



Research Article

EVALUATION AND ANALYSIS OF YIELD, PERFORMANCE AND ADOPTION OF MUSTARD (*BRASSICA JUNCEA* L) VARIETY RH-749 IN MUZAFFARNAGAR DISTRICT

SINGH P.K.¹, VERMA R.C.^{*2} AND ARYA J.K.³

¹Professor & Head, ICAR-Krishi Vigyan Kendra, Muzaffarnagar, 251 306, Sardar Vallabhbhai Patel University of Agriculture & Technology, Meerut, 250 110, India

²Sr. Scientist & Head, Krishi Vigyan Kendra, Ghazipur, 233001, Acharya Narendra Deva University of Agriculture & Technology, Ayodhya, 224 229, Uttar Pradesh, India

³Scientist (Horticulture), ICAR-Krishi Vigyan Kendra, Muzaffarnagar, 251 306, Sardar Vallabhbhai Patel University of Agriculture & Technology, Meerut, 250 110, India

*Corresponding Author: Email - rcv3011@gmail.com

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Abstract: The Mustard variety RH-749 was spread in the district through Cluster Frontline Demonstration at farmers field in Muzaffarnagar district. The demonstrations conducted during last two years (2018 and 2019) under National Food Security Mission (NFSM), were considered for the study. The results indicate that adoption of this variety significantly increased due to higher productivity, more net return and resistance for Alternaria Blight and Rust.

Keywords: CFLD, Adoption, Technology Gap, Extension Gap

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Introduction

Rapeseed/Toria and Mustard (28.6%) are the third most important edible oilseed crop of the world after Soybean and Oil palm. Two species of Rapeseed and Mustard are *Brassica juncea* and *Brassica campestris*. The oil content varies from 37-49%. The oilcake is used as feed and manure. The leaves of young plants are used as green vegetable and green stem and leaves of good source of green fodder for cattle. In the tanning industry, mustard oil used for softening leather. Indian Mustard is grown in Rajasthan, Uttar Pradesh, Madhya Pradesh, Haryana and Gujarat and also in some areas of south like Andhra Pradesh, Karnataka and Tamil Nadu. Yellow sarson is taken as rabi crops in Assam, Bihar, Orissa and West Bengal. Whereas in Punjab, Haryana and UP it is taken as catch crops. Mustard crop requires relatively cool temperature for satisfactory growth. In India mustard is grown in rabi season from September – October to February- March, successfully grown in light to heavy loam soil, light soil area also good for this. A fine seedbed is required to ensure good seed germination. Nitrogen application in to three equal splits increase the seed, Stover and Biological Yield [4]. Water and fertilizers are scarce and costly commodities and their judicious application is must to achieve higher benefits under limited resource condition. Oilseeds crops requires more of sulphur for their oil and protein synthesis, which indicated considerable increases in the yield and its quality [5]. Sowing of the crop at adequate time is an important noncash input for boosting crop productivity. Use of all advanced package of practices properly and timely resulted in optimum productivity and oil yield.

Materials and Method

The present study was carried out in randomly selected 10 villages in different blocks like Baghra, Charthawal, Budhana, Shahpur and Morna of district Muzaffarnagar, UP for 20 ha area of 50 demonstrations for 50 farmers under Cluster Frontline Demonstrations (CFLD) in 2017-19 and 2018-19 of Rabi seasons with Farmers Scientist Collaborations at Farmers Field. 50 farmers were selected randomly.

Recommended RH-749 variety for good response with the seed rate of 5.00 Kg/ha along with timely application of N: P: K@120:40:40 Kg/ha. The crop was grown on the farmers field during first fortnight of October and suggested to apply the sulphur at the rate of 15-20 kg/ha for increasing the yield and quality [6]. Advice has been given to farmers on thinning, irrigation and other cultural practices for better yield. All information and data collected by KVK Scientist. The following formulae have been used for estimation of technology gap, extension gap, BC Ratio, Adoption percentage and technology index.

Technology gap (TG) = Potential Yield (PY)- Demonstration Yield (DY)

Extension gap (EG) = Demonstration Yield (DY)-Farmers Yield (FY)

Technology Index (TI) = Potential Yield (PY)-Demonstration Yield (DY)/ Potential Yield (PY)X100

Benefit Cost Ratio (BC Ratio) = Gross Income/ Cost of Cultivation.

Adoption Rate % = No. of new farmers/ Total no. of farmers.

