Madras Agric. J., 87(10-12): 632 - 634 October - December 2000
https://doi.org/10.29321/MAJ.10.A00526

KKM 1: A new high yielding cumbu - napier hybrid grass for southern districts of Tamil Nadu

L.D. VIJENDRA DAS., S. THIRUMENI, G. KANDASAMY, G. RAJARAVINDRAN AND P. VIVEKANANDAN
Dept. of Agricultural Botany, Agricultural College, Killikulam, Vallanad - 628 252, Tamil Nadu

Abstract : The presently available cumbu - napier hybrid grass varieties Co 1, Co 2 and Co 3 are suitable for black soils under irrigated ecosystem. The new variety KKM 1 was developed for southern districts of Tamil Nadu under irrigated garden land red soil areas. It is highly leafy with long and broad soft leaves as compared to Co 2 and Co 3 with quick regeneration capacity. It had recorded an average green fodder yield of 288 t ha^{-1} yr^{-1} in station trials with a dry matter production of 16.4 t ha^{-1}. KKM 1 has a very low oxalate content compared to Co 2 and Co 3. (***Key Words*** : *Cumbu-Napier hybrid grass. Fodder quality, Fodder yield).*

Grasses and legumes are the cheapest source of feeds for ruminants and among these, grasses have priority due to their high yield potential and perenniality. Cumbu - napier hybrids under irrigated condition can augment the present demand of grass fodder. At present three cumbu - napier hybrid grass varieties *viz.*, Co 1, Co 2 and Co 3 are being recommended for cultivation under irrigated condition in Tamil Nadu. These hybrids are mostly suitable for black soil areas. A variety more suitable for the southern districts under irrigated garden land red soil areas has been in demand for a long time. Hence efforts were initiated to breed a suitable cumbu - napier hybrid grass for southern districts of Tamil Nadu.

Materials and Methods

An experiment was conducted involving 15 genotypes of fodder cumbu, five genotypes of Napier grass and 15 F_1 hybrids obtained from them along with a check Co2 at Agricultural College and Research Institute, Killikulam during 1991-92. Among the 15 hybrid IP 15507 x FD 429 was found to be superior based on *per se* performance and heterosis for four of the 13 traits studied, which was later promoted as ACK 2 (Thirumeni and Vijendra Das, 1997) for the advanced stages of yield trials.

The culture ACK 2 (KKM-1) was further tested under Multi-Location Trial (MLT) at different research stations of the TNAU during 1996-97. It was promoted to Adaptive Research Trial (ART) during 1997-98 and tested in farmers holdings in collaboration with the State Department of Agriculture at 40 locations. Laboratory studies were conducted to evaluate the fodder quality parameters.

Results and Discussion

In the station trials conducted at A.C & R.I., Killikulam from 1991-92 to 1996-97, the culture ACK 2 recorded an average green fodder yield of 288 t ha^{-1} yr^{-1} as against 200 and 192 t ha^{-1} yr^{-1} by Co 2 and Co 3, the increase being 44% and 50% respectively. In MLT also it has proved its superiority over Co 2 and Co 3 and recorded 20% and 15% increase respectively in research stations located in southern zone (Table 1). Results of 27 locations in ART indicated that ACK 2 recorded a green fodder yield of 55 t ha^{-1} yr^{-1} with an increase of 14.6% and 7.8% over Co 2 and Co 3 respectively. Better performance of ACK 2 was observed in the districts of Thoothukudi, Tirunelveli, Kanyakumari and Ramanathapuram. The overall performance revealed that the culture ACK 2 recorded highest green fodder yield of 129 t ha^{-1} yr^{-1} which has 10% increase over the best check Co 3. The morphological characters of ACK 2 are presented in Table 2.

The results of laboratory analysis of fodder quality parameter of ACK 2 in comparison with Co 2 and Co 3 are given in Table 3. ACK 2 fodder has more crude protein (9.85 g $100g^{-1}$), calcium (0.49 g 100 g^{-1}), potassium (0.66 g 100 g^{-1}), phosphorus (0.22 g 100 g^{-1}), Vitamin - thiamine (78 µg 100 g^{-1}) and micro nutrients like zinc and manganese than the check *viz.*, Co 2 and Co 3. Besides these, the

