Assessment of Mustard Cultivars on Different Performance Parameters

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ABSTRACT

The high yielding varieties of mustard played key role in enhancing the production and yield as these crops are grown under low input cultivation. The present investigation was conducted to study the farmers' perception and performance on different attributes of prevailing mustard varieties. The Semantic Differential Technique was used to know farmers' perception about selected five mustard varieties. A total of 270 farmers consisting 30 randomly selected farmers from each of the nine panchayat samities of Bharatpur district of Rajasthan were randomly interviewed. The study reported that performance of mustard varieties were not the same in all the areas, which indicated that different varieties were suitable in different agro-ecological situations or areas. It showed that there was wide variability at field conditions even in the same district. Performance of these varieties varied from region to region and their performances were not same in all the areas of the district. Different panchayat samities showed the suitability of different varieties.

Key Words : Perception; Semantic differential technique; Performance; Attributes;

Rapeseed-mustard contributes significantly to the total edible oilseed production in India. This group includes seven cultivated crops. These crops are widely grown in northern, central and eastern India and are major source of edible oil in this region. Rapeseed-mustard witnessed spectacular growth after the inception of technology mission on oilseed in 1986. The production and yield have increased from 2.68 mt and 674 kg/ha during 1985-86 to 3.97 mt and 902 kg/ha, respectively during 2002-03. The high yielding varieties played key role in enhancing the total production and yield and their role gain impends because these crops are grown under low input cultivation. Number of high yielding varieties of rapeseed-mustard have been developed after the inception of All India Coordinated Research Project on oilseeds in 1967 as per the need of different agro-climatic zones of the country.

Attributes of technology are the characteristics of a technology by which a technology can be described. Individuals' perceptions of these characteristics are predictive of the rate of adoption. The reception given to a new technology is not so fortuitous and unpredictable as it sometimes appears to be. The character of the idea is itself an important determinant *(Barnett 1953).* It is adopters' perceptions of the attributes of technologies, not the attributes as classified by experts or technology advocates, which affect their rate of adoption because adopters are the ultimate users of a technology. The rate of adoption of a technology depends upon perception of the characteristics of that technology by the users. Perception of an innovation is most important in affecting rate of adoption. As evident from the past research, the innovations, which are perceived to possess more favourable features, are readily and more quickly adopted by farmers. *(Barnett, 1953, Kivlin, 1960, Lionberger 1960, Rogers and Shoemaker, 1971.* Therefore, the present study was conducted with following objectives:

1. To study the farmers' perception about different attributes of prevailing mustard varieties
2. To study the farmers preferences of mustard varieties based on field performance.

The authors utilized the semantic differential, a technique used to measure perceptions of other objects, in order to operationalize perceptions of the characteristics of innovation. Semantic differential stems from a desire to give quantitative measurement to meaning (*Osgood 1970*). The adoption behaviour of the farmers is largely determined by their meanings attached to various innovations. According to *Osgood (1970)* the semantic meaning refers to what people mean by an object to which they are referring. It is obvious that semantic meaning varies from individual to individual or from group to group, depending upon their perception of the object.

In the present study, the selected innovations were considered as objects and the attributes of innovation as

quantitative dimensions to which different meanings are attached by farmers based on their previous experience.

METHODOLOGY

The present study was conducted in Bharatpur district of Rajasthan. Bharatpur district was purposely selected because of its apt representation. This district is leading mustard producing area that alone contributes 10 per cent of the total rapeseed-mustard production of the country. For the present study, five mustard varieties viz. Varuna, Pusa Jaikisan, Rohini, RH-30 and Chippka (a local variety) were selected to know the performance of these varieties at farmers field as perceived by the adopter farmers. For the purpose of measurement, 20 attributes of variety, which were somewhat concrete and capable of evincing varied response from the farmers, were selected after the consultation with experts.

