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new multicut fodder sorghum COFS 29 for Tamil Nadu

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Abstract: **A multicut fodder sorghum COFS 29 (TNS 30 x *S. sudanense*) was developed to meet long felt demand of the dairy farmers of Tamil Nadu. The new variety is having a yield potential of 170 t ha^{-1} of green fodder per year in five harvests (main crop + four ratoons) at 65-70 days intervals. It is tall in stature and produces 10-15 thin tillers, highly leafy with high palatability. It has more crude protein content than Co 27 and less crude fibre and HCN content. The Digestible Dry Matter and *In vitro* digestible dry matter are also higher than Co 27.**

Key words: ***Multicut fodder sorghum.***

ıtroduction

The genetically improved cattle population :eds more green fodder but now only 46.6 :r cent of the total requirement is met which sulted in getting only 50 per cent of their ilk production potential. Enhancing the availability nutritious green fodder throughout the year suggested to get more milk production :ontinuously.

Fodder sorghum is an important crop of Tamil Nadu cultivated both under irrigated and rainfed condition. Dry straw of the grain sorghum obtained after harvest of the grain is usually :ed to the cattle, such straws do not provide quality fodder for milch cattle due to very high crude fibre content and very low crude protein. The fodder sorghum variety Co 27 released in 1986 (Surendran, *et al.* 1988) has green fodder yield potential of 40 t ha^{-1} in 65-70 days. It is a single cut type, produces 2-3 tillers and two more ratoons can be had under favourable seasonal conditions. However, there was a long felt need for a multicut fodder sorghum with about five cuts in a year to save on the seed cost. To fulfill this demand, a multicut fodder sorghum COFS 29 was developed and released during 2001 for general cultivation in Tamil Nadu.

Materials and Methods

The highly tillering wild perennial sorghum, *S. sudanense* was crossed with the culture TNS 30 having medium height and long, broad leaves. From the F_2 segregating population perennial plants with very high tillering, and early flowering *i.e.* in 65 to 70 days were selected, selfed and advanced for further purification. In the F_8 generation, a promising selection with most of the fodder attributes stabilized, was identified, and designated as TNFS 9602 and advanced for multi location evaluation in comparison with the already available fodder sorghum variety Co 27. The three year station trials and two year multi location tests conducted in the different research stations in seven different locations were in randomised block design. The culture was also tested under All India Co-ordinated trials in eleven locations throughout the country. The Adaptive Research Trials were conducted in farmers fields at 39 locations throughout Tamil Nadu. The fodder quality parameters were also estimated by standard procedures.

Results and Discussion

The results of the three year station trials are presented in Table 1. It is to be noted that the new culture TNFS 9602 could be ratooned repeatedly four times unlike the control variety Co 27 whose green fodder yield declined and become uneconon-fical even at the third cut. On an average the new culture recorded a green fodder yield of 172.6 t ha^{-1} in five cuts over a year as against Co 27 which recorded only 95.5 t ha^{-1} in three cuts. The green fodder yield was the maximum in the sown crops in both the varieties and it gradually reduced over the subsequent ratoons. However, the reduction in green fodder yield in subsequent ratoons was substantial in the check variety Co 27 compared to the new culture TNFS 9602. In the new culture there was a mean yield advantage of 23.34 per cent over Co 27 even at the third cut stage.

Table 1. Green fodder yield in the station trials over five cuts. (t ha^{-1})

Year	Cuts	TNFS 9602	Co 27	Percentage over control	Mean percentage over three cuts
1996-97	1	44.7	40.2	11.19	
	2.	40.5	30.8	31.49	25.63
	3.	35.8	25.3	41.50	
	4.	25.8	-		
	5.	27.6	-		
	Total	174.4	96.3		
1997-98	1.	40.0	35.1	13-96	
	2.	38.3	32.4	18-20	20.66
	3.	35.6	26.9	32.34	
	4.	27.9	-		
	5.	28.8	-		
	Total	170.6	94.4		
1998-99	1.	40.5	36.2	11.88	
	2.	41.3	32.6	!6069	23.70
	3.	36.7	27.0	35.93	
	4.	28.0	-		
	5.	26.3	-		
	Total	172.8	95.8		
	Over all Mean	172.6	95.8		

Table 2. Green Fodder yield of Fodder Sorghum TNFS. 9602 in Multilocation Trials (t ha^{-1}). 1998-99 and 1999- 2000.

