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# Green Manuring

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## **Abstract**

**G**reen manuring is the practice for improving soil fertility and productivity by ploughing and turning undecomposed green plant tissue into the soil. It adds organic matter in to the soil and improves water holding capacity. There are two types of green manuring, *i.e.* green manuring *in situ* and green leaf manuring. Green manuring *in situ* means green manure crops like Cowpea, Dhaincha, Sunnhemp etc. are grown and incorporated in the same field. Green leaf manuring is pruning of green leaves or twigs from various trees like Glyricidia, Pongamia, Subabul, etc. are collected from elsewhere and incorporated in to another field as manure. It improves the soils' physio-chemical and biological properties and fertility.

## **Introduction**

**O**ver use of chemical fertilizers, pesticides, and others in new agricultural sector causes environmental pollution and also it depletes the soil. So now the sustainability of agricultural production and maintenance of soil fertility are of important concerns. In this regard green manuring can play an important role as it showed versatile impacts like improvement of soil physico-chemical and biological properties nutrient supply to succeeding crops, and plant protection. At the early to mid-blooming stage the green manure would be more beneficial (Marshall 2002). High concentration of N in clipped sunn hemp materials has great potential as an organic N fertilizer (Seaman *et al.*, 2004).

### **Types of Green Manuring**

There are mainly two types of green manuring, *viz.*

- I. Green manure *in situ*
- II. Green leaf manuring

### **I. Green Manuring *in situ***

**G**reen manure crops are grown in the field either as a pure crop or intercrop with main crop in the same field and it can be incorporated in to the soil as manure. The common green manure crops are sunn hemp (*Crotalaria juncea*), daincha (*Sesabania aculeata*), Pillipesera (*Phaseolus trilobus*) and guar (*Cyamopsis tetragonoloba*). Mostly legumes with fast substantial succulent vegetation are used as green manure crop. Broadcasting method of sowing can be done (Figure 1 and Table 1).

### **II. Green Leaf Manuring**

**G**reen leaf manuring refers to soil green leaves and tender twigs from shrubs and trees and nearby forest areas are collected and turned in to the soil. It includes Gliricidia (*Glyricidia sepium/ maculate*), Subabul (*Leucaena*

Table 1: Green manure crops

S. No.	Crop	Scientific name	Nutrient composition (N,P,K%)	Seed rate (kg ha <sup>-1</sup> )	Green matter yield (t ha <sup>-1</sup> )
1	Sunnhemp	<i>Crotalaria juncea</i>	2.3, 0.2, 1.4	45	9-17
2	Daincha	<i>Sesbania aculeata</i> and <i>Sesbania speicosa</i>	3.5, 0.3, 1.0	30	5
3	Wild Indigo	<i>Tephrosia purpurea</i>	1.8, 0.1, 0.3	20-25	8-10
4	Sesbania	<i>Sesbania speciosa</i>	2.71, 0.53, 2.21	35-40	16-17
5	Pillipesara	<i>Phaseolus trilobus</i>	3, 0.1, 0.3	35	3-5



1- Seed; 2- Broadcasting of seed; 3- Seedling stage; 4- Vegetative stage; 5- Flowering stage; 6- In cooperation with rotavator

Figure 1: Green manure crop (Sunnhemp) cycle from seed to incorporation

*leucocephala*), *Peltophorum* (*Peltoforum ferrugenum*), *Pongamia* (*Pongamia pinnata*), *Neem* (*Azadirchta indica*).

### Characteristics of Ideal Green Manure Crops

An ideal green manure crop should have deep rooting system, low water and nutrient requirement quick growing to produce abundant biomass. The biomass produced should have low fibrous material to facilitate quick decomposition and it should have high capacity to fix atmospheric nitrogen.

### Importance of Green Manuring

Increase use of chemical fertilizers depletes the soil. But green manure crop in cooperation increases the organic matter of soil and improves soil structure. It reduces

the soil loss by soil erosion. It acts as a source of nitrogen. Green manure crop which grown as intercrop reduces weed infestation.

### Limitations

Sufficient time should be available for growing the green manure crops and also it incurred extra expenditure for growing green manure crops. If going for green leaf manuring also extra expenditure on transport is required and green leaf manuring crops would not be available in all seasons. Some of the green manure crops are easy susceptible to pest and diseases. If we overcome these problems green manuring will give an extra benefit to the farmers and soil.

### Conclusion

Over use of chemical fertilizers can be avoided by using green manure crops. To get maximum benefit green manure crop should be incorporated into soil at proper age. It should be turned into soil at flowering stage, which is about 7-8 weeks after sowing. It fixes nitrogen and it helps to improve the fertility status of soil.

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