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An economic analysis of factor affecting seed purchase, requirement and availability of major principal crops in Haryana

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Abstract

Quality seeds hold key position as it alone contributes nearly 20-25 per cent more to the agricultural production. One district for each crop viz., Karnal for paddy, Sirsa for wheat and cotton, and Bhiwani for rapeseed & mustard and bajra crops were selected purposively representing highest area under these crops. SRR of paddy, wheat, rapeseed & mustard and bajra were increased to 30.48, 33.80, 32.39 and 76.95 per cent in 2011-12. SRR of cotton was increased to 65.57 per cent in 2011-12. Major factors which affect seed purchase were includes the non availability of seed in time or desired variety, higher price, lack of awareness, lack of credit facilities, need to travel long distance etc. Adverse climatic condition, SRR, performance of desired variety, adoption level of farmers and price of seed and expansion of area are affects the seed requirements. Irregular supply of seed, adverse climatic condition, market and transportation facilities, price of seed and expansion of area affects seed availability.

Keywords: Seed replacement rate, price, seed, credit, transportation

Introduction

The estimates for requirement of seed must be available two to three years in advance, i.e., to meet the demand for particular seed, its production has to be organized at least two years in advance. The changes in weather, price of crops, prices of competing crops etc. may change the prospects of demand for seed of a particular crop variety at the commencement of sowing season. In case of increased demand for seed, its supply cannot be increased as production cannot be organized immediately whereas, a fall in demand would result in carryover of stocks. Such uncertainties in demand for seed make its pricing a complicated exercise.

The general farm produce retained for seed cannot be substituted for quality seed as it generally lacks genetic vigour and has poor germination. In Haryana the seed replacement rate (SRR) in rice, wheat and bajra during 2008-09 was only 20.08, 25.90 and 65.28 per cent respectively. In case of cotton, the SRR was 80 per cent while in oilseeds this was 75.76 per cent during the same year. The reason for low replacement of certified seed may be due to their high price and non-availability of seed at right place and right time, particularly in the case of small farmers who generally have low availability of cash money.

A major factor constraining production and wider usage of quality/certified seed is its relatively higher price than that of farm saved ordinary seed. There is no scheme of administered prices or price control at present in respect of seeds. There have been complaints of instances of private seed industry exploiting the farmers by fixing very high prices, particularly for hybrids. Profitability being the major consideration for private sector firms, they provide only those seed for which there is effective demand and adequate profits. This means varieties which need to be replaced by farmers every season and which are popular with farmers are promoted. There is also a feeling that in some cases, prices charged by Public Sector Corporations are higher than warranted. Presently the seed price is governed by demand and supply forces in the market. The sound seed pricing policy has to ensure that seed producers get reasonable prices. Similarly, the seed corporations undertaking marketing and distribution should be able to obtain reasonable margins. At the same time, the user farmers must get quality seeds at reasonable prices.

Rice, wheat, bajra, cotton and rapeseed & mustard are the important crops in Haryana state. The high yielding variety seed of rice and wheat is responsible for the green revolution in India. Rice is the second largest food grain crop produced in Haryana state accounting for 26.54 per cent of the total food grain produced in 2009-10. Wheat stood most important crop of rabi season ranking first in area (54.89% of the total food grain area) and production (68.37% of total food grain production) during same period.

Bajra accounted 12.88 per cent area of total food grain. Cotton is also an important cash crop in kharif season containing 8.58 per cent area of the commercial crops in the state. Rapeseed & mustard is the important cash crop among oilseed crops in the state.

Material and Methods

One district for each crop viz., paddy, wheat, cotton, rapeseed & mustard and bajra were selected purposively representing highest area under these crops for the triennium average (2006-07 to 2008-09). Thus, Karnal for paddy, Sirsa for wheat and cotton, and Bhiwani for rapeseed & mustard and bajra crops were selected purposively. One block having highest area under selected crop from each district was selected for the ultimate sampling unit.

Twenty five villages were selected, five from each block. In these villages 79 for paddy, 74 for wheat, 53 for cotton and 57 for rapeseed & mustard seed growers were present. In bajra, 1005 farmers were found in selected villages. In case of rapeseed & mustard, seed growers from Hisar were selected due to the non-availability of seed grower in Bhiwani districts.

