) Organic manures
 - (a) Bulky organic manures (b) Concentrated organic manures (c) Green manures
 - (i) Green manuring in situ (ii) Green leaf manuring
- (2) Recycling of organic waste
 - (a) Compost (i) Vermicompost (ii) Phospho compost (iii) Bio compost
 - (b) Crop residue management
- (3) Bio fertilizers (4) Integrated nutrient management
- (5) Non-chemical weed control measures (6) Biological pest management

Table 3: Nutrient content of different organic manures

Organic manure	Nutrient content		
	N%	P2O5%	K2O
FYM	0.5	0.20	0.5
Farm compost	0.5	0.15	0.5
Town compost	1.4	1.0	1.4
Night soil	5.5	4.0	2.0
Poultry manure	3.03	2.63	1.4
Neem cake	5.22	1.08	1.48
Linseed cake	5.56	1.4	1.28
Groundnut cake	7.29	1.53	1.33
Fish manure	4-10	3-9	0.3-1.5
Row bone meal	3-4	20-25	-
Steamed bone meal	1-2	25-30	-
Blood meal	10-12	1-2	1.0

Singh et al. (2003)

Soil health:

Soil health can be defined as the "the continued capacity of soil to function as a vital living system, within ecosystem and land-use

boundaries, to sustain biological productivity, promote the quality of air, water and environments, and maintain plant, animal, and human health".

In general term that describes the ability of a soil to function.

- (1) Soil physical properties
- (2) Chemical properties and
- (3) Biological properties

Soil health governed by the following factors:

Functions of some important properties of soil for plant

Aeration	:	Roots require oxygen for respiration and nutrient uptake
Organic matter	:	The reservoir for nutrients
Soil pH	:	Regulates nutrient availability
Soil type	:	The heavier the soil the greater the ability to store nutrients
Moisture	:	Needed to dissolve nutrients in order to be absorbed by roots
Microorganism	:	Breakdown organic matter to release nutrients
Bulk density	:	Low bulk density create favorable physical condition
C:N ratio	:	Decomposition of organic matter

Influence Of Organic Farming Practices On Production:

Green Manuring:

Effect on:

1) Macro and secondary nutrients	2) Micro nutrients
3) Yield of crops	4) Reclamation of alkali soils
5) Residual activitiesn	

Vermicompost

Advantages:

a) Favorable on soil biological life.	b) Increase water retention capacity of soil.
c) Increase the aeration of soil.	d) Promote establishment of microorganisms.
e) Production of better quality of compost.	f) Addition of auxins and actinomycetes.

Integrated Nutrient Management:

Necessary due to:

1. Introduction of high yielding varieties	2. Increased use of fertilizers.
3. Depletion of organic matter.	4. Higher prices of fertilizers
5. Deficiency of micro nutrients	

CONCLUSION

Organic farming is a welcome alternative by two angles for farmers it is less financial draining, for the environment which will be less taxing to eco system and would help to improve soil fertility. Quality of agricultural produce improves by organic manures than fertilizer because of the supply of all the growth principles besides all the essential plant nutrients. As a result metabolic function get regulated more effectively and hence improvement in the quality of produce. Food

production of world fluctuates widely from place and year to year. As such, organic farming can ensure a ray of hope to sustain and increase productivity levels. The traditional organic farming coupled with bio-inputs like bio fertilizers, effective microorganisms and bio-pesticides may help to achieve the stability in agricultural production.