

Research Article

A study to assess the factors for increasing the wheat productivity in Haryana

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Abstract

The present investigation was undertaken to assess the factors for increasing the wheat productivity in Haryana. The study was conducted in five districts namely, Hisar, Sirsa, Rohtak, Yamunanagar and Mehendergarh of Haryana state. These districts were selected purposively because of wheat with other crops were grown in these five districts. Further, from each district, two villages were selected, randomly. Thus, the ten villages were selected from five districts and from each village, 10 farmers were randomly, selected and 100 farmers were interviewed. Majority of the farmers followed the Rice-wheat, Cotton-wheat and Bajra-wheat, Sorghum-wheat and Guar-wheat crop rotation with 68 per cent, 61 per cent and 59 per cent, respectively. Most of the farmers were agreed with 'Very less availability of recently releases varieties' ranked 1st with mean score (2.78) followed by 'Unavailability of desired varieties' (2.71), 'Unavailability of farm inputs at required time' ranked 3rd and 'Lack of training towards new technologies' ranked 4th as per mean score of (2.54) and (2.53), respectively. 'Lack of knowledge about plant protection and fertilizers doses' was found at 5th rank and 83 per cent of the farmers had knowledge about 'Field preparations', 'Irrigation schedule', and 'Rainfall' affects productivity of wheat.

Ninety one per cent farmers agreed that 'High cost of agro-chemical and inputs', 'Low risk bearing capacity', 'Irregular rainfall'(87%) and 'Control of diseases and pests'(80%) was barrier in productivity. Seventy nine per cent of farmers were agreed that 'Lack of awareness about varieties released for particular area' followed by 'Non- availability of fertilizers at required time'(69 %), 'knowledge about seed treatment'(62 %) and 'inadequate dose of fertilizer application'(60 %) was constraint in productivity.

Keywords: Awareness, constraints, low productivity, wheat

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Introduction

Wheat (*Triticum aestivum* L.) is the second most important food crop in India after rice, both in terms of area and production. India standing on top position in total area under cereals, the productivity of cereals is not so satisfying, comparing with other nations with less area under cereals (Sreekanth *et al* 2017). Agriculture has been the backbone of the Indian economy and it will continue to remain so for a long time. It has to support 17 per cent of world population from 2.3 per cent of world geographical area and 4.2 per cent of world's water resources. In India, wheat production performed substantially better increasing from 10.40 million tons to 85.93 million tons. Agricultural production has two components food grains and non-food grains. The former contributes approximately two-thirds of total agricultural production. As far as food grains output in concerned, the total production increased from 50.8 million tons in 1950-51 to 264.77 million tons in 2014-15. Now, the central challenge of Indian agriculture is low productivity especially in cereals. Wheat is important cereal which is grown on the most fertile and irrigated areas in the country. In India, wheat is grown between 110N to 550 N latitude and 720E to 920E longitude and at an altitude of more than 3000 m above mean sea level. The causes of low productivity of wheat are excessive pressure of population on land, social environment, land degradation, uncertain monsoons, inadequate irrigation facilities, uneconomic land holdings and inability to use HYV seeds, unscientific fertilizer consumption, incidence of pests and diseases, capital formation in agriculture, poor mechanization of farming, subsistence nature of farming and weakness in policy perspectives. Soil and water salinity and the lack of irrigation are the principal constraints affecting crop. Rathod *et al* revealed that 36.8 per cent farmers fully adopted demonstrated wheat production technology whereas, 21.5 per cent farmers adopted partially. The major constraints observed in wheat production were salt affected soil as well as poor quality of irrigation water. Salinity decreased germination per cent, root length, callus size, coleoptile length, seedling growth [1-4], reduced fertile ears, ear length, grain yield, straw yield, harvest index and test weight [5, 6]. There are many reasons for low productivity in agriculture in wheat.

Methodology

The present study was conducted in Haryana state and five districts Hisar, Sirsa, Rohtak, Yamunanagar, and Mehendergarh were selected, purposively, because of wheat with other crops cropping systems are practiced in these five districts. Further, from each district, two villages were selected, randomly. Thus ten villages were selected from five districts and from each village ten farmers were randomly, selected and thus, 100 farmers were interviewed.