A list of registered seed growers of Karnal, Sirsa and Hisar districts was obtained from the office of HSDC head office Panchkula. Similarly, the list of seed growers of private processing plants was also obtained from the selected processing plants of study area. A sample of 30 seed growers (10 each of small, medium and large categories) for each crop was selected to collect the required information regarding the extra expenses incurred by them in seed marketing. Thus, a total of 150 respondents were selected.

Both primary as well as secondary data have been used in the present study. The primary data were collected by survey method through personal interview on the pretested schedule designed for the study.

The data pertaining to the area of districts and blocks for selected crops were taken from various issues of Statistical Abstract of Haryana and Directorate of Agriculture, Panchkula for different years. The data regarding the requirement, distribution and replacement rate of seed in Haryana were collected from Directorate of Agriculture, Panchkula, Haryana.

The data on processing and marketing costs of paddy, wheat, cotton, rapeseed & mustard and bajra seed in public sector were collected from HSDC head office, Panchkula for the year 2011-12. These costs for private sector were collected from the private seed processing agencies. Information regarding marketing costs and margins of the intermediaries were collected from Govt. agencies, wholesalers and retailers for the concerned crops.

Seed Replacement Rate (SRR)

In order to examine the extent of seed replacement rate of certified seed, the seed replacement rate in selected crops of different years were taken into consideration. The SRR is the percentage of area sown out of total area of the crop planted in the season by using quality seeds other than the farm saved seed. The SRR for individual crop was worked out by using the following formula:

$$\text{SRR (\%)} = \frac{Q}{A \times K} \times 100$$

Where,

Q = Quality seed used by farmer

A = Area under the crop (hectare)

K = Seed rate per unit area (quintals)

Factor affecting seed purchase, requirement and availability

A sample of 150 farmers was interviewed for studying the different factors in the purchase of certified seed. The factors were non-availability of seeds in desired variety and in appropriate time, higher price of seeds, lack of awareness, credit facility not available, need to travel long distance and seed not being of good quality. Factors affecting seed requirement included the adverse climatic condition, seed replacement rate, performance of desired variety, adoption level of farmer, price of seed and expansion of area. Factor affecting seed availability were irregular supply of seed, adverse climatic condition, market facilities, transportation facilities, price of seed and expansion of area.

Results and Discussion

Seed Replacement Rate

The seed replacement rate of paddy, wheat, bajra, cotton and oilseeds certified seeds in Haryana showing fluctuating trend. It is because of climatic changes, price fluctuation, increase of cost of cultivation, decrease in crop yield and non availability of desired varieties seed. The overall seed replacement rate of principal crops in Haryana were sowing an increasing trends. Seed replacement rate (SRR) of paddy, wheat and bajra were 14.05, 14.24 and 43.32 per cent in 2000-01 which increased to 30.48, 30.80 and 65.67 per cent in 2011-12. SRR of cotton was increased to 65.67 per cent in 2011-12. In rapeseed & mustard, it was increased to 89.55 per cent in 2009-10. The seed replacement rates of certified seed in India (2009-10) were 31 per cent for wheat, 94 per cent for mustard, in cotton, it was 73 per cent and for bajra, it was 46 per cent in country. Verma and Sidhu (2009) ^[9] were found SRR of paddy is low (24.35%) in India (Table 1).

Seed replacement for paddy at national level shows an increasing trend. It may be because of the introduction of high yielding varieties and yield differences were more in comparison to traditional varieties. It is also observed that in paddy, there is no stable variety and farmers select the different varieties every year depending upon the performance in previous year.

This continuous increase in the seed replacement rate of wheat seed may be due to regular release of high yielding and popular wheat varieties. These varieties also became popular among the farmers and influenced the replacement rate for many years. This is very high as compared to SRR at national level. With the awakening among the farmers, introduction of HYV of wheat and availability of seed, the SRR of certified seed of wheat increasing continuously.

The SRR of cotton quality seed increased to 13.02 per cent in 1985-86. During this period, SRR of cotton seed fluctuates year to year. This may be due to climatic changes (heavy rainfall), price fluctuations and more infestation of insect pest and diseases, increase in cost of cultivation, stagnation in crop yield and non availability of desired varieties seed. Availability of desired variety seed has positive effects on adoption of quality seed. Rai (1998) also found increasing trend in SRR of wheat and paddy but decreasing trend in SRR of cotton.

SRR of quality seed in rapeseed & mustard is increasing during some years. The main reasons of this increasing SRR of oilseeds are remunerative crops of the area low seed rate, being a cross pollinated crop yield difference is more,

availability of desired variety seed, remunerative price, publicity and awakening among the farmers.

