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An Analysis of Factors Associated with Productivity of Dryland Crops in Haryana

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ABSTRACT

Dryland farming plays an important role in agricultural production of the country. It is a way of life for a majority of Indian farmers. It is characterized by the resource poor, small and marginal farmers, a poor infrastructure and low investments in technology and inputs. Research indicated that, not more than 20-22 per cent of modern scientific technologies have been adopted by the farming community due to one or the other reasons. It is inevitable that the second green-revolution has to come from the dryland farming and accordingly the application of technology, inputs and investments has to be tailored to convert these so-called "grey areas into green". Resource conserving technologies are the recommended practices/technologies for efficient conservation of soil and water for maximization of the productivity of crops under dryland situation. Rapeseed & mustard, gram and bajra are the major crops grown in Rabi and Kharif season, respectively, in dry farming zone of South West Haryana. The average productivity of rapeseed and mustard, gram and bajra is quite low. This study highlighted that the adoption of crop production technologies in cultivation of rapeseed and mustard, gram and bajra crops was low under dryland farming situation. Keeping the importance of sustaining the yields of dryland crops, a study was undertaken to understand the contribution of independent variables to the productivity of rapeseed & mustard, gram and bajra crops under dryland farming situation in South-West Haryana. The results of the study highlighted that the total variation contributed by the all variables was found to be nearly 78 per cent in rapeseed and in case of mustard and gram 56 per cent. The full adoption of crop production technologies is very important in achieving desired level of productivity of dryland crops. The farmers should be educated and trained through various extension methodologies in order to adopt full package of recommended dryland farming technologies

Key words: Profile of dryland farmers, Regression coefficient analysis, productivity of dryland crops , independent variables

INTRODUCTION

In India, 70 per cent of the farming (100.1 million hectares) is rainfed which accounts for only 42 per cent of the food grains produced. Even with the full utilization of irrigation potential, agriculture could be practised in 70 million hectare (around 50 per cent of the net cultivated area) and thus leaving 50 per cent of the net cultivated area under rainfed condition. The dryland agriculture contributes nearly half of the produce to the food basket of the nation and supports the life of a substantial chunk of the population. It is inevitable that the second green-revolution has to come from the dryland farming and accordingly the application of technology, inputs and investments has to be tailored to convert these so-called "grey areas into green". Research have indicated that not more than 20-22 per cent of modern scientific technologies have been adopted by the farming community due to one or the other reasons.

Rapeseed & mustard, gram and bajra are the major crops of Rabi and Kharif season grown in dryland farming zone of South-West of Haryana. The average yield of rapeseed & mustard increased from 405 Kg/ha (1966-67) to 1655 Kg/ha (2009-10) whereas the average yield of gram increased from 500 Kg / ha (1966-67) to 735Kg / ha (2009- 10) and and the average yield of bajra increased from 418Kg/ ha (1966-67) to 1593 Kg/ha (2009-10). (Statistical abstract of Haryana, 2009-10). Still, the average yield of these crops is low as compared to the yields what the scientists are obtaining at their research farms. The adoption of crop production technologies play an important role in achieving desired level of productivity of dryland crops. With this background, the present study was planned with the specific objective to understand the contribution of independent variables to the productivity of rapeseed & mustard, gram and bajra crops under dryland farming situation in South-West Haryana.

METHODOLOGY

The study was carried out in dryland farming zone of South-West Haryana. Three districts, namely, Gurgaon, Mahendergarh and Bhiwani were purposively selected for the study. The villages, namely, Malab and Bhadas from block Nuh; the villages, viz, Bagipur and Dhulera from block Nangal Chaudhary and the villages, namely, Miran and Chhapar Rangdhan from block Tosham were

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selected randomly for the study. Thus, 6 villages formed the sample of the study. From each village, 25 farmers were randomly selected who were practising dryland farming. Thus, 150 farmers practising only dryland farming constituted the sample of the study.

Selection of crops

The major dryland crops, namely, Gram, Rapeseed and Mustard (Rabi crops) and Bajra (Kharif crop) were considered for the study. As for as kharif crop (Bajra) was concerned, the total number of 150 respondents were taken. However, 118 farmers were growing Gram and rest 32 respondents were growing Rapeseed and Mustard, formed the sample in Rabi season.

Research Design

The ex-post facto research design (cause and effect) was used. The design was considered appropriate because the phenomenon had already occurred.

