https://doi.org/10.29321/MAJ.10.A04458

Green leaf manuring and green manuring

By

M. KANTI RAJ
Headquarters Deputy Director of Agriculture, Madras

Introduction: The terms "Green Leaf Manuring" and "Green Manuring" convey technically different meanings, though the ultimate object is the same in both cases. The practice of lopping green leaves from trees like Pungam, Neem etc., and applying them to paddy fields is called "Green Leaf Manuring." When crops like Pillipesra, Daincha, Sunnhemp, Indigo and Wild Indigo (Kolinji or Vempali) are raised in a field for ploughing in, it is termed "Green Manuring."

Experiments conducted both in this Province and elsewhere have definitely proved that application of green leaf to paddy fields is beneficial and the yield thereby can be increased by 10—15 per cent (i.e., one to two bags of paddy per acre). The quantity normally recommended for application is about 5,000 lb. (roughly four cart loads) per acre. This should be applied in addition to cattle manure, oil cakes or chemical manures.

Green Leaf Manuring: The possibilities of green leaf manuring will be examined first, as it is not complicated with unsurmountable limiting factors. There are various trees whose leaves are suitable for green leaf manuring. Compared with all of them "Gliricidia" is a very quick growing one. The lopping of leaves can begin when the tree is about 3 years old. Each tree when fully grown i.e., after 5 years can be expected to give on an average about 200 lb. of green leaf per lopping (lopping should be done only once a year). On this basis about 25 trees are necessary to supply the required quantity (5,000 lb.) of green leaf per acre.

Gliricidia trees are best raised by transplanting seedlings. The suitable periods for raising nursery and transplanting seedlings are indicated below:

	Raise nursery in	Transplant Seedlings
(a) Places wherein rainy season commences in June — July	April — May	July — August
(b) Places wherein rainy season commences in September — October	June — July	September — October

The seedlings should be transplanted 4 to 5 feet apart. They will have to be carefully watered during the first year and protected with a "tree guard" till they are well over 6 ft. high. One pound of Gliricidia seed will cost about Rs. 5/- and there will be over 3,000 seeds in that quantity. It has already been estimated that 25 trees are required per acre and the cost of 35 seeds (allowing 10 trees for casuality) will be less than two annas. Can this amount be considered expensive? Gliricidia was introduced in 1935 in Hagari Farm from Ceylon (vide 1938—1939 Agricultural Research Station Report). It is very probable that the beautiful colour of the flowers attracted Mr. Edmonds, Ex-Deputy Director, who was responsible for its introduction. It has not spread widely because of lack of sufficient quantity of seed. In 1949 all the available quantity, about 300 lb. of seeds (i.e., 9 lakhs seed) were distributed. Only a part of the demand was met. The position is bond to improve in the years to come.

The three limiting factors involved in adopting this practice are: (a) finding suitable site (vacant back-yards etc.,) to plant the tree; (b) watering them regularly during the first year of their growth; (c) putting up "tree guards" to protect them against goats and cattle till they are over 6 ft. high. Such of the ryots who have necessary facilities to get over these factors should adopt them in their own interest—to obtain an increased yield from the paddy crop.

Green Manuring: The position with regard to raising green manuring crops is entirely different. Since the crop has to be raised right in the cultivated field, many limiting factors have to be over come.

(i) *Single Crop Wet Lands:* Let us first take the single crop paddy fields and examine the possibilites of raising green manure crops. The paddy planting seasons vary form tract to tract according to time of receipt of water in the irrigation sources, as indicated below:

		Planting	Harvesting
(a)	West Coast (Malabar and S. Kanara)	June—July	October—November
(b)	Circars (Vizag, Godavaries, Guntur and Kistna)	July—August	November—December
(c)	Central (Ceded Southern Districts)	July—October	November—February

The land will lie fallow for about six months. The green manure crops that can remain without becoming woody and fibrous and thereby rendered unfit for green manuring purpose, are Indigo and Wild Indigo.

The seeds require some amount of moisture in the soil to facilitate germination and growth during the first two months. Such conditions exist only from October to December. In practice this would mean in single crop wet lands harvested in January and after, green manure crops cannot be raised successfully. Even in lands where harvesting takes place between October -- December, a good stand of the crop can be obtained provided sufficient summer rains are received. In places where the summer showers are not received or inadequate quantity is received, the stand of the crop will be very poor.

