

## Fodder Potential of Multicut Pearl millet Genotypes during Summer Season

T. Shashikala\*, K. N. Rai, R. Balaji Naik, M. Shanti, V. Chandrika and K. Loka Reddy

AICRP on Forage Crops, Acharya N.G. Ranga Agricultural University, ARI, Rajendranagar Hyderabad, Andhra Pradesh (500 030), India

### Article History

Manuscript No. 432

Received in 28<sup>th</sup> August, 2013

Received in revised form 25<sup>th</sup> October, 2013

Accepted in final form 4<sup>th</sup> December, 2013

### Correspondence to

\*E-mail: tshashikala69@gmail.com

### Keywords

Pearlmillet genotype, dry, green fodder, multicut, summer

### Abstract

Pearlmillet (*Pennisetum americanum*) is a quick growing, short duration food crop and an outstanding summer fodder crop of dry areas. Majority of recommended fodder pearl millet varieties were evolved and released based on their single cut performance, but farmers are habituated to go for 2-3 cuts in. Therefore, an experimental study was taken up during summer 2008-09 at AICRP on Forage Crops, Hyderabad centre with nine pearl millet genotypes comprising of six varieties, two hybrids and one sorghum cultivar SSG (Jumbo) in a randomized block design with three replications to assess and identify the pearl millet genotypes having high fodder yield potential and also high nutritive value under multicut experimentation. The results revealed that among nine genotypes studied, the variety ICMV 08111 (811 q ha<sup>-1</sup>) has recorded significantly high green fodder yield and it was on par with the genotypes ICMA 00999×ICMA 05444 (810 q ha<sup>-1</sup>) followed by Rijko Bajra (791 q ha<sup>-1</sup>), ICMV 05777 (784 q ha<sup>-1</sup>), ICMA 00999×IP 17315 (770 q ha<sup>-1</sup>), ICMV 05555 (720 q ha<sup>-1</sup>) than that of the check variety SSG (Jumbo 552 q ha<sup>-1</sup>). It is also observed that, there is no much significant difference in the green fodder yield potential between hybrids and varieties. On the other hand, the highest green fodder yields were recovered in second cut irrespective of the genotype. However, Rijko bajra (277 q ha<sup>-1</sup>) recorded highest dry fodder yield followed by ICMA 00999×ICMV 05444 (220 q ha<sup>-1</sup>). Rijko Bajra recorded high crude protein yield of 30.4 q ha<sup>-1</sup>.

### 1. Introduction

Pearlmillet is a fast growing short duration crop. It has high biomass production potential and serves as an ideal crop under low rainfall conditions with high tillering ability, high protein content (10-12%) and ratoon ability, thus making it as an outstanding summer growing fodder crop for the rainfed situations (Patel et al., 2008). The green fodder of Bajra is leafy, palatable and very nutritious feed stock for cattle ensuring good milk yield. Being any time forage, pearl millet, unlike sorghum, can be grazed, or cut and fed at any growth stage, as it has no HCN content. deAndrade and deAndrade (1982) mentioned that pearl millet are excellent for producing silage, particularly in regions with dry spells during the rainy season, pearl millet can produce higher silage yields with higher protein than sorghum. Green fodder scarcity is the most common problem from November to June due to non availability of green fodder in grazing lands during lean period. Majority of recommended fodder bajra varieties were evolved and released based on their single cut performance, but farmers are habituated to go for 2-3

cuts in according to their need. Harinarayana et al. (2005) also mentioned that Single-cut pearl millet varieties with limited forage potential of 30 t ha<sup>-1</sup> and 0.27 to 2.24 t day<sup>-1</sup> ha<sup>-1</sup> are currently dominating the forage market. Development of intra-specific forage hybrids that combine the ability for repeated harvests (multicuts), earliness to first harvest (cut), short harvesting intervals, quick regeneration, the built-in tillering potential, high green fodder yield, high quality factors and low anti-nutritional factors like oxalic acid and nitrates has tremendous opportunity to improve pearl millet as a forage crop. Therefore to quantify the fodder yield potential of pearl millet cultivars under multicut evaluation, an experimental study was conducted at AICRP on Forage Crops, Hyderabad centre to identify a suitable genotype of the multicut pearl millet having high green fodder yield potential during summer season or lean period to overcome scarcity deAndrade and deAndrade (1982) were mentioned that pearl millet is excellent for producing silage, particularly in regions with dry spells during the rainy season and can produce higher silage yields with higher protein than sorghum.



