

## A Review

# Sunnhemp as green manure

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### ABSTRACT

Green manuring with sunnhemp is an age-old practice. But with the advent of green revolution, intensive cultivation and use of chemical fertilizer (NPK), rice-wheat-cropping system become the dominant practice both in developed and developing countries. As a result agroecosystem is being affected very badly, which is the burning concern of agriculture scientist all over the world. Sustainable Agriculture is the slogan of these days where sunnhemp can play a pivotal role as green manure in maintaining soil health and agroecosystem. Moreover, with increasing price of fertilizer farmers again realized the importance of sunnhemp. In addition to increasing organic matter, reducing soil Ph and increasing water-holding capacity, the direct and residual response of sunnhemp green manuring is quite encouraging in rice, wheat and sugarcane. Reports on amount of nitrogen addition through green manure varied considerably. But on an average 50-60 kg nitrogen /ha is being added in soil. Moreover due to succulent nature of its foliage it decompose very quickly which makes easy fit in the cropping system. Sunnhemp can be grown as dual purpose also i.e. green manure as well as fibre crop because after harvesting of fibre crop, the top portion (30 cm from top) can be incorporated in to the soil, which substantially increase the yield of succeeding crop.

**Key words :** Sunnhemp, Green Manure, Agro-ecosystem.

### INTRODUCTION

Green manuring and cultivation of quick growing crops for this purpose, chiefly of leguminous family, has been an ancient practice in most parts of the world associated with agriculture. Of the large number of crops used for this purpose, probably none suits the purpose better than *Crotalaria juncea* – a fairly rapid growing plant with relatively short life cycle capable of being raised without any special soil preparation. When ploughed down it requires comparatively short time to decompose and besides acting as an important bio-fertilizer, it also yields fibre (Datt *et al.* 1996). The use of *Crotalaria juncea* as green manure and fibre had led the agriculture scientists to advocate its cultivation in areas deficient in manurial constituents and in such localities where other crops may not be successfully grown (Singh and Singh, 1936; Singh, 1963; Panse *et al.* 1965; Sutaria and Patel, 1975 and Agarwal *et al.*, 1993).

With the advent of green revolution in rice and wheat, intensive agriculture and use of highly responsive inorganic fertilizers (NPK) its use as green manure as well as fibre has been drastically reduced. As a result of continuous rice - wheat cropping system with high doses of inorganic fertilizers, agro-ecosystem has been greatly disturbed and productivity of soil, in general, remains stagnant inspite of the addition of more and more fertilizers (Gupta and Tripathi, 2001; Narang and Gill, 1996; Mann and Ashraf, 1985; Dubey *et al.* 1997; Bhardwaj and Datt, 1995). In this backdrop, scientists all over the world started the slogan of "Sustainable agriculture" with Integrated Nutrient Management (INM) where sunnhemp would definitely play an important role in cropping system to restore and maintain the soil health and fertility (Conway and Barbier, 1990).

### Time and method of incorporation of green manure :

The time at which a green manure crop should be

buried is the most important in deriving the full benefit from the green manure. A number of investigations have been carried out on these aspects of green manuring of sunnhemp in rice, wheat and sugarcane (Panse *et al.* 1965; Mukherjee and Agarwal, 1950; Dubey *et al.* 1997; Singh, 1984). Seven to nine weeks old sunnhemp crop as green manure was found to give significant response in rice and wheat (Sharma *et al.* 2000). In case of sugarcane best result was obtained when sunnhemp was buried at 8-11 weeks after sowing (Singh and Singh, 1936 and Srivastava and Pandit, 1968). Green manuring is done either by growing green manure crop *in situ* and incorporating it in the soil by ploughing before sowing or planting the main crop or by bringing it from elsewhere and incorporating at the appropriate time before the crop is sown. The later one is called green leaf manuring where generally leaves of the perennial crop and trees such as *Gliricidia*, *Ipomoea carnea* etc are used. However, studies experiment showed that, in cases of sunnhemp or dhaincha, *in situ* green manuring is generally practiced and give better responses in comparison to green leaf manuring.

### Crop age and nutrients :

Nutritional studies concomitant with crop age were done by Singh and Singh (1936), Kanwar and Hardyal, (1959) and Srivastava and Pandit (1968). They found that the percentage of organic matter, nitrogen and other essential elements increased with the age of the plant and attained maximum at 60-75 days after sowing.

Nitrogen content of the plant increases gradually upto 60 days of sowing and thereafter it declined. Thus ploughing of the crop before or after 60 days would reduce the maximum manurial efficiency of the crop. Besides nitrogen, other inorganic constituents are also very important. In the dry matter the percentage of ash is gradually increased in the same directions as that of nitrogen. Thus the maximum amount of mineral elements is at two months stage. But

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