

Short Communication

Forage Production as Influenced by Pasture Treatments in Research and On-farm Trials

N.K. Sharma

Agricultural Research Station, Keshwana, Jalor 343 001, India

Development of wastelands through establishment and management of pasture prevents land degradation and facilitates forage production. About 1.8 lac hectare of land in Transitional Plain of Luni Basin (zone II) is under permanent pasture. Establishment and management techniques can improve their productivity, and forage requirement of livestock can also be largely met (Sharma *et al.*, 1999). The objectives of the study were to quantify the effects of different pasture establishment techniques on pasture production, and to acquaint the farmers with pasture establishment techniques through demonstration.

The field experiment was conducted at ARS, Keshwana, Jalor, as well as in Korana watershed of Ahore Panchyat Samiti (an administrative unit) of district Jalor (Rajasthan). In watershed area the experiment was conducted in the fields of three farmers. The experiment was laid out in 5 x 4 m plots in factorial RBD with 12 treatments listed in Table 1.

In the last week of June, dry sowing of *C. ciliaris* was done in rows 50 cm apart under rainfed conditions. Complete basal dose of FYM, phosphorus and 20 kg nitrogen was applied at the time of sowing and 20 kg nitrogen was top dressed

in the last week of July. Fertilizers were given through DAP and urea. The grass germinated after an effective rain in the first week of July. The grass was harvested in the first week of September and green forage yield was recorded.

Bunding increased forage production by 6.5% over non-bunded plots (Table 1). The differences between banded and non-banded plots were more pronounced in low rainfall zone and on sloping lands. During growing period (July and August), precipitation received was 230 mm. There were 21 rainy days. Therefore, in seasons or areas where precipitation and number of rainy days are less, the effect of bunding may be more pronounced due to higher rate of infiltration due to checking the flow of rain water. Hence, water will be available to the plant over a longer period, resulting in good growth and production of the grass.

Sowing of *C. ciliaris* grass provided significantly higher forage yield (46.6%) over natural grass. This suggests that the reseeding with improved seed increases the productivity of natural pastures or range lands. Reseeding also prevented growth of unwanted plants. Venkateswarlu *et al.* (1992), while reviewing the work of CAZRI, Jodhpur, concluded that protection, moisture

Table 1. Green forage yield ($t\ ha^{-1}$) of *Cenchrus ciliaris* with bunding, seeding and fertilizer application at Research Farm of ARS, Keswana, Jalor and at farmers' fields

Treatments	Research Farm	Farmer 1	Farmer 2	Farmer 3
Bunding				
No bunding	11.00	8.64	5.25	5.50
Bunding	11.71	9.13	5.65	5.78
SEm \pm	0.26	-	-	-
CD (P = 0.05)	NS	-	-	-
Reseeding				
Natural grass	9.21	*	1.71	**
Sown pasture	13.50	8.88	5.45	5.64
SEm \pm	0.26	-	-	-
CD (P = 0.05)	0.75	-	-	-
Fertilization				
Control	10.44	8.23	3.62	4.64
N & P ₂ O ₅ @ 40 kg ha ⁻¹	11.38	9.04	6.23	5.87
5 t FYM + N & P ₂ O ₅ @ 40 kg ha ⁻¹	12.25	9.38	6.50	5.41
SEm \pm	0.31	-	-	-
CD (P = 0.05)	0.92	-	-	-

* Plots were dominated by cucurbits growing naturally, and grass was negligible

** Germination of natural grass was almost nil.

conservation, reseeding with improved strains at proper time, fertilizer application and adoption of deferred rotational grazing considerably increased forage production. Singh (1988) reported increase in forage yield by 30 to 122% under different rangelands due to reseeding.

Application of nitrogen and phosphorus @ 40 kg ha⁻¹ significantly increased the forage yield over control (where no fertilizer was applied). The yield of grass with 5 t FYM + 40 kg N ha⁻¹ + 40 kg P₂O₅ ha⁻¹ was 7.7% higher over 40 kg N and 40 kg P₂O₅, but differences were not significant. Singh and Singh (1973) reported that fertilizer application increased forage yield by 55 to 130% and seed yield by 30 to 100%, over their respective controls.

Forage yield on the farmers' fields (Table 1) shows similar trend. On farmers' fields, the effect of bunding was not so pronounced, but the forage yield from *C. ciliaris* grass was higher than from natural grasslands (Table 1). Effect of fertilization was variable in different fields due to varying degree of soil fertility.

It is concluded that reseeding of improved varieties, along with bunding of plots to conserve rain water and fertilizer application is required to increase productivity of the pasture lands.

Acknowledgements

Thanks are due to Associate Director Research and staff members of ARS, Jalor, for cooperation and Directorate of Watershed Development and Soil

Conservation, Jaipur, for financial assistance.

References

- Singh, K.C. 1988. Management of arid rangelands of Rajasthan. In *Wasteland Development and Their Utilization* (Ed. K.A. Shankarnarayan), pp. 287-293. Scientific Publishers, Jodhpur.
- Singh, R.P. and Singh, K.C. 1973. Seed production in some promising desert grasses grown on drylands as influenced by fertilizer use. *Indian Journal of Agronomy* 18: 562-563.
- Sharma, N.K., Singh, R.P., Yadav, M.S. and Singh, K.C. 1999. *Forage Production in Drylands of Arid and Semi-arid Regions*. Scientific Publishers, Jodhpur.
- Venkateswarlu, J., Ram, A., Purohit, M.L., Khan, M.S., Bohra, H.C., Singh K.C. and Mathur, B.K. 1992. *Forage 2000 AD - The Scenario for Arid Rajasthan*, CAZRI, Jodhpur, 32 p.