Use of forage legumes to restore overgrazed natural grasslands in Uganda

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Introduction The natural grasslands of Uganda support over 95 % of the country's livestock. They are also used by wildlife and protect soil resources from heat and erosion. Unfortunately, the pastoral/agro-pastoral communities which derive their livelihoods from these grasslands have in turn degraded them through overgrazing and uncontrolled burning, thus lowering their productivity (pasture and animal production) and biodiversity. The natural grasses (e.g. *Panicum maximum, Brachiaria brizantha, Setaria anceps, Themeda triandra*) mature rapidly and lose quality. Furthermore, the indigenous legumes (e.g. *Neonotonia wightii, Desmodium adcsendens, Indigofera errecta*) are less persistent and productive to maintain feed quality and hence animal production. There is a need to introduce into the grassland ecosystem alternative forage legumes that combine both persistence and productivity.

Materials and methods A total of eight exotic forage legume species (Table 1) and one indigenous species (*Neonotonia wightii*) were planted into natural grass (*Brachiaria brizantha, Setaria anceps* and *Themeda triandra*) plots on four farms using over-sowing techniques (Sabiiti, 2003). Observations on emergence, seedling vigour, leafiness and reseeding ability were carried out after emergence through flowering to seed production in one year. Subsequently, herbage was clipped to determine dry matter (DM) yield and % crude protein (CP).

Results All the introduced forage species performed better than the indigenous species (*Neonotonia wightii*) (Table 1). The exotic legumes all performed better in terms of seedling emergence, seedling vigour, and leafiness and reseeding ability than the native legume. The inclusion of forage legumes into the natural grasslands more than doubled the DM yield (Table 2), and increased the percent CP above the minimum animal intake requirement of 7% (Humphreys, 1978). The most productive species in terms of DM production were *M. atroperpureum, C. pubescens, D. uncinatum, D. intortum* and *C. rotundifolia.*

Table 1 Performance of the nine forage legume species in natural grass plots in Mbarara, Uganda

Species	% Emergence*	Vigour	Leafiness	Reseeding ability
Macroptilium atropurpureum	80	10	8	6
Centrosema pubescens	75	8	7	6
Cassia rotundifolia	80	9	7	10
Desmodium intortum	75	8	8	5
Desmodium uncinatum	75	8	8	5
Stylosanthes guianensis	60	7	5	5
Stylosanthes scabra	60	6	5	5
Neonotonia wightii	50	5	5	4
Desmanthus virgatus	70	7	6	8

Score scale: 1-3 = Poor adaptability, 4-6 = Moderate adaptability, 7-10 = High adaptability (scores were based on %emergence, vigour, leafiness and reseeding ability); *Based on viable seed sown

Table 2 Productivity of natural grasslands planted with exotic forage legumes species in Mbarara, Uganda

Farm	Grass plots	Mean DM (kg/ha)	Mean % CP
1	No legume	1875	6.2
	Legume	5142	8.1
2	No legume	1724	5.9
	Legume	4462	8.4
3	No legume	1460	5.7
	Legume	3870	8.9
4	No legume	1054	6.2
	Legume	4275	9.5

Conclusion This study shows that it is possible to increase grassland production in terms of herbage yield and quality by introducing exotic forage legumes into pastoral/agro-pastoral production systems.

References

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