For each of the attributes, bipolar adjectives were formulated in consultation with the experts in the field of psychology, sociology and other social sciences. These adjectives were placed on a seven point scale, with scores ranging from one to seven. The object (variety) to be measured was placed at the centre of the scale and the respondents were requested to indicate their position or opinion on each of the 20 bipolar attributes on a seven-point scale, separately for the five selected varieties. This scale consisting of 20 bipolar adjectives was administered to 30 randomly selected farmers from each of the nine panchayat samities of Bharatpur district of Rajasthan. A total of 270 farmers from Bharatpur district were randomly interviewed for present investigation. Scoring was done by giving a weightage of 1 to 7 or 7 to 1 from one end to the other end of the bipolar adjective, depending upon their positive-negative extremities as also used by *Siddaramaiah and Shree Nithya (2000).* The minimum and the maximum scores possible on this scale for each respondent were 20 and 140 on the whole. After calculating the semantic differential scores in this way the mean percent scores (MPS) of each attribute of each of the varieties were computed for the purpose of comparison among different mustard varieties.

RESULTS & DISCUSSION

Farmers perception about different attributes of mustard varieties: It is evident from Table 1 that the MPS 72.0 of the variety Rohini indicated the possessing of more branching than other prevailing varieties in the region. Regarding basal branching, Pusa Jaikisan (MPS 47.14) was slightly better than other four varieties. The early flowering was observed in Rohini variety (MPS 44.28) followed by Chippka (MPS 43.57), RH-30 (MPS 43.14), Pusa Jaikisan (MPS 42.71) and Varuna (MPS 41.28). The number of pods per branch was reported high in Rohini with MPS 67.85 in comparison to Chippka, with MPS 59.04, Pusa Jaikisan with MPS 56.04, RH-30 with MPS 50.71 and Varuna with MPS 48.47. The MPS 65.00 indicates the maximum seed per pod in the Rohini variety. The second most variety having maximum seed per pod was Pusa Jaikisan with MPS 61.04, the Varuna had lowest seed per pod with MPS 57.57 followed by RH-30 with MPS 59.14.

The highest appression of siliquaes was in Chippka (MPS 89.14) followed by Rohini with MPS 79.19. The remaining three varieties were not characterized by appreassed siliquaes. The Chippka variety was reported of having less height with MPS 49.23 in comparison to other varieties, while Rohini (MPS 43.71) was observed slightly larger in height among the varieties. The farmers observed Rohini as early maturing with MPS 43.14 and Varuna as late maturing with MPS 38.42 in comparison to other varieties. Responses of the farmers about seed size with the mean per cent score 36.28 indicate that seed size of Rohini was smaller than other varieties. The Varuna with MPS 50.71 was observed as larger or bold seeded among all the varieties. Regarding lodging resistance, all the varieties, except Varuna with lowest MPS 44.28 were almost same.

The variety Rohini with MPS 64.14 was found with better shattering resistance followed by RH-30 with MPS 62.85. However, pod shattering was reported maximum in the Varuna variety with MPS 45.19. For disease tolerance, Pusa Jaikisan was found to be better among all the four varieties, which is depicted from its MPS of 64.57. The variety RH-30 with MPS 63.57 was found second placed regarding disease tolerance. The Chippka variety with MPS 45.61 was found most susceptible towards diseases closely followed by Rohini variety with MPS 46.19. If we analyze the MPS of all the varieties towards insect tolerance, then it is clear that variety Varuna was most susceptible towards insect infestation having lowest MPS 37.23, which was followed by Chippka with MPS 39.04. The variety Pusa Jaikisan was found highest insect tolerance (MPS 42.47) than other varieties. The MPS of all the varieties regarding weed tolerance depicted that almost all the varieties were equal towards weed tolerance except Rohini (MPS 41.38) which was slightly more weed tolerant variety in comparison to other varieties. The variety RH-30 was found better regarding drought tolerance with highest MPS 46.19 but most adversely affected with frost, fog and cold i.e. lowest

tolerance with lowest MPS 38.23. The variety Varuna was reported as the lowest drought tolerance with MPS 38.52 followed by Pusa Jaikisan (MPS 39.14), Rohini (MPS 40.71) and Chippka (MPS 41.90).

