



# KNOWLEDGE LEVEL OF FARMERS ABOUT THE RECOMMENDED PACKAGE OF PRACTICES AND PRODUCTION TECHNOLOGY ON RAPSEED AND MUSTARD CROP: A STUDY FROM JAIPUR DISTRICT OF RAJASTHAN, INDIA

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## Abstract

The present study was conducted during the year 2014-2015 in Jaipur district of Rajasthan. The study comprises of 75 sample farmers by following a multi stage stratified random sampling technique. The study reveals that most of the recommended packages and practices (seed rate 10-12 kg/ha, Machine labour 44.44 per cent with 9 to 12 number of mandays of employment generated, irrigation numbers of 4-5 times which was 55.56 per cent) of rapeseed and mustard were used by marginal farm size group followed by small (number of ploughing 5 to 6 times, human labour was utilized 50 to 60 number of mandays, which was 71.88 per cent) and medium farm size group (recommended dose of FYM, 1.51-2.00 tones, 44.00 per cent). And also adoption of technology of fertilizer and plant protection measure (completely/fully) was observed with maximum (50.00 percent) on marginal farm. Even regarding knowledge level (20.01 and above) about the production technology of rapeseed and mustard crop, it was recorded maximum on marginal with 44.44 per cent

**Key words :** Rajasthan, rapeseed, mustard, packages and practices.

## Introduction

Agriculture is the most important sector of the Indian economy from the perspective of poverty alleviation, income and employment generation. Oilseeds crops have traditionally been the backbone of agricultural economy of India. It is a group of oilseed crops which assumes the significance in Indian national economy by occupying the second position next to groundnut and is considered as a 'cash crop'. India contributes about 11-.12 per cent of the world Rapeseed and mustard production. India is the second largest importer of edible oils next to China. Rapeseed and mustard oil is consumed in India as food oil and the meal cake left the after extraction of oil forms important cattle feed. It can also be used as manure for various grain crops. Rapeseed and mustard is the principal oilseeds crop in Rajasthan, constituting 44.31 per cent of the total area (27.6 lack ha) in 2013-2014. It contributes 47.21 per cent of total Rapeseed and Mustard production(33.56 lac tonnes) in 2013-2014. In Rajasthan, major rapeseed and mustard growing districts are Alwar, Bharatpur, Kota, Jaipur, Sri Ganganagar and Hanumangarh etc. Rajasthan occupies the first place both

in terms of cultivated area and production accounting for over 45% followed by Madhya Pradesh with 13%. Haryana and Uttar Pradesh occupy the third place contributing for 11% of total production each. Thus, the top four states produce about 80% of total rapeseed & mustard production in the country (Source: USDA).

World output of rapeseed and mustard has been increasing persistently and rather steeply during the past 15 years. The output has doubled from about 36 million tonnes in 2001-02 to 70 million tonnes in 2013-14. Production from European Union and Canada has risen steadily and reached to nearly 30% and 26%, respectively of total world production. On the other hand, output from China has remained largely stable at around 12-13 million tonnes and consequently its share has declined to about 20% from about 31% a decade ago (Source: USDA).

## Methodology

The research study was being undertaken during the year 2014-2015 in Jaipur district of Rajasthan, India. The study comprises of 75 sample farmers by following a multi stage stratified random sampling technique. From Jaipur

district two blocks (Govinagarh and Shahpura) was selected purposively. A separate list of villages falling under the jurisdiction of both the selected blocks was prepared and two villages from Govindgarh and three villages from Shahpura block making a total of five villages were selected randomly. From each village 15 farmers were selected randomly from the list making a sample size of 75 for the study. The selected farmers were stratified into three groups *viz.* Group 1 marginal (0.0 to 2.0 ha) Group-2 small (2.01 to 4.0) and Group-3 medium (4.01 ha and above) respectively, based on the study area under land holding of respondents.

### **Knowledge level of farmers about the recommended package of practices on rapeseed and mustard crop**

The production of rapeseed and mustard can be increased by proving/imparting knowledge about the package of practices to the growers in Jaipur district of Rajasthan, therefore based on specific purpose of present study been justified and it has been discussed below.

