

CO 1 : A NEW *Sesbania rostrata* FOR IRRIGATED RICE FARMING

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ABSTRACT

A superior selection of *Sesbania rostrata* (Brem obra) (Sr. S1) was developed from the year 1986 to 1996 at the Paddy Breeding Station, Tamil Nadu Agricultural University, Coimbatore. The over all mean performance in station, multilocation trials and on-farm trials indicated that this culture has recorded an average yield of 24.5 t/ha as against 21.8 t/ha recorded by *S. aculeata*. The yield increase was 12.4 per cent. It has also recorded higher mean number of nodules (205) than *S. aculeata* with 210.6 per cent increase. It has high total nitrogen (3.74%) while the other *Sesbania* species viz., *S. speciosa* and *S. aculeata* recorded only 2.36 and 2.38 per cent respectively. It has low C:N ratio of 5:2 and high nitrogenase activities.

KEY WORDS : *Sesbania rostrata*, stem and root nodules, nitrogenase activity, variety

For efficient rice farming, the cheap, and higher quantity of biomass availability can be created through green manure crop like *Sesbania rostrata*. It is an introduced crop from Africa. It is preferred by the farmers because of its high biomass in shorter duration, high nodule numbers and easy decomposition. When this green manure is incorporated for rice before transplanting, about 50-80 kg of fertilizer N equivalence/ha could be achieved within 50-60 days.

MATERIALS AND METHODS

Seeds of *Sesbania rostrata* (Brem and obra) were obtained from the International Rice Research Institute, Manila, Philippines during 1986. It was raised at the Paddy Breeding Station from 1987 - 90. By adopting pure line selection procedure, promising single plants with early maturity and heavy stem nodulation were selected and named as Sr.Sel.1 (*Sesbania rostrata* selection 1). The station trials (ST) were conducted from 1991-1994 by

using the *S. aculeata* as check. During 1995-96, onfarm trials (OFT) were conducted in 25 locations through out the state. The CN ratio was estimated for *S. rostrata* in comparison with other *Sesbania* species. Similarly the total stem and root nodule numbers, nodule dry weight (g/plant) and nitrogenase activity of *S. rostrata* with other *Sesbania* were studied. A study on allround the year sowing, and the biomass yield and nitrogen accumulation in the soil was studied at 30, 45 and 60 days after sowings.

RESULTS AND DISCUSSIONS

In ST, Sr. Sel.1 has recorded the mean green matter yield of 39.8 t/ha in 45 days, while the check *S. aculeata* recorded only 36.3 t/ha (Table 1). In OFT, Sr.Sel 1 has recorded 22 t/ha as against 19.5 t/ha by *S. aculeata*. It has also recorded an average of 194 nodule number per plant as against 64 by *S. aculeata*. The over all performance revealed that the improved culture has yielded 24.5 t/ha as against 21.8 t/ha recorded by the check. Sr.Sel. 1 has also recorded higher number of nodules viz., 205 per plant as against 66 numbers registered by the check (Table 1). The qualitative and

Table 1. Over all performance of *S. rostrata* (Sr.S1) : biomass yield and nodule number

| | <i>S. rostrata</i> (Sr.S1) | | <i>S. rostrata</i> bulk/Daincha | |
|---------------------------|----------------------------|--------------|---------------------------------|--------------|
| | Nodule (Nos) | Yield (t/ha) | Nodule (Nos) | Yield (t/ha) |
| Station 1991-94 (4) | 280 | 39.8 | 80 | 36.3 |
| District trials 1995 (25) | 194 | 22.0 | 64 | 19.5 |
| Overall mean | 205 | 24.5 | 66 | 21.8 |
| % on check | 310.6 | 112.4 | 100 | 100.0 |

Table 2. Organic carbon, total nitrogen content and C:N ratio of *Sesbania* spp. after 45 days growth

| Species | Total nitrogen (%) | Organic carbon (%) | C:N ratio |
|--------------------------|--------------------|--------------------|-----------|
| <i>Sesbania rostrata</i> | 3.74 | 19.45 | 5.20 |
| <i>Sesbania aculeata</i> | 2.98 | 21.10 | 7.08 |
| <i>Sesbania speciosa</i> | 2.36 | 20.64 | 8.75 |
| CD | 0.10 | 0.63 | 0.14 |

Table 3. Performance of *S.rostrata* under year round planting cycles

| | Fresh biomass (t/ha) | | | N.Accumulation (kg/ha) | | |
|-----------|---------------------------|----|----|------------------------|-------|---------------------------|
| | 30 (Days After Sowing) | 45 | 60 | 20 | 45 | 60 (Days After Sowing) |
| January | 14 | 21 | 37 | 40.6 | 51.9 | 126 |
| February | 16 | 24 | 39 | 49.6 | 100.8 | 140 |
| March | 20 | 31 | 48 | 76.0 | 130.2 | 187 |
| April | 22 | 36 | 51 | 85.8 | 172.8 | 209 |
| May | 24 | 38 | 54 | 93.6 | 186.2 | 227 |
| June | 21 | 34 | 52 | 68.4 | 167.0 | 213 |
| July | 18 | 29 | 49 | 64.8 | 128.0 | 186 |
| August | 16 | 27 | 41 | 54.4 | 113.0 | 148 |
| September | 13 | 19 | 32 | 41.6 | 72.0 | 112 |
| October | 11 | 17 | 26 | 30.8 | 88.0 | 90 |
| November | 7 | 13 | 18 | 19.6 | 42.0 | 50 |
| December | 3 | 8 | 11 | 6.9 | 32.0 | 28 |

Experiment conducted during 1986 at Wetland Coimbatore-3.1990

quantitative analyses of green manure revealed that *S.rostrata* has high N content as compared to other green manure species. In addition, it has low organic carbon (19.45%) and low C:N ratio (5:2) (Table 2). The results of the monthly sowing experiments revealed that summer sowing (April - June) was better than other sowings (Table 3).

