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Green Manuring Semi-dry Paddy

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Introduction: In the districts of Chingleput, North Arcot and Chittoor, the bulk of the area under paddy is sown under semi-dry conditions. The sowing is done in July–August, usually by means of a *gorru*, after the onset of the South-West monsoon. The crop makes slow progress with the limited soil moisture, but in a normal season the South-West monsoon showers are sufficient to maintain the stand of the crop in the early stages of growth. After the onset of the North-East monsoon when the tanks get filled, this "semi-dry" paddy is irrigated from the tanks and thereafter the crop is treated in the same way as a wet crop of paddy. By this system of cultivation an early sowing of the crop is rendered possible, which otherwise would have to await the onset of the North-East monsoon. The one drawback in this system is the difficulty in applying green manure to the crop. The semi-dry area is usually manured with what little farm-yard manure is available, which does not exceed five cartloads per acre. Considering the large area under semi-dry paddy a practical method of green manuring the area has to be improvised. Several methods like ploughing in green manure brought from outside a month before sowing and at the time of sowing were tried. The results were not satisfactory, as the decay and disintegration of the green matter were not complete for want of the requisite moisture and when the green leaves were applied 30 days before sowing the undecomposed matter impeded ploughing and sowing operations. Sowing the green manure seeds along with paddy, pulling out and trampling in the green manure crop about two months after sowing when the crop was irrigated, however, gave better results. The following experiment was conducted from 1946—'47 to test the efficacy of this method of green manuring semi-dry paddy.

Materials and methods: The variety of paddy used for the experiment was ADT. 22 *(Vadansamba)* the predominant semi-dry variety. As the period of growth for the green manure was limited, a quick-growing crop like sunnhemp was sown. The experiment consisted of two treatments–A. Control (Paddy sown alone) and B. Paddy intersown with sunnhemp-and was laid out in ABBA manner with twelve replications, the sub-plots measuring ¾ to 1 cent. The control plots were sown to ADT. 22 by means of a *gorru* drawn by man-power. In the 'Treated' plots, after the sowing of paddy, sunnhemp was sown by means of a *gorru* in between the lines of paddy in lines 2 ft. apart. The seedrate of sunnhemp worked out to 20 lb. and of paddy to 60 lb. per acre. Seven to eight weeks after sowing when the plots were irrigated, the sunnhemp crop in flower was pulled out and trampled in between the lines of paddy. The paddy crop was harvested and the weights of grain and straw were recorded in all the sub-plots.

The experiment was conducted from 1946—'47; but owing to the failure of the North-East monsoon in 1947—'48, 1948—'49, and 1949—'50 the semi-dry area suffered badly and the experiment failed. In 1950—'51 though the season failed, reliable results were obtained as the experiment was laid out in plots which could be irrigated from an adjoining well The results of the trials in 1946—'47 and 1950—'51 are presented below:

1946—'47.

Field Number - 4D.
Previous crop - Fodder cholam
Layout - ABBA repeated 12 times.
Size of sub plot 48' x 10'
Variety - ADT. 22 (Vadansamba).

Sown :— 28—9—1946
Harvested :— 26—2—1947
Sunnhemp pulled out and trampled in :— 17-11—1946

Treatments: A. Control - Paddy alone.
B. Paddy inter - sown with sunnhemp.

(1946—'47 contd.)

Particulars	Treatment A.	Treatment B.	General mean	'Z' test satisfied or not P = 0·05	Standard error	Critical difference P = 0·05
Acre yield of grain in pounds ...	604	856	730	Yes	25·3	78·8
Percentage on control (A) ...	100·0	141·8	...		3·47	10·8
Acre yield of straw in pounds ...	2050	2882	2478	Yes	76·88	258·5
Percentage on control (A) ...	100·0	140·5	...		3·75	12·61

Conclusions :— Grain :— B, A.
Straw :— B, A.

1951—'51.

Field Number—5F.
Previous crop—Daincha.
Layout—12 x 2 randomised blocks ABBA manner.
Size of sub-plot—47' x 7'
Variety—ADT. 22 (Vadansamba).

Sown :— 2—9—1950.
Harvested :— 25—1—1951.
Sunnhemp pulled out and trampled in :— 10-10—1950.

Treatments: A. Paddy sown alone.
B. Paddy intersown with sunnhemp.

Particulars	Treatment A.	Treatment B.	General mean	'Z' test satisfied or not P = 0·05	Standard error	Critical difference P = 0·05
Acre yield of grain pounds ...	736	941	839	Yes	54·38	169·00
Percentage on control (A) ...	100·0	127·8	113·9		7·38	22·95
Acre yield of straw in pounds ...	3750	4066	3908	No	187·6	583·70
Percentage on control (A) ...	100·0	108·4	104·2		5·00	15·56

Conclusions :— Grain :— B, A.
Straw :— Treatment differences not statistically significant.

Discussion: From the results of the experiment in the two years it may be seen that growing green manure and applying it in between the lines of paddy have increased the yield of grain in both the years and of straw in one year. The increase of straw yield in 1950—'51 did not attain statistical significance. By adopting this method of green manuring the net profit in 1946—'47 is Rs. 37—6—0 and in 1950—'51 Rs. 22—14—0 per acre as detailed below:

	1946'—47	*1950—'51.*
	Rs. A. P.	Rs. A. P.
Cost of extra pair for sowing sunnhemp—½ pair ...	1 8 0	1 8 0
Cost of 20 lb. of sunnhemp seed ...	2 8 0	2 8 0
Pulling out and trampling in the green manure at 8 women per acre ...	4 0 0	4 0 0
Total ...	8 0 0	8 0 0
Cost of extra yield of paddy @ as. 2/- per pound ...	31 8 0	25 10 0
Cost of straw at 60 lb. a rupee ...	13 14 0	5 4 0
Total ...	45 6 0	30 14 0
Net gain ...	37 6 0	22 14 0

This method of green manuring is within the reach of every cultivator. When compared to the application of other manures like groundnut, castor, neem and pungam cakes, the oil cakes are not only difficult to obtain but are more costly.

It is worth while trying the T. V. A. plan of indirect fertiliser application. In the next trial two more treatments—Paddy with super and Paddy intersown with sunnhemp with super may be included.

Summary: Several methods of applying green manure to semi-dry paddy were tried. Sowing sunnhemp along with paddy in between the lines of paddy, pulling out and trampling in the green manure crop 6 to 8 weeks after sowing gave satisfactory results.