Table 1. Green fodder yield of culture ACK 2 in different trials

Name of the trial and year	Number of trials or locations	Average green fodder yield in t ha^{-1} $year^{-1}$			% over check	
		ACK 2	Co 2	Co 3	Co 2	Co 3
Station trials 1991-92to 1996-97	4	288	200	192	44	50
Southern Zone MLT 1996-97	4	193	161	168	20	15
MLT 1996-97	10	264	251	266	5.2	-
ART 1997-98	27	55	48	45	14.6	7.8
Overall Mean		129	112	117	15	10

Table 2. Morphological and biometric traits of ACK 2 cumbu - napier hybrid grass

Sl. No.	Character	ACK 2	Co 2	Co 3
1	Culm colour	Green	Green	Green
2	Node colour	Green	Green	Green
3	Leaf sheath colour	Pale green	Pale green	Pale green
4	Mid rib colour	White	White	White
5	Leaf margin	Serrated	Serrated	Serrated
6	Dorsal surface	Short hairs	Short hairs	Short hairs
7	Ventral surface	Short hairs	Short hairs	Short hairs
8	Ear Head	Greenish yellow	Greenish yellow	Greenish yellow
9	Bristles	Prominant 20-25 mm	Prominant 20-25 mm	Prominant 20-25 mm
10	Anther colour	Pale yellow	Pale yellow	Pale yellow
11	Plant height (cm)	157.0	144.3	53.2
12	Tillers per clump	11.7	9.0	8.7
13	No of leaves / Clump	168.0	136.7	72.3
14	4^{th} leaf length (cm)	113.5	98.2	84.2
15	4^{th} leaf breadth (cm)	4.9	3.3	3.2
16	Internode length (cm)	11.0	10.8	10.5
17	Stem girth (cm)	5.3	5.2	3.4
18	Leaf weight (Green)	767	370	136
	(g – plant) (Dry)	193	113	34
19	Stem weight (Green)	363	317	11
	(g – plant) (Dry)	123	100	5
20	Total weight (Green)	1130	687	147
	(g – plant) (Dry)	316	213	39
21	Leaf (%)	61.1	53.1	87.7
22	Leaf stem ratio (Green)	1:0.47	1:0.87	1:0.08
	(Dry)	1:0.064	1:0.088	1:0.015

Table 3. Fodder quality analysis of ACK 2 cumbu - napier hybrid grass.

Sl. No.	Particulars		ACK 2	Co 2	Co 3
1	Crude protein (g $100g^{-1}$)		9.85	8.42	9.25
2	Crude fibre (g $100g^{-1}$)		34.1	33.1	34.5
3	Calcium (g $100g^{-1}$)		0.49	0.28	0.36
4	Potassium (g $100g^{-1}$)		0.66	0.45	0.47
5	Magnesium (g $100g^{-1}$)		0.48	0.24	0.34
6	Phosphorous(g $100g^{-1}$)		0.22	0.18	0.17
7	Dry matter production (t ha^{-1})		16.4	17.6	19.2
8	Fat (mg $100g^{-1}$)		0.32	0.46	0.25
9	Vitamin				
	Thiamine (µg $100g^{-1}$)	Stem	78.0	67.0	70.0
		Leaf	104.0	89.0	82.0
	Riboflavin (µg $100g^{-1}$)	Stem	36.0	31.4	40.0
		Leaf	66.0	52.0	70.0
	Carotene (µg $100g^{-1}$)	Stem	0.70	0.62	0.70
		Leaf	0.82	0.70	0.85
10	Micronutrietns (ppm)				
	Iron		159	160	172
	Copper		6.3	5.8	6.8
	Zinc		15.6	12.8	14.0
	Manganese		47.0	40.0	42.0
11	Antinutrional factors				
	Oxalate (g $100g^{-1}$)		1.50	2.08	1.99
	Total phenols (g $100g^{-1}$)		4.92	4.57	4.10

oxalate content is very low (1.50 g 100 g^{-1}) as compared to Co 2 (2.08 g 100 g^{-1}) and Co 3 (1.99 g 100 g^{-1}) respectively.

In view of its superior performance, the culture ACK 2 was released as KKM-1 during January 2000 by State Variety Release Committee of Tamil Nadu as a fodder hybrid specially suited for red soil areas of southern parts of Tamil Nadu.

References

Thirumeni, S. and Vijendra Das, L.D. (1997). Interspecific hybridization between Pearlmillet and Napier grass and study of their F1 hybrids. *Madras Agric. J.* **84** : 465-469.

(Received : August 2000 ; Revised : April 2001)