

## EFFECT OF GREENMANURE INTERCROPPING ON RICE

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### ABSTRACT

Studies on *Sesbania* spp. as green manure in rice revealed that *Sesbania rostrata* and *S. speciosa* seedlings can be interplanted in *kharif* rice without affecting the yield and subsequent incorporation of the greenmanure biomass increased the yield *rabi* rice.

**KEY WORDS :** Rice, greenmanure, intercropping

In rice cultivation, low fertilizer use efficiency (FUE) warrants the application of higher doses of fertilizer for increased yield. But, judicious and balanced application of organic manures along with inorganic fertilizers causes an increase in the FUE. The use of greenmanures (GM) along with fertilizer N would help for N economy in low land rice (Khind *et al.*, 1982). Allocation of separate land for producing GM crops in the rice fields will alleviate this constraint. Hence, the present investigation was undertaken to find out the effect of intercropping of GM crops in the *kharif* rice and their incorporation for the succeeding *rabi* rice.

### MATERIALS AND METHODS

A field experiment was conducted at the Agricultural College and Research Institute, Madurai during the *kharif* and *rabi* seasons of 1992-93 in a randomised block design with four replications. Intercropping of three GM crops viz., *Sesbania rostrata*, *S. speciosa* and *S. aculeata* were compared with control (Table 1). The soil was sandy loam having 7.6 pH with 142, 11.2 and 325 kg/ha of available N, P K respectively. Normally, a rogue space of 30 cm is allowed at every 1.5 m interval in transplanted rice. *S. speciosa* and *S. aculeata* were planted in the rogue space of the

*kharif* rice (ADT 36) on 40th day after transplanting, adopting intra row spacing of 30 cm. After the harvest of *kharif* rice, the GM crops were cut and incorporated *in-situ*. Subsequently, *rabi* rice (IR 20) was transplanted. At the time of harvest of the first season crop, number of nodules and GM biomass were recorded and N content in the GM crops was estimated. Rice yield and other biometric observations were recorded.

### RESULTS AND DISCUSSION

Among the three GM crops, *S. rostrata* produced significantly higher biomass of 8.2 q/ha, which was closely followed by *S. speciosa* (7.8 q/ha). *S. aculeata* did not establish well under transplanted condition and hence it produced low GM biomass (Table 1).

Number of nodules was significantly more in *S. speciosa*, *S. rostrata* had lesser number of root nodules but, it had more stem nodules. This was reflected in higher N content in *S. rostrata*.

#### Effect of intercropping on *kharif* rice

The control plot (without intercrop) recorded higher rice (72 q/hq) and straw (106.6 q/ha) yields. However, there were no significant differences among intercropping treatments on grain and straw

Table 1. Effect of inter-cropping green manure crops in *kharif* rice

Treatment	Green manure			<i>Kharif</i> Rice	
	Green biomass (q/ha)	Root nodule / N plant	content (%)	Green yield (q/ha)	Straw yield (q/ha)
No intercropping	-	-	-	72.0	106.6
<i>Sesbania rostrata</i>	8.2	18(620)*	2.38	71.0	105.1
<i>S. speciosa</i>	7.8	120	1.56	71.1	105.7
<i>S. aculeata</i>	1.6	76	1.83	71.5	104.7
CD(P=0.05)	0.9	5		N.S.	N.S.

\* Figure in parenthesis is number of stem nodules

Table 2. Effect of green manure incorporation on *rabi* rice

Treatments	Plant height (cm)	Effective tillers (No.)	Grain number panicle	1000 grain weight (g)	Grain yield (q/ha)	Straw yield (q/ha)
Control	71.8	9.7	101.6	21.90	41.6	75.4
<i>Sesbania rostrata</i>	81.4	11.9	116.2	22.04	45.5	82.4
<i>S. aculeata</i>	74.6	10.3	105.6	21.96	43.3	78.2
<i>S. speciosa</i>	81.8	11.5	114.8	22.06	45.2	81.3
CD (P=0.05)	4.1	1.6	14.3	N.S.	3.6	6.3

yields. This indicated that the growth and yield of *kharif* rice was not affected by intercropping of GM in rogue space.

#### Effect of intercropping on *rabi* rice

It was observed that the growth and yield components such as plant height, effective tillers and number of grains per panicle were significantly influenced by incorporation of *S. rostrata*, which was closely followed by *S. speciosa* (Table 2). However, there was no significant effect on 1000 grain weight due to incorporation of GM crops. The efficient utilisation of mineralised N from the incorporated *S. rostrata* and *S. speciosa* along with applied fertilizer nitrogen would have increased the availability of N throughout the growth period increasing the growth and yield attributes in *rabi* rice.

Incorporation of GM exhibited a profound effect on grain and straw yield over control. Among the treatments, incorporation of *S. rostrata* recorded

significantly increased grain (45.5 q/ha) and straw (82.4 q/ha) yield which was 9.4 and 9.3 per cent higher than control respectively. The grain and straw yields obtained with *S. rostrata* incorporation were comparable with that of *S. speciosa* incorporation. The yield increase in *rabi* rice was attributed to better growth and yield components under GM incorporation with recommended level of inorganic fertilizers. Similar yield increase in rice due to combined application of inorganic fertilizer and GM has been reported by Meelu and Rekhi (1981) and Jayaraman (1991).

#### REFERENCES

- JAYARAMAN, S. (1991). Studies on the utility of *Leucaena* as green leaf manure on N economy in rice (IR 20). *Madras Agric. J.*, 78: 313-315.
- KHIND, C.S., MEELU, O.P. and VIRAJBERI. (1982) Efficiency of greenmanure substituted for applied nitrogen in rice. *Int.Rice Res.Newsl.*, 7(4):20.
- MEELU, O.P. and REKHI, R.S. (1981). Mung straw management and nitrogen economy in rice culture. *Int.Rice.Res. Newsl.*, 6(4): 21.

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## EVALUATION OF ELITE SAFFLOWER ENTRIES FOR THEIR REACTION TO APHID

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#### ABSTRACT

The re-evaluation of 21 elite safflower entries was made under both field and cages conditions at different locations for their reaction to aphid *Uroleucon compositae* T. Six entries viz., SSF-141, GMU-4608, 4625, 4627, JLSF-409 and 406 with comparatively good seed yield and less aphid population were identified as resistant to aphid. These entries could be exploited in breeding programme to develop high yielding safflower varieties with tolerance to aphids.

KEY WORDS : Safflower, elite entries, evaluation, aphid

Safflower (*Carthamus tinctorius* L.) is mainly cultivated for edible oil in this country over an area of 7.34 lakh ha with the production of 3.48 lakh tonnes. It is attacked by about 36 insect and

non-insect pest species in India (Anon., 1987). Of them, the aphid, *Uroleucon compositae* Theobald is the major pest (Akashe *et al.*, 1992) causing 35 to 72 per cent loss in yield (Suryawanshi and Pawar.