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# Midge-Resistant Sorghum Cultivar ICSV 745

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- Highly resistant to sorghum midge, *Contarinia sorghicola*
- Yields as well as commercial cultivars
- Resistant to leaf diseases, downy mildew, ergot, and sugarcane aphid



ICRISAT

Plant Material Description no. 49

International Crops Research Institute for the Semi-Arid Tropics  
Patancheru 502 324, Andhra Pradesh, India

## Purpose of Description

ICSV 745 is a midge-resistant sorghum line developed at ICRISAT Asia Center, Patancheru, India. It has been released for cultivation in Karnataka as DSV 3. It has also performed well in on-farm trials in Andhra Pradesh and Tamil Nadu in India, and in Sudan.

## Origin and Development

ICSV 745 was selected as a midge-resistant line at ICRISAT Asia Center during the 1985 rainy season. It was derived by pedigree selection from the cross ICSV 197 x A 6250, and bears the selection no. PM 14415-4-1-1-1.

## Plant Characters

ICSV 745 has tan plant color, and medium thick and nonjuicy stem. Leaves are broad, thick, and drooping with white midrib. Boot leaf is short and erect. It is a medium-duration cultivar (60-85 days to 50% flowering). Its panicle is compact at the base and semi-loose at the apex. Glumes are short, straw-colored, and cover about one third of the grain. Seed is lustrous, asymmetrical, without subcoat, with a thin pericarp and a beak.

## Performance

ICSV 745 is a dual-purpose cultivar. In 1987 and 1988, it had higher yields than the commercial controls (Table 1). In 1989, in the Mesoamerican sorghum yield trial, it yielded 4.67 t ha<sup>-1</sup> compared with 4.46 t ha<sup>-1</sup> of the local control, ISIAP Dorado. In the 1989-1990 AICSIP trials, it yielded 3.30 t ha<sup>-1</sup> across locations compared with 3.18 t ha<sup>-1</sup> of CSV 11.

ICSV 745 has been tested extensively on farmers' fields in Dharwad, Karnataka, India, during 1989 to 1991. It yielded 2.92 t ha<sup>-1</sup> under high-yielding environments compared with 2.89 t ha<sup>-1</sup> of such commercial cultivars as CSH 5, CSH 9, M 35-1, etc. Under high midge pressure, it yielded 101% more than the commercial cultivars. In on-farm trials in Andhra Pradesh, India, it yielded 0.5 to 2.8 t ha<sup>-1</sup> compared with 0.7 to 2.2 t ha<sup>-1</sup> of the commercial cultivar, ICSV 112.

## Susceptibility to Other Insects and Diseases

ICSV 745 has shown high levels of resistance to sorghum midge across various locations and seasons (Table 2). It is less susceptible to sugarcane aphid (*Melanaphis sacchari*) than CSH 1. It is as susceptible as CSV 11 to shoot fly (*Atherigona soccata*) and spotted borer (*Chilo partellus*), and moderately susceptible to head bug (*Calcoris angustatus*). It is resistant to rust (*Puccinia purpurea*), leaf blight (*Exserohilum turcicum*), anthracnose (*Colletotrichum graminicola*), zonate leaf spot (*Gleocercospora sorghi*), downy mildew (*Perenoscelerospora sorghi*), and ergot (*Sphacelia sorghi*).

## Reference

Sharma, H.C., Agrawal, B.L., Vidyasagar, P., Abraham, C.V., and Nwanze, K.F. 1993. Identification and utilization of resistance to sorghum midge, *Contarinia sorghicola*. Crop Protection 12:265-273.

**Table 1. Performance of midge-resistant cultivar, ICSV 745, under normal conditions and under midge infestation during 1987 and 1988 Preliminary Variety Trials.**

Cultivar	Days to flowering <sup>1</sup>		Plant height (cm) <sup>1</sup>		Yield (t ha <sup>-1</sup> )			
	1987	1988	1987	1988	Under normal conditions <sup>1</sup>		Under midge infestation <sup>2</sup>	
					1987	1988	1987	1988
<b>ICSV 745</b>	71	69	215	239	5.16	3.53	3.06	4.26
<b>Commercial controls</b>								
CSV 11	67	67	178	217	3.85	3.06	2.58	NT <sup>3</sup>
CSH 11	58	59	152	161	3.20	2.87	0.15	1.22
SE	±0.5	+0.7	+4.2	-	±0.23	±0.10	-	±0.66

1. Mean across six locations during 1987 and seven locations during 1988.

2. At Dharwad, Karnataka.

3. Not tested.

**Table 2. Reaction of ICSV 745 to sorghum midge, *Contarinia sorghicola*, under natural infestation and headcage screening.**

Cultivar	Midge damage (%)		Damage rating <sup>1</sup>			
	Natural infestation	Headcage (no-choice conditions)	Dharwad	Patancheru	Bhavani-sagar	Warangal
ICSV 745	18	22	2	2	5	3
Resistant control DJ 6514	18	20	2	2	2	1
Susceptible control CSH 1	90	94	9	9	8	8
SE	+6.7	+7.5	+0.21	+0.28	±0.21	±0.18

1. Damage rating: 1 = <10% midge-damaged spikelets, and 9 = >80% midge-damaged spikelets.



**ICRISAT**

**Plant Material Descriptions**  
from the  
**International Crops Research Institute for the Semi-Arid Tropics**

Brief descriptions of crop genotypes identified or developed by ICRISAT, including:

- germplasm accessions with important agronomic or resistance attributes;
- breeding materials, both segregating and stabilized, with unique character combinations;
- cultivars that have been released for cultivation.

These descriptions announce the availability of plant material, primarily for the benefit of the Institute's cooperators. Their purpose is to facilitate the identification of cultivars and breeding lines and to promote their wide utilization. Requests for seed should be addressed to the Director General, ICRISAT, or to appropriate seed suppliers. Materials for research are sent by ICRISAT to cooperators and other users free of charge.