Station/cuts	TNFS 9602	CO 27	Percent over check
Madurai (3)	139.67	107.19	30.30
Aruppukottai (3)	58.21	65.15	-10.65
Bhavanisagar (1)	42.60	33.32	27.85
Virudachalam (2)	42.77	34.11	25.39
Madurai (3)	99.92	98.75	1.19
Killikulam (1)	24-30	20.64	17.73
Paiyur(2)	37.70	31.70	18.93
Mean (2.14)	63.60	55.84	12.82
Calculated yield per year	148.40 in 5 cuts	78.18 in 3 cuts	89.82

The multilocation trials were conducted over seven locations during 1998-2000 (Table 2). In Madurai, during 1998-99, a maximum green fodder yield of 139.67 t ha^{-1} was recorded in three cuts with an yield advantage of 30.3 per, cent over Co27 (107.19 t ha^{-1}). On an average in the multilocation trials, the new culture TNFS 9602 recorded a calculated green fodder yield of 148.40 t ha^{-1} in five cuts, compared to only 78.18 t ha^{-1} by Co 27 in three cuts.

In the All India Co-ordinated trials, the new culture was tested at eleven locations and compared with the national checks 855 F and MFSH 3, during *Kharif* 1998-99. (Table 3). While three centres had recorded three cuts, the other

Table 3. Green fodder yield of fodder sorghum TNFS. 9602 in All India Co-ordinated trials - IVT multicut 1998-99 *Kharif* (t ha^{-1})

Sl.No.	Centre	TNFS 9602	Check 855 F	Check MFSH.3
1.	Hissar (2)	63.00	59.33	59.00
2.	Delhi (2)	90.14	81.07	89.04
3.	Anand (3)	80.00	91.80	96.60
4.	Jabalpur(2)	108.75	84.88	94.25
5.	Rahuri (2)	68.50	68.20	66.67
6.	Hyderabad (2)	68.03	67.47	75.24
7.	Coimbatore (3)	97.30	90.60	74.40
8.	Pantnagar (2)	88.64	96.06	93.46
9.	Urlikanchan (2)	63.81	65.71	72.63
10.	Ludhiana (2)	52.28	60.16	55.27
11.	Aurangabad (2)	49.33	51.99	58.66
	All India Average (2.18)	75.43	74.30	75.93
	All India Rank	5	6	4

Table 4. Dry fodder yield of fodder sorghum TNFS 9602 in All India Co-ordinated Trials IVT-Multicut 1998- 99 *Kharif* (t ha^{-1})

Sl.No.	Centre	TNFS 9602	Check 855 F	Check MFSH.3
1.	Hissar (2)	20.15	18.88	18.02
2.	Delhi (3)	28.36	26.32	28.97
3.	Anand(3)	16.97	14.95	15.44
4.	Jabalpur(2)	25.16	19.29	22.68
5.	Rahuri (2)	17.38	17.17	15.45
6.	Hyderabad (2)	17.87	13.43	18.15
7.	Coirnbatore (3)	31.40	25.60	23.00
8.	Pantnagar(2)	21.80	19.20	19.24
9.	Urlikanchan (2)	13.46	12.70	14.21
10.	Ludhiana (2)	12.39	14.10	12.81
11.	Aurangabad (2)	19.66	26.00	23.33
	All India Average (2.1	8	8.882	19.208
	All India Rank	1	6	3

eight centres recorded only two cuts each. The culture TNFS 9602 recorded a green fodder yield of 75.43 t ha^{-1} compared to 74.30 t ha^{-1} in 855 F and 75.93 t ha^{-1} in the hybrid fodder sorghum MFSH 3. The Jabalpur centre had recorded the maximum green fodder yield of 108.75 t ha^{-1} in two cuts compared to 84.88 t ha^{-1} recorded by 855 F.

The dry fodder yield recorded at the different centres in the All India Co-ordinated trials is given in Table 4. The culture TNFS 9602 had recorded the maximum dry fodder yield of 20.418 t ha^{-1} and occupied the All India first rank, compared to 18.882 t ha^{-1} in 855 F (Sixth rank) and 19.208 t ha^{-1} in MFSH 3 (third rank).

