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Varietal Performance of Oilseeds and Pulses at Farmers Field in Vindhyan Zone under Rainfed Condition

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Abstract

Front Line Demonstration (FLD) is one of the methods of transfer of Technology which helps in popularization and adoption of technology at larger scale which resulted increase in production and productivity. It is also a most popular and suitable way for the assessment of varieties because of directly involvement of scientists conducting the demonstrations at farmer's field which enables them to have first hand information related to technology. The results of FLD on oilseeds and pulses conducted by KVK, Sonebhadra showed a greater impact on farmers face due to significant increase in crop yield over local check. In the present study, however, due to rainfed condition the extension gap was lower than the technological gap and technology index but increase in yield of demonstration is also considerable because of adverse macro and micro farming situations.

Key Words: Oilseed, pulse, technology index, technology gap, extension gap, farmer, rainfed

Introduction

In Vindhyan Zone where oilseeds and pulses are most suited, farmers are growing pulses and oilseeds over larger area which requires more attention towards use of improved varieties, seed treatment, field preparation, time of sowing to plant establishment and plant protection measures and finally harvesting of crops and marketing. Most of the farmers in Vindhyan Zone are still using traditional varieties as the seed of improved varieties are expansive and are not readily available in the rural areas. Therefore, to create awareness among the farmers and farming communities, efforts have been made to popularize the improved varieties of oilseeds and pulses developed by public sector. With this objective to demonstrate the yield performance of improved varieties of oilseeds and pulses with the existing cultivars and to find out the yield gaps at farmer's field, the Front Line Demonstrations were undertaken.

Materials and Methods

The present study was undertaken in Mirjapur and Sonbhadra districts of Vindhyan Zone during 2001-2005. These districts were critically surveyed by the scientists of Remandated KVK/KVK, Sonbhadra for the Front Line Demonstrations (FLDs) on improved varieties of oilseeds viz., mustard/toria, Sesamum and linseed and pulses viz., Pigeonpea, field pea,and lentil. A total of 14 varieties of oilseeds and pulses including 2 in mustard/toria (NDR-8501 and Narendra Ageti Rai - 4), 2 in sesamum

(T-78 and G-4), 2 in linseed (Neelam and Shewta),2 in pigeon pea(NDA-1 and Bahar), 3 in gram(Awarodhi, Udai and Pusa-256), 2 in field pea(M-15 and M-2) and 1 in lentil(NDL-1) were randomly demonstrated at 78 different location in an area of 32.5 ha land. The demonstrated trails were regularly monitored and cross sectional data on output of new varieties were collected. In addition to this, data on traditional practices followed by the farmers have also been collected.

To estimate the technology gap, extension gap and technology index, the following formula were used.

Technology Gap=Potential yield-Demonstration yield

Extension Gap= Demonstration Yield-Farmers' Yield

$$\text{Technology Index} = \left[\frac{Pi-Di}{Pi}\right] x100$$

Where Pi=Potential yield of i^{th} crop
Di= Demonstration yield of i^{th} crop

Results and Discussion

It is generally supposed that the best technology at research station also perform best at farmer's field, however, the assumptions of consistency or repeatability of technology performance between research station and farmer's field may not hold universally. With this view, selection of such technologies for farming communities should not be based on research station trails only because performance of such technologies also depends upon micro farming situations. Therefore, it is necessary to compare such technologies with the existing farmers practices. The results of present action research also show a greater impact of improved varieties over the existing cultivars [1]

Gap Analysis and Technology Index

Performance of front line demonstration (FLDs) trails and potential yield of respective oilseed and pulse crops were compared to find out the yield gaps, which further categorized into technology and extension gaps. The adoption of technology in front line demonstration trails was studied through technology index, which shows suitability of the varieties at farmers' field. The lower the value of the technology index indicated more suitability of demonstrated varieties.

Mustard/Toria On the basis of pooled demonstrated yield analysis of cultivars, the average yield of demonstrated varieties at farmer's field was 8.4 q/ha compared to 6.35q/ha from local check. Though the FLD trails were conducted under the close supervision of scientists but still there is a big gap between the potential yield and demonstration yield. This might be due to adverse weather conditions (occurrence of drought since 2002-2005) and soil fertility that is why location specific recommendations are necessary to bridge the gap. It is clearly indicated in the table that mustard/toria obtained mean yield of 8.4q/ha, which was 32.28per cent higher than the local check. [2&3] Technology Index is lowest in case of Narendra ageti rai-4 followed by NDR-8501, which indicate that Narendra ageti rai-4 is performing best at farmers' field. Aphid is a major problem of mustard in Vindhyan Zone which can be avoid by early sowing of variety Narendra ageti rai-4.

Sesamum: Two varieties viz., T-78 and G-4 were taken for FLD trails to compare with existing varieties T-78 performed extremely well at farmers field with Technology Gap of only 1.5q/ha and

Technology Index of 25%, however, the Extension Gap was minimum (0.5q/ha) with variety G-4(Table-1).Technological Gap might be due to micro farming situations.

Linseed: Analysis of pooled data indicated that Sweta variety of Linseed which yielded 7.50q/ha in demonstration trails is most suited to Vindhyan region because it has tolerance against drought. Variety Sweta shows 38.89 per cent increase in yield over control with lesser technological gap i.e. 7.5 and Technology Index i.e. 50.50%. Variety Neelam also performed well and proved superior over control. The reason behind more Technological Gap might be due to drought, soil fertility and other micro-farming situations.

