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Manures , Fertilizers and Soil Fertility Management

02. Green Manures

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02.1

Green Manuring:

It can be defined as a practice of ploughing or turning into the soil undecomposed green plant tissues for the purpose of improving the soil fertility.

Green manure refers to “a plant material incorporated with the soil while **green or **soon after maturity** for improving the soil to supply nutrients, particularly N, to a standing crop”**

(Soil Science Society of America, 1978)



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Object of green manuring

- The object of green manuring is to add an organic matter into the soil and thus, enrich it with 'N' which is most important and deficient nutrient.

Types of green manuring:

- There are two types of green manuring
- 1. Green manuring *in-situ*:
- 2. Green leaf manuring



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1. Green manuring *in-situ*:

- When green manure crops are grown in the field itself either as a pure crop or as intercrop with the main crop and buried in the same field, it is known as Green manuring *In-situ*. E.g.: Sannhemp, Dhaicha, Urd, Mung, Cowpea, Berseem, Senji, etc.

Crops suitable for green manuring

Dhaincha (*Sesbania aculeata*),
Sunhemp (*Crotalaria juncea*),
Cowpea (*Vigna sinensis*),
Pea (*Pisum sativum*),
Berseem
(*Trifolium alexandrinum*),
Lucerne (*Medicago sativa*)



Dhaincha



Sunhemp



Cowpea



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2. Green leaf manuring:

- It refers to turning into the soil with green leaves, green twigs collected from shrubs and trees grown on bunds, waste lands and nearby forest area. E.g.: Glyricidia, wild Dhaicha, Karanj

Crops suitable for green leaf manuring



Glyricidia

Glyricida (*Glyricidia maculata*),
Neem (*Azadiracta indica*)
Karanja (*Pongamia glabra*)
Wild indigo (*Tephrosia purpurea*)
Subabool



Karanja (Pongamia glabra)



Leucaena leucenalis



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Methods of Green Manuring in situ

Summer sown catch crop

Land Preparation: 3-4 ploughings followed by 1 laddering

Sowing : May-June , immediately after 1st monsoon rains.
Dhaincha and Sunhemp are generally sown in Aman Paddy field for green manuring.

Method of sowing: broadcasting

Seed Rate: Dhaincha : 40-45 kg/ha

Sunhemp : 40-50 kg/ha Moong : 25-30 kg/ha

Manuring: Superphosphate@150 kg/ha applied at last ploughing(increases the P availability for succeeding Aman rice

Burial of GM crops: At the flowering stage; (Dhaincha 6-8 wks old, Sunhemp: 4-5 wks old). During decomposition there must be adequate moisture in the field and allowed to decompose for 3-4 weeks



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Characteristics of a good manuring:

- 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.



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Advantages of green manuring

- It adds organic matter to the soil and simulates activity of soil micro-organisms.
 - It improves the structure of the soil thereby improving the WHC, decreasing run-off and erosion caused by rain.
 - Leguminous crop fixes 'N' from the atmosphere and adds to the soil for being used by succeeding crop.
- Increase Farm production - using green manures can increase the production of grains, pulses, vegetables, fodder, fuel, etc. grown on the farm.
 - Reducing weeds - green manures cover the ground and so reduce the work and cost of weeding.

Nutrient taken up from the deeper layers by green manure crops and return the nutrient to the top soil



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Disadvantages of green manuring:

- Under rain fed conditions, the germination and growth of succeeding crop may be affected due to depletion of moisture for the growth and decomposition of G.M.
- G.M. crop inclusive of decomposition period occupies the field least 75-80 days.
- Sometimes it may be costly for poor and low land farmers.
- Disease, insects and nematodes may come up due to improper decomposition

THANK YOU