

Evaluation Of Hybrid Pearl Millet Lines In The Sudan-Savanna Of Nigeria

Yakubu Yahaya

Maina Ibn Mohammed

Bashir Alhaji Baba

Mohammed, Isa

Lake Chad Research Institute, Maiduguri

Abstract: *Nine varieties of pearl millet lines comprising of seven hybrids from ICRISAT, Kano, and two open pollinated checks from Lake Chad Research Institute were evaluated at LCRI Experimental farm, Maiduguri during the 2009 wet season (August to November). Results showed that grain yield varied significantly among the millet varieties/lines evaluated. Only three hybrid millet gave higher yield than SOSAT-C88. Super Boss recorded the highest grain yield of 2933.3kg/ha, while the lowest yield was PAC 909 with 1166.7kg/ha. The superiority of Super Boss over the popularly grown millet, open pollinated varieties, SOSAT-C88 and LCIC 9702 was about 25 and 35 percent yield increase. The early maturing varieties were PAC 909 (50DAS) and Kameri- Boss-65 (51DAS), while Nutri-feed was the late maturing among the entries.*

Keywords: *Hybrid; Pearl Millet; Sudan-Savanna; Nigeria*

I. INTRODUCTION

Pearl millet is predominantly grown as a dryland cereal in the Sudan-Sahelian ecological zone of Nigeria. The zone is prone to drought, heat stress and soils that are too infertile to permit reliable production of other staple food grains. Abiotic constraints like downy mildew, striga, millet head-miner and millet stem borer high temperatures and sporadic rainfall are equally important across these major production zones. Pearl millet production in Nigeria during the last decade has increased only by 0.7 percent and this was as a result of collaborative research efforts by Lake Chad Research Institute (LCRI) and International Crops Research Institute for the Semi- Arid Tropics (ICRISAT).

The result of this collaboration has led to the development and release of improved open pollinated millet varieties which are high yielding and of good end-use quality. In order for demand to meet up with population growth rate, it was estimated that about 5.7 million tones of millet will be required by the year 2010 as against the 4.7 million tonnes in

1994 (Shaib *et al.* 1997). Therefore to enhance production, there is need to increase productivity per unit area and consequently the level of income among the millet growing farmers through the development and release of hybrid millet varieties with potential yields that could double or triple the current millet production, particularly through strong positive yield synergies among improved crop varieties, fertilizer and other management techniques (Srinivasarao *et al.* 2007; Tabo *et al.* 2007).

The direct beneficiaries of this project are poor small holder farmers and their households and others involved in the crop commodity value chain as there will be improvement in their income and productivity through the use of hybrid millet.

II. MATERIALS AND METHOD

Nine varieties (Seven hybrids, PAC 909, PAC 931, Super Boss, Kameri Boss -65 and Nutri-feed LCPJ-HB-1, LCRI-HB-2 (from ICRISAT) and two open pollinated SOSAT-C88 and

LCIC 9702 (from LCRI) were evaluated in LCRI demonstration farm Maiduguri during the 2009 wet season. The nine millet varieties were laid in a randomized block design with three replications. Each plot consists of 3 x 5m", inter and intra row spacing of 75cm and 50cm were used.

The millet varieties were sown on the 5th of August, 2009. Plants were thinned to two seedlings per hill two weeks after sowing. Fertilizer was applied at the recommended rates of 60kg N, 30kg P₂O₅ and 30kg K₂O. All the treatments received basal application of 30kg N, 30kg P₂O₅ and 30kg K₂O, while the second dose of 30kg N/ha was applied four weeks after sowing using urea. All cultural and management practices recommended for millet production were employed.

Data were taken on five randomly selected plants per plot to estimate days to 50% flowering, plant height, panicle length, panicle width and number of tillers per plant. Panicle from the net plot were harvested and weighed to estimate the head weight. The grain yields were determined after threshing the panicles. The data collected were subjected to Analysis of Variance and the means were separated using the Least Significant Difference (LSD 0.05).

III. RESULTS AND DISCUSSION

The performance of hybrid millet lines vis-a-vis open pollinated millet varieties (Table 1). The flowering period of these millet lines/varieties varied from 50 - 60 DAS. Four varieties, PAC 909, PAC 931, Kaveri Boss-65 and LCRJ HB-1 flowered early and were less than the average mean of 55 DAS. The mean plant height ranged from 122.8cm to 188.7cm. Kaveri Boss-65 had the shortest plant height of 122.8cm, this confers resistance/ tolerance to lodging. Grain yield varied significantly among the millet varieties/lines evaluated. Only three hybrid millet yielded higher than SOSAT-C88 (Table 1). Super Boss recorded the highest grain yield of 2933.3kg/ha, while the lowest yield was PAC 909 with 1166.3kg/ha. The superiority of Super Boss (hybrid) over the popularly grown millet, open pollinated varieties, SOSAT-C88 and LCIC 9702 was about 25 and 35 percent yield increase. This result corroborates the findings of Virk (1988) and Gowada and Rai (2005) that reported yield of hybrid millet over open pollinated cultivars between 25-30 percent.

S/ N.	Genoty pes	Day 50% flowering (days)	Plant heigh t (cm)	Pani cle lengt h (cm)	Panicle width (cm)	Tille r coun t/plant	Panicle weight (kg)	Grain yield kg/ha ¹	1000 seed weigh t (g)
1.	PAC 909	50	123.50	25.73	2.64	6	3666.7	1166.3	6.75
2.	PAC 931	54	136.67	26.07	2.86	6	4266.7	2446.6	8.05
3.	Super Boss	55	148.40	27.50	2.80	6	3966.7	2933.3	9.25

4.	Kaveri Boss-65	51	122.83	22.93	2.34	6	3666.7	1823.3	7.35
5.	Nutri Feed	60	164.67	28.23	2.39	6	4266.7	2600.00	6.95
6.	LCRI HB-1	54	182.53	35.70	2.64	5	4233.3	1560.00	6.95
7.	LCRI HB-2	55	174.10	29.40	2.52	5	4633.3	1946.6	7.85
8.	SO SAT (Check)	57	176.83	24.67	2.37	6	4466.7	2200.00	8.25
9.	LCIC 9702 (Check)	59	188.73	25.70	2.57	5	3983.3	1902.00	6.85
	Mean (X)	55	157.59	27.33	2.57	6	4127.8	2064.2	7.56
	CV(%)	4.48	7.83	12.29	9.90	21.81	21.04	64.7	11.347
	S.E.+ (mean)	1.4	7.126	1.94	0.15	0.71	501.53	771.9	0.2860
	LSD (0.05)	**	**	**	NS		NS	NS	NS

Table 1: Mean Performance of pearl millet hybrid evaluated at Maiduguri in 2009

IV. CONCLUSION

The result showed that the hybrids were better in yield and other agronomic characters than open pollinated varieties. There is need to develop more male sterile lines and restores parents from a wild germplasm population so as to maximize the heteroses for better high yielding pearl millet hybrids.

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