

FODDER SORGHUM CO 27 FOR INCREASED NUTRITIOUS FODDER

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Research work done to evolve a high yielding, multicut fodder sorghum variety resulted in the release of Co 27 Fodder Sorghum strain which is a hybrid derivative of sorghum Co 11 and *S. halepense*. Co 27 has got a green Fodder yield potential of 44.5 t/ha in 55.60 days under irrigation in first harvest and 24.5 t/ha in 55 days after the first harvest in the ratoon crop. It gives an yield of 20.8 t/ha under rainfed condition.

Among cereals, sorghum assumes specific importance in India as a major grain cum fodder crop and it is also extensively grown for fodder, particularly in the Northern States. Sorghum is preferred over maize in kharif because of its high tolerance to wide variations in soil and moisture conditions. Many characteristics like quick growing and high yielding ability, high dry matter content, leafiness, better palatability, hardiness and intake, good for silage making and above all, most suited for hay making go in its favour to make it an ideal forage crop and as a source of feed to the animals.

Genetic diversity is the basis of any crop improvement programme. Once the available genetic variability present in a species is exploited, the obvious avenue open to a breeder is to go for interspecific hybridisation so as to achieve further genetic improvement, in the desired direction, (Paroda and Lodhi 1980). Wild species like *Sorghum halepense* has been found easily crossable with

cultivated sorghum varieties that have 20 chromosomes (Casady and Anderson, 1952; Hadley 1953, Hadley and Mohan, 1956), *Sorghum halepense* is resistant to insects and drought, multi tillering, perennial in habit and regarded as weed in India and other countries. Krishnaswamy *et al.*, (1956) developed 20 chromosome hybrids between diploid *S. halepense* and cultivated sorghum which combined characters of both the parents. Through such interspecific crosses, it would be possible to develop perennial and multicut sorghums which may ensure regular and higher fodder supply.

MATERIALS AND METHODS

The improved fodder sorghum strains Co 11 and K 7 which are grown in the districts of Coimbatore, Periyar and Salem as *Adai Cholan* are monocolm types. The wild species *S. halepense* is profusely tillering in habit, rhizomatous and suitable for multicut. The cultivated fodder sorghum *S. bicolor* var. *mediocre* (Co 11) was hybridised with *S. halepense* (diploid) and in the progenies, selec-

Table 1 Performance of FS 1 in Research Stations and Adaptive Research Trials

Place	Mean green fodder yield t/ha		
	FS 1	CO 11	K 7
<i>a) Irrigated</i>			
i) Department of Forage Crops, Coimbatore	44.54	36.69	40.44
Percentage of increase over Co 11	21.39	—	—
Percentage of increase over K 7	10.02	—	—
<i>ii) Multilocation Trials</i>			
Livestock Research Station, Kattupakkam	32.84	30.09	34.2
University Research Centre, Vellore	43.75	41.25	38.45
Agricultural Research Station, Bhavanisagar	28.46	26.86	25.38
Agricultural Research Station, Alianagar	26.42	23.80	19.40
Regional Research Station, Paiyur	32.29	34.51	33.25
Mean	32.75	31.30	30.15
Percentage of increase over Co 11	4.63	—	—
Percentage of increase over K 7	8.62	—	—
<i>iii) Adaptive Research Trials</i>			
North Arcot district	31.00	24.50	25.60
South Arcot district	12.23	12.65	12.10
Dharmapuri district	8.03	8.50	8.11
Salem district	22.84	23.38	22.06
Periyar district	18.15	15.56	17.63
Coimbatore district	10.46	9.28	9.18
Mean	17.12	15.65	15.78
Percentage of increase over Co 11	10.94	—	—
Percentage of increase over K 7	8.49	—	—

