

Evaluation of Hybrid Rice Varieties in West Bengal Condition

Nation Chamling¹, A. K. Basu²

¹ Department of Seed Science and Technology, Faculty of Agriculture, Bidhan Chandra Krishi Viswavidyalaya, Mohanpur, West Bengal, Nadia -741252, India

² Department of Seed Science and Technology, Faculty of Agriculture, Bidhan Chandra Krishi Viswavidyalaya, Mohanpur, West Bengal, Nadia -741252, India

Abstract: Two rice hybrids and four check varieties were evaluated for yield and yield attributing traits at two different locations viz., Seed Farm, Kalyani and Farmer's Field, Bankura, West Bengal during 2011-13. Highest number of filled grains per panicle was produced after NK9315 followed by NK6302, KRH2 and MTU7029. Test weight of hybrid types including KRH2 were significantly similar with each other and were of higher magnitude in comparison to that of standard varieties. Yield per hectare was of highest magnitude for NK9315 in both 2011 and 2013 in both the situation followed by NK6302, while it was reverse in 2012.

Keywords: Rice, hybrids, yield, test weight, check varieties

1. Introduction

When Rice (*Oryza sativa* L.) is one of the pivotal staple cereal crops feeding more than half of the world population. Theoretically, rice still has great yield potential to be tapped and there are many ways to raise rice yield, such as building of irrigation works, improvement of soil conditions, cultural techniques and breeding of high yielding varieties. Among them, it seems at present that the most effective and economic way available is to develop "hybrid varieties". Hybrid rice technology has proved to be one of the most feasible and readily adoptable approaches to break the yield barrier, as they yield about 15-20 per cent more than the best of the improved or High Yielding Varieties. The estimated area under hybrid rice in India is about 1.32 m ha. Hybrid technology has been widely acclaimed and accepted. High magnitude of variability in a population provides the opportunity for selection to evolve a variety having desirable characters.

2. Material and Methods

The trial was made during three consecutive kharif season of 2011, 2012 and 2013 at two different locations: Location 1- District Seed Farm 'D'-Block, B.C.K.V., Kalyani, Nadia and Location 2- Farmer's Field, Indas, Bankura following same trial design and similar cultural practices. Two rice hybrids viz., NK9315, NK6302 were evaluated along with the check varieties viz., MTU7029 (Swarna), IET4094 (Khitish), IET4786 (Shatabdi), KRH2 (Karnataka hybrid 2). The trial was conducted in a randomized block design with four replications. Plot size and spacing was maintained at 4m x

3m and 20cm x 15cm, respectively. Normal cultural practices were followed. The fertilizer application was given @ 100:50:50::N:P:K (kg/ha) according to the recommended time and doses. Data on days to 50% flowering, plant height, productive tillers/ m², panicle length, 1000-grain weight and yield (tonnes/ha) were recorded.

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3. Result and Discussion

Days required to 50 % flowering were of higher magnitude for both the concerned hybrid types which were very close with that of MTU7029, though slight response with environmental/locational changes were noted within safe limits. Both NK9315 and NK6302 can be identified as tall

Table 1: Performance of the hybrid types and local checks for average days required to 50% flowering and plant height (cm)

Varieties	Days to 50% flowering							
	BCKV Farm				Farmer's Field			
	2011	2012	2013	Average	2011	2012	2013	Average
NK 9315	109	109	110	109	108	110	106	108
NK 6302	102	104	103	103	102	101	104	102
MTU	105	104	108	106	105	108	109	107

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IET 4786	88	89	88	88	86	87	84	86
IET 4094	84	85	83	84	84	85	85	85
KRH2	84	83	82	83	82	85	84	84
SEm (±)	0.92	0.87	0.67		0.88	1.03	1.02	
CD at 5%	2.77	2.63	2.02		2.64	3.11	3.07	

Plant Height (cm)								
Varieties	BCKV Farm				Farmer's Field			
	2011	2012	2013	Average	2011	2012	2013	Average
NK 9315	133.5	138.0	132.0	135	111.6	107.0	106.0	119
NK 6302	132.5	132.1	136.9	134	110.0	96.2	104.0	114
MTU 7029	94.0	97.0	99.0	97	92.0	93.0	109.0	94
IET 4786	106.5	105.0	100.9	104	112.7	111.2	84.0	108
IET 4094	115.3	126.5	111.0	118	112.3	112.6	85.0	110
KRH2	122.0	125.0	126.9	125	120.0	118.0	84.0	120
SEm (±)	0.94	0.98	0.93		1.09	1.16	0.70	
CD at 5%	2.83	2.94	2.79		3.29	3.51	2.10	

types, showing almost equal plant types and slightly varying with change in growing environment, while MTU7029 was the most dwarf type (Table 1). Average number of productive tillers of six different types ranged between 12-16 in university farm and 12-15 in farmer's field, slight variation in this parameter could be noticed over the years; higher number of tillers in 2012 may be due to congenial climatic

which probably took active role for exhibition of higher yield of the hybrid types under consideration. The results were in unison with Krishnaveni *et al.* [5] (2006). Test weight

Table 2: Performance of the hybrid types and local checks for average number of productive tiller/m² and panicle length (cm)

