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High yielding CMS-based hybrids of safflower

K ANJANI, DEMUDU NAIDU P, M D SHARIFF BABA

Directorate of Oilseeds Research, Hyderabad-500 030

Email:naagbt@gmail.com

Two CMS-based hybrids, DSH-249 and DSH-250, evaluated at multilocations for two years under rainfed and irrigated conditions, exhibited 14 and 29% superiority over the national check hybrid, NARI-H-15 for seed yield and 17 and 29% superiority for oil yield. Both hybrids were resistant to Fusarium wilt; DSH-249 possessed higher oleic content (35%).

Table 1. Mean seed and oil yields of DSH-249 and DSH-250 under rainfed and irrigated conditions over locations and years

Hybrid	Mean seed and oil yields (kg/ha)				Overall mean		Mean seed and oil yields (kg/ha) over locations and years	Overall increase in seed and oil yields over hybrid check (%)
	2012-13		2013-14		2012-13	2013-14		
	RF*	I*	RF [§]	I [#]				
DSH-249	1048 (328)	1922 (565)	1476 (548)	2478 (624)	1485 (446)	2022 (582)	1754 (514)	14 (17)
DSH-250	1384 (408)	1853 (538)	1840 (669)	2749 (680)	1618 (473)	2336 (630)	1977 (556)	29 (27)
NARI-H-15 (HC)	1314 (401)	1417 (432)	1446 (492)	1919 (417)	1365 (417)	1704 (459)	1534 (438)	
CV (%)	15	12	15	13	13	14		
CD (P=0.05)	158	185	184	197	120	135		

RF: Rainfed; I: Irrigated; Figures in parentheses indicate data related to oil yield; *Mean of 4 locations; [§]mean of 5 locations; [#] mean of 6 locations; HC; Hybrid check

Having rapid jump in productivity is difficult in safflower as it being a self-pollinated species. This problem could be overcome through development of hybrids. However, the released CMS-based safflower hybrids could play negligible role in yield improvement due to constraints associated with CMS system in hybrid seed production in large scale. This could overcome through development of first ever CMS system in safflower in India (Anjani, 2005) and the CMS-based hybrids. The paper presents the performance of two CMS-based hybrids at multilocations under rainfed and irrigated

conditions for two years (2012-13 and 2013-14) in All India Coordinated Research Project (Safflower) trials.

Two CMS based hybrids viz., DSH-249 and DSH-250 developed at DOR, four GMS-based hybrids and a GMS-based check hybrid, NARI-H-15 were evaluated at eight locations (4 rainfed and 4 irrigated) in RBD with three replications in 2012-13. In 2013-14, DSH-249 and DSH-250 were evaluated along with a CMS hybrid, DSH-242, a check hybrid, NARI-H-15 and two check varieties viz., A1, PBNS-12, and three test varieties in RBD with three replications at 11 locations (4 rainfed and 6 irrigated). Fatty acid composition of DSH-249 and NARI-H-15 was assessed using GLC at DOR, Hyderabad

Both the CMS-based hybrids, DSH-249 and DSH-250 were found to be superior to the check hybrid, NARI-H-15 with respect to seed and oil yields in multilocation evaluation trials in 2012-13 and 2013-14 (Table 1). DSH-250 maintained superior performance even under rainfed situations at all locations in both the years. The overall performance of DSH-249 and DSH-250 in irrigated conditions was 36 and 44% higher, respectively, than that in rainfed conditions. Both the hybrids were found to be resistant to Fusarium wilt in multilocation wilt sick plots. Oleic content in DSH-249 ranged from 32.5-39.49% (Av. 35%) while it was 12.9-16.52% (Av. 14.78%) in NARI-H-15 across the eight locations.

The two CMS hybrids consistently yielded higher than the GMS-based check hybrid, NARI-H-15 over locations and years indicating absence of deleterious effects of sterile cytoplasm on hybrid performance. DSH-249 is a stable medium oleic hybrid developed first time in safflower. Through variety improvement seed yield increase beyond 7% is very difficult and time taking. On the contrary, through hybrids, 14-29% increase in seed yield and 17-27% jump in oil yield could be realized in safflower.

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Sesame varieties for high yield and resistant to alternaria leaf spot disease

SVS GANGADHARA RAO

Agricultural Research Station, Kokkirapalle, Yellamanchili – 531 055, Visakhapatnam

E.mail : gangadharsvs@yahoo.c.in, gangadharsvs@rediff.com

Sesame is one of the important oil seed crops grown from ancient times for its unique oil. It is believed to be originated in India and then introduced to Middle East and South Africa (Ethiopia). It contains 45–55 % oil with a protein content of 20–25%. The oil is rich in anti oxidants viz., *sesamin* and *sesamol*, hence resistant to oxidative rancidity thereby increase shelf life. Anti oxidants are known to give immunity to the body. In view of its rich sources of vitamin E it has been used as skin nourishment. Phytosterols are believed to reduce cholesterol levels in blood, enhance the immune response and decrease the risk of certain cancers. Sesame seeds add the highest total phytosterol content @ 400–413mg /10grams. Although sesame oil has got unique medicinal and nutritive values the crop is vulnerable to the fluctuations in the climate i.e., photo and thermo sensitivity and prone to diseases like alternaria leaf spot and phyllody. Keeping the scenario in view an attempt was made to develop a variety with high yield and resistant to alternaria leaf spot.

Eight cross bred lines along with the check YLM 66 were tested during kharif 2014 in the randomized block design with three replication at Agricultural Research Station, Yellamanchili, Visakhapatnam Dist. Andhra Pradesh. The plot size adapted is 0.9 x 4m (3rows of 4m length) in view of limited seed. The spacing adapted is 30cm between the rows and 15 cm between the plants. The package was followed as recommended by Acharya N.G Ranga Agricultural University. Data was recorded on plant height in cm, No.of branches per plant, No. of capsules per plant, days to maturity and seed yield. Disease reaction was also observed.

Out of eight sesame cultures viz., YLM 140, YLM 147 the culture YLM 146 (G2 X Vinayak) recorded highest seed yield (1517kg/ha) followed by YLM 142 (EC355653 x YLM 66) with 1462 kg/ha when compared to the check YLM 66 (1241 kg/ha) given in the table 1. During Kharif 2014 most of the cultures including germplasm were badly effected due to alternaria leaf spot and stem blight in view of heavy rains. Under these conditions the above cultures showed resistance to the disease besides giving higher yield. Ojiambo et.al 1999 monitored the *alternaria sesami* in 110 sesamum accessions of SIK at 5 different stages. Plant ages of larger leaf had faster rate of disease incidence he reported.