

## **Organic / eco-friendly agriculture - Dry farming - Concepts and principles**

**Organic farming:** Organic farming is a production system where all kinds of agricultural products are produced organically, including grains, meat, dairy, eggs, fibers such as cotton, flowers and processed food products.

Organic farming avoids or largely excludes the use of synthetic fertilizers, pesticides, growth regulators and livestock feed additives.

### **Need & scope of organic farming**

- Increase in awareness and health consciousness
- Global consumers are increasingly looking for organic food, which is considered safe, and hazard free.
- The global prices of organic food are more lucrative and remunerative.
- The potential of organic farming is signified by the fact that the farm sector has abundant organic nutrient resources like livestock, water, crop residue, aquatic weeds, forest litter, urban, rural solid wastes and agro industries, bio-products.
- India offers tremendous scope for organic farming as it has local market potential for organic products

### **Principles (International Federation of Organic Agriculture Movements - IFOAM, 1972)**

1. To produce food of high quality in sufficient quantity.
2. To interact in a constructive and life-enhancing way with natural systems and cycles.
3. To consider the wider social and ecological impact of the organic production and processing systems.
4. To encourage and enhance biological cycles within the farming system, involving micro-organisms, soil flora and fauna, plants and animals.
5. To maintain and increase the long-term fertility of soils.
6. To maintain the genetic diversity of the production system and its surroundings, including the protection of wildlife habitats.
7. To promote the healthy use and proper care of water, water resources and all life therein.
8. To use, as far as possible, renewable resources in locally organized production systems.
9. To give all livestock conditions of life with due consideration for the basic aspects of their innate behaviour.
10. To minimize all forms of pollution.
11. To allow every one involved in organic production and processing a quality of life which meets their basic needs and allows an adequate return and satisfaction from their work, including a safe working environment.
12. To progress towards an entire production, processing, and distribution chain which is both socially just and ecologically responsible.

### **Advantages of organic farming**

- Nutrition - Improved soil health makes food dramatically superior in mineral content
- Poison-free - Free of contamination with health harming chemicals like pesticides, fungicides and herbicides.
- Food tastes better
- Food keeps longer - can be stored longer
- Disease and pest resistance - because of healthy plants
- Weed competitiveness - Healthier crops able to compete
- Lower input costs - No costly chemicals used, nutrients are created in-situ (in the farm)

- Drought resistance
- More profitable - Due to greater food value of organic produce consumers are willing to pay premium prices
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### **Disadvantages of organic farming**

- Productivity - Low productivity is often reported as the quantum nutrient used comparatively lower
- Labour intensive - Cultivation requires more labour especially for weed control
- Skill - requires considerable skill to farm organically Ex. Choice of alternatives for control of pests
- Lack of convenience in management compared to easier management like fertilizer application in conventional methods

### **Synonyms of organic farming**

Eco-farming  
 Biological farming  
 Bio-dynamic farming  
 Macrobiotic agriculture

### **Eco-farming**

- Farming in relation to ecosystem.
- It has the potential for introducing mutually reinforcing ecological approaches to food production.
- It aims at the maintenance of soil chemically, biologically and physically the way nature would do it left alone.
- Soil would then take proper care of plants growing on it.
- ***Feed the soil, not the plant*** is the watchword and slogan of ecological farming.
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### **Biological farming**

Farming in relation to biological diversity.

### **Biodynamic farming**

Farming which is biologically organic and ecologically sound and sustainable farming.

## **Dryland Agriculture**

Indian agriculture is predominantly a rainfed agriculture under which both dryfarming and dryland agriculture are included. Out of the 143 million ha of total cultivated area in the country, 101 million ha (i.e. nearly 70%) area are rainfed. In dryland areas, variation in amount and distribution of rainfall influence the crop production as well as socio-economic conditions of farmers. The dryland areas of the country contribute about 42% of the total food grain production. Most of the coarse grains like sorghum, pearl millet, finger millet and other millets are grown in drylands only. The attention has been paid in the country towards the development of dryland farming. Efforts were made to improve crop yields in research projects at Manjari, Solapur, Bijapur, Raichur and Rohtak. An all India co-ordinated research project for Dryland Agriculture was launched by ICAR in 1970 in collaboration with Government of Canada and later Central Research Institute for Dryland Agriculture (CRIDA) was established at Hyderabad.