The SRR of bajra quality seed increased due to low seed rate, availability of seed, publicity and awakening among the farmers.

Table 1: Seed replacement rate of principals crops (Per cent)

India					
Year	Paddy	Wheat	Cotton	Rapeseed & mustard	Bajra
2001-02	19.22	13.04	21.21	38.39	45.92
2002-03	19.31	13	21.86	44.64	48.47
2003-04	19.16	13	19.84	66.96	51.02
2004-05	16.27	16.48	20.73	58.48	44.9
2005-06	21.33	17.64	21.78	55.36	55.36
2006-07	22.41	21.76	19.84	60.71	55.1
2007-08	25.87	25.23	15.3	58.62	48.47
2008-09	30.05	26.84	12.07	52.67	62.92
2009-10	33.6	31.86	11.65	74.8	48.85
2010-11	37.47	32.63	10.43	63.64	61.43
2011-12	40.42	32.55	33	78.88	60.4
Haryana					
2000-01	14.05	14.24	49.39	31.65	43.32
2001-02	11.24	18.08	6.41	42.64	48.34
2002-03	15.77	17.92	50.00	50.14	26.84
2003-04	14.50	20.10	46.20	55.32	44.38
2004-05	14.11	20.29	48.77	55.23	38.48
2005-06	16.40	21.05	47.02	68.91	39.37
2006-07	16.85	23.13	49.64	76.45	45.30
2007-08	16.61	23.57	27.66	92.05	47.99
2008-09	16.38	25.59	14.65	93.85	51.05
2009-10	16.91	34.08	1.86	89.55	76.95
2010-11	21.69	33.67	66.80	30.03	79.45
2011-12	30.48	33.80	65.67	32.39	

Source: Director of Agriculture, Sector-21, Panchkula

Requirement and Availability of certified/quality seed

The requirement and availability of certified/quality seeds are presented in Table 2. In case of paddy the requirement was 78, 82.37 and 84.80 lakh quintal and total availability was 80.32, 89.95 and 92.92 lakh quintal during 2012-13 to 2014-15. It has seen that as the requirement increases the total availability was also increases. In case of wheat the total requirement (112.53 lakh quintal) is more than total

availability (108.35 lakh quintal) during 2013-14. But in years 2012-13 and 2014-15 the total requirement is less than the availability. Similarly in case of cotton, rapeseed & mustard and bajra total availability is more than total requirement. The total requirement of cotton, rapeseed & mustard and bajra was 2.41, 2.44 and 2.64 and the total availability of seed was 2.72, 2.64 and 2.96 during 2012-13.

Table 2: Crop-wise requirement and availability of certified/quality seeds (Lakh Quintal)

Crop	2012-13			2013-14			2014-15					
	Requirement	Availability		Requirement	Availability		Requirement	Availability				
		Public	Private	Total		Public	Private	Total		Public	Private	Total
Paddy	78	44.63	35.69	80.32	82.37	47.99	41.97	89.95	84.80	46.46	46.46	92.92
Wheat	108.2	53.44	58.79	112.23	112.53	49.12	59.23	108.35	112.53	44.78	72.07	116.86
Cotton	2.41	0.31	2.41	2.72	2.21	0.13	2.33	2.46	2.22	0.05	2.57	2.63
Rapeseed & Mustard	2.44	1.24	1.4	2.64	2.61	1.60	1.15	2.74	2.64	1.45	1.25	2.70
Bajra	2.64	0.14	2.82	2.96	2.52	0.82	2.67	3.49	2.42	0.16	2.53	2.69

Source: Department of Agriculture, Cooperation & Farmers Welfare

It is the certified/quality seeds made available to the farmers/growers that could raise crop productivity by enhancing seed replacement rate. It is shown in the Table 3. The availability of certified/quality of hybrid seed is more in 2010-11 to 2014-15 except paddy in the year 2011-12 to

2013-14. The seed requirement of Paddy was 9.80 and 15.10 which was less than the availability i.e. 10.90 and 19.50 during 2010-11 and 2014-15, respectively. While in case of cotton and bajra seed availability is more than the requirement during 2010-11 to 2014-15.

