

VARIETAL PERFORMANCE OF HIGH YIELDING VARIETY AND ECONOMICS OF RADISH (*RAPHANUS SATIVUS*) THROUGH FRONT LINE DEMONSTRATION (FLD) IN EAST KAMENG DISTRICT OF ARUNACHAL PRADESH

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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 Radish viz., Arka Nishant, Arka hansh, Kashi sweta and Kashi hansh variety in five villages during 2016-17 and 2017-18. The varieties introduced were Arka Nishant, Arka hansh, Kashi sweta and Kashi hansh against local check. Kashi hansh variety recorded the highest yield (175 q/ha) followed by Kashi sweta (150 q/ha), Arka hansh (145 q/ha) and Arka Nishant (140q/ha). The increase in yield percentage over local check variety was recorded to be the highest against Kashi Hansh (35%) followed by Kashi sweta (30%), Arka hansh (25%) and Arka Nishant (24%). Benefit cost ratio was found to be the highest in case of the variety Kashi hansh (2.22:1) followed by var. Kashi sweta (2.16:1), Arka Nishant (2.08:1) and Arka hansh (1.98:1). Thus, all the four varieties had shown better performance as compared to the local check variety in respect of yield and yield attributing characteristic and benefit cost ratio.

Keywords: Varietal performance, Yield, Net income, B:C ratio

INTRODUCTION

Radish is a popular vegetable in East Kameng district of Arunachal Pradesh. It is cultivated under glass house conditions for early market, but large scale cultivation in the field is more common. Radish (*Raphanus sativus*) is a root vegetable grown and consumed all over the world and is considered part of the human diet, even though it is not common among some populations. Usually, people eat radishes raw as a crunchy vegetable, mainly in salad, while it also appears in many Arunachal dishes. In addition, the edible root of radish varies in its flavor, size, and length throughout the world. Being a quick growing crop it can be easily planted as a companion crop or intercrop between the rows of the other vegetables. It can also be planted on ridges, separating one plot from another. It is cultivated all over India, especially near the city markets. The botanical name of radish is *Raphanus sativus*. The enlarged edible roots are fusiform and differ in colour from white to red. There are two distinct genetical groups in radish. The Asiatic varieties, which are primarily for tropical climates, produce edible roots in the first season and seed in the second season as a biennial crop. On the other hand, the exotic or European varieties produce roots in the plains of tropical and subtropical climate and seeds in the hills of temperate climate. 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 Radish KVK of East Kameng district

has conducted front line demonstration (FLD) Programme with HYV of Radish along with improved package and practices.

MATERIALS AND METHODS

The investigation was carried out to Front line demonstration (FLD) programme was conducted on Radish in five villages viz. New Sopung, Pampoli, Wessang, Sngrikwa and Jayanti of East Kameng district including twenty five numbers farm and farm women family in an around 2 ha of land. The Front line demonstration FLD is carried out in two consecutive years i.e. 2016-17 and 2017-18 in the farm land of same farm families. 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, four high yielding Radish varieties of 30 -45 days duration viz., Arka Hansh and Arka Nishant released from Indian Institute of Horticulture Research, Benglor, Karnataka and Kashi Hansh and Kashi sweta released from Indian Institute of Vegetable Research, Varanasi Uttar Pradesh. All agronomic measures were undertaken in each of the farmer's field from sowing to the crop harvesting by the KVK scientist along with farmers. For comparative study the HYV of Radish demonstration conducted with proper package and practices nearby local check varieties with farmers practices. Before and during the demonstration period trainings were conducted on HYV Radish cultivation, field day organized for

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popularizing the varietal performance against local check, crop harvesting experiment conducted to find out yield performance in presence of representative of district agriculture officers, local leaders and farmers and farm women.

RESULTS AND DISCUSSION

Radish can be grown on nearly all types of soils, but the best results are obtained on light friable loam soil

that contains ample humus. Heavy soils produce rough, mis-shapen roots with a number of small fibrous laterals and, therefore, such soils should be avoided. The crop yield and yield attributing characteristic were recorded during the experiment such as Plant height (cm), Root length (cm), Root diameter (cm), Number of Leaf/Plant and Yield/ha (q) of each farmers plot against the local check.

