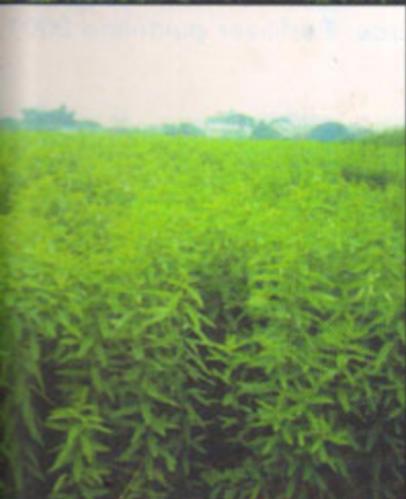


GREEN MANURING

For Sustainable Agriculture



**Laxmi Lal
P.M. Khan
Sunil Dadhich**

GREEN MANURING FOR SUSTAINABLE AGRICULTURE

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Preamble

Green manuring can be defined as practice of ploughing or turning into the soil un-decomposed green plant tissues for the purpose of improving the soil. Usually the green manure crops are turned under when they are still green, thus the name green manure. Occasionally these crops may be allowed to mature or even to lie over winter before being ploughed under and still may be classed as green manures. In the narrow sense the green manure crop is one that has been grown specifically for the purpose of being incorporated into the soil. In actual practice, however, the term is usually used to include the turning under of almost any plant material other than crop residues irrespective of its state of maturity.

Green manuring is an age old practice adopted to improve the productivity of soil. Green manuring has received little attention during past few decades, mainly because fertilizers have become the most commonly used sources for supplying nutrients to crop plants. The low costs and ready availability of chemical fertilizers has pushed back the use of green manuring all over the world. However in the face of a continuing energy crisis, increasing fertilizer prices and increasing concern for environmental degradation, green manuring is increasingly appealing as a means to reduce losses of soil organic matter, compaction, and soil erosion and still maintain economic returns. The importance of nitrogenous and organic manures in improving soil productivity is an established fact all over the world. Indian soils are deficient particularly in nitrogen and organic matter, containing on an average 0.03 to 0.07 per cent nitrogen and 0.3-0.6 per cent organic carbon against 0.1 to 0.17 per cent nitrogen and 1.0 to 3.0 per cent organic carbon in temperate climates. There is thus urgent need for an extensive use of organic

nitrogenous manure to supplement the need of essential nutrients that are deficient in our soils.

As a whole our soils are not so fertile as they once were. Commercial fertilizers can be used in adding plant nutrients to the soil, and farm manure is an excellent source of nutrient and organic matter. Only in few instances, however, is the supply of manure adequate to meet soil improvement requirements. There is need to make a greater use of soil management practices which will reduce losses of nutrients by leaching, control the devastating effects of erosion and add organic matter to the soil. Green manuring and the use of bulky organic manures for improving soil productivity is an old age practice with the farmers. FYM, Compost and green manure are commonly used organic manures. The availability of FYM and compost is getting scarce and scarce with increasing specialization and mechanization which is decreasing cattle population.

The use of cattle dung as fuel cakes imposes very serious restrictions on the available quantity of a precious indigenous supply of organic manure. Even when the whole of cattle dung is conserved and turned into useful manure, the supply of organic manure so produced would meet the need of only about 20 per cent of country's cultivated area. The demand of plant nutrient need has considerably increased with expansion of irrigation facility, introduction of high yielding varieties and intensive cropping which can not be met with cattle dung manure alone.

The use of green-manure crops will aid in these respects, since the availability of FYM and compost is getting scarce and scarce with increasing specialization and mechanization which is decreasing cattle population. Green manuring is recognized to be a good method of improving soil fertility as it can supplement the inadequate supplies of farm yard manure and other bulky organic manures, so much prized for crop production.

Increased intensification of cropping with higher production needs has encouraged scientist all over India and abroad to explore possibilities of using some alternative form of organic manure to supplement existing meager supply of FYM. Composting, however simple the technique might be, has not yet become popular with farming community due to scarcity of water, labour and time, etc. Although the use of oil cakes can supplement the need of organic

manure but their limited availability and high cost, can be used on very limited scale.

Green manuring, thus appears to be the only suitable alternative which could meet our growing demand of manurial requirements. The general consensus of opinion is that green manuring is potent enough not only to maintain soil productivity but rather improve it. However, there are certain very important considerations which restricts universal adoption of green manuring as a routine farm practice mainly due to scarcity of rainfall, irrigation facility, prevailing system of crop rotation, nature of the soil and the economics of green manuring versus an alternative paying crop. No cultivator would like to adopt green manuring if there was any possibility of getting as an alternative cash crop from his land.

A large number of experiments have been carried out in India to evaluate the relative merit of green manure and other forms of organic manuring including the use of bulky organic manures like FYM, compost, oil cakes and chemical fertilizers. These experimental data are, however, scattered in different scientific journals.

An effort has been made in the following chapter to collate information on various facets of green manuring – ease with which green manure biomass decompose under widely varying soil, temperature, rainfall and irrigation facilities. The relative utility of legumes and non-legumes as green manure has also been brought out. The effect of green manuring on soil physical and chemical properties in addition to that on nutrient availability and crop responses has been elucidate based on existing information.

Green manures can effectively meet a part of the nutrient needs of crops but can not completely replace fertilizer in realizing moderate to high yields on sustained basis: Green manuring thus constitutes an important components of integrated plant nutrient supply system along-with chemical fertilizers and biofertilizers.

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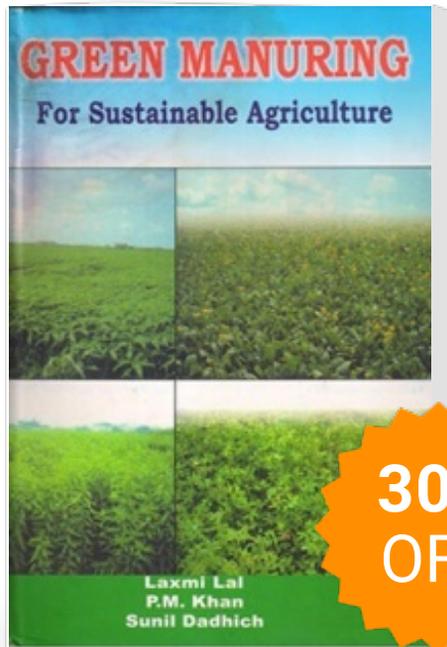
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