#### **1. Ploughing of rapeseed and mustard field (in numbers)**

The rapeseed and mustard seeds being small in size require very fine ploughing/tilth and well leveled surface field at the of sowing, so removal of weeds as well as precious crop waste materials is must for the better production/yield of the rapeseed and mustard. Therefore, keeping in view 5-6 times/numbers of ploughing was recommended followed by leveling is must to meet the requirement of better seeding as table 1 reveals that the overall farm size group was found maximum with 54.67 per cent was ploughing 4-5 times and it was found least with 14.67 per cent was ploughing their field 2-3 times, respectively. It was found that the maximum with 65.63 per cent on small, followed by medium with 24.00 per cent and it was found to be least with 16.67 per cent on marginal farm size group.

#### **2. Recommended seed rate used (kg/ha)**

The seed rate is also one of the important input factors in the cultivation of rapeseed and mustard crop, but due to the rain-fed condition of the study area, farmers are using less quantity of seeds and also due to high cost; whereas seeds plays a vital role in the intensive agriculture, due to the adoption of different improved hybrid seeds on the farm. As per the table maximum (55.56 per cent) of marginal farm size group was used 10-12 kg of seed rate per hectare for getting better yield, whereas it was followed by small with 34.38 per cent and it was least with 24.00 per cent on medium farm size group, respectively.

While in case of overall farm size group maximum with 53.33 per cent respondents was used/ adopted 8-10

kg of seed rate per hectare, especially the marginal and small farm size groups are willing to used more seed rate, but due to high cost of seed, the farmers cannot adopt it, so financial constraints is one of the major problem of cost item for the selected respondents.

#### **3. Selection of hybrid seed on farm (hybrid variety)**

After the introduction of high yield/ variety seeds most of the farmers are using expect 11.11 per cent of the respondents was using local variety due to taste variation (organic product) as well as the mindset of the side effects by consuming HYV seeds, due to the recommended doses of fertilizer and plant protection measures in the field crop. As improved seeds is one of the most important input factor in the cultivation of rapeseed and mustard crop due to the rain-fed condition/ are, so production as well as productivity was low due to the existence of local variety seed, therefore most of the respondent has adopted the different hybrid varieties of seeds on their farm.

As it was clear from the fact that TS-38 variety of seed are mostly liked by the maximum respondents (56.00 per cent) on medium, followed by small with 46.88 per cent and it was found to be least with 33.33 per cent on marginal farm size group, respectively. While the TS-36 variety of seed was liked by maximum respondents with 40.63 per cent on small followed by marginal with 33.33 per cent and it was found to be least with 32.00 per cent on medium farm size group, respectively.

Even the M-17 variety of seed was grown by the maximum respondents with 22.22 per cent on marginal, followed by small with 12.50 per cent and it was found to be least with 12.00 per cent on medium farm size group, respectively, whereas, the local variety was alone group by marginal farm size group, due to the mindset of organic product as well as getting better market value/price of the product as compare to different HYV product.

While in case of overall farm the maximum 46.67 per cent of respondents was adopted with TS-38 HYV variety seed, followed by 36.00 per cent with TS-36 variety 14.67 per cent with M-17 variety, it was found least with local variety 20.17 per cent has adopted their responses on their farm, especially on marginal farm size group, some respondent didn't adopt the HYV due to having the concept of organic product and cannot replace by growing of local variety and using only FYM on their farm for getting/fetching better prices from the market of their product.

#### **4. Utilization of human labour**

As human labour was one of the important input factor in the cultivation of rapeseed and mustard crop, due to potentiality of providing the direct employment as

well as readily available on their farm of family labour within the households as and when required or needed, therefore the number of family labour is directly connected with the family size, as much family size was large more opportunity of employment in manday available of the farm, which plays a vital role due to intensive agriculture in nature and mindset of non-paid wages to other to outside/ others and save the direct cost of farm and to utilize it with available family manpower on the farm, which was basically due to adoption of hybrid seed, more agricultural practices and cares is needed.