Table 3: Crop-wise requirement and availability of certified/quality of Hybrid seeds (Lakh Quintal)

Crop	2010-11		2011-12		2012-13		2013-14		2014-15	
	Req.	Av.	Req.	Av.	Req.	Av.	Req.	Av.	Req.	Av.
Paddy	9.80	10.90	9.90	9.20	31.60	31.30	42.80	34.20	15.10	19.50
Cotton	14.40	15.60	19.50	22.50	22.40	25.40	15.90	17.90	17.90	21.70
Bajra	21.90	26.00	24.60	28.40	24.00	27.10	23.60	33.20	21.00	24.80

Source: Department of Agriculture, Cooperation & Farmers Welfare

Req.: Requirement, Av.: Availability

Factor affecting seed purchase, requirement and availability

About 40, 50, 30, 43.33, 20 and 17 per cent of paddy, wheat, cotton rapeseed & mustard seed grower and bajra grower respectively indicated that seed not available timely. It was found that 30, 36.67, 36.67, 20, and 16.67 per cent paddy, wheat, Cotton, rapeseed & mustard and bajra respectively respondents indicated the problems of non availability of desired varieties of quality seed. Higher prices of the quality seeds was also the major problem quoted by the 20 per cent of paddy, 30 per cent wheat, 26.67 per cent cotton 23.33 per cent rapeseed & mustard seed growers and 30 per cent bajra growers respectively as the another severe problem for purchase of these principal crop. Further 30 per cent paddy, 23.33 per cent wheat, 13.33 per cent cotton, 23.33 per cent rapeseed & mustard and 20 per cent bajra respondent were not aware about the quality seed of these crops. Lack of credit facility was the major problem indicated by 20 per cent

paddy, 13.33 per cent wheat and 16.67 per cent cotton and 13.33 per cent rapeseed & mustard seed growers and 20 per cent bajra grower have also indicated the difficulty in purchase of seed. The seed grower/respondent have need to travel to long distance for purchasing quality seed was the another constraint indicated by 13.33, 20, 13.13, 13.33 and 16.67 per cent of the paddy, wheat, cotton, rapeseed & mustard seed grower and bajra growers. In paddy, 16.67 per cent farmers quoted that seed is not of good quality. Similarly 13.33 per cent wheat, 13.33 per cent cotton 10 per cent rapeseed & mustard seed growers and 13.13 per cent bajra growers were also have same opinion (Table 4). Tripathy *et al.* (2006)^[8] also found similar pattern of result in their study. Similar factor affecting the seed purchase was obtained by Chauhan (2002)^[2]. Non availability of seed and lack of credit facility were major problem in seed purchase also found by Sivakumar (2006)^[7].

Table 4: Factors affecting seed purchase

S. No.	Factors	Paddy	Wheat	Cotton	Rapeseed & mustard	Bajra
1	Non-availability of seed in time	12 (40)	15 (50)	13 (43.33)	6 (20)	5 (16.67)
2	Non-availability of desired variety seed	9 (30)	11 (36.67)	11 (36.67)	6 (20)	5 (16.67)
3	Higher seed prices	6 (20)	9 (30)	8 (26.67)	7 (23.33)	9 (30)
4	Lack of awareness about quality seed	9 (30)	7 (23.33)	4 (13.33)	7 (23.33)	6 (20)
5	Credit facility not available	6 (20)	4 (13.33)	5 (16.67)	4 (13.33)	6 (20)
6	Need to travel long distance	4 (13.33)	6 (20)	4 (13.33)	4 (13.33)	5 (16.67)
7	Seed is not of good quality	5 (16.67)	4 (13.33)	4 (13.33)	3 (10)	4 (13.33)
Total number of farmers		30	30	30	30	30

Figures in the parenthesis represent the percentage of the total

Note: Multiple response

It was found that 50 per cent paddy, 40 per cent wheat, 43.33 per cent cotton, 43.33 per cent rapeseed & mustard and in bajra 43.33 per cent respondent indicated that the adverse climatic condition directly affect the seed requirement. Another factor which affect the seed requirement was low seed replacement quoted by about 43, 33, 33, 40 and 36.67 per cent of paddy, wheat, cotton, rapeseed & mustard and bajra respondent respectively. In paddy, 40 per cent and 30 per cent wheat respondents opinion that seed is not of good quality i.e. lack in purity, germination and vigour leading to lower yield. In cotton 30 per cent seed grower, 20 per cent

rapeseed & mustard seed growers 23.33 per cent bajra growers were have same problem. Higher prices of the quality seeds was the major factor which affect the seed requirement quoted by 16.67 per cent of paddy, 20 per cent wheat, 16.67 per cent cotton, 20 per cent rapeseed & mustard seed growers and 16.67 per cent of bajra growers. Expansion of area affect the requirement of seed indicated by 13.33 per cent of paddy, 13.33 per cent of wheat, 13.33 per cent of cotton, 16.67 per cent of rapeseed and mustard seed growers and 13.33 per cent bajra growers (Table 5).