Regarding frost, fog and cold tolerance, the variety Chippka was found to be most suitable with MPS 51.90 followed by Rohini with MPS 43.76, Pusa Jaikisan with MPS 43.09, Varuna with MPS 42.66 and RH-30 with MPS 38.23.The MPS 45.71 of Pusa Jaikisan variety indicated the greater suitability for saline soil followed by Chippka with MPS 44.28, Varuna with MPS 43.57 and RH-30 with MPS 40.00. The Rohini variety with MPS 38.52 showed lowest suitability for saline soil among all the varieties. The very low MPS for all the varieties regarding suitability for late sowing indicated that none of varieties were suitable for late sowing.

Table 1. Perception of farmers about different attributes of mustard varieties measured through Semantic Differential Technique (N=270)

S.N.	Attributes of varieties	Varieties (Mean Per cent Scores)				
		Varuna	Rohini	Pusa Jaikisan	RH-30	Chippka
1.	More branching	61.14	72.00	65.14	62.14	64.23
2.	Basal branching	45.00	45.71	47.14	45.14	45.80
3.	Early flowering	41.28	44.28	42.71	43.14	43.57
4.	More pods/branch	48.47	67.85	56.04	50.71	59.04
5.	More seed per pod	57.57	65.00	61.42	59.14	61.04
6.	Appressed siliquaes	45.28	79.19	46.85	48.42	89.14
7.	Dwarf ness	45.57	43.71	45.66	46.66	49.23
8.	Early maturing	38.42	43.14	41.09	40.76	41.00
9.	Bold seed	50.71	36.28	48.57	48.28	43.57
10.	Lodging resistance	44.28	50.71	51.38	50.38	51.23
11.	Shattering resistance	45.19	64.14	61.14	62.85	61.85
12.	Diseases tolerance	59.28	46.19	64.57	63.57	45.61
13.	Insects tolerance	37.23	40.00	42.47	41.28	39.04
14.	Weed tolerance	39.71	41.38	39.76	39.52	39.04
15.	Drought tolerance	38.52	40.71	39.14	46.19	41.90
16.	Frost/ fog/ cold tolerance	42.66	43.76	43.09	38.23	51.90
17.	Suitable for saline soil	43.57	38.52	45.71	40.00	44.28
18.	Suitable for late sowing	36.28	34.28	32.42	35.57	32.85
19.	Oil content	62.14	78.09	63.52	61.42	70.00
20.	Production	63.57	80.00	70.71	67.47	70.47
	Total	945.87	1054.94	1008.53	960.87	1044.79
	Overall	47.29	52.74	50.42	48.04	52.23
	Rank	V	I	III	IV	II

The mean per cent scores regarding production, most preferred attributes of the variety by the farmers, indicated that Rohini (MPS 80) was the best in performance of yield. The second best in production was Pusa Jaikisan with MPS 70.71, which was closely followed by Chippka with MPS 70.47. The RH-30 with MPS 67.47 got forth place with regard to performance of yield followed by Varuna as lowest in yield performance.

The second most preferred attribute of mustard varieties by the farmers i.e. oil content was found highest in Rohini variety with MPS 78.09 followed by Chippka with MPS 70.00, Pusa Jaikisan with MPS 63.52, Varuna with MPS 62.14 and RH-30 with MPS 61.42. After critical analysis of each attribute for all the varieties, it has been observed that the variety Rohini was perceived better than the Chippka, Pusa Jaikisan, RH-30 and Varuna on account of identified attributes or indicators and the ranks have also been assigned accordingly.

