

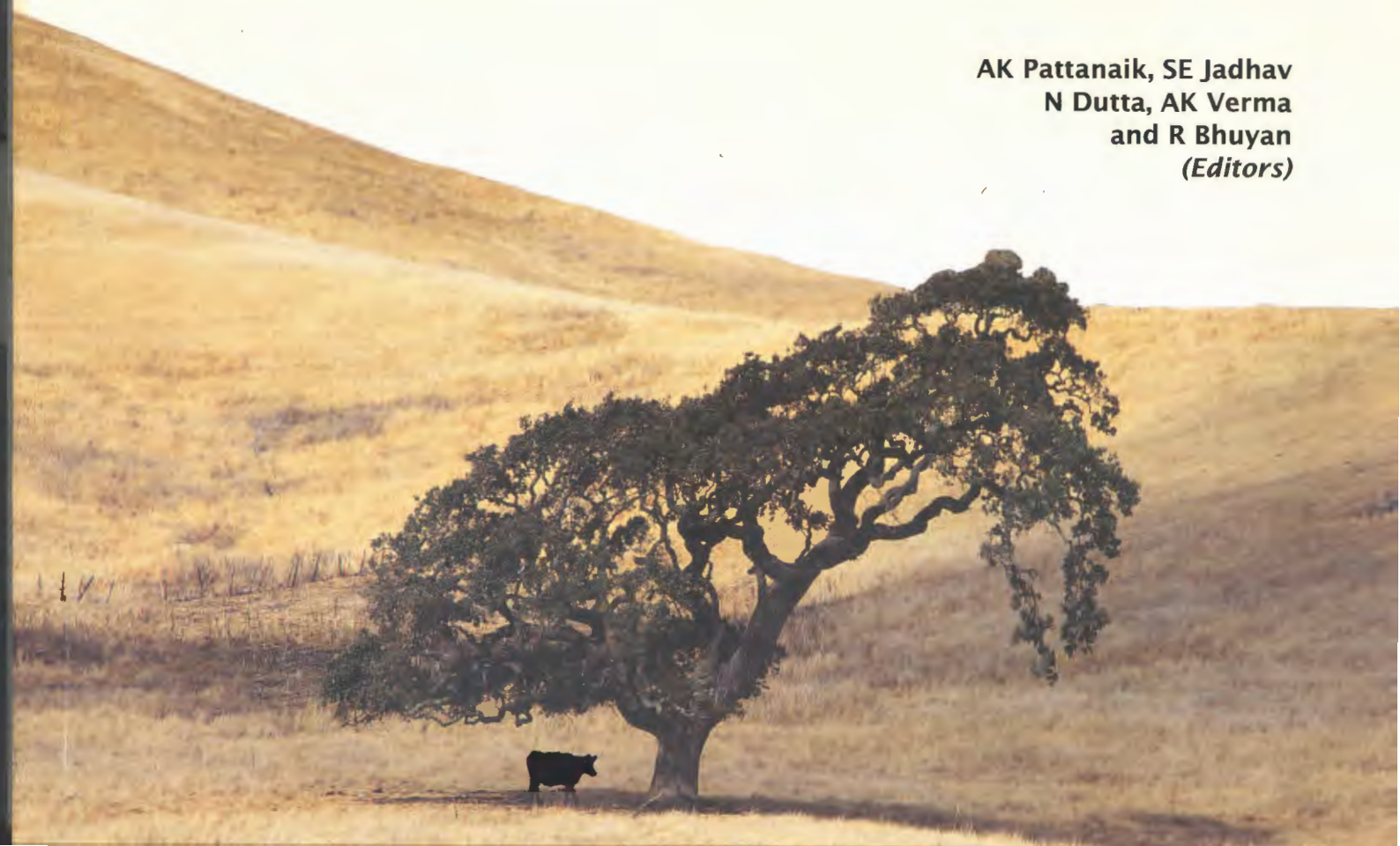
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# **ECO-RESPONSIVE FEEDING AND NUTRITION**

**LINKING LIVESTOCK AND LIVELIHOOD**

**ABSTRACT PAPERS**

**AK Pattanaik, SE Jadhav  
N Dutta, AK Verma  
and R Bhuyan  
(Editors)**



## Evaluation of Different Cultivars of Sorghum for Fodder Quality and Agronomic Performance in Semi-Arid Tropics

K.S.Vinutha, P.Srinivasa Rao\*, G.S. Anil Kumar, K.V.S.V. Prasad<sup>1</sup>, Y. Ramana Reddy<sup>1</sup>, R.S. Prakasham<sup>2</sup>, V.V.N. Yaswanth<sup>2</sup> and M. Blümmel<sup>1</sup>

International Crops Research Institute for the Semi-Arid Tropics, Patancheru-502324, India

