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Performance of Sehima Nervosum Entries Under Different Fertility Levels and Cutting Intervals in Semi Arid Region of Andhra Pradesh

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ABSTRACT

A field experiment was conducted during 2004-06 at Hyderabad with eighteen treatments comprising of three sehima entries (IGS-9901, IGS-9907 and IGS-9908), three fertility levels (control, 30 N+20P and 60N+40P kg ha^{-1}) and two cutting intervals (30 and 60 DAS). The experiment was laid out in factorial randomized block design with three replications. The pooled data of two years revealed that the sehima entry IGS-9901 supplemented with 60 N + 40 P_2O_5 kg ha^{-1} harvested at 30 days interval gave significantly higher green fodder (21.64 t ha^{-1}), dry matter (6.88 t ha^{-1}) and crude protein yield (0.35 t ha^{-1}). The performance of all entries of sehima was superior when harvested at 30 days after sowing (30DAS) at each fertility level.

Key words : Cutting interval, Entries, Fertility level, Forage yield, Sehima.

Sehima(*Sehima nervosum)* commonly known as Sen grass is one of the predominant indigenous perennial grass best suited for waste lands of arid and semi arid regions. It is having crude protein content of 5% and responds well to fertilizer application. It can be either grazed or cut and fed. Forage production of grasses is directly influenced by different agro techniques like selection of high yielding variety, nutrient and cutting management. Response to applied nutrients particularily N and P by perennial grasses is highly variable with climatic condition and genotypes (Hazra and Tripathi, 1994).Cutting interval (Harvest time) is an important management practice, which not only influences forage yield but also its quality. Grasses should be harvested at an appropriate growth stage in order to obtain higher green forage with acceptable drymatter content and nutrients, particularly protein. (Mohammed *et al.,* 1988). Hence, the present study was undertaken to study the response of pre released sehima entries to fertility levels (N&P levels) and cutting intervals under semi arid climatic conditions of Andhra Pradesh.

MATERIALS AND METHODS

A field experiment was carried out for two consecutive years (2004-05 and 2005-06) at AICRP on forage crops, Livestock Research Institute, Rajendranagar, Hyderabad, Andhra Pradesh to study the performance of Sehima entries to fertility levels and cutting intervals. The soil of the experimental field was sandy loam low in organic carbon (0.25 and 0.29),low in nitrogen (220 and 229 kg ha^{-1}) medium in available phosphorus (25.0 and 26.7 kg $ha^{-1)}$ and potash(245 and 254 kg ha^{-1}) at the start and end of the experiment, respectively. The total rainfall of 768 and 1040 mm was received in 46 and 58 rainy days during 2004-05 and 2005-06, respectively. The occurrence of most of the rains was concentrated between mid June to mid October. The treatments consisted of 18 combinations comprising of three sehima entries (IGS-9901, IGS 9907 and IGS 9908), three fertility levels i.e. control (without N & P), 30 N + 20 P kg ha^{-1} and 60 N + 40 P kg ha^{-1}) and two cutting intervals (30 and 60 days). The experiment was laid out in factorial randomised block design with three replications. The seeds of 3 sehima entries were sown in nursery beds as per recommended seed rate and transplanted in the month of May, 2004. Six-week-old seedlings of sehima grass entries were transplanted in the first week of July after first heavy downpour. Two seedlings were planted at a row-to-row distance of 50 cm and plant-to-plant 30 cm. Application of fertilizers was done as per treatment levels through urea and single super phosphate. In the first year, half dose of N and full dose of P was applied as basal and the remaining half dose of N was top dressed at one month after transplanting. In second year, half dose of nitrogen was applied and full dose

Table 1. Influence of fertility levels and cutting management on growth, yield and quality of *sehima nervosum* entries (mean of 2 years)