As table reveals that maximum with 71.88 per cent of the human labour was utilized on small farm size group to generate 50 to 60 number of mandays, which was followed by medium with 60.00 per cent and it was found least with 50.00 per cent on marginal farm size group, respectively. Whereas on the marginal farm, it was found maximum with 33.33 per cent followed by small with 33.33 per cent and it was recorded least with 20.00 per cent on medium farm size group for getting the employment of 60 to 80 numbers of mandays, respectively.

While 20.00 per cent on the small farm as maximum respondents, followed by marginal farm with 16.67 per cent and it was found to be least with 20.00 per cent on medium farm size group, for getting employment of 40 to 60 numbers of mandays, respectively. While on farm maximum with 54.67 per cent of respondents was getting/generating of 50 to 60 numbers of man-day, followed by 25.33 per cent with 60 to 80 numbers of man days, it was found least with 20.00 per cent was getting/generating employment of 40 to 60 numbers of man days, respectively.

##### **5. Machine labour used (in man days/ha)**

As machine labour is one of the input factor in the cultivation of rapeseed and mustard crop, so machine labour is also important to play a vital role in intensive agriculture, due to the adoption of different improved hybrid seeds and mechanized farming on farm. As table reveals that the machine labour generates employment, it was found maximum with 44.44 per cent with 9 to 12 number of mandays employment generated and it was recorded least with 15.63 per cent with 3 to 6 numbers of mandays on small farm size group, respectively.

Whereas, on overall farm size group maximum was recorded with 54.67 per cent respondent was getting employment of 6 to 9 mandays due to machine used on farm followed by 34.67 per cent was getting employed of 9 to 12 mandays and it was found least with 10.67 per cent was of 3 to 6 mandays was getting/generating employment due to machine, respectively.

##### **6. FYM doses utilized (in tones/ha)**

As FYM doses is concern, it was one of the most important input factor in the cultivation of rapeseed and mustard crop due to the rain-fed conditions/area, so FYM doses in tones per hectare is very important and having an important significant role in intensive agriculture, due to the adoption of different hybrid seed varieties on the farm. As the table reveals that the recommended doses of 1.51 to 2.00 tonnes of FYM was found maximum with 61.11 per cent on marginal farm, followed by medium with 44.00 per cent and it was recorded least with 32.00 per cent on small farm size group, respectively.

While in case of overall farm size group maximum with 41.33 per cent of the respondents were utilized using 1.51 to 2.00 tonnes per hectare of farm yard manure followed by 40.00 per cent of the respondent was using 1.00 to 1.50 tonnes per hectare of farm yard manure, while it was found minimum of 2.01 to 2.50 tonnes per hectare of farm yard manure with 18.67 per cent, respectively.

##### **7. Irrigation used (in numbers/ha)**

As irrigation is one of the most important input factors in the cultivation of rapeseed and mustard crop due to rain-fed condition/are; so numbers of irrigation is very important and play a vital role in intensive agriculture, due to adoption of recommended numbers of irrigation water used on the farm. As table reveals that the irrigation numbers of 4-5 times was found maximum (55.56 per cent) on marginal farm size group, followed by small with 40.63 per cent and it was recorded least (32.00 per cent) on medium farm group, respectively.

While in case of overall farm size group maximum (36.00 per cent) respondents was adopted both minimum (1-2 times) and maximum (4-5 times), especially on the marginal and small farm size groups some respondents depend on rain due to the save on cost.

##### **8. Fertilizer and plant protection measures technology methods (adoption)**

The fertilizer and plant protection measures are the most important factors in cultivation of rapeseed and mustard crop, so balance dose has to play an important role in intensive agriculture, due to adoption of hybrid seed on the farm as it has direct relation/association with fertilizer and pesticides. As table reveals that respondents followed completely/fully adopted the technology of fertilizer and plant protection measures with maximum (50.00 percent) on marginal farm, followed by small with 40.63 per cent and it was recorded least with 36.00 per cent on medium farm size group, respectively.

