

## Varietal Intervention of High Yielding Variety of Rice through Front Line Demonstration (FLD)

Sanjoy Borthakur<sup>1</sup> Binod Kalita<sup>2</sup> and Manoj Kr. Singh<sup>3</sup>

**Abstract:** The Krishi Vigyan Kendra of East Kameng district of Arunachal Pradesh has conducted Front Line Demonstrations with introduction of High Yielding Variety (HYV) of rice viz., Ranjit, Bahadur and Mahsuri variety in two villages during 2010-11 and 2011-12. The varieties introduced were Ranjit, Mahsuri and Bahadur against local check. Ranjit variety recorded the highest yield (46.00 q/ha) followed by Bahadur (43.89 q/ha) and Mahsuri (41.0 q/ha). The increase in yield percentage over local check variety was recorded to be the highest against Ranjit (125.25%) followed by Bhadur (119.85%) and Mahsuri (102.47%). Benefit cost ratio was found to be the highest in case of the variety Mahsuri (2.56:1) followed by var. Ranjit (2.49:1) and Bahadur (2.38:1). Thus, all the three varieties had shown better performance as compared to the local check variety in respect of yield and yield attributing characteristic and benefit cost ratio.

### INTRODUCTION

Rice is one of the major cereal crops of East Kameng district of Arunachal Pradesh occupying an area of 8,267 ha with average production of 10,767 MT and average productivity is 800 kg/ha during 2010-11 (Anonymous, 2013) which is far below the productivity of rice growing states of India and national average productivity (2,000 kg/ha). It is due to use of age old production practices and low yielding traditional varieties as well as no seed replacement for long period of time. Moreover, farmers of the district are unaware about improved varieties and package and practices released by different research institutions. In order to enhance the productivity of rice KVK of East Kameng district has conducted front line demonstration (FLD) Programme with HYV of rice along with improved package and practices.

### MATERIALS AND METHODS

The FLD programme was conducted in two villages viz. Lower Pampoli and Jayanti of Seppa Administrative block including Six numbers farm family in an around 2 ha of land. The FLD is carried out in two consecutive years i.e. 2010-11 and 2011-12 in the farm land of same farm families following the concept and methodology put forwarded by Venkatasubramanian *et al.* (2009) and Srinivas *et al.* (2014). The main objective of the programme was enhancement of productivity through varietals intervention in turn improves the farm income and to propagate the improved package of practices in the district. In the programme, three high yielding rice varieties of 150 -160 days duration viz., Ranjit, Bahadur and Mahsuri released from Assam Agricultural University, Jorhat which was developed from Regional Agriculture Research Station (RARS), Assam Agricultural University, Titabor, Jorhat, Assam were used. All agronomic

<sup>1</sup> Programme Coordinator, KVK, East Kameng, Pampoli – 790102, Arunachal Pradesh

<sup>2</sup> Junior Scientist (Agronomy), AICRP on maize, RARS, Gosaigaon, AAU

<sup>3</sup> SMS (Horticulture), KVK, East Kameng, Pampoli – 790102, Arunachal Pradesh

E-mail: mr.mksingh2008@rediffmail.com

measures were undertaken in each of the farmer's field from nursery seed bed preparation to the crop harvesting by the KVK scientist along with farmers. For comparative study the HYV of rice demonstration conducted with proper package and practices near by local check varieties with farmers practices. Before and during the demonstration period trainings were conducted on HYV rice cultivation, field day organized for popularizing the varietal performance against local check, crop cutting experiment conducted to find out yield performance in presence of representative of district agriculture officers, local leaders and farmers.

## RESULTS AND DISCUSSION

The physico-chemical properties of soil is sandy loam in nature, well drain, moderate to heavy soil erosion hazard, moderate to strong acidic in nature, rich in organic matter content, medium in

phosphorous and potash content. The crop yield and yield attributing characteristic were recorded during the experiment such as plant height at maturity, total number of tillers/hill, number of effective tillers/hill, panicle length, total number of grains/panicle, number of filled grains/panicle, test weight, grain yield of each farmers plot against the local check.