Table 5: Factors affecting seed requirement

S. No.	Factors	Paddy	Wheat	Cotton	Rapeseed & mustard	Bajra
1	Adverse climatic condition	15 (50)	12 (40)	13 (43.33)	13 (43.33)	13 (43.33)
2	Seed replacement rate	13 (43.33)	10 (33.33)	10 (33.33)	12 (40)	11 (36.67)
3	Performance of desired variety	12 (40)	9 (30)	9 (30)	10 (33.33)	7 (23.33)
4	Adoption level of farmers	10 (33.33)	9 (30)	9 (20)	6 (20)	6 (20)
5	Price of seed	5 (16.67)	6 (20)	5 (16.67)	6 (20)	5 (16.67)
6	Expansion of area	4 (13.33)	4 (13.33)	4 (13.33)	5 (16.67)	4 (13.33)
Total number of farmers		30	30	30	30	30

Figures in the parenthesis represent the percentage of the tota

Note: Multiple response

It was observed that 40 per cent paddy growers were had the problem of irregular supply of seed. Similarly, 50 per cent wheat, 43.33 per cent cotton, 40 per cent rapeseed & mustard seed growers and 43.33 per cent bajra growers have faced the above problem. In paddy, 36.67 seed growers indicated that the certified seed were not available due to the undeveloped market facilities, 40 per cent wheat, 40 per cent cotton, 33.33 per cent rapeseed & mustard seed growers and 30 per cent bajra growers were also having the same opinion. Transportation facilities were also affect the seed availability

quoted by 30 per cent of paddy, 20 per cent wheat, 26.67 per cent cotton, 23.33 per cent rapeseed & mustard seed growers and 26.67 per cent bajra growers. Other factor affecting seed availability was the high prices indicated by 20, 16.67, 20, 20 per cent of paddy, wheat, cotton, rapeseed & mustard and 23.33 per cent bajra respondent respectively. Similarly, expansion of the are also major seed availability affecting factor quoted by 13.33 per cent paddy, 16.67 per cent wheat, 16.67 cotton, 10 per cent rapeseed & mustard seed growers and 16.67 per cent bajra growers (Table 6).

Table 6: Factors affecting seed availability

S. No.	Factors	Paddy	Wheat	Cotton	Rapeseed & mustard	Bajra
1	Irregular supply of seed	12 (40)	15 (50)	13 (43.33)	12 (40)	13 (43.33)
2	Adverse climatic condition	11 (36.67)	12 (40)	12 (40)	11 (36.67)	10 (33.33)
3	Market facilities	10 (33.33)	7 (23.33)	11 (36.67)	10 (33.33)	9 (30)
4	Transportation facilities	9 (30)	6 (20)	8 (26.67)	7 (23.33)	8 (26.67)
5	Price of seed	6 (20)	5 (16.67)	6 (20)	6 (20)	7 (23.33)
6	Expansion of area	4 (13.33)	5 (16.67)	5 (16.67)	3 (10)	5 (16.67)
Total number of farmers		30	30	30	30	30

Figures in the parenthesis represent the percentage of the total

Note: Multiple response

Conclusion

Seed replacement rate (SRR) of paddy, wheat and bajra were 7.56, 4.83 and 0.04 per cent in 1966-67 which increased to 16.91, 34.08 and 76.95 per cent in 2009-10. SRR of cotton was increased to 49.64 per cent in 2006-07. In rapeseed & mustard, it was increased to 89.55 per cent in 2009-10. Non availability of seed in time or desired variety, higher price, lack of awareness, lack of credit facilities, need to travel long distance and unreliable quality are the main factors affecting seed purchase. Adverse climatic condition, seed replacement rate, performance of desired variety, adoption level of farmers and price of seed and expansion of area are directly affects the seed requirements. Irregular supply of seed, adverse climatic condition, market and transportation facilities, price of seed and expansion of area affects seed availability.

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