**Table 1 :** Knowledge level of farmers about the recommended package of practices on rapseed and mustard crop.

S. no.	Particulars	Marginal	Small	Medium	Overall
<b>1.</b>	<b>Ploughing of field (in numbers)</b>				
a.	2-3 times	1 (5.56)	2 (6.25)	8 (32.00)	<b>11 (14.67)</b>
b.	4-5 times	14 (77.78)	9 (28.13)	11 (44.00)	<b>23 (30.67)</b>
c.	5-6 times	3 (16.67)	21 (65.63)	6 (24.00)	<b>41 (54.67)</b>
	<b>Total</b>	<b>18 (100.00)</b>	<b>32 (100.00)</b>	<b>25 (100.00)</b>	<b>75 (100.00)</b>
<b>2.</b>	<b>Recommended seed rate used (kg/ha)</b>				
a.	6-8 kg	3 (16.67)	6 (18.75)	2 (8.00)	<b>13 (17.33)</b>
b.	8-10 kg	5 (27.78)	15 (46.88)	17 (68.00)	<b>40 (53.33)</b>
c.	10-12 kg	10 (55.56)	11 (34.38)	6 (24.00)	<b>22 (29.33)</b>
	<b>Total</b>	<b>18 (100.00)</b>	<b>32 (100.00)</b>	<b>25 (100.00)</b>	<b>75 (100.00)</b>
<b>3.</b>	<b>Selection of hybrid seed on farm (hybrid variety)</b>				
a.	M-17 variety	4 (22.22)	4 (12.50)	3 (12.00)	<b>11 (14.67)</b>
b.	TS-36 variety	6 (33.33)	13 (40.63)	8 (32.00)	<b>27 (36.00)</b>
c.	TS-38 variety	6 (33.33)	5 (46.88)	14 (56.00)	<b>35 (46.67)</b>
d.	Local variety	2 (11.11)	0 (0.0)	0 (0.0)	<b>2 (2.6 )</b>
	<b>Total</b>	<b>18 (100.00)</b>	<b>32 (100.00)</b>	<b>25 (100.00)</b>	<b>75 (100.00)</b>
<b>4.</b>	<b>Utilization of human labour (in man days/ha)</b>				
a.	40-50 numbers	3 (16.67)	2 (6.25)	5 (20.00)	<b>15 (20.00)</b>
b.	50-60 numbers	9 (50.00)	23 (71.88)	15 (60.00)	<b>41 (54.67)</b>
c.	60-80 numbers	6 (33.33)	7 (21.88)	5 (20.00)	<b>19 (25.33)</b>
	<b>Total</b>	<b>18 (100.00)</b>	<b>32 (100.00)</b>	<b>25 (100.00)</b>	<b>75 (100.00)</b>
<b>5.</b>	<b>Machine labour used ( in man days/ha)</b>				
a.	3-6 numbers	4 (22.22)	5 (15.63)	6 (24.00)	<b>8 (10.67)</b>
b.	6-9 numbers	6 (33.33)	18 (56.25)	11 (44.00)	<b>41 (54.67)</b>
c.	9-12 numbers	8 (44.44)	9 (28.13)	8 (32.00)	<b>26 (34.67)</b>
	<b>Total</b>	<b>18 (100.00)</b>	<b>32 (100.00)</b>	<b>25 (100.00)</b>	<b>75 (100.00)</b>
<b>6.</b>	<b>FYM doses utilized (in tones/ha)</b>				
a.	1.00-1.50 tones	0 (0.0)	13 (40.63)	6 (24.00)	<b>30 (40.00)</b>
b.	1.51-2.00 tones	11 (16.11)	13 (40.63)	11 (44.00)	<b>31 (41.33)</b>
c.	2.01-2.50 tones	7 (38.89)	6 (18.75)	8 (32.00)	<b>14 (18.67)</b>
	<b>Total</b>	<b>18 (100.00)</b>	<b>32 (100.00)</b>	<b>25 (100.00)</b>	<b>75 (100.00)</b>
<b>7.</b>	<b>Irrigation used (in number/ha)</b>				
a.	1-2 times	1 (5.56)	8 (25.00)	11 (44.00)	<b>27 (36.00)</b>
b.	3-4 times	7 (38.89)	11 (34.38)	6 (24.00)	<b>21 (28.00)</b>
c.	4-5 times	10 (55.56)	13 (40.63)	8 (32.00)	<b>27 (36.00)</b>
	<b>Total</b>	<b>18 (100.00)</b>	<b>32 (100.00)</b>	<b>25 (100.00)</b>	<b>75 (100.00)</b>
<b>8.</b>	<b>Fertilizer and plant protection measure technology methods (adoption)</b>				
a.	Not adopted	4 (22.22)	7 (21.88)	5 (20.00)	<b>16 (21.33)</b>
b.	Partial adopted	5 (27.78)	12 (37.50)	11 (44.00)	<b>25 (33.33)</b>
c.	Completely/ Fully adopted	9 (50.00)	13 (40.63)	9 (36.00)	<b>34 (45.33)</b>
	<b>Total</b>	<b>18 (100.00)</b>	<b>32 (100.00)</b>	<b>25 (100.00)</b>	<b>75 (100.00)</b>