Pigeonpea: Analysis of pooled data shows that both varieties performed better over control. The average yield of demonstrated varieties at farmers' field was 16.0q/ha compare to 9.15q/ha from local check (Table-2) which was 74.91 per cent higher than the local check. NDA-1, a variety developed by NDUA&T, Faizabad performed well at farmers' field with Technology Gap of of only 6.7q/ha and Technology Index of 30.45% where as variety Bahar also performed better with Technology Gap of only 8.30q/ha and Technology Index of 32.20% indicating high feasibility of its adoption among farmers.

Chickpea: Data depicted in table-2 shows that Pusa-256 performed extremely well at farmers field with Technology Gap of only 13.1q/ha and Technology Index of 52.40%.The performance of other varieties (up to 28.89% yield increase over local check) resulted in better adoption and replacement of other chickpea varieties from this region. Technology Gap is more in case of Udai(19.80/ha), which might be due to environmental and soil conditions [4].

Technology Index was also highest with Udai (66.00%) followed by Awarodhi (61.33%).Hence, according to criterion after Pusa-256, Awarodhi is best variety for adoption.

Fieldpea: Data presented in table -2 shows that maximum demonstration yield(12.50q/ha) was obtained with M-15 which yielded 50.60 per cent more over control, however, the less Technological Gap of 12.60q/ha was recorded with M-2 with less Technology Index of 50.40% in comparison to M-15 having Technological Gap of 19.5q/hand Technological index of 60.94 %, respectively.

Lentil: Analysis of data presented in table -2 shows that lentil variety NDL-1 performed better in demonstration trails yielded 12.40q/ha with Technological Gap of 9.60q/ha and Technology Index of 43.64 per cent. Yield in percent over control was 30.53% also shows its superiority over control.

Overall, it is concluded that low cost input technologies either in single or multiple component demonstrations i.e. introduction of high yielding varieties, balanced use of fertilizers, seed treatment with suitable fungicides and use of bio-fertilizers for seed treatment can enhanced

yield of oilseeds and pulses considerably. There is great scope for popularizing oilseeds and pulses production technologies and it could be demonstrated to potential yield gap of such crops.

Table 1. Varietal Performance of Oilseeds at Farmers Field in Vindhyan Zone under Rainfed condition.

Crop	**Variety demonstrated**	**No. of locations**	**Yield(q/ha)**			**Yield increased over control (%)**	**Technologi-cal Gap (q/ha)**	**Extension Gap (q/ha)**	**Technol-ogy Index (%)**
			Potential yield	**Demo yield**	**Control**				
Mustard/ Toria	NDR-8501	30	25.00	9.00	6.80	32.35	16.00	2.20	64.00
	Narendra Ageti Rai-4	12	20.00	7.80	5.90	32.20	12.20	1.90	17.50
	Weighted mean	**-**	**22.50**	**8.40**	**6.35**	**32.28**	**14.10**	**2.05**	**40.75**
Sesamum	T-78	36	6.00	4.50	3.40	32.35	1.50	1.10	25.00
	G-4	24	6.00	3.70	3.20	15.62	2.30	0.50	38.33
	Weighted mean	**-**	**7.0**	**4.10**	**3.30**	**23.99**	**1.90**	**0.80**	**31.67**
Linseed	Sweta	36	15.00	7.50	5.40	38.89	7.50	2.10	50.50
	Neelam	12	15.00	6.25	5.40	15.74	8.75	0.85	58.33
	Weighted mean	**-**	**15.00**	**6.88**	**5.40**	**31.95**	**10.62**	**1.43**	**60.42**

Table 2. Varietal Performance of Pulses at Farmers Field in Vindhyan Zone under Rainfed condition.

Crop	Variety demonstrated	No. of locations	Yield(q/ha)			Yield increased over control (%)	Technological Gap (q/ha)	Extension Gap (q/ha)	Technology Index (%)
			Potential yield	Demo yield	Control				
Pigeonpea	NDA-1	48	22.00	15.30	9.20	66.30	6.70	5.45	30.45
	Bahar	24	25.00	16.70	9.10	83.51	8.30	7.60	32.20
	Weighted mean	**-**	**23.50**	**16.00**	**9.15**	**74.91**	**7.50**	**6.53**	**31.83**
Chickpea	Awarodhi	36	30.00	11.60	9.00	28.89	18.40	2.60	61.33
	Udai	36	30.00	10.20	9.20	10.87	19.80	1.00	66.00
	Pusa-256	12	25.00	11.90	9.30	27.96	13.10	2.60	52.40
	Weighted mean	**-**	**23.33**	**11.23**	**9.17**	**22.57**	**12.10**	**2.07**	**59.91**
Fieldpea	M-15	24	32.00	12.50	8.30	50.60	19.50	4.20	60.94
	M-2	24	25.00	12.40	9.20	34.78	12.60	3.20	50.40
	Weighted mean	**-**	**28.50**	**12.45**	**8.75**	**42.69**	**16.05**	**3.70**	**55.67**
Lentil	NDL-1	12	22.00	12.40	9.50	30.53	9.60	2.90	43.64
	Weighted mean	**-**	**22.00**	**12.40**	**9.50**	**30.53**	**9.60**	**2.90**	**43.64**

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