

At 6-8 weeks old green manure crop of sunhemp/dhaincha accumulates about 3-5 ton/ha dry matter and 100-120kg N/ha which when incorporated *in-situ*, supplements upto 50% of the total N requirement of the rice.

Advantages of Green Manuring :

1. Deep-penetrating roots of green manures crops break open the deep layer of hard pan of the soil.
2. Brings up the nutrients from the deeper soil layer and make it available to the shallow rooted crops upon its decomposition.
3. Enrich the soil with biologically fixed nitrogen, adds organic matter and other macro and micro nutrients to the soil.
4. The organic matter added to the soil through green manures acts as a food for micro organism.
5. Green manure protects the soil from erosion and nutrient loss.

Important conclusive points of green manuring :

1. Green manuring is an effective and cheap way of improving the soil fertility.
2. For green crop legume is preferable
3. It acts as cover crop in soil erosion areas.
4. It is a good amendment source for reclamation of soil problem.
5. Young leaves can be incorporated immediately after planting but older crop is to be buried 4-8 weeks ahead of the planting.
6. Optimum dose of green biomass is 4-5 ton/ha
7. Green manure is as efficient as ammonium sulphate or urea.
8. Improves low fertility status of soils.
9. Important component of low input natural farming.

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GREEN MANURING : AN OPTION TO INCREASE SOIL FERTILITY AND CROP PRODUCTIVITY



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Green manuring is a practice of ploughing or turning of un-decomposed green plant tissues into the soil for the purpose of improving physical condition as well as fertility status of soil.

Characteristics of Green Manuring Crops :

1. Capable of establishing and growing quickly.
2. Tolerant to adverse climatic conditions such as drought, water logging, high and low temperature etc and tolerant to pests and diseases.
3. Should possess adequate *Rhizobium* nodulation potential and must be effective nitrogen fixer.
4. Should be capable of growing very fast and capable of accumulating sufficient fixed Nitrogen in 4-6 weeks.
5. Easy to incorporate and quickly decomposable.

Types of Green Manures :

(a) Green manuring *in situ* :

In this system green manure crops are grown *in situ* or in the field and buried in the same field which is to be green manured. Paddy makes good response immediately after green manuring with dhaincha.

Land Preparation : Land is prepared by giving 3 to 4 ploughings followed by planking.

Sowing of Seeds : The seeds of green manuring crops are sown in May to June, immediately after first monsoon rain. Dhaincha and Sunhemp are generally grown in paddy field for green manuring.

Method of Sowing: Green manures crops usually can be sown by broad casting.

Seed Rate :

Dhaincha	40-45kg/ha
Sunhemp	40-50kg/ha
Mung	25-30kg/ha
Berseem	20-25kg/ha
Lucern	15-20kg/ha

Burial of green manuring crops : The best time for turning the green manuring crops is when it is at flowering stage. The majority of green manuring crops take about 6-8 weeks from date of sowing to attain the flowering stage. At 6-8 weeks old Dhaincha and 4-5 weeks old Sunhemp crops are suitable for burying. The crops to be buried for green manuring should be succulent. The Green Manure crops are allowed to decompose for 3-4 weeks and then the planting of next crops is done for satisfactory results.

(b) Introduced green leaf manuring :

It refers to the collection of leaves and tender twigs from shrubs and trees grown on bunds, waste land and nearby forest areas and then incorporates them into cultivable fields. This is a very ideal practice for hilly areas. The common shrubs and trees used for greenleaf manuring are Gliricidia, Wild dhaincha, Wild indigo, Wild cassia, Subabul,

Karaja and Neem, alder, etc. *Weed species like Ambrosia, Eupatorium etc can also be used as green manuring*

Principal Green Manuring Crops :

Both legumes and non legumes are being used as green manure in India since ages. But the inherent quality of nitrogen fixation by legumes makes them more suitable as green manures. Some of the important green manure crops are as follows :

Leguminous green manure crops :

Sunhemp, Dhaincha, Blackgram, Mung, Cowpea, Khesri, Berseem, Azolla, Rice bean, Soyabean, Lentil, Pea.

Non-leguminous green manuring crops :

Bhang, Jowar, Maize, Sunflower, Mustard, Carrot, Sesame, Niger, Corinder, Wheat, Radish.

Some tips for harvesting maximum benefits from green manuring

1. Choice of crop: Leguminous crops should be given preference over non-leguminous crops.

2. Time of sowing: The best time of sowing for green manure is immediately after first monsoon showers. Seeds with 25- 30 % higher seed rate can be sown by broadcasting.

3. Time gap between incorporation & sowing of next crops: The time required for complete decomposition of the turned green matter before planting the next crop depend upon:

A. Weather condition: Hot and humid conditions favour rapid decomposition.

B. Nature of the buried green materials: Succulent tissues take lesser time in decomposition than woody tissues

C. Soil texture and availability of moisture is also important for decomposition: Normally in light textured soil with optimum moisture, sowing/planting can be done after 2-7 days; while in heavy textured soil with high moisture to water logged conditions sowing/planting should be done after 7-12 days.

Potential of green manuring : Nitrogen added in kg/ha;

Sunhemp-----84kg/ha

Dhaincha-----77kg/ha

Blackgram/greengram---38kg/ha

Cowpea -----57kg/ha

Khesari-----61kg/ha

Pea-----80kg/ha