

## Breeding and evaluation of forage soyabeans

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**Introduction** The principal use of soyabean in the US in the early 1900s was as livestock forage. Soyabeans are less expensive to establish than small seeded perennial legume forages and can provide legume protein after winter killing of perennial legumes. Soyabean can improve production distribution by vigorous growth during the hot summer season when traditional perennial legumes are less productive.

**Materials and methods** Three soyabean cultivars were bred for forage production: Donegal, Derry and Tyrone. At Orange, VA, Tyrone and the grain-type cultivar Hutcheson were interplanted with pearl millet and sorghum and tested for height and forage yield. At Ames, IA, Derry and Donegal were tested with Hutcheson in four replications for yield and forage quality (Darnosarkoro, 2001).

**Results** At Orange the forage soyabean cultivar grew taller than Hutcheson and was more competitive with pearl millet than Hutcheson (Table 1). All soyabeans were overgrown by the sorghum. At Ames the forage lines showed a yield advantage over Hutcheson (Table 2). For the earlier-maturing cultivars Donegal and Hutcheson crude protein declined in mid-season and then increased. For all cultivars, IVDMD decreased over the growing season.

**Table 1** Height and yield at Orange, VA, 1996

Soyabean lines and associated species	Height (cm)		Yield t/ha
	Grass	Soybean	
Sorgo 10	231	0	9.34
P. Millet	137	0	6.94
Hutcheson	0	91	6.25
Hutcheson & Sorgo 10	236	106	8.74
Hutcheson & P. Millet	142	99	8.56
Tyrone	0	180	8.00
Tyrone & Sorgo 10	239	147	9.68
Tyrone & P. Millet	150	168	9.79

**Table 2** Yield, *in vitro* dry matter digestibility (IVDMD) and crude protein (CP), g/kg, Ames, IA, 1994

Cultivar	Forage yield t/ha	Days after planting								
		46	60	74	88	102	116	130	144	
Derry	11.5	702	644	590	558	566	550	537	564	IVDMD
		260	219	180	154	158	157	155	150	CP
Donegal	10.2	698	634	595	581	574	618	597	626	IVDMD
		243	198	168	142	160	184	184	197	CP
Hutcheson	8.1	703	666	625	608	596	595	598	609	IVDMD
		260	229	195	177	171	169	190	183	CP
LSD (0.05)	1.7	13.2	17.2	20.0	17.5	19.9	19.2	43.5	27.0	IVDMD
		12.4	14.3	11.6	12.5	9.9	11.4	20.2	12.9	CP

**Conclusions** The forage cultivars grew significantly taller than conventional grain-type soyabean cultivars, suggesting their ability to better compete in the sward with other tall growing species such as pearl millet. Yields of the forage soyabeans were higher than yields of conventional grain cultivars.

### Reference

Darnosarkoro, M., M.M. Harbur, D.R. Buxton, K.J. Moore, T.E. Devine & I.C. Anderson (2001). Growth, development, and yield of soybean lines developed for forage. *Agronomy Journal*, 93, 1028-1034.