The Adaptive Research Trials (ART) were conducted over 39 locations throughout Tamil Nadu during 1998-2000. The results of the best 15 locations are presented in Table 5. The mean calculated green fodder yield over all the

Table 5. Green Fodder yield (t ha^{-1}) of Fodder Sorghum TNFS 9602 under Adaptive Research Trials

Sl.No.	District/Location	TNFS 9602	Co.27
Madurai (1999-2000)			
1.	Madurai North	54.63	50.00
Thoothukudi (1999-2000)			
2.	Vilathikulam	39.50	36.25
Kanchcepuram (1998-1999)			
3.	Walajabad	39.00	38.50
4.	Chithamor	41.10-	40.60
5.	Padapai	47.00-	37.00
Kancheepuram (1999- 2000)			
6.	Thiruporur	39.40	38.27
7.	Chitla pakkam	40.63	38.23
Cuddalore (1998 -1999)			
8.	Kanur	55.50	46.80
9.	Gunamangalam	56.00	47.00
Trichy (1999 -2000)			
10.	Kottapatti	49.50	47.00
11.	Pullainbadi	61.00	63.25
Thiruvallur (1999 -2000)			
12.	Kumarakuppam	104.00	109.00
13.	Pallipattu	41.00-	31.00
Thiruvannamalai (1999-2000)			
14.	Kattampoondi	46.50	47.50
15.	Vadathandalam	47.50	45.50
	Total	762.2	715-90
	Mean calculated yield over an year t ha^{-1} (for 39 locations)	165.74 in 5 cuts	95.45 in 3 cuts

39 locations was worked out as 165.74 t ha^{-1} in five cuts in TNFS 9602 compared to 95.45 t ha^{-1} in CO 27 over three cuts.

The fodder quality parameters and the biometrical characteristics of the new culture in comparison with the check CO 27 is given in Table 6. The new culture TNFS 9602 was superior to CO 27 in respect of dry matter, crude protein, crude fat, total ash, calcium, magnesium and potash content and in *in vitro* dry matter digestibility per cent. The anti nutrient, HCN content was less than that in CO 27. Though the plant height was slightly shorter than CO 27, the number of tillers per plant (10-15), so also the number of leaves per plant (80-105) were more. The leaves were narrow but longer than CO 27, the leaf stem ratio was higher and the stem girth was thinner than CO 27. Thus, TNFS 9602 is more palatable than CO 27.

The new culture TNFS 9602 was on par with CO 27 and MFSH 3 in its field reaction towards the downy mildew, zonate leaf spot and grey leaf spot diseases (Table 7). It has recorded less incidence of shoot fly dead hearts and stem borer than CO 27 and MFSH 3, in view of

Table 6. Quality Parameters and biometrical details of Fodder Sorghum culture TNFS. 9602

Sl. No.	Particulars	TNFS 9602	Co. 27
	Dry matter per cent	23.6	22.8
2.	Crude Protein per cent	8.41	7.93
3.	Crude Fibre per cent	25.60	25.97
4.	Crude Fat per cent	2.98	2.86
5.	Nitrogen free Extract per cent	46.43	47.90
6.	Total ash content	13.16	12.51
7.	Calcium content per cent	0.68	0.62
8.	Phosphorus content per cent	0.30	0.28
9.	Magnesium content per cent	0.58	0.52
10.	Potash content per cent	1.86	1.41
11.	HCN ppm	185	200
12.	DDM q ha^{-1}	88.38	31.934
13.	IVDMD per cent	50.3	48.00
1.	Days to 50% flowering	65 -70	65-70
2.	Plant height cm	220- 250	250-300
3.	No. of tillers per plant	10- 15	1-3
4.	Panicle length cm	30 -35	22-26
5.	No. of leaves / plant	80- 105	15-30
6.	Leaf length cm	75-90	70-85
7.	Leaf width cm	3.5- 4.6	5-6
8.	Leaf-Stem ratio	0.20- 0.25	0.18-0.22
9.	Stem girth cm	2.5-3.0	3.0- 3.8

Table 7. Disease score (1-9) in TNFS 9602

Variety	Grey leaf spot	Zonate leaf spot	Downy mildew
TNFS 9602	2.0	2.0	2.0
CO 27	2.0	2.0	2.0
MFSH 3	2.0	2.0	2.0

Pest score in TNFS 9602

Variety	Shootfly percent (DH)	Stem Borer percent
TNFS 9602	13.4	8.15
CO 27	15.6	10.12
MFSH 3	27.4	21.08

the superior yielding ability, quality parameters and increased tolerance towards pests and diseases, the culture TNFS 9602 was released for large scale general cultivation throughout Tamil Nadu as multicut fodder sorghum variety COFS 29 during January 2001.

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