

BSR-1-A NEW SORGHUM VARIETY FOR WESTERN ZONE OF TAMIL NADU

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ABSTRACT

'BSR-1 sorghum' a new variety has been developed by the Agricultural Research Station, Bhavanisagar. The variety tested under the culture number ICSV. 239, is a pureline selection isolated from a cross developed at the International Crop Research Institute for Semi-Arid Tropics, Hyderabad. The variety is suitable for both *kharif* and summer seasons of the western zone and has a grain yield potential of 3500 kg under *kharif* and 6000 kg/ha under irrigated summer conditions. It matures in 105-110 days.

KEY WORDS : Sorghum, Variety-BSR-1, Western Zone

Sorghum is largely grown for its grain as well as for its fodder in Tamil Nadu. In the Western Zone comprising Coimbatore, Periyar, Tiruchengode taluk of Salem, Karur taluk of Tiruchirapalli, Palani-Oddanchattiram, Dindigul taluks of Dindigul Anna district and parts of Periyakulam in Madurai district, the crop is raised both under *kharif* and summer irrigated seasons. In these parts, the crop is raised in June-July-August under rainfed conditions and January-February under irrigated conditions. Since hybrids of sorghum need renewal of seeds every season, farmers prefer to grow varieties which can easily spread among farmers. Therefore, a pure breeding variety with high yield will be beneficial to the farmers and may also result in wide coverage of area resulting in increased production. With this objective in mind, selection of varieties better than the existing cultivars was attempted.

MATERIALS AND METHODS

The International Crop Research Institute for Semi-Arid Tropics (ICRISAT) is handling large number of cultures of different combinations at the Agricultural Research Station, Bhavanisagar. While studying these cultures, a derivative of the cross (SC 108-3 X CSV.4) 16-3-1 x (MR.801 x R.2751) 4-1-1) was found to be superior with semi-compact earheads. This genotype was obtained from ICRISAT along with two other cultures viz., ICSV.197 AND ICSV.202. These three cultures were raised, mass selections made and evaluated with Co.24, Co.25 and Co.26 as checks at Bhavanisagar conditions from 1987 to 1991 both during *kharif* and irrigated summer seasons, adopting appropriate statistical design. After

establishing its superiority at the station trials, the culture was tested at multi-locational trial along with other cultures in the research stations and adaptive research trials both in *kharif* and irrigated summer seasons in Western Zone of Tamil Nadu.

RESULTS AND DISCUSSION

The main yield obtained at the station trials during *kharif* and irrigated summer season from 1987 to 1991 are furnished in Table 1. The mean yield for the five years indicates the superiority of ICSV. 239 with 38.7 per cent increased grain yield than the high yielding check Co.26. The straw yield was four per cent less in ICSV.239 than the check. The mean grain yield for summer irrigated season was also found to be 16.5 per cent (3608 kg/ha) higher than the check Co.26 (3098 kg/ha). The culture was tested at Bhavanisagar under multi location trials during summer, 1989 and ICSV.239 registered 39.4 per cent increased grain yield over the check Co.26 (Table 1). However the straw yield was low in the culture (11.6 less than Co.26).

In *kharif*, 1991, the culture was tested under multi location trials at five locations in Tamil Nadu. In four out of five locations, the culture ICSV.239 was found superior to Co.26. The mean performance over the five locations indicated the superiority of the culture by 24 per cent in grain yield over Co.26 (Table 1).

Based on the superiority, it was sent for adaptive research trials during irrigated/summer and *kharif* 1991 seasons in western Zone. Out of 16 locations tested during summer, the culture rendered 14 per cent higher yields than Co.26 in 14

Table 1. Performance of sorghum ICSV.239 (BSR-1).