## 2. Material and Methods

A field experiment was conducted during summer season, 2008-09 at AICRP on Forage Crops, ARI, ANGRAU, Rajendranagar, Hyderabad. The soil was sandy loam in texture with pH of 8.13, low in available Nitrogen and medium in available phosphorous and available potash. Nine genotypes comprising of six varieties, two hybrids of pearl millet and one sorghum cultivar viz., ICMV 05222, ICMV 05444, ICMV 05555, ICMV 05777, ICMV 08111, ICMA 00999×ICMV05444, ICMA 00999×I P17315, Rijko Bajra and jakharana were evaluated against the popular Sorghum cultivar SSG (Jumbo) in a RBD with 3 replications. In general, farmers were habituated to grow sorghum as a fodder crop even during summer due to lack of awareness about the performance of other fodder crops like pearl millet. Unlike sorghum, pearl millet cultivars are free of HCN content, an anti-nutritional factor which is detrimental to the animal health. The multicut pearl millet cultivars were obtained from ICRISAT, Hyderabad and were sown on 3<sup>rd</sup> March, 2009. The crop was supplied with recommended dose of fertilizer 100-50-40 kg N, P<sub>2</sub>O<sub>5</sub> and K<sub>2</sub>O ha<sup>-1</sup>. Nitrogen was given in two splits, half as basal and the remaining half at 30 days after sowing. After every cut, 30 kg N ha<sup>-1</sup> was given as top dressing. Crop was sown at a row distance of 30 cm. First cut was taken at 50 days after sowing irrespective of 50% flowering duration. Subsequent cuttings were taken at 30 days interval. Hence in this experiment first cut was taken on 27<sup>th</sup> April, 2009, second cut on 27<sup>th</sup> May, 2009 and third cut was taken on 27<sup>th</sup> June, 2009.

## 3. Results and Discussion

The results presented in Table 1 revealed that all the pearl millet cultivars recorded highest green fodder yields than that of check variety SSG (Jumbo). It is observed from the pooled over date of 3 cuts, significantly green fodder yield was recorded by the entry ICMV 08111 (811 q ha<sup>-1</sup>) and it was on par with the genotype ICMA 00999×ICMA 05444 (810 q ha<sup>-1</sup>) followed by Rijko Bajra (791 q ha<sup>-1</sup>), ICMV 05777 (784 q ha<sup>-1</sup>), ICMA 00999×IP 17315 (769 q ha<sup>-1</sup>) and ICMV 05555 (720 q ha<sup>-1</sup>) than that of the check variety SSG (Jumbo 552 q ha<sup>-1</sup>) as given in Table 1. These results indicate that pearl millet cultivars during summer grow vigorously and put up more biomass with heavy tillering even with minimum irrigations than the Sorghum cultivars which are popular among the farmers as fodder crop to cultivate. Harinarayana et al. (2005) also narrated that pearl millet uses less water per unit of forage production, tolerates both lower and higher soil pH and higher aluminum concentration, and is rich in minerals as compared to sorghum. In first cut ICMV 08111 recorded highest significant green fodder yield of 215 q ha<sup>-1</sup>. Where as in the second cut ICMV 05777 recorded highest green fodder yield of 329 q ha<sup>-1</sup> and was on par with the genotype ICMV 08111 (326 q ha<sup>-1</sup>) and Rijko Bajra (326 q ha<sup>-1</sup>). It was observed that fodder yields obtained from second cut were more than 50% higher than the first cut irrespective of the genotypes. This may be attributed due to maximum tillering after first cut. Similar results were recorded in the experiment conducted by Chandrika et al.

