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LINKING LIVESTOCK AND LIVELIHOOD

ABSTRACT PAPERS

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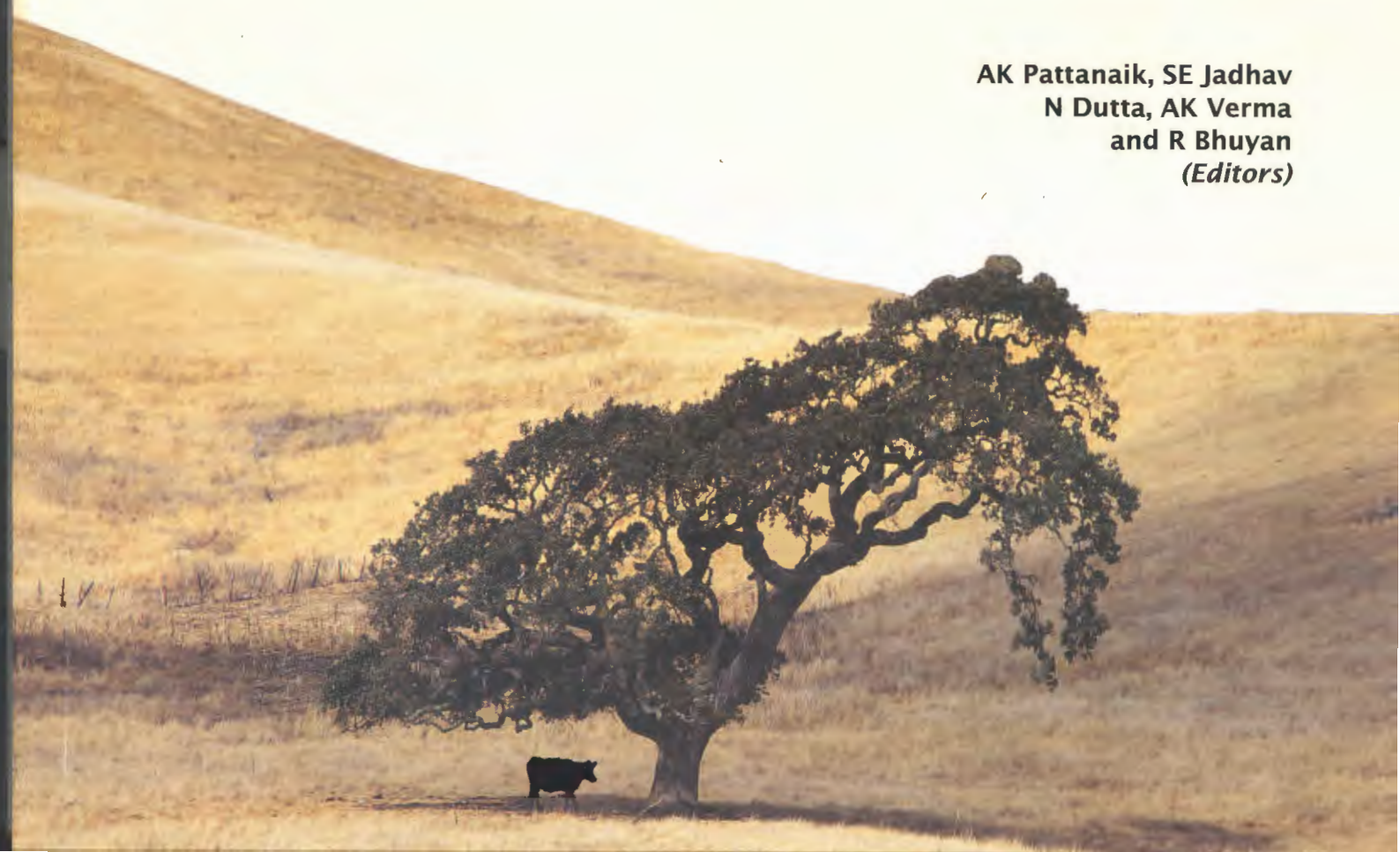

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Variation in Vegetable Soybean for Fresh Pod and Haulm Yield and Forage Quality

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SUMMARY: Vegetable soybean (*Glycine max* (L.) Merr.) is a type of soybean in which the immature pods are harvested for human consumption. The crop residues or haulms may be used as livestock feed or as green manure. Twenty six vegetable soybean lines grown in Hyderabad, India during June 2013 showed significant variation for fresh pod and haulm yield and forage quality traits. Vegetable soybean lines, SwarnaVasundhra and AGS 406 were the best performer in terms of fresh pod yield, haulm yield and *in vitro* organic matter digestibility.

