

# An appraisal of the potential for soybeans in the United Kingdom

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**Introduction** Soybean is a most important crop worldwide, accounting for 56% of world oilseed production and 69% of world protein meal consumption in 2003 (Soystats, 2004). Since their introduction in the early 1800's, forage soybeans have been grown widely in USA. Used originally as a forage crop, this use largely had been forgotten until Dr T. E. Devine (United States Department of Agriculture, Agricultural Research Service; USDA-ARS) released 4 new forage cultivars. Soybeans potentially offer UK farmers a high quality protein source in a short season and also meet the requirements of supermarket chains to remain GM free. This paper aims to indicate whether soybeans can be grown successfully in the UK.

**Materials and methods** Field trials at the Royal Agricultural College in 2000-01 and 2003-04 investigated the potential of soybeans as a forage source for on-farm feeding. The site was in the Cirencester area on a calcareous, stony, reddish brown clay (Sherborne series). The trials focused on varietal selection, fertiliser applications, inoculant use and harvest date. All forage varieties were sourced from the USDA-ARS. Grain varieties originated mainly from eastern Europe, with one entry from Canada. Samples were assessed for DM Yield, Crude Protein and Fibre Content (NDF). Scores of resistance to lodging were noted also.

**Results** Forage yields varied between seasons and between harvest dates; forage varieties yielded more than grain types at later harvests. Largely due to predation at emergence, plant populations were variable. Covering the crop with fleece immediately after drilling in 2004 increased plant populations (data not shown). A pre-emergent herbicide, used in all seasons, controlled most grass weeds but was ineffective against *Solanum nigrum* and *Bilderdykia convolvulus*. Mean CP values ranged from 11-14% DM; values up to 20% DM were recorded but not consistently. The best adapted forage types yielded >10t DM/ha in a poor season (Table 1).

**Table 1** Mean yield and nutrient content of whole crop soybeans evaluated in Cirencester

Variety	Type	Year	Source	Origin	DM Yield t/ha	CP % DM	NDF % DM
Tara	Forage	2003	USDA-ARS	USA	11.5	11.31	37.4
Donegal	Forage	2001	USDA-ARS	USA	12.2	12.46	40.2
7P116	Forage	2001	USDA-ARS	USA	8.9	13.68	43.4
8GH-85-2	Forage	2001	USDA-ARS	USA	7.1	13.26	44.8
Altesse	Grain	2003	Premium Crops	Canada	7.04	13.92	45.3

**Discussion** In order to assess the suitability of whole crop soybean for use as a forage crop in the UK, a SWOT analysis shows its benefits and limitations:

Strengths	Weaknesses
Crude Protein content: 11-14 (max 20) %DM	Cost and effectiveness of weed control
Yield: 7-12t (max 18) t DM/ha	Varietal choice
Short growing season	Few herbicides approved
Low fertiliser input	Lack of literature and guidelines for successful cropping.
No disease problems to date	High seed cost
Opportunities	Threats
Non GM protein	Predators (birds, rabbits)
Export	Weed control
Nitrogen fixation- reduced fertiliser costs	Frost
	Risk of lodging in wet seasons

**Conclusion** These initial trials suggest that soybeans may be a viable option as a high yielding forage crop for UK conditions. However, substantial difficulties must be overcome.

## References

Soystats (2004). Soybean Production 2003. [online]. Soystats. Available from: <http://www.soystats.com/2004> [Accessed 15/08/04]