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GREEN MANURING: A BLESSING TO HIGHER AGRICULTURAL PRODUCTIVITY

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ABSTRACT

The intensive cultivation resulted in a decline in factor productivity, soil organic carbon, soil aggregates stability, water holding capacity, soil fertility and soil biotic life. These changes may affect the agricultural production system largely. Green manuring is a process of incorporating the green plants into the soil to improve the nitrogen and soil organic matter. Green manuring is one of the important alternative approaches to improve the soil fertility and availability of nutrients in the soil for plant uptake, growth and development

INTRODUCTION

Post-green revolution, modern agriculture focussed on higher agricultural productivity and production. However, the intensive cultivation resulted in a decline in factor productivity, soil organic carbon, soil aggregates stability, water holding capacity, soil fertility and soil biotic life. These changes may affect the agricultural production system largely. Hence, the need for improving soil health was observed, and many practices were developed around the globe.

Green manuring is an important alternative to improving soil fertility and nutrient availability in the soil for plant uptake, growth and development. In simple words, green manuring incorporates green plants into the soil to improve the nitrogen and soil organic matter.

WHY NEED GREEN MANURING?

- ✓ It improves the nutrient availability for crop plants.
- ✓ It improves soil organic matter.
- ✓ It helps to improve soil aggregate stability.
- ✓ It improves the water holding capacity.
- ✓ It improves the soil's microbial and enzymatic activities.

- ✓ It breaks the disease-pest inoculum cycle.
- ✓ It increases soil aeration.

CRITERIA FOR SELECTION OF IDEAL GREEN MANURING CROP

- ✓ Quick growing
- ✓ Leguminous in nature with the ability for biological nitrogen fixation
- ✓ A crop must be cost-effective
- ✓ Requires less irrigation
- ✓ Requires less crop protection measures
- ✓ Easily decomposable on incorporation

TYPES OF GREEN MANURING

Green manuring is grouped into two types:

a. Insitu green manuring: A crop is grown in the same field and ploughed. Examples sesbania, dhaincha etc.

b. Green leaf manuring: The leaves, twigs or biomass are collected from one field and added to the field where green manuring is targeted. Examples glyceridia, calotropis etc.

Some important green manure crops based on their time of application are given below:

Crop	**Sowing time**	**Seed rate (kg ha^{-1})**	**Green biomass (t ha^{-1})**	**Nitrogen fixed (kg ha^{-1})**	**Period (weeks)**
To support *Kharif* season					
Dhaincha	April-July	70-80	20-25	80-100	6-8
Sunhemp	April-July	70-100	25-30	60-100	5-6
Cowpea	April-July	40-50	40-60	60-75	7-9
Mung bean	June-July	20-25	20-25	20-30	11-12
To support *Rabi* season crop					
Indian clover (senji)	October-December	25-30	25-30	120-130	6-8
Berseem	October-December	20-25	20	50-60	4-6

BENEFITS OF GREEN MANURING

- ✓ Good green manure crops may add 20-30 kg N, 4-5 kg P_2O_5, 17-20 kg K_2O, 1-2 kg S, 1-11.5 kg magnesium, 25 ppm zinc and 105 ppm iron.
- ✓ The green manure crop adds to soil organic matter content, which act as a source of food and energy for soil microbes.
- ✓ It helps in binding the soil particles and improves the soil aggregate stability.

- ✓ It helps to improve the water holding capacity.
- ✓ It improves the soil microbial and enzymatic activities, which helps in nutrient transformation in soil.
- ✓ It breaks the disease-pest inoculum cycle.
- ✓ It also contributes in increasing soil aeration.

SOME DIFFICULTIES IN THE ADOPTION OF GREEN MANURING

- ❖ Lack of quality seed material
- ❖ Lack of assured irrigation for decomposition of incorporated green manure crop
- ❖ Low biomass in green manure crops due to early onset of flowering
- ❖ Lack of awareness among farmers
- ❖ Lack of govt support and policy intervention

CONCLUSION

Green manuring is a process of incorporating green plants into the soil to improve nitrogen and soil organic matter. Green manuring is an important alternative to improving soil fertility and nutrient availability in the soil for plant uptake, growth and development. In addition, green manuring may help sequester carbon from the atmosphere and support efforts to combat climate change.

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