The Average plant height of Ranjit, Bahadur, Mahsuri and local check were recorded 102.4, 103.2, 127.8 and 126.5 cm, respectively. Total number tillers recorded highest against variety Ranjit (39) followed by Bahadur (33), Mahsuri (27) and local check (15). The effective tillers number also recorded highest against variety Ranjit (31) followed by Bahadur (26), Mahsuri (21) and local check (11). The other properties like panicle length, number of grains/panicle, number of filled grains/panicle were also recorded highest against Var. Mahsuri followed by

**Table 1**  
Yield attributing characteristics of high yielding varieties of rice and local rice variety  
(Average data of 2010-11 and 2011-12)

Variety	Average plant height (cm)	Average total no. of tillers/hill	Average effective no. of tillers/hill	Average panicle length (cm)	Average no. of grains / panicle	Average Nos. of filled grain/panicle	Average test weight (g)
Ranjit	102.4	39	31	22.6	235	227	32
Bahdur	103.2	33	26	22.5	230	223	33
Mahsuri	127.8	27	21	24.5	270	259	21
Local check	126.5	15	11	23.9	123	95	33

**Table 2**  
Yield Performance of HYV and Local check varieties of Rice

Year	Season	Variety	No of Farmers	Area in ha	Demo yield (q/ha)	Yield of local check (q/ha)	Increase in yield (%)
2010-11	Kharif	Ranjit	2	0.67	45.0	20.1	123.88
		Bahadur	2	0.67	43.0	19.8	117.17
		Mahsuri	2	0.67	40.0	20.0	100.00
		Total/average	6	2.01	42.67	19.97	113.69
2011-12	Kharif	Ranjit	2	0.67	46.9	20.7	126.57
		Bahadur	2	0.67	44.5	20.0	122.50
		Mahsuri	2	0.67	42.0	20.5	104.88
		Total/average	6	2.01	44.47	20.40	117.97
Pooled data of 2010-11 & 2011-12	Kharif	Ranjit	4	1.34	46.0	20.4	125.25
		Bahadur	4	1.34	43.8	19.9	119.85
		Mahsuri	4	1.34	41.0	20.25	102.47
		Total/average	12	4.02	43.57	20.18	115.85

Ranjit, Bahadur, and Local check. The test weight of the HYVs was found at par with the local check varieties except Mahsuri which recorded 21 g against 33 g of local check. (Table 1)

It is observed from Table 2 that in both the years, Ranjit variety recorded highest yield followed by variety Bahadur and Mahsuri as compared to yield of local check variety in both the years. Table revealed that the average yield of demonstrated

varieties was 43.5 q/ha against 20.18 q/ha of local check varieties and increase in yield was 115.85%. Among the HYVs, Ranjit variety recorded the highest yield (46.00 q/ha) followed by Bahadur (43.89 q/ha) and Mahsuri (41.0 q/ha). The increase in yield percentage over local check varieties was recorded to be the highest against Ranjit (125.25%) followed by Bhadur (119.85%) and Mahsuri (102.47%).

**Table 3**  
**Economic performance of HYV and Local check varieties of Rice**

Year	Crop	Av. Cost of cultivation Rs./ha		Av. Gross return Rs./ha		Av. Net return Rs./ha		Benefit cost ratio
		Demo	Local	Demo	local	Demo	Local	
2010	Ranjit	17000	7000	41000	18065	24000	11065	2.41:1
	Bahadur	17000	7000	39400	17870	22400	10870	2.32:1
	Mahsuri	17323	7000	43000	18000	25677	11000	2.48:1
	Average	17108	7000	41133	17978	24026	10978	2.40:1
2011	Ranjit	17500	7500	44865	19490	27365	11990	2.56:1
	Bahadur	17500	7500	42825	19000	25325	11500	2.45:1
	Mahsuri	17823	7500	47000	19350	29177	11850	2.64:1
	Average	17608	7500	44897	19280	27289	11780	2.55:1
Pooled data of 2010 & 2011	Ranjit	17250	7250	42933	18778	25683	11528	2.49:1
	Bahadur	17250	7250	41113	18435	23863	11185	2.38:1
	Mahsuri	17573	7250	45000	18675	27427	11425	2.56:1
	Average	17358	7250	43015	18629	25658	11379	2.48:1