Variables used in the study

The variables for the study were selected on the basis of possible influence on the subject based on the past research as well as the personal observations in the study area. As far as the independent variables are concerned, the technological, personal, motivational, situational and extension variables possessed relationship with the productivity.

RESULTS AND DISCUSSION

A. Profile of farmers based on their personal attributes under dryland farming.

Profile of dryland farmers based on their personal attributes is depicted in the Table 1.

The data in Table 1 indicated that majority of farmers had no formal education (60.67 %) followed by primary school education (12 %) and middle school education (10 %). Most of the farmers (91.33 %) had medium to high farming experience. The level of farm size of 86.67 per cent of farmers was low to medium. The majority (82.37 %) of farmers had low to medium innovation proneness. The risk orientation level of 89.33 per cent of farmers and scientific orientation level of 84 per cent of farmers was low to medium. The majority (86 %) of farmers had low to medium management orientation.

EXTENSION ORIENTATION

B. Average yield of crops under dryland farming .

Table 1: Respondents' profile based on their personal attributes

n= 150

Name of variable	Category	No	Percentage
Education	No formal education	91	60.67
	Primary education	18	12.00
	Middle school education	15	10.00
	High school education	11	7.33
	Pre/senior sec education	9	6.00
	Collegiate	4	2.67
	Graduate	2	1.33
Farming Experience	Low	13	8.67
	Medium	101	67.33
	High	36	24.0
Farm size	Low	24	16.00
	Medium	106	70.67
	High	20	13.33
Innovation proneness	Low	55	36.37
	Medium	69	46.00
	High	26	17.33
Risk orientation	Low	63	42.00
	Medium	71	47.33
	High	16	10.67
Scientific orientation	Low	94	62.67
	Medium	32	21.33
	High	24	16.00
Management orientation	Low	62	41.33
	Medium	67	44.67
	High	21	14.00
Extension orientation	Low	52	34.67
	Medium	89	59.33
	High	9	6.00
Mass media use	Low	18	12.00
	Medium	87	58.00
	High	45	30.00

Table 2: Productivity of selected crops under dryland farming

n=150

Name of the crop	Respondents			Productivity (kgs/acre)	
	No.	Per cent	Crop Season	Average obtained yield	Average recommended yield
Rapeseed and Mustard	32	21.33	Rabi	459.06	550.00-900.00
Gram	118	78.67	Rabi	252.84	600.00-800.00
Bajra	150	100	Kharif	890.37	1300.00

The data in Table 2 showed that a majority (79 %) of dryland farmers had grown gram in rabi season. Only 21.33 per cent of respondents had grown rapeseed and mustard crop in the same season. All the farmers had grown bajra crop in kharif season. The average obtained yield of rapeseed and mustard, gram and bajra was 459.06, 252.84 and 890.37 kgs/acre, respectively. This finding may be justified that in the contact of dryland area of South-West Haryana, the farmers grow gram as main

pulse crop in Rabi season. The dryland farmers cultivate bajra crop in Kharif season only and it is used both as grain and fodder purpose.

It is also evident from the Table 2 that the productivity of rapeseed and mustard, gram and bajra crops in South-West Haryana was much below the yield obtained per acre with full package (rapeseed and mustard 550-900 kgs, gram 600-800 kgs and bajra 1300 kgs). The similar results were reported by Tumbare an Bhoite (2000) and Yadav and Singh (2002).

C. Contribution of independent variables to the productivity of rapeseed & mustard, gram and bajra crops.

The data in Table 3 highlighted that 78 per cent of variation in productivity of rapeseed and mustard was explained by the 12 selected variables. Among these variables, only the utilization of inputs, adoption of recommended crop production technologies, farming experience and mass media use had significant contribution to the productivity of rapeseed and mustard.

Table 3: Regression Co-efficient of factors influencing the productivity of Rapeseed and Mustard

n=32

Variables	Regression coefficients	Standard error	't' value
Technological variables			
Utilization of inputs	18.790**	09.044	4.197
Adoption of recommended crop production technologies	15.440**	7.753	2.613
Adoption of recommended resource conserving technologies	8.394	4.286	1.95
Personal variables			
Education	13.103	7.828	1.674
Farming experience	5.637**	2.426	2.813
Innovation proneness	14.214	13.208	1.076
Risk orientation	15.656	8.506	1.407
Motivational variables			
Scientific orientation	2.708	8.744	0.310
Management orientation	4.364	11.066	0.394
Situational variables			
Farm size	-9.869	19.811	-0.498
Extension variables			
Extension orientation	21.953	5.032	2.368
Mass media use	31.710**	11.129	2.849

** Significant at 5 per cent level $R^2 = 0.780$**

The data presented in Table 4 showed that regression coefficient values indicated that 0.562 per cent of the variation in the productivity of gram was explained by all the variables. Among the selected variables, only adoption of recommended resource conserving technologies and farming experience had significant contribution to the productivity of gram.