Table 2 Details of quality characters of FS

Characters	RS 1 (as percentage)	Co 11	K-7	Increase percent	
				Over Co.11	Over K 7
Dry matter	24.17	20.26	21.52	19.29	12.31
Drymatter yield (t/ha)	10.76	7.43	8.69	44.81	23.82
Protein content	9.82	9.38	9.77	4.69	0.51
Crude protein yield (kg/ha)	1055	720	800	16.52	31.87
Brix	7.40	6.20	6.30	9.35	17.46
Total ash	9.62	10.62	10.30	—	—
Ether extraction	2.58	2.28	2.31	—	—
Crud fibre	30.83	34.04	33.26	—	—
NEE	47.36	43.98	44.06	—	—
Total carbohydrate	78.19	78.02	77.32	—	—
Organic matter	91.38	90.38	90.20	—	—
Calcium	0.44	0.44	0.48	—	—
Phosphorus	0.18	0.15	0.14	—	—
IVDMD	65.80	62.60	61.60	—	—
HCN at 5% flowering	2.5 ppm	10.0 ppm	9.6 ppm	—	—

tion of plants was effected towards a combination of attributes related to fodder production. This resulted in the identification of a promising hybrid derivative namely FS 1 (Forage Sorghum 1). The variety FS 1 combines the property of juicy stem of Co 11 and tillering and ratooning ability as well as hardness *S. halepense*.

Discussion: FS 1 tested under field trials for three seasons at Coimbatore in comparison with Co 11 and K 7 under irrigation. The results revealed that FS 1 recorded over a period of three seasons, a mean green fodder yield of 44.54 t/ha in the first crop in 55-58 days in contrast to 36.69 (65-70 days) and 40.44 t/ha (65-70 days) of Co 11 and K 7 respectively the order of increase being 21.39 and 10.02 percent (Table 1). The green fodder yield of ratoon crop of FS 1 is 24.50 t/ha in 55 days after the first harvest. Under rainfed conditions, it fetches an yield of 20.8 t/ha on an average as compared with 17.5 and 17.8 t/ha realised from Co 11 and K 7. It has got a dry matter content of 24.17 per cent, protein content of 9.82 per cent, brix content of 7.40 and digestibility of 65.80 percent which are higher than those of the existing strains Co 11 and K 7. FS 1 is rich in other mineral elements as well (Table 2.)

FS 1 was tested in 20 centres in multilocation trials and 56 centres in Adaptive Research trials. Under multilocation trials, it recorded a mean green fodder yield of 32.75 t/ha as against 31.30 and 30.15 t/ha of Co 11 and K 7 which represent an in-

crease of 4.63 and 8.62 percent respectively (Table 1). In Adaptive Research trials under rainfed conditions, FS 1 recorded a mean green fodder yield of 17.12 t/ha as against 15.65 and 15.78 t/ha of Co 11 and K 7 which represent an increase of 10.94 and 8.49 percent over Co 11 and K 7 respectively (Table 1). Because of its superior performance both in Research Stations and farmers fields, FS 1 was released as Fodder Sorghum Co 27 strain for cultivation in Coimbatore, Periyar, Salem, Dharmapuri, North Arcot and South Arcot districts in 1986.

REFERENCES

- CASADY, A. J., and K. L. ANDERSON 1952. Hybridisation, Cytological and inheritance studies of a sorghum cross-autotetra-ploid sudangrass x (Johnson grass x 4n sudangrass) *Agron. J.*, 44 : 189-194
- HADLEY, H. H., 1953. Cytological relationship between *Sorghum vulgare* and *S. halepense*. *Agron J.*, 45 : 139
- MOHAN, J. H. 1956. The cytogenetic behaviour of progeny from a back cross (*Sorghum vulgare* x *S. halepense*) x *S. Vulgare*. *Agron J.*, 48 : 102-108
- KRISHNASWAMY, N., V. S. RAMAN and P. CHANDRASEKHARAN, 1956. An interspecific hybrid of grain sorghum x Johnson grass (*S. halepense*) *Curr Sci.*, 25 : 195-197
- PARODA R.S., and G.P. LODHI 1981. Genetic improvement in Forage Sorghum *Forage Res.* 7A : 17-56