<sup>1</sup>International Livestock Research Institute, Patancheru-502324, India

<sup>2</sup>Indian Institute of Chemical Technology, Hyderabad-500 007, India

\*Correspondence: p.srinivasarao@cgiar.org

**SUMMARY:** Thirty four improved sorghum cultivars were evaluated for fodder quality and agronomic performance using two cuts harvested during the rainy season 2014 at ICRISAT, Patancheru following randomized complete block design with two replications. Within cuts consistent significant cultivar difference were only observed for biomass yields which ranged from 17.3-33.8 t ha<sup>-1</sup> in the first cut to 3.2 and 17.4 t ha<sup>-1</sup> in the second cut. Within and across cuts cultivar-dependent variations in fodder quality traits were statistically largely insignificant and inconsistent.

**Keywords:** Agronomy, Cultivars, *In vitro* evaluation, Laboratory traits, Sorghum

### BACKGROUND

The Indian livestock sector is expected to emerge as engine of agricultural growth because of the increasing demand for animal sourced food. However feed and fodder shortage are serious constraints, since out of the 55 micro-regions of the country, 43 suffer feed and fodder shortages. Also land and water are becoming scarce, and there is a growing demand for green forage options that are high yielding but more water use efficient than for example maize. To date development agencies made little headway in increasing the area under fodder cultivation, which still hovers around 4 to 5% of the cultivatable area. More attractive forage options in terms of fodder biomass, biomass fodder quality and water use efficiency are needed. Multi-cut sorghum forage cultivars might provide such an option, particularly for closing seasonal fodder gaps in small scale but intensifying dairies in India.

### METHODOLOGY

A total of 34 improved sorghum cultivars (11 grain, 11 sweet sorghum, 6 forage, 5 germplasm accessions and 1 *bmr*) were evaluated for feed quality and agronomic performance, in two cuts during rainy season 2014, at ICRISAT, Patancheru, following randomized complete block design with two replications. The traits recorded were nitrogen content (N), acid detergent lignin (ADL), metabolizable energy (ME) and *in vitro* organic matter digestibility (IVOMD) along with dry biomass yield (t ha<sup>-1</sup>). Five representative plants from two rows were harvested, dried and ground to pass through 1 mm mesh. All samples were analyzed by near infrared spectroscopy (NIRS; Foss Forage Analyzer 5000 calibrated for this experiment against conventional chemical and *in vitro* analyses. General linear model (GLM) was used for analysis of variances (SAS, 2008).

### RESULTS

Mean and ranges in some key fodder traits are reported in Table 1. The nitrogen content ranged from 2.23-2.89% and 2.06-2.72%, in first and second cut respectively. The mean ADL was little affected by date of harvest while IVOMD increased from 55.7 to 59.7% from first harvest to second

**Table 1.** Important fodder traits in 34 sorghum lines

Parameters	Harvest		
	I cut	II cut	I cut - II cut
<i>Stover nitrogen (%)</i>			
Mean	2.56	2.4	2.47
Range	2.23-2.89	2.06-2.72	2-27-2.70
Probability	0.44	0.99	0.73
<i>ADL (%)</i>			
Mean	4.18	4.25	4.22
Range	3.59-4.70	3.95-4.59	3.86-4.56
Probability	0.03	0.77	0.46
<i>IVOMD (%)</i>			
Mean	55.7	59.7	57.7
Range	52.5-58.9	57.1-62.6	55.8-60.1
Probability	0.75	0.18	0.69
<i>ME (MJ kg<sup>-1</sup>)</i>			
Mean	7.99	8.6	8.29
Range	7.59-8.37	8.29-8.96	7.99-8.66
Probability	0.84	0.09	0.82
<i>Dry biomass yield (t ha<sup>-1</sup>)</i>			
Mean	22.9	8.47	15.6
Range	17.3-33.8	3.2-17.4	11.0-23.0
Probability	0.0082	<.0001	0.65

cut (Table 1). Similar trend was observed for ME (7.99 to 8.20 MJ kg<sup>-1</sup>). The dry biomass ranged from 17.3-33.8 t ha<sup>-1</sup> in first cut and from 3.20-17.4 t ha<sup>-1</sup> in second cut.

### CONCLUSION

The evaluated sorghum cultivar significantly differed for dry biomass productivity at both cuts. Date of harvest had stronger effects on fodder quality traits than cultivar. While observed ranges in key forage traits such as N, IVOMD, ME among cultivars would be livestock nutritionally significant, they could not statistically be confirmed. Analyzing just two field replications apparently yield insufficient number observations for analysis.

### REFERENCE

SAS. 2008. Statistical Analysis System. SAS Institute Inc. Release 9.2 ed. Cary, New York, US.