Results and Discussion

Table 1 revealed that majority of the farmers in Haryana followed the rice – wheat and cotton – wheat crop rotation with 68 percent and 61percent, respectively.59 percent of the respondents were follow wheat with crops like Bajra, Jawar and Guar. Other crop rotation with wheat was adopted by 60 percent farmers.

Table 1 Crop rotation. n=100

Sr. no.	Particulars	Yes (%)	No (%)
1	Rice-Wheat	68	32
2	Cotton-Wheat	61	39
3	Bajra/sorghum/Guar-Wheat	59	41
4	Other crops-Wheat	60	40
5	Fallow-Wheat	0	100

Causes for low productivity of wheat

The data revealed in **Table 2** that majority of the farmers were agreed with the statement ‘Very less availability of recently releases varieties’ and ranked 1st with mean score (2.78) followed by ‘Unavailability of desired varieties’ (2.71), ‘Unavailability of farm inputs at required time’ was 3rd in rank and ‘Lack of training towards new technologies’ was ranked 4th as per mean score of (2.54) and (2.53), respectively. ‘Lack of knowledge about plant protection and fertilizers doses’ was found at 5th rank (**Figure 1**).

Table 2 Causes for low productivity of wheat. n=100

Sr. No.	Causes	Very Severe	Severe	Not So Severe	Weighted mean	Rank Order
1.	Very less availability of recently releases varieties	85	8	7	2.78	I
2.	Unavailability of desired varieties	83	5	12	2.71	II
3.	Unavailability of farm inputs at required time	72	10	18	2.54	III
4.	Lack of training towards new technologies	67	19	14	2.53	IV
5.	Lack of knowledge about plant protection and fertilizers doses	63	25	12	2.51	V
6.	Non availability of soil/water testing facilities at village/block level	72	6	22	2.50	VI
7.	Lack of knowledge regarding new varieties	71	7	22	2.49	VII
8.	Lack of co-ordination among the working agency	67	14	19	2.48	VIII
9.	Low level of adoption towards new technologies	62	17	21	2.44	IX
10.	Lack of good extension contact and mass media exposure	62	15	23	2.42	X
11.	Low level of adoption of weather forecasting services	63	3	34	2.29	XI
12.	Non availability of proper plant protection measures	59	10	31	2.28	XII
13.	Lack of liason between field functionaries and farmers	50	26	24	2.26	XIII
14.	Non- adoption of recommended farm practices	37	43	20	2.17	XIV
15.	Adulteration of farm inputs	31	44	25	2.06	XV
16.	Less control on weed/insects/diseases	44	17	39	2.05	XVI

Factors affecting productivity of wheat

Table 3 revealed that the factors ‘Seed rate at the time of sowing’ affects the productivity was found 95 percent, knowledge regarding ‘Selection of varieties according to area and weather condition’ was 94 percent, ‘Climatic conditions’ affecting productivity was 91 percent, 88 percent farmers agreed that ‘Timely availability of herbicide and

their quality' affects productivity, 87 percent farmers agreed with 'Time and method of sowing', 86 percent farmers agreed that 'Diseases and pest control affects' productivity and 83 percent farmers had knowledge that 'Field preparations', 'Irrigation schedule, and 'Rainfall' affects productivity of wheat crop (**Figure 2**).