Table 1. Yield attributing characteristics of high yielding varieties of Radish and local Radish variety (Average data of 2016-17 and 2017-18)

Variety	Average plant height (cm)	Average Root length (cm)	Average Root diameter (cm)	Average effective no. of leaf/plant	Average root weight (g)	Average yield (q)
Arka Hansh	15.42	22	2.8	11	100-110	145
Arka Nishant	13.25	25	2.2	10	110-118	140
Kashi Sweta	14.02	28	3.5	12	120-140	150
Kashi Hansh	12.32	31	3.2	15	115-130	175
Local check	9.45	15	1.9	08	90-95	95

The Average plant height of Arka Hansh, Kashi sweta, Arka Nishant and Kashi Hansh and local check were recorded 15.42, 14.02, 13.25, 12.32 and 9.45 cm, respectively. Average Root length (cm) was recorded highest against variety local check Kashi Hansh (31) followed by Kashi Sweta (28), Arka Nishant (25), Arka Hansh (22) and local check (15). The Average Root diameter (cm) also was recorded highest against local variety Kashi Sweta (3.5) followed by Kashi Hansh (3.2), Arka Hansh (2.8), Arka Nishant (2.2) and local check (1.9). The other

properties like Average effective number of leaf/plant were recorded Kashi Hansh (15) followed by Kashi Sweta (12), Arka Hansh (11), Arka Nishant (10) and Local check (08). Also were recorded Average root weight (g) highest was Kashi Sweta (120-140), followed by Kashi Hansh (115-130), Arka Nishant (110-118), Arka Hansh (100-110) and local check (90-95). The Average yield (q) were highest found Kashi Hansh (175), followed by Kashi sweta (150), Arka Hansh (145), Arka Nishant (140) and local check (95).

Table 2. Yield Performance of HYV and Local check varieties of Radish

Year	Season	Variety	No of Farmers	Area in ha	Demo yield (q/ha)	Yield of local check (q/ha)	Increase in yield (%)
2016-17	Ravi	Arka Hansh	06	0.08	145.0	98.0	25
		Arka Nishant	06	0.08	140.0	95.1	24
		Kashi Sweta	06	0.08	150.0	97.2	30
		Kashi Hansh	07	0.08	175.0	96.5	35
		Total/average	25	2.00	610.0	386.8	114
2017-18	Ravi	Arka Hansh	06	0.08	142.0	97.0	24
		Arka Nishant	06	0.08	138.0	98.2	25

Kashi Sweta	06	0.08	151.0	95.4	29
Kashi Hansh	07	0.08	177.0	95.9	33
Total/average	25	2.00	608.0	386.5	111

It is observed from Table 2 that in both the years, Kashi Hansh variety was recorded highest yield followed by variety Arka Hansh, Arka Nishant and Kashi Sweta as compared to yield of local check variety in both the years. Table revealed that the average yield of demonstrated varieties was 610 q/ha

against 386.8 q/ha of local check varieties and increase in yield was 35%. Among the HYVs, Kashi hansh variety was recorded the highest yield (175 q/ha) followed by Kashi sweta (150 q/ha), Arka Hansh (140 q/ha) and Arka Nishant (140 q/ha).

Table 3. Economic performance of HYV and Local check varieties of Radish

Year	Crop	Av. Cost of cultivation		Av. Gross return		Av. Net return Rs./ha		Benefit cost ratio	
		Demo	Local	Demo	local	Demo	Local	Demo	Local
2016	Arka Hansh	90750	95000	180000	150000	89250	55000	1.98	1.57
	Arka Nishant	85450	82000	178000	142000	92550	60000	2.08	1.73
	Kashi Sweta	85450	80000	185000	145000	99550	65000	2.16	1.81
	Kashi Hansh	85450	75145	190000	135452	104550	60307	2.22	1.80
	Average	347100	332145	733000	572452	385600	240307	8.44	6.91
2017	Arka Hansh	90750	94000	180000	150000	89250	59589	1.98	1.59
	Arka Nishant	85350	82000	178245	141589	92895	59456	2.08	1.72
	Kashi Sweta	85350	80000	184750	145000	101400	65000	2.21	1.81
	Kashi Hansh	85000	75000	189690	135000	104690	60000	2.23	1.80
	Average	346450	331000	732685	571589	388235	244045	8.5	6.92

The economic analysis of demonstration showed that variety Kashi Hansh showed highest average gross return (Rs. 190,000) followed by variety Kashi Sweta (Rs. 185000), Arka Hansh (Rs. 180000) and Arka Nishant (Rs. 178000). The variety Kashi Hansh recorded the highest average net return (Rs. 104550) followed by variety Kashi Sweta (Rs. 99550), Arka Nishant (Rs. 92550) and Arka Hansh (Rs. 89250). Benefit cost ratio was also found to be the highest in variety Kashi Hansh (2.22) followed by var. Kashi Sweta (2.16), Arka Nishant (2.08) and Arka Hansh (1.98). Although among the HYVs the yield was recorded to be the lowest in case of Arka Nishant, due to its fine root 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 Kashi Hansh. (Table 3)

Front Line Demonstration on high yielding varieties of radish showed that the variety Kashi hansh, Kashi Sweta, Arka hansh and Arka Nishant 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 DDA and HDO Office of the district for popularizing the varieties through further demonstrations in different parts of the district. The consistent good results of almost all of the parameters had given comfortable yields both for plot and total tuber yield from the rest of the treatment.

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