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Short Communication

Evaluation of HHB 67 like Pearl Millet Hybrids under Dryland Conditions

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HHB 67 is an early maturing (60-62 days) pearl millet hybrid, released and notified by Government of India in 1990 for general cultivation in all the pearl millet growing areas of the country (Kapoor *et al.*, 1989). The hybrid did specially well in dryland regions of Haryana and Rajasthan (approximately 50% pearl millet area of India). It was initially developed by attempting single cross between a seed parent 843A and an inbred restorer H77/833-2 in the year 1984. Inspite of its extra earliness, the hybrid performed well in grain yield compared with other hybrids and open-pollinated varieties (OPVs). It fits well in early or late sown conditions and multiple or inter-cropping systems. HHB 67 combines several special characteristics like high grain yield, quality fodder, synchronous maturity and downy mildew resistance and excels other hybrids with mean performance under severe drought and abiotic stresses (Khairwal *et al.*, 1990, 1999). So far no epidemic of downy mildew has been noticed on farmers field in Haryana state or elsewhere in HHB 67, but traces of downy mildew have been observed in nucleus/breeder seed production plots of 843A and H77/833-2 (Khariwal personal communication) in 1999, 2000, 2001. This rings an alarm of the possibility of inoculum build up and increased susceptibility of the parental lines of HHB 67 to downy mildew. Hence, there is an urgent need to improve downy mildew resistance in 843A and H77/833-2. ICRISAT, Hyderabad, has taken a lead to improve and develop resistant versions of the parental lines of HHB 67 to provide more life to this wonder hybrid (Hash *et al.*, 2002).

The material for the present study consisted of three pearl millet pollinators [H77/833-2 original (ICRISAT uniform selection): ICMR 01007: H77/833-2 BC_4F_3 Progeny 46 (DMR1 from ICMP451), and ICMR01004; H77/833-2 BC_4F_3 Progeny 202 (DMR4 from ICMP 451)] and 22 male sterile lines (similar to 843A), but with enhanced downy mildew resistance. Sixty six HHB 67 like hybrids were developed by crossing three pollinators with 22 male sterile lines and were evaluated in kharif 2001 at Regional Research Station, CCS Haryana Agricultural University, Bawal, Haryana. Each hybrid was planted in two rows of 4 m length with three replications keeping row to row and plant to plant

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Table 1. Mean, range and agronomically desirable HHB 67 like hybrids involving three restorer lines and 22 male sterile lines for different morphological traits

Restorer lines	CMS line	Hybrid	Trait	Mean	Range	Improved version*	Grain yield (kg ha^{-1})	Days to 50% flowering	Plant height (cm)	Ear length (cm)	DM incidence (%)
H77/833-2 Original	22	22	DF	40.45	39-44	None	–	–	–	–	–
			PH	140.36	121-151	None	–	–	–	–	–
			EL	19.32	18-21	None	–	–	–	–	–
			GY	1604.27	888-2619	ICMH01083	2619	39	144	20	0
						ICMH1097	2619	44	121	18	0
						ICMH01089	2277	40	138	18	0
ICMR01007	22	22	DF	39.64	38-42	None					
			PH	144.09	128-155	None					
			EL	19.59	17-21	None					
			GY	1753.41	972-2855	ICMH1122	2853	38	155	18	0
						ICMH01112	2555	40	139	20	0
						ICMH01107	2416	41	149	20	0
						ICMH01115	2202	39	145	19	0
						ICMH1121	2147	40	134	20	0
						ICMH01123	2130	40	149	20	3.0
ICMR01004	22	22	DF	40.45	38-43	None	–	–	–	–	–
			PH	148.86	126-159	None	–	–	–	–	–
			EL	22.82	19-26	None	–	–	–	–	–
			GY	1758.36	936-2853	ICMH01128	2853	40	154	25	0
						ICMH01133	2369	42	148	23	0
						ICMH01144	2230	40	148	24	0
						HHB 67	2361	41	149	21	0

DF = days to 50% flowering PH = plant height Hybrid mean 1702 * mean + 20% advantage

EL = ear length GY = grain yield CD (5%) 221

distance of 45 cm and 15 cm, respectively. Data on days to 50% flowering, plant height (cm), ear length (cm) and grain yield (kg plot^{-1}) were recorded in each replication. Analysis of variance for grain yield was also performed.

Mean square value obtained from analysis of variance indicated significant differences between HHB 67 like hybrids for grain yield. Pollinator wise hybrids mean, range and hybrids having more than 20% advantage over respective pollinator hybrids mean are presented in Table 1. There were no significant differences in mean value of hybrids involving three pollinators in respect of days to 50% flowering plant height and ear length, Hybrids involving pollinators ICMR 01004 and ICMR 01007 exhibited more grain yield over hybrids having H77/833-2 as an original pollinator. Three H77/833-2, six ICMR01007 and four ICMR01004 hybrids having 20% advantage over respective pollinator hybrids mean were identified (Table 1). Two HHB 67 like hybrids (ICMH01122, ICMH01128) yielded as high as 2853 kg ha^{-1}. One of these two hybrids, ICMH01122 (ICMA 99022 x ICMR01007) flowered in 38 days, but had smaller ear heads (18 cm). Another hybrid ICMH01128 (ICMA01030: 21 x 14-16 x ICMR01004) was comparatively tall (154.0 cm) with desirable ear length (25 cm). These two HHB 67 like hybrids need to be exploited as an alternative of HHB 67 in dryland conditions. Other agronomically improved version of HHB 67 is ICMH01112 (ICMA 99012 x ICMR01007). It may be concluded that pollinators ICMR01007 and ICMR01004 have the ability to provide downy mildew resistant versions of HHB 67. The elite versions need to be tested extensively at farmers' fields before releasing them for general cultivation.

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