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Productivity of grasses in association with *Hardwickia binata* under rainfed conditions

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Keywords: *Cenchrus ciliaris*, *Chrysopogon fulvus*, *Hardwickia binata*, Moisture conservation practices, *Panicum maximum***Introduction**

Adoption of silvipasture system on wastelands offers, without impairing the growth of trees, an extra yield of grass during monsoon season and top feed during summer seasons. The leaf fodder from the hardy trees and shrubs serve as an insurance against fodder scarcity during drought to the livestock. In view of this the present study was carried out to assess the productivity of different grasses in association with *Hardwickia binata* under moisture conservation practices under rainfed condition.

Materials and Methods

A field experiment was conducted on sandy loam soil during 2008-2013 at Central Research Farm (25° 27' N latitude, 78° 37' E longitude and 275 m above mean sea level) of Indian Grassland and Fodder Research Institute, Jhansi to assess the productivity of different grasses in association with *Hardwickia binata* under moisture conservation practices in semiarid rainfed condition. There were 9 treatment combinations replicated thrice in randomized block design. The treatment consisted of establishment of three grasses viz. *Cenchrus ciliaris*, *Chrysopogon fulvus* and *Panicum maximum* and construction of three mechanical measures for moisture conservation viz. staggered trenches (2 m x 0.5 m x 0.5 m), bunding and control (without bund and staggered trenches).

Results and Discussion

Growth parameters and pruned yield of *H. binata* did not affected significantly by establishment of different grasses (Table 1). However, construction of staggered trenches recorded significantly higher height (4.22 m), diameter at breast height (7.01 cm), dry leafy forage yield (0.44 t ha⁻¹) and fire wood (0.49 t ha⁻¹) of *H. binata* as compared to control treatment (without trenches- height 3.88 m, diameter at breast height 6.34 cm, leafy forage yield 0.36 and fire wood 0.36 t ha⁻¹) in 5th year of establishment. Enhanced tree growth was also reported under staggered trenches by Shukla *et al.* (2014) in bael.

Intercropping of Guinea grass with *S. hamata* in association with *Hardwickia binata* produced significantly higher dry forage yield (7.41 t ha⁻¹) as compared to intercropping of *Chrysopogon fulvus* (5.21 t ha⁻¹) and *Cenchrus ciliaris* with *S. hamata* (6.43 t ha⁻¹). In mechanical measures, construction of bund resulted in significantly higher total dry forage yield from pasture (6.89 t ha⁻¹) than control treatment (5.57 t ha⁻¹). Kumar *et al.* (2009) have also reported highest forage production *i.e.* > 7.0 t DM ha⁻¹ in aonla through *in-situ* moisture conservation.

Table 1. Effect of moisture conservation measures and grasses on dry forage yield of pasture, growth parameters and pruned dry yield of *Hardwickia binata*

Treatment	Dry forage yield (t ha ⁻¹)	<i>Hardwickia binata</i>			
		Height (m)	Diameter at breast height	Pruned dry yield (t ha ⁻¹)	
				Leaves	Fire wood
Grasses					
<i>C. ciliaris</i>	6.43	4.08	6.82	0.42	0.45
<i>C. fulvus</i>	5.21	4.01	6.73	0.40	0.43
<i>P. maximum</i>	7.41	4.05	6.35	0.39	0.41
CD (P=0.05)	0.49	NS	NS	NS	NS
Moisture conservation measure					
Control	5.57	3.88	6.34	0.36	0.36
Trenches	6.59	4.22	7.01	0.44	0.49

Bund	6.89	4.04	6.56	0.41	0.45
CD (P=0.05)	0.49	0.25	0.48	0.04	0.06

Conclusion

It can be concluded that intercropping of Guinea grass with *S. hamata* in association with *Hardwickia binata* and construction of bund in sandy loam soil produced maximum dry forage yield from pasture. In *H. binata* construction of staggered trenches resulted in highest growth parameters and pruned dry leafy forage yield and fire wood in 5th year of establishment.

References

- Kumar, Sunil, A. K. Shukla., Ramesh Singh, S. Tiwari and A. K. Rai. 2009. Establishment of hortipasture system in drought through soil and water conservation measure. *IGFRI Newsletter* 15: 6.
- Shukla, A. K., Sunil Kumar., S. N. Ram, H. V. Singh, S. G. Watpade and K. K. Pramanick. 2014. Bael (*Aegle marmelos*) based hortipastoral system with moisture conservation in semiarid condition. *Journal of Tree Sciences*. 33: 7-11.