Table 1: Performance of multicut pearl millet genotypes for green fodder yield, dry fodder yield and crude protein yield during summer 2008-09

Sl. No.	En-try code	Name of entry	GFY (q ha <sup>-1</sup> )					DFY (q ha <sup>-1</sup> )					CPY (q ha <sup>-1</sup> )				
			1 <sup>st</sup> cut	2 <sup>nd</sup> cut	3 <sup>rd</sup> cut	Pooled	rank	1 <sup>st</sup> cut	2 <sup>nd</sup> cut	3 <sup>rd</sup> cut	Pooled	rank	1 <sup>st</sup> cut	2 <sup>nd</sup> cut	3 <sup>rd</sup> cut	Pooled	rank
1	T <sub>1</sub>	ICMV 05222	153	277	184	614	7	34	53	35	122	10	3.6	5.5	4.8	13.9	9
2	T <sub>2</sub>	ICMV 05444	125	260	180	565	9	40	66	47	153	8	4.1	5.5	6.0	15.6	8
3	T <sub>3</sub>	ICMV 05555	202	291	236	729	6	50	85	69	204	4	4.8	10.9	7.1	22.8	5
4	T <sub>4</sub>	ICMV 05777	191	329	264	784	4	53	83	66	202	5	4.2	11	8.4	23.6	4
5	T <sub>5</sub>	ICMV 08111	215	326	270	811	1	55	84	70	209	3	4.3	15.1	8.7	28.1	2
6	T <sub>6</sub>	ICMA 00999× ICMV 05444	160	383	267	810	2	50	92	78	220	2	4.2	13.8	7.4	25.4	3
7	T <sub>7</sub>	ICMA 00999 ×IP 17315	208	291	270	769	5	49	61	57	167	7	3.5	9.3	6.2	19.0	7
8	T <sub>8</sub>	Rijko Bajra	170	326	295	791	3	50	121	106	277	1	3.7	12	14.7	30.4	1
9	T <sub>9</sub>	Jakharana	156	257	191	604	8	49	80	59	188	6	3.9	12.3	5.9	22.1	6
10	T <sub>10</sub>	SSG (Jumbo)	149	208	194	552	10	39	49	46	133	9	2.5	7.4	4.6	14.5	10
Grand Mean			173	294	235	702		48	77	63	187		3.8	10.2	7.3	23.9	
SEm±			11.5	16.6	14.3	39.9		3.6	11.7	5.7	18.6		0.8	1.12	0.9	2.5	
CD (p=0.05)			34.6	49.7	43.1	119.6		10.7	35.3	16.9	55.9		1.8	3.4	2.7	7.5	

GFY: Green fodder yield; DFY: Dry fodder yield; CPY: Crude protein yield

(2012). Rijko Bajra recorded significantly higher dry fodder yield of 277 q ha<sup>-1</sup> followed by 00999×ICMA 05444 (220 q ha<sup>-1</sup>). Significantly lower dry fodder yield was observed with the check variety SSG (Jumbo-133 q ha<sup>-1</sup>). The highest crude protein yield pooled over 3 cuts was recorded by Rijko Bajra (30.4 q ha<sup>-1</sup>), followed by ICMV 08111 (28.1 q ha<sup>-1</sup>). Similar results were obtained by Patel et al. (2008) with the summer sown pearl millet crop. Similarly, genotypic variations in forage pearl millet were reported by Pathan and Bhilare (2009).

#### 4. Conclusion

The study revealed significant variation among the multicut pearl millet genotypes for green fodder, dry fodder and crude protein yields. The multicut pearl millet genotypes ICMV 08111, Rijko Bajra and ICMA 00999×ICMV 05444 exhibited high green fodder, dry fodder, crude protein yield potential. These can be used further breeding programmes to develop multicut pearl millet varieties.

#### 5. References

Chandrika, V., Shashikala, T., Shanti, M., Loka Reddy, K.,

2012. Production potential of multicut fodder Bajra genotypes under varied dates of sowing. Journal of Research ANGRAU 40(3), 54-57.

deAndrade, J.B., deAndrade, P., 1982. Produca de silagem do milheto (*Pennisetum americanum* (L.) K. Schum.). Boletim de Industria Animal 392, 155-165.

Harinarayana, G., Melkania, N.P., Reddy, B.V.S., Gupta, S.K., Rai, K.N., Kumar, P.S., 2005. Forage potential of sorghum and pearl millet. In: 7<sup>th</sup> International Conference on the Development of Dryland, ICARDA, Syria. 292-321.

Patel, M.R., Sadhu, A.C., Patel, R.M., Parmar, H.P., Kher., 2008. Cutting management in different genotypes of forage Bajra during summer season. Research on Crops 9(2), 325-327.

Pathan, S.H., Bhilare, R.L., 2009. Growth parameters and seed yield of forage pearl millet varieties as influenced by nitrogen levels. Journal of Maharashtra Agricultural Universities 34(1), 101-102.