Details	Year (Centres)	Locations	Kharif (June-July-Sept-Oct)								
			Seed yield (kg/ha)		Straw yield (t/ha)		Seed yield (kg/ha)		Straw yield (t/ha)		
Comparative yield trials at ARS, Bhavanisagar	1987-		2051	2845	16.2	15.5	3098	3608	17.2	14.2	
	1991		(100.0)	(138.7)	(100.0)	(95.7)	(100.0)	(116.5)	(100.0)	(82.6)	
Multi Location Trials	1989-		3246	-	-	-	251.6	3507	8.6	7.6	
	1991		(100.0)	(123.7)	-	-	(100.0)	(139.7)	(100.0)	(88.4)	
Adaptive Research Trials	1991	Periyar									
		K.10	1804	2110	9.69	9.65	2471	2729	12.6	11.5	
		S.9	-	-	-	-	-	-	-	-	
	1993(3)	Coimbatore	-	-	-	-	2403	2634	11.4	8.5	
	1993(3)	Madurai	-	-	-	-	2558	2972	8.5	8.2	
	1991(1)	Trichy	-	-	-	-	3150	4375	14.5	10.1	
		Mean	1804	2110	9.69	9.65	2517	2860	11.8	9.55	
			(100.0)	(177.0)	(100.0)	(9.96)	(100.0)	(113.6)	(100.0)	(85.4)	
	1993(10)	Periyar	-	-	-	-	3379	3504	12.0	10.8	
	1993(15)	Coimbatore (S15)	-	-	-	-	2973	3327	9.9	9.4	
	1993(4)	Trichy (S4)	-	-	-	-	1908	2097	-	-	
	1993(2)	Salem (S2)	-	-	-	-	2242	2603	4.0	5.9	
	Mean	-	-	-	-	2772	3077	9.76	9.3		
						(100.0)	(111.0)				
Overall mean			2872	3310	15.1	14.5	2806	3252	13.3	11.3	
increase/decrease over check			-	-	-	(-3.3)	-	16.4	-	(11.6)	

locations (Table 1). In *kharif*, the mean increased grain yield from ten locations was 17.0 per cent over Co.26.

In 1993 summer, the results from 31 centres spread over four districts indicated the superiority of ICSV.239 to the tune of 11 per cent over Co.26. In the overall assessment of all the trials from 1987 to 1993, the culture was found to be superior to Co.26 in grain yield (43.4% in *kharif* and 16.4% in summer season).

The culture was studied for its reaction to the major pests during summer and *kharif* 1989 under field conditions. The pest incidence was low in culture ICSV.239 during summer in respect of ear head bug (5.0) compared to Co.26 (31.0/earhead). In *kharif* 1989, the incidence was less than other cultures and checks in respect of shoot fly damage, stem borer and earhead bugs.

The chemical composition and the digestibility were assessed at ICRISAT, Hyderabad (Table 2). It could be seen that the fibre content of ICSV.239 was less (30 per cent) compared to 36.5 per cent in

Co.26. The total soluble sugar of the grains was higher (1.4) than Co.26 (1.0). The culture ICSV.239 ranks first in the matter of digestibility of stem, which is an added advantage.

Sorghum variety BSR-1 grows to a height of 1.8 m. The leaves are long, broad and dark green in colour with dull white midrib. The nodes and internodes are covered with leaf sheath. The peduncle is exposed or partly enclosed in the boot leaf. The earhead is long, cylindrical and semi compact. The seeds are partly covered by glumes which are straw coloured at maturity. The grain is pearly white in colour. This variety matures in 105 - 110 days.

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Table 2. Biometric characters, chemical composition and digestibility of shoot of sorghum

Entry	Days to first flowering	Mean plant height (cm)	Panicle length (cm)	Panicle width (cm)	No. of leaves (cm)	Leaf length (cm)	Leaf breadth (cm)	Stem thickness (cm)	Farhead weight (g)	Grain yield per plant (g)	Straw yield per plant (g)	100 grain weight (g)	Protein content of leaf	Protein content of stem	Protein content of grain	Fibre content of leaf	Fibre content of stem	Fibre content of grain	Total soluble sugar of grain	Ash (gram)	Dry matter digestibility of leaf	Dry matter digestibility of stem	
Co.26	61	64	182	23.4	10.9	11.4	73.5	6.7	4.9	54.0	35.6	272.0	23.0	5.5	1.4	6.9	29.1	36.5	2.8	1.0	1.8	1.341	1.455
																					(1)	(3)	
ICSV 239	61	64	167	21.8	13.7	12.1	67.3	7.2	6.1	81.6	65.0	186.0	24.0	5.3	1.5	7.5	28.5	30.1	2.7	1.4	1.9	1.404	1.326
																					(2)	(1)	

Figures in parenthesis indicate rank; * Mean of two estimations.