Table 4: Regression Co-efficient of factors influencing the productivity of Gram (Chik Pea)

n = 118

Variables	Regression coefficients	Standard error	't' value
Technological variables			
Utilization of inputs	4.587	5.623	0.815
Adoption of recommended crop production technologies	12.745	7.788	1.636
Adoption of recommended resource conserving technologies	17.390**	4.143	4.197
Personal variables			
Education	2.298	0.049	0.526
Farming experience	18.966**	6.847	2.770
Innovation proneness	1.558	3.144	0.496
Risk orientation	2.046	6.548	0.312
Motivational variables			
Scientific orientation	2.677	3.065	0.874
Management orientation	0.242	2.601	0.093
Situational variables			
Farm size	-4.542	7.440	-0.610
Extension variables			
Extension orientation	1.671	2.426	0.689
Mass media use	5.661	4.895	1.613

** Significant at 5 per cent level $R^2 = 0.562$**

The data in Table 5 showed that All the selected variables contributed to an extent of 56 per cent towards the productivity of bajra. Among them, utilization of inputs, adoption of recommend crop production technologies, adoption of recommended resource conserving technologies, farming experience and mass media use had significant contribution to the productivity

The technological factors play a significant role in enhancing the productivity of rapeseed and mustard, gram and bajra. The adoption of crop production technologies in rapeseed and mustard and adoption of appropriate resource conserving technologies in gram help in efficient utilization of soil, water and input utilized. In case of gram, because of high cost of cultivation, the crop production technologies had not

contributed significantly to its productivity. The bajra crop is grown mainly in rainy season and its irrigation requirement is normally fulfilled by rainfall . Therefore, bajra crop responds well to each one of the critical inputs such as high yielding varieties, application of fertilizers and other management practices. The above findings are in line with the findings reported by Biswas (2001, Sahay (2002). Venkataswamyreddy (1987) and Yadav and Singh (2008).

Table 5: Regression Co-efficient of factors influencing the productivity level of Bajra (Pearl millet) n=150

Variables	Regression coefficients	Standard error	't' value
Technological variables			
Utilization of inputs	17.208**	7.467	2.631
Adoption of recommended crop production technologies	22.056**	6.192	2.524
Adoption of recommended resource conserving technologies	18.256**	9.296	2.679
Personal variables			
Education	6.254	6.691	0.935
Farming experience	18.870**	11.032	2.891
Innovation proneness	1.200	4.427	0.271
Risk orientation	7.431	9.860	0.754
Motivational variables			
Scientific orientation	8.256	9.296	1.615
Management orientation	1.410	3.675	1.715
Situational variables			
Farm size	-0.278	3.920	-0.071
Extension variables			
Extension orientation	15.523	8.930	0.392
Mass media use	17.012**	5.842	2.713

** Significant at 5 per cent level $R^2 = 0.562$**

CONCLUSION

The total variation contributed by the all variables in rapeseed and mustard was found to be nearly 78 per cent. Among the selected variables, the utilization of inputs, adoption of recommended crop production technologies, farming experience and mass media use had significant contribution to the productivity of rapeseed and mustard. The total variation contributed by the all variables in gram was found to be nearly 56 per cent. Among the independent variables, only adoption of recommended resource conserving technologies and farming experience had significant contribution to the productivity of gram. All the variables contributed to an extent of 56 per cent of the productivity of bajra. Among them, utilization of inputs, adoption of recommend crop production technologies, adoption of recommended resource conserving technologies, farming experience and mass media use had significant contribution to the productivity.

Most of the dryland farmers were having lack of information/knowledge about recommended high yielding varieties, seed treatment, bio-fertilizer application, integrated pest management, integrated weed management and chemical plant protection measures therefore, the farmers should be educated and trained by the extension personnel of state deptt. of agriculture and state agricultural university by using various extension methodologies for adopting and popularizing dryland farming technologies among the farmers.

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