Keywords: Dual purpose, Fodder legume, Food legume

BACKGROUND

Vegetable soybean is a type of soybean (*Glycine max* (L.) Merr.) from which the immature pod is harvested at R_6 growth stage (when pods are still green and the beans in the pods are 80% mature)and used as a fresh or frozen vegetable. Immature pods are boiled and the seeds extracted as a highly nutritious snack food. It is popularly known as *edamame* in Japan, *maodou*in China and green soybean in North America (Carter and Shanmugasundaram, 1993). Vegetable soybean seeds are larger (over 30g/100 seeds), have a milder flavor, nuttier texture and are easier to cook in comparison to grain soybean (Nair *et al.* 2013).After the harvest of the fresh pods, the crop residues may be used as livestock feed. Here we report on the testing of 26 vegetable soybean lines for fresh pod yield and forage quality traits.

METHODOLOGY

Twenty six vegetable lines were sown in a randomised block design with four replicates in Hyderabad, India during June 2013 (Kharif season). Data on fresh pod yield/plant(SY) and haulm yield/plant (HY) were recorded at R_6 stage. In addition, nitrogen (N) content, neutral detergent fibre (NDF), acid detergent fibre (ADF), acid detergent lignin (ADL), metabolisable energy (ME) and*in vitro* organic matter digestibility (IVOMD) were determined by Near-Infrared Reflectance method. Four lines (3 best (SwarnaVasundhra, AGS 406 and GC 84501-32-1) and 1 poor (AGS 459) based on performance during 2013) were grown during June 2014 (*Kharif* season) in the same location adopting similar experimental design as in 2013. A combined analysis of the data from 2013 and 2014 was conducted for the above mentioned traits. Broad sense heritability estimates were worked for the traits.

RESULTS

Significant variation ($P<0.05$) was observed for all the traits studied for the vegetable soybean lines (Table 1). Swarna Vasundhra, AGS 406 and GC 84501-32-1 recorded highest values for fresh pod yield. In terms of forage yield, Swarna Vasundhra, AGS 610 and GC 84501-32-1 were the best performers. GC 84501-32-1, AGS 406 and AGS 292 showed the highest values for nitrogen content. In the case of IVOMD, Swarna Vasundhra, AGS 610 and AGS 330 recorded the highest values. Fresh pod yield showed significant ($P=0.05$) and positive association with haulm yield, nitrogen content and IVOMD. During 2014, line x year interaction was significant for haulm yield, seed yield, N content, ME and IVOMD. High heritability estimates were recorded for N content, NDF, ADF, ADL and IVOMD. Haulm yield and metabolisable energy showed moderate heritability values.

Table 1. Variation among vegetable soybean lines grown in Hyderabad, India during 2013 for fresh pod, haulm yield and forage quality

Line	N	NDF	ADF	ADL	ME	IVOMD	HY kg/ha	PY kg/ha	SY kg/ha
AGS 292	2.1	33.3	25.6	4.9	8.6	61.4	170.0	1961.1	111.9
AGS 328	2.0	40.9	32.9	7.0	8.7	61.4	241.1	1369.5	236.1
AGS 329	1.5	48.9	38.2	8.6	8.4	58.0	158.9	1633.8	403.8
AGS 330	1.9	35.9	28.9	5.4	8.8	62.0	303.3	1694.9	371.3
AGS 380	1.8	39.8	29.2	6.1	8.7	60.9	128.9	1771.7	109.3
AGS 404	1.9	39.8	32.3	6.6	8.8	61.6	383.3	2373.7	510.1
AGS 406	2.1	30.0	23.9	4.5	9.4	66.2	587.8	3783.0	900.8
GC05047-708-1	1.7	45.1	36.5	7.8	8.7	60.5	281.1	2313.0	345.1
GC05050-347-2	1.8	44.2	34.5	7.5	8.9	61.5	120.0	800.3	78.9
GC05051-380-3	1.8	43.5	32.7	7.0	8.7	60.7	75.6	596.7	52.9
GC05051-400-4	1.6	42.5	33.8	7.0	8.9	61.3	322.2	1899.5	357.3
GC05052-SN31-2	1.7	51.7	41.7	9.4	8.7	59.7	334.4	1983.4	298.1
GC84501-32-1	2.4	36.4	24.1	5.6	8.6	61.8	610.0	3594.7	727.6
SwarnaVasundhra	2.1	35.7	24.5	5.3	8.7	61.1	871.1	4612.7	978.8
P	<0.0001	<0.0001	<0.0001	<0.0001	0.001	0.001	<0.0001	<0.0001	<0.0001
LSD	0.38	9.84	7.43	2.10	0.53	3.85	155.24	480.89	3.85

CONCLUSION

The study showed the potential for selection of vegetable soybean lines for haulm yield and most of the forage quality traits.

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