Farmers preferences of mustard varieties based on the their field performance : Table 2 depicts farmers' preferences of mustard varieties based on their field performance in different panchayat samities of Bharatpur district of Rajasthan. Table reveals that Rohini variety was dominant in four panchayat samities namely Nadbai (56.66 per cent), Bharatpur (46.66 per cent), Kumher (40.00 per cent) and Nagar (36.66 per cent). In these areas, majority of the farmers preferred Rohini variety as the performance of this variety was better than other varieties. Pusa Jaikisan variety was preferred by majority of the farmers of Kama and Deeg Panchayat Samities.

The majority of the farmers of Roopwas, Bayana and Weir preferred the Chippka variety due to its good performance in their areas. RH-30 was also preferred by many farmers of almost all panchayat samities, while, the oldest variety varuna was still most preferred by some farmers of all panchayat samities except Bharatpur and Kumher.

Table 2. Farmers' preferences of mustard varieties based on the their field performance in different panchayat samities of Bharatpur district of Rajasthan (N=270)

Panchayat Samities	Varieties' Preferences (%)					
	Rohini	BIO- 902	RH-30	Chipkka	Varuna	Others
Bharatpur (N=30)	46.66	13.33	10.00	20.00	-	10.00
Kumher (N=30)	40.00	16.66	10.00	13.33	-	20.00
Nagar (N=30)	36.66	16.66	13.33	10.00	6.66	16.66
Nadbai (N=30)	56.66	10.00	6.66	6.66	6.66	13.66
Deeg (N=30)	20.00	26.66	13.33	10.00	3.33	26.66
Kama (N=30)	10.00	30.00	13.33	6.66	10.00	26.66
Roopwas (N=30)	16.66	6.66	13.33	33.3	6.66	16.6
Bayana (N=30)	20.00	10.00	16.66	26.6	3.33	16.66
Weir (N=30)	16.66	10.00	13.33	23.3	6.66	23.3
Bharatpur district as	(31.85)	(15.55)	(12.22)	(15.18)	(4.81)	(20.37)

There were substantial numbers of farmers who preferred other varieties to Rohini, Pusa Jaikisan, RH-30, Chippka and Varuna. These other varieties mostly included the varieties released by the private agencies. A large number of farmers (26.66 per cent) of Deeg and Kama panchayat samities preferred these other varieties. When we analyze the whole district, it was found that Rohini was the most preferred variety by the farmers (31.85 per cent) of the district. The Pusa Jaikisan was second most preferred variety by the farmers (15.55 per cent) closely followed by Chippka (15.18 per cent) and RH-30 (12.22 per cent). Besides these four prominent varieties, other varieties like Arawali mustard, Pusa Bold, Laxmi etc. released by govt. agencies and varieties released by private agencies were also preferred by many farmers of different panchayat samities because of their better performance in their areas.

CONCLUSION

Rohini variety was preferred by majority of the farmers because of high production, high oil content, abundance branching, more number of pods per branch, more number of seeds per pod, resistance to shattering in comparison to other varieties. The similar findings were also given by *Rai et al (2002).* A revealing finding of this study was that a local variety commonly known as Chippka, was almost as popular as Rohini. The farmers reported that the attributes or characteristics of this local variety closely followed to the attributes of Rohini. Besides other attributes, Chippka variety had highest appression of the siliquae, which protected the crop from frost, fog and cold injuries and also made the harvesting easy. However, it should also be noted that both varieties had lowest disease tolerance that could make the big loss in case of disease infestation, if due attention is not paid to adopt the disease control measures. However, in overall, it can be said that Rohini, Chippka (a local variety), Pusa Jaikisan, RH-30 were the popular varieties among the farmers and widely grown in the Bharatpur district of Rajasthan. Further, it was clear that performance of all mustard varieties were not same in all the areas, which indicated that different varieties were suitable in different agro-ecological situations or areas. It showed that there was wide variability at field conditions even in the same district. Performance of these varieties varied from region to region and their performances were not same in all the areas of the district. Different panchayat samities showed the suitability of different varieties.

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