



Role of Green Manuring in Organic Farming

(Shivali Dhiman, *Sristi, Anuj Sohi and Rahul Pathania)

Dr. Yashwant Singh Parmar University of Horticulture and Forestry, HP-173230, India

*Corresponding Author's email: sristisharma519@gmail.com

Soil health degradation is one of the most important problems faced by the farmers. Due to it the land is becoming barren. Therefore, to overcome this problem the concept of organic farming came into existence. Therefore, green manuring is one of the most important types of manure used in organic farming. Green manures are fertility building crops and may be broadly defined as crops grown for the benefit of the soil. The green manuring crops improve the humus, organic carbon, nitrogen and soil microbial growth. Green manuring can bring a number of advantages to the grower. It leads to the addition of organic matter to the soil. Green manuring crops increase the biological activity in the soil. These crops improve soil structure. Green manure crops help in reducing soil erosion. They help to increase the supply of nutrients available to plants. These crops help in reducing leaching losses. It is also reported that green manuring crops help to suppress weeds, reducing pest and disease problems, providing supplementary animal forage.

Introduction

Natural nature production is the mechanism by which synthesised fertilisers, growth regulators and livestock feed additives are not or partially omitted by this system. It uses crop rotations, green manures, vegetables, crop residues, animal fumes, organic waste from the field and elements of organic pest management to sustain soil fertility and provide plant nutrients and control insecticides, pests and diseases and weeds. Green manure is an organic farming part. Green manure is the method of soil enrichment by ploughing under or soil some green manure plant when it is green or shortly after it begins to bloom. "Wort of the Green manures are due to the inclusion of organic matter in the soil." Organic matter in the soil is known for its genuine soil fertility as one of its most important elements. The disintegration of this organic matter affects the soil nutrient availability. Green manure crops are classified as crops produced for green manure. Any of the likely green manures are sunhemp, dhanicha, cowpea, mung, bean, guar, berseem and so on. Dhanicha, sunhemp, mung bean and guar cultivated during the kharif season,

Green Manuring

It is a practice of plugging in the green plants tissue grown in the field or adding green plants with tender twigs or leaves from outside and incorporating them into the soil for improving the physical structure as well as fertility of the soil.

Importance of Green Manuring

- Green Manuring contributes 40 to 80 kg nitrogen per ha.
- Besides supplying nitrogen, it prevents loss of nitrogen by leaching and erosion.
- Vigorous root system of green manure keeps the soil particles bound together.
- Green manure reclaims saline and alkaline soils.

- Some green leaf manure crops serve as fodder.
- The growth of green manure crops is very fast.

Characteristics of an Ideal Green Manure Crop

- An ideal green manure crop should have following characteristics
- It must have deep rooting system, facilitating nutrient mining from subsurface soil.
- It should have low water and nutrient requirement.
- It should be quick growing to produce abundant biomass.
- The biomass produced should have low fibrous material to facilitate quick decomposition.
- Should have high capacity to fix atmospheric nitrogen.

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:

- Rapid and aggressive initial growth and efficient soil cover.
- Producing large amounts of bio-mass (green and dry matter)
- Capacity to recycle nutrients

Ease of establishment and management in the field

- Resistance to attacks by pests and diseases and not act as a host
- A deep penetrating and well developed root system
- Easy to manage during establishment and during incorporation into the soil.
- Potential for multipurpose use on the farm .
- Tolerance or resistance to drought and/or frosts
- Tolerance to low soil fertility and be adapted to degraded soils
- Ability to produce seeds in sufficient quantities to increase the areas under the crop
- Not invading and causing difficulties for the succeeding crop in the crop rotation.
- Capacity to re-sprout in the event that parts of the area are cut down.

Green Manure is of two types:

1. Green leaf manure

2. In-situ green manure

1. Green leaf manure

- Green leaves and tender plant parts of the plants are collected from shrubs and trees growing on bunds, degraded lands or nearby forest and they are incorporated or mixed into the soil 15-30 days before sowing of the crops depending on the tenderness of the foliage or plant part.
- Forest tree leaves are the main sources for green leaf manure.
- Plants growing in wastelands, field bunds etc., are another source of green leaf manure.
- The important plant species useful for green leaf manure are neem, mahua, wild indigo, Glyricidia, Karanji (Pongamia glabra) calotropis, avise(Sesbania grandiflora), subabul and other shrubs.

2. In-situ green manure

- In this system the short duration suitable crops are grown in a field prior to crop cultivation and then cut and buried in the same site when approximately 50 percent of all plants are flowering.
- The most important green manure crops are sun hemp, Dhaincha, Pillipesara, Clusterbeans and Sesbania rostrata etc.

Advantages

- Green manuring improves soil structure, increases water holding capacity and decreases soil loss by erosion.

- Growing of green manure crops in the off season reduces weed proliferation and weed growth.
- Green manuring helps in reclamation of alkaline soils.
- Root knot nematodes can be controlled by green manuring.
- It increases the availability of certain plant nutrients like P₂O₅, Ca, K, Mg and Fe.
- Improves soil structure
- Increases water holding capacity and bulk density of the soil
- Decreases soil loss by erosion
- It improves the structure of the sub-soil by deep rooting system.
- It facilitates the penetration of rainwater, thus decreasing run-off and soil erosion.
- Green manuring checks weed growth by quick initial growth.
- Green manuring crops aid in the reclamation of saline and alkaline soil by the release of organic acids

Benefits of Green Manure Crops

- Supply of Organic Matter
- Addition of Nitrogen
- Nutrient and Soil Conservation
- Increases the Biochemical Activity
- Green Manuring Increases Crop Yield
- Building of Organic Matter and Improved Soil Structure
- Improvement in Soil Physical Properties
- Benefits of Rooting Action
- Weed Suppression
- Soil and Water Conservation

Criteria for selection of green manures include

- Plants are fleshy and soft & fast growing
- fast to decompose
- leguminous
- don't attract pests and diseases
- don't compete with crops
- provide nutrients needed in the soil

Conclusion

Green manuring technology is gaining importance due to increasing emphasis on soil health. minimize environmental pollution and cut down the use of chemical in agriculture. Application of green manure crops supplements the chemical fertilizers and restores soil fertility. Therefore, it is an eco-friendly low cost technology to conserve the natural resources besides maintaining. environmental quality in a sustainable manner.