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IMPORTANCE OF GREEN MANURING IN CROP PRODUCTION AND SOIL HEALTH

Mamata^{1*} Roshan Choudhary¹ and Sarita Choudhary²

¹. Department of agronomy, RCA, MPUAT, Udaipur

². Department of soil science and Agricultural chemistry, RCA, MPUAT, Udaipur

* Author E-mail: n.gurjar101@gmail.com

Introduction:

Green manure crops will offer a huge number of benefits to soil and future crops. They are commonly used to improve the soil, for organic matter, nutrient or to control weeds. Green manuring has become a very important agricultural practice since last three decades, but the interest gradually has declined as the fertilizers were available readily in the market. What we now understand is that the benefits of a green manure crop far outweigh the nutrients that add back into the soil. Green manuring is a common method of conserving moisture in the soil and it also improves soil organic matter as well.

Intensive cultivation, low and imbalance use of fertilizers, soils are continuously depleted and degraded. Green manuring (GM) is a well-known practice performed by the farming communities almost around the world. Green manuring can be defined as the growing of a crop for the specific purpose for incorporating it in to soil while green, or 50 per cent flowering with a view to improving the soil and benefiting subsequent crops or Practice of ploughing or turning into the soil undecomposed green plant tissues for the purpose of improving physical condition as well as fertility of the soil.

Purpose of green manuring:

1. To increasing organic matter content in Soil
2. Maintain and improve soil structure
3. Reduce the loss of nutrients, particularly nitrogen
4. Provide a source of nitrogen
5. Reduce the soil loss by erosion

Types of green manuring: Green manuring is adopted in various ways in different states of India to suit soil and climatic conditions. Broadly speaking, the following two types of green manuring can be differentiated.

Classification of Green manuring: Classified into two groups as -

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

I. Green manuring in situ:

In this system, green manure crops are grown and buried in the same field which is to be green manured either as a pure crop or as intercrop with the main crop. This is most common green manure crops grown under this system are sunnhemp (*Crotalaria juncea*), daincha (*Sesbania aculeate*), Pillipesera (*Phaseolus trilobus*) and guar (*Cyamopsis tetragonoloba*).

- The green manure crops are mostly legumes which are fast growing and yield substantial succulent vegetation.
- There is little or no preparatory cultivation.
- Sowing is effected by broad cast adopting a heavy seed rate.
- Green manuring can be safely adopted for irrigated and irrigated dry crops.
- But when rains are sufficient and evenly distributed green manuring could be followed even under rain fed conditions when the rain fall is above 900 mm (Application of lime is suggested to neutralize organic acids that are formed during decomposition (Bone meal preferred).

Green manure crops: 1. Sunnhemp (*Crotalaria juncea*)

- i) It is a unique crop possessing, fibre, fodder and green manurial value with nutrient composition of 2.3% N, 0.2% P and 1.4% K.
- ii) It can be raised beneficially for irrigated dry conditions.
- iii) Under high rain fall conditions it is grown in dry lands.
- iv) Grown in medium fertile soils.
- v) Seed rate is 45 kg ha⁻¹.
- vi) Green matter yield 9-17 tonnes ha⁻¹.

2. Daincha (*Sesbania aculeate*) and (*Sesbania speicosa*):

- i) They are erect growing deep rooted crops and useful to open soil and improve drainage in heavy soils.
- ii) Nutrient composition (3.5% N, 0.3% P and 1.0% K).
- iii) These crops are grown on heavy soils.
- iv) They are non-fodder crops and non-palatable.
- v) They correct sodic soils specially *S. speciosa* as it is less woody and less fibrous, which gives heavy foliage and easily decomposable.
- vi) Seed rate 30 kg ha⁻¹
- vii) Yield 5 tonnes ha⁻¹

3. Indigo (*Indigofera tinctoria*)

- i) Slow growing, deep rooted drought resistant crop
- ii) It is not relished by cattle
- iii) Can be grown in fruit gardens and plantations during non-monsoon
- iv) Seed rate is 20 kg ha⁻¹
- v) Yield is 5 tonnes ha⁻¹

4. Wild indigo (*Tephrosia purpurea*)

- i) It is suited for hard coarse gravelly textured soil and poor soils
- ii) It is used as a green leaf manure also
- iii) Self grown crop when sown once
- iv) Suitable for unirrigated orchards like mango, sapota
- v) Nutrient composition crop (1.8% N, 0.1% P and 0.3% K leaf 3.2% N, 0.1% P and 1.2% K)

II. Green leaf manuring:

Green leaf manuring refers to turning into the soil green leaves and tender twigs collected from shrubs and trees grown on bunds, waste lands and nearby forest areas. The common shrubs and trees used are Glyricidia (*Sesbania speciosa*) and Karanj (*Pongamia pinnata*) etc.

Soil health and green manuring:

Soil health is one of the major factors for successful plant growth. But most of agricultural soils are deficient in organic matter and nutrients. If practices for soil health improvement and maintenance are not included in agricultural system, it can be very hazardous in future. Improvements in soil physical and chemical properties are attributed to the integrated use of green manure and fertilizers due to better nutrient uptake. Therefore, green manuring practice in our agricultural system is also helpful in maintaining the soil health. Incorporation of green manure improved soil nutrient status. Improvement of soil organic Carbon was about 12% higher over recommended practices. Soil NPK improvement was 12 to 21% by green manuring. Soil organic matter, soil health and crop growth was significantly improved by the addition of green manure Crops. Decrease in soil pH and increase in soil organic carbon was observed after three weeks of vetch green manuring compared to fallow.

Green manuring and crop yield:

Agricultural systems are leading towards Intensification. Inclusion of green manuring in our agricultural system is one of the most important factors for sustainable agriculture. Because green manure crops not only maintain but also improve the soil characteristics. These crops are also directly or indirectly involved in the yield improvement of the subsequent crop. It can be helpful for maximizing the yield of major crops. It is therefore,

dire need for improvement in our agricultural system to get maximum benefits from high yielding varieties by improving the soil health. The use of green manuring alone is not enough. Integrated use of manuring and fertilizer should be enough to cope with the requirements of high yielding varieties for crop production.

Conclusion:

Green manuring is one of the best alternatives to improve the soil health and meet thenutritional of succeeding crop. The loss of nitrogen can be prevented by the incorporation of green manure crops in the soil. Green manure crops are mostly leguminous crop because they help in the fixation of the nitrogen by the use of Rhizobium. Most commonly used crops are Dhiancha (*Sesbania aculeate*), sun hemp, guar etc. The green manure crops check soil Erosion, improve physico-chemical properties of soil, biological and provide plant protection. By the use of green manuring we can have the sustainable agriculture and evergreen agriculture as it helps in the restoring the soil quality and prevents the degradation of land.

References:

- Cherr, C. M., Scholberg, J. M. S., and McSorley, R. (2006). Green manure approaches to crop production: A synthesis. *Agronomy journal*, **98**(2), 302-319.
- Zentner, R. P., Campbell, C. A., Biederbeck, V. O., Selles, F., Lemke, R., Jefferson, P. G., and Gan, Y. (2004). Long-term assessment of management of an annual legume green manure crop for fallow replacement in the Brown soil zone. *Canadian Journal of Plant Science*, **84**(1), 11-22.