## Characteristics of Dryland Agriculture

Dry land areas may be characterized by the following features,

1. Uncertain, ill-distributed and limited annual rainfall
2. Occurrence of extensive climatic hazards like drought, flood etc.
3. Undulating soil surface
4. Occurrence of extensive and large holdings
5. Practice of extensive agriculture, i.e., prevalence of monocropping etc.
6. Relatively large size of fields
7. Similarity in types of crops raised by almost all the farmers of a particular region
8. Very low crop yield
9. Poor economy of the farmers

## Dryland Agriculture

It is the profitable production of useful crops, without irrigation, on lands (arid and semi arid) that receive annual rainfall of less than 750mm

## Rainfed Agriculture

It is the profitable production of useful crops, without irrigation, on lands (humid & subhumid regions) that receive annual rainfall of more than 750mm

## Difference between rainfed and irrigated farming

	<b>Rainfed farming</b>	<b>Irrigated farming</b>
<b>1</b>	In a certain part of the year crop is grown where rainfall received	Through out the year depending upon the water availability
<b>2</b>	Crops/crop varieties having drought tolerance or less water requirement are used	According to the need, crops or their varieties are selected
<b>3</b>	Duration of crops depends on the rainfall duration/ growing period most of the times short duration (LGP)	Depending upon the need
<b>4</b>	Mixed cropping is beneficial	Generally pure cropping is done
<b>5</b>	Due to limitation of moisture one or two crops in a year is possible	More than two crops in a year are grown, subject to availability of water
<b>6</b>	The field is ploughed to deep to increase infiltration of rains	No need for deep ploughing to conserve soil moisture
<b>7</b>	Land is prepared immediately after rainfall	Land is prepared according to optimum time of sowing
<b>8</b>	Risk of crop failure is expected due to insufficient soil moisture or drought	No risk of crop failure

## Improved dryland technologies

Following are the various improved techniques and practices recommended for achieving the objective of increased and stable crop production in dryland areas.

- **Crop planning:** Crop varieties for dryland areas should be of short duration through resistant tolerant and high yielding which can be harvested within rainfall periods and have sufficient residual moisture in soil profile for post-monsoon cropping.
- **Planning for weather:** Variation in yields and output of the dryland agriculture is due to the observation in weather conditions especially rainfall. An aberrant weather can be categorized in three types viz.,
  - a. Delayed onset of monsoon.
  - b. Long gaps or breaks in rainfall and
  - c. Early cessation of rains towards the end of monsoon season.Farmers should make some changes in normal cropping schedule for getting some production in place of total crop failure.
- **Crop substitution:** Traditional crops/varieties which are inefficient utilizer of soil moisture, less responsive to production input and potentially low producers should be substituted by more efficient ones.
- **Cropping systems:** Increasing the cropping intensities by using the practice of intercropping and multiple cropping is the way of more efficient utilization of resources. The cropping intensity would depend on the length of growing season, which in turn depends on rainfall pattern and the soil moisture storage capacity of the soil.
- **Fertilizer use:** The availability of nutrients is limited in drylands due to the limiting soil moisture. Therefore, application of the fertilizers should be done in furrows below the seed. The use of fertilizers is not only helpful in providing nutrients to crop but also, helpful in efficient use of soil moisture. A proper mixture of organic and inorganic fertilizers improves moisture holding capacity of soil and increase during tolerance.
- **Rain water management:** Efficient rain water management can increase agricultural production from dryland areas. Application of compost and farm yard manure and raising legumes add the organic matter to the soil and increase the water holding capacity. The water, which is not retained by the soil, flows out as surface runoff. This excess runoff water can be harvested in storing dugout ponds and recycled to donar areas in the server stress during rainy season or for raising crops during winter.
- **Watershed management:** Watershed management is a approach to optimize the use of land, water and vegetation in a area and thus, to provide solution drought, moderate floods, prevent soil erosion, improve water availability and increase fuel, fodder and agricultural production on a sustained basis.
- **Alternate Land use:** All drylands are not suitable for crop production. Same lands may be suitable for range/ pasture management and for tree farming and ley farming, dryland horticulture, agro-forestry systems including alley cropping. All these systems which are alternative to crop production are called as alternate land use systems. This system helps to generate off-season employment mono-cropped dryland and also, minimizes risk, utilizes off-season rains, prevents degradation of soils and restores balance in the ecosystem. The different alternate land use systems are alley cropping, agri-horticultural systems and silvi-pastoral systems, which utilizes the resources in better way for increased and stabilized production from drylands.