Thus, *S.rostrata* is more suitable for summer irrigated (or) residual moisture soil condition to raise it as green manure crop for rice based cropping system to increase the soil N pool besides improving the soil physical, chemical and biological properties through the addition of organic matter. It withstands water logging and flooding, grows well on fine textured soils and tolerates soil salinity. On decomposition, it releases on an average of 70 kg N/ha during rice cropping season and produce increase in yield up to 20- 50 per cent (Table 4). The varietal key character and the package of practices for green manure crop are as follows.

Description of variety

Plant Height : 100-150 cm (45-60 days)
350-400 cm (at maturity
120 days)

Distinguished morphological characteristics:

Stem colour : Green, nodulated
Leaves : Bipinnately compound
Flowers : Auxillary raceme (2-7)
typical papilionaceous.

Table 4. Nodule number, nodule dry weight and nitrogenase activity of *Sesbania* spp after 45 days of growth

| <i>Sesbania</i> spp | Nodule (No./Plant) | Nodule dry weight (g/plant) | Nitrogenase activity (n moles ethelene produced/g nodule/hours |
|------------------------|-----------------------|-----------------------------------|---|
| <i>S.rostrata</i> stem | 238.60 | 0.390 | 460.91 |
| <i>S.rostrata</i> root | 56.30 | 0.270 | 230.00 |
| <i>S.aculeata</i> root | 82.30 | 0.693 | 240.07 |
| <i>S.rostrata</i> root | 110.40 | 0.477 | 273.60 |
| CD | 3.94 | 2.081 | 9.52 |

Standard petal : Yellow in colour with
pinkish dots all over.

Wing petals : Bright yellow in colour

Keel petal : Light yellow in colour

Anthers : Diadelphous (9+1)

Pods : Auxillary clusters (2-5) con-
taining 15-30 seeds per pod

Seeds : Light to dark brown

1000 seed weight : 16-20 g

Maturity (range : 45 - 50 days (seed to
in number of first flowering)
days) seedling/
transplanting to
flowering

Seed to seed : 120 - 150 days (seed to seed)

Package of practices for CO 1

Seed rate : 50 kg/ha

Seed treatment : Treat the seeds with hot
water (65°C) for 10 to 15 min.
and soak them for 24 hrs.
before sowing to improve
germination
or
Treat the seeds with concen-
trated sulphuric acid for
15 min. @ 100 ml. per kg. of
seeds. Then make thorough
wash, shade drying and use
it for sowing. This treatment
gives the highest germination
(90%) and vigour index.

| | | | |
|-----------------------------|---|----------------|--|
| Method of sowing: | Seed drilling or broadcasting. | Green manure : | At 45 to 60 days after sowing, the crop will be ready for ploughing in situ as green manure crop. The plants can also be pulled out, chopped and spread to the field for decomposition before transplanting. |
| Irrigation : | As and when necessary. | | |
| To induce stem nodulation : | Collect fresh nodules from the base of the stem, make pulp and spray on the stem portion where the nodules are to be induced. | | |

Madras Agric. J., 84(7): 354-356 July 1997

PROBLEMS PERCEIVED BY THE STAFF IN THE PLANNING AND IMPLEMENTATION OF INTEGRATED RURAL DEVELOPMENT PROGRAMME

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ABSTRACT

A study was conducted in Kerala to ascertain the problems perceived by the Block Development Officers (BDOs) and Village Extension Officers (VEOs) in the planning and implementation of Integrated Rural Development Programme (IRDP). Both the BDOs and the VEOs perceived that 'misutilisation of assets by beneficiaries', 'beneficiaries lack managerial ability to take care of the assets', and 'block officials lack adequate transportation to reach beneficiaries efficiently' are the three most important problems encountered.

KEY WORDS : Integrated rural development programme, implementation, problems

The Integrated Rural Development Programme popularly known by its acronym, IRDP is the single largest anti-poverty programme currently underway in the country. The programme was launched in 1978-79 in 2800 selected blocks within the country and was extended to all the 5011 blocks with effect from 2 October 1980. The success of IRDP depends to a great extent on the effectiveness of block machinery. In this context, the block/village level officials have been assigned with important roles and responsibilities under IRDP. However, these roles and responsibilities of translating the programme from paper to action are not free from problems/constraints. With this backdrop, a study was conducted in Kerala to ascertain the problems perceived by the IRDP staff in the planning and implementation of the programme.

MATERIALS AND METHODS

An exclusive set of problems was identified based on review of literature. These problems were subjected to hairsplit analysis by discussing with

the extension experts and senior officials of Department of Rural Development. Through this process, 82 problems covering the various aspects of planning and implementation of IRDP were finally selected for inclusion in the study.

The respondents were first asked to indicate whether they perceived a particular problem as a problem. If their response is 'yes', they were further asked to rate categorically the seriousness of the problem on a three point scale ('most serious problem', 'serious problem', 'somewhat of a problem'). A weight of 3, 2 and 1 was given for these responses respectively. If they did not perceive a problem as a problem, '0' weight was given. The total score obtained by a particular problem was arrived at based on the number of respondents under each category of responses and the corresponding weight of responses. Based on the total score obtained, the 82 problems were rank ordered.