

reproductive phase indicating the predominance of dominant alleles. The estimates of the ratio $\hat{A}_2/4\hat{A}_1$ was not equal to the theoretical value of 0.25 for the traits. The ratio $(4\hat{D}\hat{A}_1)^{0.5} + F/(4\hat{D}\hat{A}_1)^{0.5} - F$ indicated the excess of dominant genes than recessive genes for plant height, days to reproductive phase and length of main spike while recessive genes for remaining characters. If the genes are dominant in nature, the extent of genetic advance over mean percentage will be high. The ratio (\hat{h}^2/\hat{A}_2) was higher than unity for all the traits except plant height and days to reproductive phase. This indicated that these characters were governed by more than one gene group. Liang and Walter (1968) reported that complementary gene action depressed the ratio in wheat. Gulati *et al.* (1976) reported in barley that a single recessive gene controlled short plant structure.

The correlation coefficient (r) between the parental order of $(W_r + V_r)$ and parental measurement (Y_r) was negative for all the traits except grain yield/plant indicated that the positive genes were mostly dominant in the expression of these characters.

The choice of the breeding methodology depends upon the nature and magnitude of gene action. It is evident from the present study that both additive and non-additive type of gene action for most of the characters studied. Additive genetic

variance is responsible to extend homozygosity in the population, while non-additive portion of genetic variance which is no doubt desirable an important to maintain the heterozygosity in the population for improvement purposes and recurrent selection could hold promise for genetic improvement of these traits.

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Stylosanthes scabra (Muyal Masal): A PROTEIN RICH DROUGHT TOLERANT FODDER LEGUME

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ABSTRACT

Among the five species of *Stylosanthes*, viz. *S. scabra*, *S. hamata*, *S. humilis*, *S. quianensis* and *S. viscosa* tested for yield potential at the Department of Forage Crops, Tamil Nadu Agricultural University, Coimbatore. *S.scabra* was found superior. This species recorded 26.57 tons of green fodder 8.79 tons of dry matter, and 1.48 tons of crude protein per ha per year. It also had maximum dry matter content, plant height, branches and leaves per plant. Based on the desirable traits and high green fodder yield potential, *Stylosanthes scabra* was released under the local name *Muyal masal* by the Tamil Nadu Agricultural University, Coimbatore in January, 1991.

KEY WORDS : *Muyal Masal*, *Stylosanthes scabra*, Fodder Legume

In general, animal productivity in the tropics and sub-tropics is low compared to temperate areas, the primary limitation being poor nutrition quantitatively as well as qualitatively (Pandey,

1990). In our country, more than 60 per cent of the land area for crop production is under rainfed condition. Only about 4 per cent of the cultivated area is under cultivated forages and it is only 1.68

Table 1. Comparative performance of *Stylosanthes* species

Species	Green fodder yield t/ha/yr	Dry matter yield t/ha/yr	Crude protein yield t/ha/yr
<i>S. guianensis</i>	25.50	6.14	1.14
<i>S. hamata</i>	26.50	6.89	1.26
<i>S. humilis</i>	24.57	6.88	1.01
<i>S. scabra</i>	26.57	8.79	1.48
<i>S. viscosa</i>	24.80	6.63	1.24

per cent in Tamil Nadu. As there is little scope of increasing the area under cultivated forages, the alternative is to produce maximum per unit area in unit time with special reference to drought tolerant, protein rich, high yielding legume in order to increase the quality of fodder.

Stylosanthes, a genus of stiff under-shrubs, has many species. Among the species adapted for areas of less than 1000 mm annual rain fall, *Stylosanthes scabra*, a perennial small browse plant, is a best pasture legume that can be utilised by the animal (Jones *et al.*, 1986). *Stylosanthes* has a lower phosphorus requirement for maximum growth than other legumes. By over sowing of the native pastures with this genus, nitrogen uptake doubled and animals were able to exceed their maintenance energy requirement (Jones, 1974). *Stylosanthes* species have great potentials in improving and stabilising animal production from tropical grasslands (Burt *et al.*, 1980; Edye *et al.*, 1984; Nandanwar *et al.*, 1991).

MATERIALS AND METHODS

The Department of Forage Crops, Tamil Nadu Agricultural University, Coimbatore obtained the seeds of *Stylosanthes scabra* from the Project Director, Dryland Development Project, Amberpet, Hyderabad. Other species *viz.*, *S. hamata*, *S. humilis*, *S. guianensis* and *S. viscosa* were collected from Alamadhi, Jhansi and Bangalore. All the four species were grown in observation plots and sufficient seed were collected. An yield trial was

conducted with the five species, randomised with three replications. The seeds were sown in September, 1987 and first cutting was taken up in December end a total of five cuttings taken till December 1986. A mixed cropping trial with *Cenchrus glaucus* Co 1 and *S. scabra* in a ratio of 3:1 was conducted.