Results and Discussion

The potential and field performance of the RH-749 along with local check were evaluated and data are given in [Table-1]. Show that significant yields obtained in different blocks of Muzaffarnagar by use of highly improved variety of Mustard RH-749. It is very clear that if the farmers were aware about improved variety of mustard and all the packages of practices in a good frame of time work, yield will be more and more in all blocks of Muzaffarnagar. The highest yield recorded in Charthawal 20.5 q/ha followed by Shahpur 20.3 q/ha, Budhana 19.2 q/ha, Morna 18.8 q/ha and lowest yield recorded in block Baghra 18.7 q/ha and average yield 19.6 q/ha whereas in check average yield recorded 15.6 q/ha. Overall, 25% yield increased by used highly improved variety. Highest yield increased in block Baghra 30.76% followed by Budhana 29.7%, Shahpur 29.3%, Charthawal 21.30% and lowest increased in yield Morna 15.33%.

[Table-2] shows that the cost of cultivation in different blocks of Muzaffarnagar between Rs. 18900 to Rs. 20050/ha and average cost of cultivation Rs. 19450/ha.

Table-1 Yield (Q/ha) of Mustard Variety RH-749 in Different Blocks of Muzaffarnagar

SN	Blocks	No. of Farmers	Area(ha)	Seed Rate (Kg/ha)	NPK(Kg/ha)	Potential Yield(q/ha)	Yield(q/ha) Check	Yield(q/ha) Demonstration	% Increase in Yield
1	Baghra	10	4.0	5.0	120:40:40	22.0	14.3	18.7	30.76
2	Charthawal	10	4.0	5.0	120:40:40	22.0	16.9	20.5	21.30
3	Budhana	10	4.0	5.0	120:40:40	22.0	14.8	19.2	29.70
4	Shahpur	10	4.0	5.0	120:40:40	22.0	15.7	20.3	29.30
5	Morna	10	4.0	5.0	120:40:40	22.0	16.3	18.8	15.33
6	Average	10	4.0	5.0	120:40:40	22.0	15.6	19.5	25.00

Table-2 Economic Performance of Demonstrations

SN	Blocks	No. of Farmers	Cost of Cultivation(Rs/ha)	Gross Income(Rs/ha)	Net Income(Rs/ha)	B:C
1	Baghra	10	18900	76670	57770	4:01
2	Charthawal	10	19600	84050	64450	4.28:1
3	Budhana	10	20050	78720	58670	3.92:1
4	Shahpur	10	19200	83230	64030	4.33:1
5	Morna	10	19500	77080	57580	3.95:1
6	Average	10	19450	79950	60500	4.11:1

Table-3 Technological Impacts of Demonstration

SN	Blocks	Technology Gap(Q/ha)	Extension Gap(Q/ha)	Adoption %	Technological Index
1	Baghra	3.3	4.4	13.30	15.0
2	Charthawal	1.5	3.6	11.10	6.18
3	Budhana	2.8	4.4	12.20	12.72
4	Shahpur	1.7	4.6	10.60	7.72
5	Morna	3.2	2.5	11.70	14.54
6	Average	2.5	3.9	11.78	11.36

The average gross return in demonstrated blocks Rs. 79950/ha and average net return Rs. 60500/ha with Benefit and Cost Ratio 4.11:1. The highest net return in Charthawal block with Benefit and Cost Ratio 4.28:1. This crop is more profitable from other crops and other varieties of mustard because cost of cultivation is low in comparison to other crops and got more income in all blocks. In farmers practice sulphur not used for mustard cultivation. So, Sulphur application according to need of the crop is better for its growths and yield. Fertilizers and irrigation application time to time resulted high yield and income. Selection of variety on area basis has produced more responsiveness for high yield and better quality. In [Table-3] shows the adoption of mustard variety RH-749 has significant impact on seed yield and yield gap.

Conclusion

Yield increased in demonstration field due to adoption of newly released variety. Adoption % ranged from 10.60 to 13.30% with a mean percent increase of 11.78% as compared to local check. Rana *et al* (2002) [7] reported that demonstration is quite successful in farmers practice. Kadian *et al* (1997) [8] reported that technology gap can be narrowed down only by location specific technology-based recommendations. The variety RH-749 fast replacing local varieties. The demand of quality seed of this variety is also increasing which has led to participatory seed production at farmers field.

Application of research: The study concludes that in future all farmers has to provides all the package of practices properly and timely to insure better yield with good quality with appropriate cost of cultivations etc

Research Category: Crop Science

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****Principal Investigator or Chairperson of research: Dr R. C. Verma**

University: Acharya Narendra Deva University of Agriculture & Technology Kumarganj, Ayodhya, 224 229, Uttar Pradesh, India
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Study area / Sample Collection: Baghra, Charthawal, Budhana, Shahpur and Morna of district Muzaffarnagar

Cultivar / Variety / Breed name: Mustard (*Brassica juncea* L) Variety RH-749

Conflict of Interest: None declared

Ethical approval: This article does not contain any studies with human participants or animals performed by any of the authors.
Ethical Committee Approval Number: Nil

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