Further, lands where harvesting takes place between October — December, if they are of heavy clay and develop wide cracks in summer, green manure crops cannot be expected to come up satisfactorily. In view of these limiting factors, it is possible to raise green manure crops — Indigo and Wild Indigo — in single crop wet lands provided (a) the harvest takes place before December; (b) the land is not heavy clay and does not develop cracks in summer; (c) some appreciable quantity of summer showers are received.

(ii) *Double Crop Wet Lands:* In the case of double crop wet lands, the fallow period will be from March — April to June — July. The green manure crops that can successfully come up during this short period, are Pillipesara, Sunnhemp and Daincha. The seeds will have to be sown in March — April after receipt of summer showers. If during the period of growth, further rains are not received, the crop will have to be irrigated at least once in two or three weeks, if sufficient quantity of green leaf is required. Owing to dearth of green forage, in this hot season the crop raised will be the main target of attack by stray cattle and goats. Careful watch has to be kept and this is possible only, if all the ryots in any particular area combine together. This is the main drawback limiting the extension of this practice.

In places, where summer showers are absent or negligible, the crop will have to be raised and maintained only with irrigation, The water will have to be drawn only from wells since no river channel or tank will then be functioning, probably with the exception of a few spring channels. The demand for irrigation water for the other standing crops would be great during this part of the year, due to excessive heat. Further there must be adequate supply of water in the wells. Invariably the wells fail in most of the cases. Under such circumstances is it any wonder that the ryots try to save the standing crops by judicious usage of failing supply of water in the wells, rather than venturing to raise green manure crop?

Conclusion: In the above paragraphs, I have made an attempt to present the limiting factors from a Provincial point of view and therefore, they do not relate to any particular region or tract. It is very likely

that in some places the limiting factors may not exist and even if they exist, the ryots would be taking special steps to overcome them. Some striking instances, I am aware of, are :—

(a) Sugarcane is planted in February—March. Two months after i.e., April—May sunnhemp seeds are dibbled over the ridge, a little away from the base of the plant. The green manure crop is pulled out in June—July, applied near the base of the plant and earthed up.

NOTE: (The sunnhemp seed should not be sown before two months, after planting the cane, otherwise cane crop will be affected)

(b) Ragi is raised as an irrigated crop in January—February. A month after transplanting seedlings, while hoeing, Indigo seeds are dibbled. The ragi crop is harvested in April—May leaving the Indigo plants behind. With the aid of summer showers and a few irrigations given irregularly, a good crop of Indigo is obtained by about July—September. It is pulled and applied to paddy fields.

(c) Scientists do not advocate growing green manure crops in dry lands and ploughing it in, the reason being, the moisture available in dry lands is limited. If a green manure crop is ploughed in, the small quantity available will be utilised by it during decomposition and there will be nothing left for the main crops cultivated afterwards. In Nandigama taluk, Kistna District, green gram is raised in April—May and ploughed in August. The main crops Jonna (Cholam), Chillies, Tobacco, are raised in September without any adverse effect on the yield. The only explanation that can possibly be given is that during August, the rainfall is heavy in the tract and it facilitates quick decomposition without drawing supply from the soil.

(d) In some parts of Pulivendla taluk, Cuddapah District, the ryots after harvesting paddy in December raise sunnhemp, cut it in March, remove the green stuff and put in pits (this is called composting) and the decomposed stuff is applied to the paddy fields in July. In some taluks, inter-space avaliable in mango topes and coconut gardens are cultivated in August—October and sown with wild Kolinji. The crop is utilised as green manure for paddy fields next year. Do these attempts not show that where there is a will, there is a way ?

(e) In some places, ryots go even as far as twenty miles to the nearest forest and bring green leaf to be applied to paddy fields, at considerable cost and inconvenience. Does this not confirm the statement that the ryots are aware of the benefits claimed for this practice ?

If these practices are not universally adopted it is not because the ryots are not aware of the benefits but because of the operation of the limiting factors. Each ryot as his own problems and he should think about methods of getting over them.