RESULTS AND DISCUSSION

Among the five species tried (Table 1) *S. scabra* recorded the highest green fodder yield (26.57 t/ha/yr) followed by *S. hamata* 26.50 t/ha/yr. The dry matter yield also was maximum in *S. scabra* followed by *S. hamata*. Similarly, the highest crude protein yield was recorded by *S. scabra* followed by *S. hamata*. Nandanwar *et al.* (1991) recorded highest drymatter yield of 8.68 t/ha in 1988-89 with *S. scabra*

The dry matter content was maximum in *S. scabra* (Table 2) followed by *S. humilis*. *S. viscosa* had the highest crude protein followed by *S. hamata*. *S. scabra* attained the maximum plant height with the highest number of primary secondary- tertiary branches and leaves per plant (Table 2). Nandanwar *et al.* (1991) also reported that *S. scabra* recorded highest height than other species of *Stylosanthes*

The mixed cropping of *S. scabra* with Co1 (*Cenchrus glaucus*) in the ratio of 1:3 yielded 39.25 t/ha/yr. of green fodder, 11.41 t/ha/yr of dry matter and 2.89 t/ha/yr of crude protein (Table 3). The dry matter and crude protein yield of the mixed crop were 1.9 per cent and 22.8 per cent more than the pure crop. Similar findings were reported earlier by Rai (1989).

Based on the desirable performance of the species, *Stylosanthes scabra* was released under the local name *Muyal masal* by the Department of Forage Crops, School of Genetics, Tamil Nadu Agricultural University, Coimbatore during January 1991.

Table 2. Metric and quality parameters

Parameters	<i>S. guianensis</i>	<i>S. hamata</i>	<i>S. humilis</i>	<i>S. scabra</i>	<i>S. viscosa</i>
Plant height (cm)	40.3	39.9	37.7	60.2	53.3
Number of primary branches per plant	12	13	11	14	10
Number of secondary branches per plant	17	16	15	18	19
Number of tertiary branches per plant	12	11	10	13	13
Number of leaves per plant	203	204	197	274	265
Dry matter content (%)	24.03	25.85	28.01	33.10	26.75
Crude protein content (%)	18.44	18.70	14.69	16.88	18.75

Table 3. Mixed crop trial

Crop	Green fodder yield t/ha/yr	Dry matter yield t/ha/yr	Crude protein yield t/ha/yr	Percentage over Co.1	
				DMyd	Cpyd
Blou buffel	40	11.20	1.01	-	-
<i>Stylosanthes scabra</i>	32	10.59	1.79	-	72.2
Mixed crop Co.1 + <i>scabra</i> 3:1	39.25 (30.97 + 8.28)	11.41 (8.67 + 2.74)	1.24 (0.78 + 0.46)	1.9	22.8

As the seeds have tightly covering husks, they have to be treated with concentrated sulphuric acid for 3 min or boiling water for 5 min soaked in cold water for 24 h after decanting the acid and then sown. Shallow sowing to a depth of 1.25 cm has to be done for good germination. The first harvest is made at the time of first flowering which may be 75 days after sowing. Subsequently, according to the growth, 4 or 5 cuttings are taken in an year. During summer, seed multiplication can be carried out when the plants are shaken to collect the falling mature seeds or the inflorescences can be hand picked and seeds separated by threshing. The self sowing capacity of the species renders better establishment of the crop during the second year onwards. It comes up well in wide range of soils under rainfed conditions having an annual rainfall 500 to 900 mm. It is a highly drought tolerant nutritious legume fodder species suitable for arid and semi arid regions producing highly palatable green fodder.

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ANALYSIS OF STABILITY PARAMETERS FOR RICE GROWN IN SODIC SOILS

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ABSTRACT

Twenty five salinity-alkalinity tolerant rice varieties tested under sodic soil conditions over four years indicated presence of considerable genetic variation among genotypes. None of the genotype showed stability for all the traits studied. Genotype 2107 showed stability for five traits and recorded low stable grain yield. Genotype 2114 (SSRC 92217) alone recorded stable grain yield of 3072 kg/ha with average response, suitable for all environments. The genotype 2122 (SSRC 91216) recorded 3086 kg/ha of grain yield with below average response and suitable for unfavourable environment. This entry recorded above average mean for all other parameters but were not stable.

KEY WORDS : Rice, Stability Parameters, Sodic Soils

Among the abiotic stresses, salinity and alkalinity are very serious soil related constraints affecting the crop productivity of rice. The extent of area affected by salinity and alkalinity in Tamil

Nadu is over 0.30 million ha. The present investigation was undertaken to identify stable genotypes to these areas.