

## Agricultural Growth through Green Manure

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### ABSTRACT

*Green manuring is an arable-farming practice in which un-decomposed green material is in-corporated into soil in order to increase its immediate productivity. Green manure crops can be leguminous as well as non-leguminous. The practice of ploughing or turning into soil under-composed green plant tissue for the purpose of improving physical condition as well as fertility of the soil is referred to as green manure and the manure obtained by this method is known as green manure. Green manuring is widely practiced in Karnataka, West Bengal, Andhra Pradesh, Orissa, Madhya Pradesh, Punjab and Uttar Pradesh, while it is practiced on a limited scale in other States. This paper is based on the secondary data sources and the main objectives of this paper is to know the characters of green manure crops, to discuss about various types of green manuring and to understand the benefits of green manure.*

### INTRODUCTION

Green manuring is an arable-farming practice in which un-decomposed green material is incorporated into soil in order to increase its immediate productivity. Green manure crops can be leguminous as well as non-leguminous. Unlike synthetic N fertilizers, legumes utilized as green manures (GM) represent a potentially renewable source of biologically fixed N and may also fix and add large amounts of carbon to cropping systems.

The practice of ploughing or turning into soil under-composed green plant tissue for the purpose of improving physical condition as well as fertility of the soil is referred to as green manure and the manure obtained by this method is known as green manure. Green manuring is widely practiced in Karnataka, West Bengal, Andhra Pradesh, Orissa, Madhya Pradesh, Punjab and Uttar Pradesh, while it is practiced on a limited scale in other States.

### METHODOLOGY AND OBJECTIVES

This paper is based on the secondary data sources like journals, websites, news papers, official reports and other published materials.

#### OBJECTIVES

1. To find out the objectives of the green manure technique.
2. To know the characters of green manure crops.
3. To discuss about various types of green manuring.
4. To understand the benefits of green manure.

#### OBJECTIVES OF ORGANIC FARMING

1. To develop a sustainable agriculture system for guaranteed adequate food production in the foreseeable future.
2. To develop self-sufficient agriculture system.

3. To develop an alternative strategy over chemical farming this would be a guideline for the working of biological processes in natural eco-systems.

#### THE DESIRABLE CHARACTERISTICS GREEN MANURE CROPS

For green manure crops to be agro-nominally attractive and economically viable, the plants should have the following characteristics:

1. Rapid and aggressive initial growth and efficient soil cover.
2. Producing large amounts of bio-mass (green and dry matter)
3. Capacity to recycle nutrients
4. Ease of establishment and management in the field
5. Resistance to attacks by pests and diseases and not act as a host
6. A deep penetrating and well developed root system
7. Easy to manage during establishment and during incorporation into the soil.
8. Potential for multipurpose use on the farm
9. Tolerance or resistance to drought and/or frosts
10. Tolerance to low soil fertility and be adapted to degraded soils
11. Ability to produce seeds in sufficient quantities to increase the areas under the crop
12. Not invading and causing difficulties for the succeeding crop in the crop rotation.
13. Capacity to re-sprout in the event that parts of the area are cut down.

#### CROPS SUITABLE FOR GREEN MANURING

Crops suitable for green manuring are divided into two groups:

1. Non-legumes or Non-leguminous crops.
2. Legumes or leguminous crops.

**Non-legumes or Non-leguminous crops:**

The non-legumes used as green manuring crops provide only organic matter to the soil. The non-legumes are used for green manuring to a limited extent. Examples: Mustard, Wheat, Radish, Carrot, Jowar, Maize, Sunflower, etc.

**Legumes or leguminous crops:**

The legumes used as green manuring crops provide nitrogen as well as organic matter to the soils. Legumes have the ability of acquiring nitrogen from the air with the help of its nodule. The legumes are most commonly used as green manuring crops. Examples: Mung, Cowpea etc.

**TYPES OF GREEN MANURING****Green-Leaf Manuring:**

It refers to turning into soil the green leaves and tender green twigs collected from shrubs and trees grown on bunds, wastelands and nearby forest areas. The common shrubs and trees used. This system is common in eastern, southern and central India.

**Green Manuring 'In Situ':**

In this system, green manures are grown and incorporated in the same field which is to be green-manured, either as a pure crop or as an intercrop with the main crop. Generally, annual legumes such as Sesbania, cowpea and Sannhemp, etc. are used for 'in situ' green manuring.

**BENEFITS OF GREEN MANURING****Supply of Organic Matter:**

Green manure supplies organic matter to the soil. The organic residues from green manure also help to provide the stability of soil structure needed for optimum plant growth. Humus formed from green manure increases the absorptive capacity of soil, promotes drainage and granulation, which help the plant growth. Green manuring improves the structure of the soil. Organic matter stimulates the activity of soil micro-organisms.

**Addition of Nitrogen:**

The green manuring crop supplies additional nitrogen to organic matter, if it is a legume crop, which has the ability to fix nitrogen from the air with the help of its root nodule bacteria. The legume crop adds nitrogen for the succeeding crop. They return the plant nutrients of deeper layers to the upper top soil.

**Nutrient and Soil Conservation:**

Green manuring crops act as cover crop. They protect the soil from erosion and nutrient loss by taking up soluble nutrients which might otherwise have been lost in drainage water or due to erosion. Green manuring crops make available phosphorous and other nutrients for the succeeding crops. Green manure has a marked residual effect also.

**REFERENCES**

[1] Archives of "The Hindu" national daily news paper.

**Increases the Biochemical Activity:**

The organic matter added to soil by way of green manure acts as food for micro-organisms. The organic matter stimulates the activity of micro-organisms and they stimulate the biochemical changes accordingly.

**Green Manuring Increases Crop Yield:**

Green manure increases the organic matter and nitrogen content of the soil. It is proved that if green manuring is done properly, it always results in increased yields of the succeeding crops

**Building of Organic Matter and Improved Soil Structure:**

A major benefit obtained from green manuring is the addition of organic matter to the soil. Reported increases of soil organic matter following GM use often range between 0 and 1% of total soil mass.

**Improvement in Soil Physical Properties:**

Green manuring has favourable effects on soil physical properties. The soil physical properties that are affected by incorporation of the green manure include the structure, moisture retention capacity, consistency and density.

**Benefits of Rooting Action:**

The extensive root system of some green manure crops is highly effective in loosening and aerating the soil. When GM crops are planted after a sub soiling treatment, they help extend the soil-loosening effects of the sub soiling treatment.

**Weed Suppression:**

Green manure crops occupy the vacant space and light and thereby shade the soil and reduce the opportunity for weeds to establish themselves.

**Soil and Water Conservation:**

The soil conservation benefits provided by green manure crops extend beyond protection of bare soil during non-crop periods. The mulch that results from a chemically or mechanically incorporated GM. crop increases water infiltration and reduces water evaporation from the soil surface.

**CONCLUSION**

Despite high N<sub>2</sub>-fixation, addition of organic matter, increased grain yields, and various positive effects on soil physical and chemical parameters, the use of green manure legumes in crop production systems has been dramatically declining over the last 30 years. In India, green manuring is a simple yet viable technology, which will bring both short and long term benefits. In view of the supply-demand gap in fertilizers, escalating costs, environmental concerns, organic farming and sustain ability of high productivity, green manuring will perhaps be a widely adopted technology in the future.

[2] Indian Economy, Mishra and Puri.

- [3] National Sample Survey Organisation reports.
- [4] The Hindu, Survey of Environment,
- [5] [Wikipedia.org/wiki/green manure](https://en.wikipedia.org/wiki/Green_manure).