Treatments	Yield (t ha $^{-1}$)					
	Plant height (cm)	Leaf Stem ratio	Crude protein percent	Green fodder	Dry fodder	Crude protein
Entries (E)						
IGS 9901	106.8	0.72	4.94	21.64	6.88	0.35
IGS 9907	108.0	0.62	5.03	12.61	4.25	0.22
IGS 9908	112.0	0.66	5.28	15.13	5.50	0.30
SEm±	**5.6**	**0.03**	**0.13**	**4.4**	**1.6**	**0.1**
CD (0.05)	**NS**	**0.07**	**0.26**	**12.9**	**4.7**	**0.3**
Fertility levels (F)						
Control(No NP)	109.5	0.57	4.10	11.26	3.61	0.15
30N+20P kg ha^{-1}	107.2	0.67	5.35	18.18	6.26	0.34
60N+40P kg ha^{-1}	110.1	0.76	5.80	19.93	6.77	0.39
SEm±	**5.6**	**0.03**	**0.13**	**4.4**	**1.6**	**0.1**
CD (0.05)	**NS**	**0.07**	**0.26**	**12.9**	**4.7**	**0.3**
Cutting interval (C)						
30 DAT	98.7	0.72	4.67	17.17	5.73	0.28
60 DAT	117.2	0.61	5.51	15.75	5.36	0.30
SEm±	**4.6**	**0.03**	**0.10**	**3.6**	**1.3**	**0.1**
CD (0.05)	**9.3**	**0.09**	**0.21**	**10.6**	**7.9**	**0.3**
CV%	**15.4**	**15.2**	**7.5**	**8.0**	**8.9**	**11.7**
Interaction						
E X F						
SEm±	9.7	0.06	0.2	7.6	2.8	0.2
CD (0.05)	NS	NS	0.4	22.3	8.2	0.4
E X C						
SEm±	7.9	0.05	0.2	6.2	2.3	0.2
CD (0.05)	NS	NS	0.4	NS	NS	NS
F X C						
SEm±	7.9	0.05	0.2	6.2	2.3	0.2
CD (0.05)	NS	NS	NS	NS	NS	NS
E X F X C						
SEm±	13.7	0.08	0.3	10.8	4.0	0.3
CD (0.05)	NS	NS	0.9	31.8	11.8	NS

of P was applied in the first fortnight of June with the onset of early showers and the remaining half dose of N was top dressed at one month after first application. Two cuts were taken in each year. The data on growth and yield were recorded at each cut and pooled for two years. Standard procedures were followed for drying and analysis of plant samples.

RESULTS AND DISCUSSION

The perusal of data (Table 1) indicated that performance of sehima entries was significantly influenced due to fertility levels and cutting interval. Growth in terms of plant height of sehima entries did not showed significant variation due to fertility levels. Plant height of sehima entries was significantly higher at cutting interval of 60 days compared to 30 days. Leaf stem ratio of entry IGS 9901 was significantly higher over other entries and was followed by IGS9908 and IGS 9907 respectively. Among fertility levels, leaf stem ratio was increased linearly from control ('0' N P) and reached maximum at 60 N + 40 P kg ha^{-1} . Leaf stem ratio was significantly higher at cutting interval of 30 days than that of 60 days. Non significant interaction between entries, fertility levels and cutting intervals was observed on plant height and leaf stem ratio of sehima.

Green, dry fodder yield and crude protein yield of sehima entry IGS 9901 was significantly higher over other entries and registered an increase of 71.6, 61.9 and 59.1 percent over IGS 9907 and 43.0, 25.0 and 16.7 percent increase over IGS 9908 in terms of green, dry fodder yield and crude protein yield respectively. Green, dry fodder yield and crude protein yield was significantly increased from control ('0' NP) to 60 N + 40 P kg ha^{-1} . But the increase was 61.7 to 73.7 per cent from ('0'NP) Kg ha^{-1} level to 30 N + 20 P kg ha^{-1} whereas the increase was only 8.0 to 9.6 per cent from 30 N + 20 P kg ha^{-1} to 60 N + 40 P kg ha^{-1} . Trivedi (2001) reported an increase of 20 and 22 percent biomass was found with N (40 kg ha^{-1}) and P (25 kg ha^{-1}) alone respectively. Green and dry fodder yield were significantly higher at cutting interval of 30 days than that of 60 days. However, crude protein percent and crude protein yield was slightly higher at cutting interval of 60 days the higher yield of grasses with harvest of 60-70 interval could be ascribed to optimum period available for the growth of grasses (Ram *et al*, 2008).

The interaction of three factors i.e. entries, fertility levels and cutting interval was significant for green and dry fodder yield (Table). The entry IGS 9901 supplemented with 60 N + 40 P kg ha^{-1} harvested at 30 days interval gave significant higher green fodder (26.98 t ha^{-1}) and dry matter yield (8.02 t ha^{-1}) and it was on par with cutting interval of 60 days and also with yield of same entry at fertility level of 30 N+ 20 P kg ha^{-1} at both cutting intervals. The performance of all entries of sehima was superior when harvested at 30 days after sowing at each fertility level.

Thus, it is suggested that sehima entry IGS-9901 supplemented with 60 N + 40 P kg ha^{-1} and cutting interval of 30 days was found optimum and may provide higher biomass for sustaining the livestock of semi arid region

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