The figure in the parenthesis indicates the percentage to the total.

**Table 2** :Distribution of respondents based on their overall knowledge level about the production technology for the rapeseed and mustard cultivation.

S.no.	Category	Knowledge Score	Marginal	Small	Medium	Overall
a.	Low	<16.00	3 (16.67)	3 (9.38)	2 (8.00)	<b>10 (13.33)</b>
b.	Medium	16.01-20.00	7 (38.89)	22 (68.75)	18 (72.00)	<b>44 (58.67)</b>
c.	High	20.01<	8 (44.44)	7 (21.88)	5 (20.00)	<b>21 (28.00)</b>
	<b>Total</b>	-	<b>18 (100.00)</b>	<b>32 (100.00)</b>	<b>25 (100.00)</b>	<b>75 (100.00)</b>

Mean Knowledge Score = 23.90; Standard deviation knowledge score= 2.86 and score range 16-20.

The figure in the parenthesis indicates the percentage to the total.

While in case of overall farm size group maximum (45.33 per cent) respondents was adopted completely / fully adopted the recommendation/available technology of fertilizer and plant protection measures, even on the marginal, small and medium farm size groups, mostly have adopted it, but few of the respondents have not adopted due to the high cost of fertilizers and plant protection measures.

#### **Distribution of respondents based on their overall knowledge level about the production technology for the rapeseed and mustard cultivation**

So far the knowledge is concern it is fore most and important factor for enhancing and upgrading the level of respondents about the cultivation as well as packages of practices, besides that it also provide the knowledge how to use the available resources judiciously with limited means during the production, marketing and post harvest technology of rapeseed and mustard crop, so knowledge level is basically provides an important role in intensive agriculture due to develop the skill or updating the knowledge level of the respondents.

Table 2 reveals that the knowledge level (20.01 and above) is concern about the production technology of rapeseed and mustard crop, it was recorded maximum on marginal with 44.44 per cent followed by small with 21.88 per cent and it was recorded least with 20.00 per cent on medium farm size group, as the knowledge level about the production technology of rapeseed and mustard crop was found maximum with 72.00 per cent on medium farm, followed by 68.75 per cent on small farm size group with 38.89 per cent of medium level of knowledge ranging from 16.01 to 20.00, respectively.

#### **Conclusion**

This paper could be concluded with the fact that recommended number (5 to 6 times) of ploughing was found maximum among the small farm size group, while in case of recommended seed rate (10-12 kg/ha), Machine labour (44.44 per cent with 9 to 12 number of mandays of employment generated), irrigation numbers of 4-5 times

(55.56 per cent) was mostly used by marginal farm size group. And also adoption of technology of fertilizer and plant protection measure (completely/fully) was observed with maximum (50.00 percent) on marginal farm. TS-38 variety of seed is mostly liked by the maximum respondents (56.00 per cent) on medium when it comes to selection of hybrid seed on farm (hybrid variety). The study also reveals that maximum with 71.88 per cent of the human labour was utilized on small farm size group to generate 50 to 60 number of mandays. Recommended dose of FYM (1.51-2.00 tones) was found to be utilized more 44.00 per cent by medium farm size group. It was also found that the knowledge level (20.01 and above) is concern about the production technology of rapeseed and mustard crop, it was recorded maximum on marginal with 44.44 per cent.

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