(MSP of (2010)- Var. Ranjit and Bahadur Rs. 800.00/q, Var. Mahsuri Rs. 950.00/q, Var. Local Rs 650.00/q. MSP of (2011)- Var. Ranjit and Bahadur Rs 850.00/q, Var. Mahsuri Rs 1000.00/q, Var. Local Rs 700.00/q.)

The economic analysis of demonstration showed that variety Mahsuri showed highest average gross return (Rs. 45,000) followed by variety Ranjit (Rs. 42,933), Bahadur (Rs. 41,113). The variety Mahsuri recorded the highest average net return (Rs. 27,427) followed by variety Ranjit (Rs. 25,683), Bahadur (Rs. 23,863). Benefit cost ratio was also found to be the highest in variety Mahsuri (2.56:1) followed by var. Ranjit (2.49:1) and Bahadur (2.38). Although among the HYVs the yield was recorded to be the lowest in case of Mahsuri, due to its fine grain quality the price of the produce is higher than the other two varieties leading to higher benefit cost ratio and net return of the variety Mahsuri. (Table 3).

## SUMMARY

Front Line Demonstration on high yielding varieties of rice showed that the variety Ranjit, Bahadur and Mahsuri were superior over the local check variety in terms of yield and yield attributing characteristic and the duration of HYV were almost same with local check and the varieties were preferred by the farmers. From the economic point of view too, the farmers found the varieties suitable for enhancement of their economy. The farmers have started growing these varieties in their farm. The seeds of these varieties have been multiplied in the KVK demonstration farm and distributed to the farmers for large scale adoption and also supplied to the ATMA of the district for popularizing the

varieties through further demonstrations in different parts of the district.

### References

- Kumar, A.; Kumar, R. and Yadav, V. P. S. (2010), Impact Assessment of Frontline Demonstrations of Bajra in Haryana State. *Indian Res J Ext Edu.* **10(1)**: 105-108.
- Mishra, D.K.; Paliwal, D.K.; Tailor, R.S. and Deshwal, A.K. (2009), Impact of front line demonstrations on yield enhancement of potato. *Indian Research Journal of Extension Education* **9(3)**: 26-28.
- Mubarak, T. Z.; Bhat, A.; Zargar, M. A. and Wani, A.A. (2013), Impact of improved technology on yield and economics of rice (*Oryza sativa* L.) at farmers' field in temperate zone. *Crop Res.* **45(1, 2 & 3)**: 29-32.
- Singh, B.D. and Dabas, Y.P.S. (2011), Success story of horsegram front line demonstration in Almora district of Uttarakhand. *Indian Fmg.* **61**: 32-34.
- Srinivas, A.; Rao, V.G. and Swaroopa, V.J. (2014), Yield gap analysis of sorghum through Front Line Demonstrations in Tribal area of East Godavari District, Andhra Pradesh. *International Journal of Engineering Science and Innovative Technology (IJESIT).* **3(6)**: 642-646.
- Tomer, R. K. S., Mishra, A. K. and Sharma, P. (2001), Impact of new technology on yield and economics of linseed (*Linum usitatissimum* L.) on the farmers' field. *J.Oilseed Res.* **18** : 99-101.
- Venkatasubramanian V., Sanjeev, M.V. and Singha, A.K. (2009), Concept, approaches and methodologies for technology application and transfer - a resource book for KVKs. Zonal Project Directorate, Zone III, ICAR, Umium, Meghalaya, pp 85-97.