Productive tiller/m ²								
Varieties	BCKV Farm				Farmer's Field			
	2011	2012	2013	Average	2011	2012	2013	Average
NK 9315	10.2	18.1	16.0	15	9.7	17.9	15.9	15
NK 6302	9.7	18.1	9.3	12	9.8	17.7	10.9	13
MTU 7029	14.0	17.3	15.5	16	12.0	11.9	14.5	13
IET 4786	12.9	17.1	14.1	15	10.5	13.7	12.6	12
IET 4094	14.3	11.6	15.9	14	10.7	11.5	14.4	12
KRH2	12.1	10.6	14.5	12	11.2	10.8	13.4	12
SEm (±)	0.84	0.54	0.39		1.12	0.68	0.58	
CD at 5%	2.54	1.63	1.17		3.38	2.04	1.76	
Panicle length (cm)								
Varieties	BCKV Farm				Farmer's Field			
	2011	2012	2013	Average	2011	2012	2013	Average
NK 9315	27.2	29.9	28.7	29	26.1	27.1	25.3	26
NK 6302	22.0	26.7	21.9	24	24.3	24.8	23.2	24
MTU 7029	22.2	23.5	26.7	24	18.9	19.6	18.2	19
IET 4786	24.0	27.9	22.0	25	25.2	25.8	22.2	24
IET 4094	25.0	31.1	24.9	27	23.6	26.4	23.6	25
KRH2	26.1	24.8	27.6	26	22.1	23.2	23.2	23
SEm (±)	0.77	0.49	0.67		0.69	0.50	0.65	
CD at 5%	2.33	1.47	2.01		2.09	1.50	1.95	

of all the hybrid types including KRH2 were significantly similar with each other and were of higher magnitude in comparison to that of standard varieties. These present findings were in agreement with earlier investigations of Deshpande and Dalvi [2] (2006). Yield per hectare was of highest magnitude for NK9315 in both 2011 and 2013 in both the situation followed by NK6302, while it was reverse in 2012, maybe due to genotypic preference of the individual

hybrids towards changed climatic conditions over the years; and yield of both the types could be noticed as remarkably higher than that of other types included in the trial (Table 3). The yield advantage of rice hybrids over inbred varieties has already been reported by several researchers (Malabanan M [6] (2007), Akram *et al.* [1] (2007) and Sreedhar *et al.* [7] (2011)).

Table 3: Performance of the hybrid types and local checks for average weight of 1000 grains (g) and yield (t/ha)

1000 grain weight								
Varieties	BCKV Farm				Farmer's Field			
	2011	2012	2013	Average	2011	2012	2013	Average
NK 9315	28.4	28.4	28.4	28	28.5	28.8	28.4	29
NK 6302	27.9	28.0	28.3	28	27.9	27.9	28.1	28
MTU 7029	19.2	21.1	18.7	20	18.9	19.6	21.1	20
IET 4786	25.2	25.3	25.5	25	25.4	25.7	25.2	25
IET 4094	24.8	24.8	24.9	25	24.9	24.9	24.8	25
KRH2	26.2	27.0	28.0	27	26.7	27.9	27.9	28
SEm (±)	0.77	0.49	0.67		0.69	0.50	0.65	
CD at 5%	2.33	1.47	2.01		2.09	1.50	1.95	
Yield (t/ha)								
Varieties	BCKV Farm				Farmer's Field			
	2011	2012	2013	Average	2011	2012	2013	Average
NK 9315	9.85	10.84	10.20	10.30	8.7	9.85	9.20	9.25
NK 6302	8.57	12.06	9.80	10.14	7.74	11.47	8.91	9.37
MTU 7029	7.23	7.32	6.58	7.40	7.25	6.83	7.17	7.08
IET 4786	8.76	7.98	7.84	8.19	8.67	9.10	8.26	8.68
IET 4094	8.20	7.30	9.42	8.31	7.98	8.67	7.89	8.18
KRH 2	7.60	7.90	8.20	7.90	7.46	7.89	6.97	7.44
SEm (±)	0.14	0.17	0.08		0.06	0.09	0.06	
CD at 5%	0.44	0.52	0.23		0.20	0.29	0.18	

4. Conclusion

The results of current experiment indicated that highest number of filled grains per panicle was produced after NK9315 followed by NK6302, KRH2 and MTU7029, which probably took active role for exhibition of higher yield of the hybrid types under consideration, it may also be confirmed through the average filled grain percentage of different types included in the trial. Test weight of all the hybrid types including KRH2 were significantly similar with each other and were of higher magnitude in comparison to that of standard varieties. Contribution of this parameter for higher yield of the concerned hybrids should also to be noted; and yield of both the hybrid types could be noticed as remarkably higher than that of other types included in the trial.

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Author Profile



Nation Chamling received his B.Sc. and M.Sc. degree in Agriculture, Department of Seed Science and Technology from Central Agricultural University, Manipur India during 2009 and Anand Agricultural University, Gujarat, India in 2011 respectively. He is currently working as a senior research fellow and is about to complete his doctoral degree programme very shortly from Bidhan Chandra Krishi Viswavidyalaya, West Bengal, India.



Asit Kumar Basu has more than thirty two years of experience in research field including doctoral and post doctoral level and about twenty seven years of teaching experience in genetics and plant breeding. He is currently working as a professor in Agriculture faculty, department of Seed Science and Technology, Bidhan Chandra Krishi Viswavidyalaya, West Bengal, India.