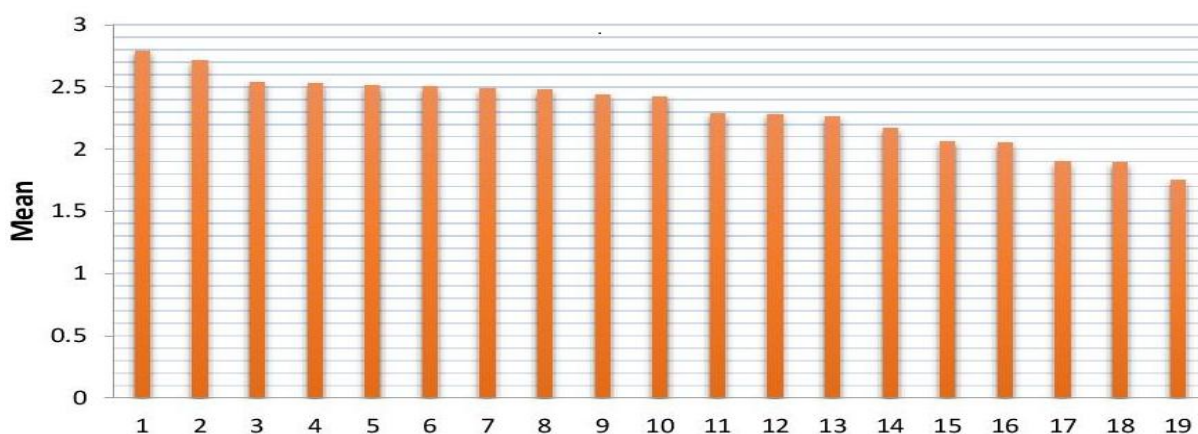


Figure 1 Causes for low productivity

Table 3 Factors affecting productivity of wheat, n=100

Sr. No.	Statements	Response	
		Yes (%)	No (%)
1.	Type of soil and soil pH	73	27
2.	Field preparation	83	17
3.	Time and method of sowing	87	13
4.	Selection of varieties according to area and weather conditions	94	6
5.	Seed rate as sowing time	95	5
6.	Seed treatment	64	36
7.	Seed quality	61	39
8.	Irrigation schedule	83	17
9.	Fertilizers application	72	28
10.	Fertilizers dose and quality of fertilizers	77	23
11.	Diseases/pests control	86	14
12.	Timely application of fungicides/insecticides and their quality	77	23
13.	Weed control	79	21
14.	Timely availability of herbicide and their quality	88	12
15.	Inter cultural operation	75	25
16.	Climate conditions	91	9
17.	Rainfall	83	17
18.	Harvesting time and method	55	45
19.	Availability of labor	41	59

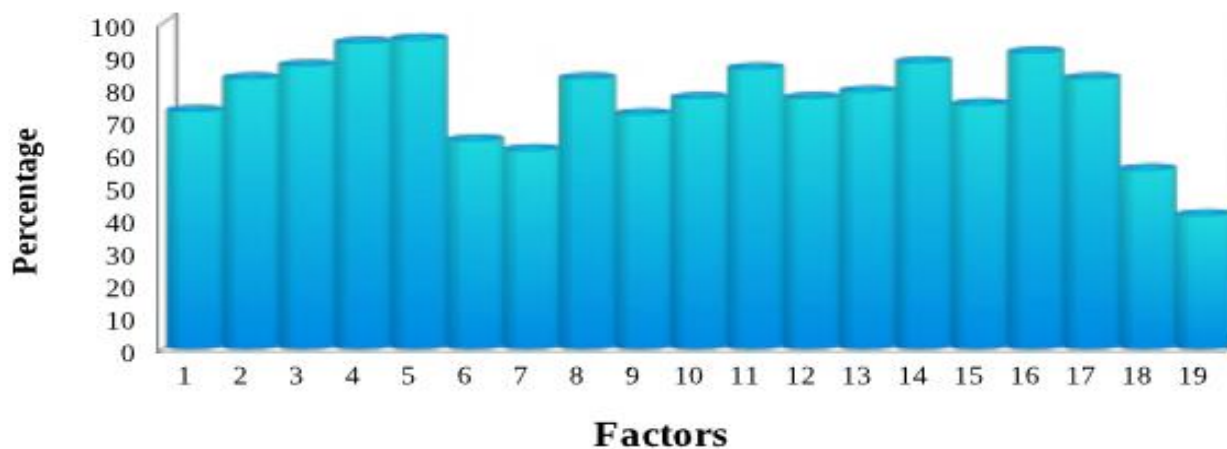


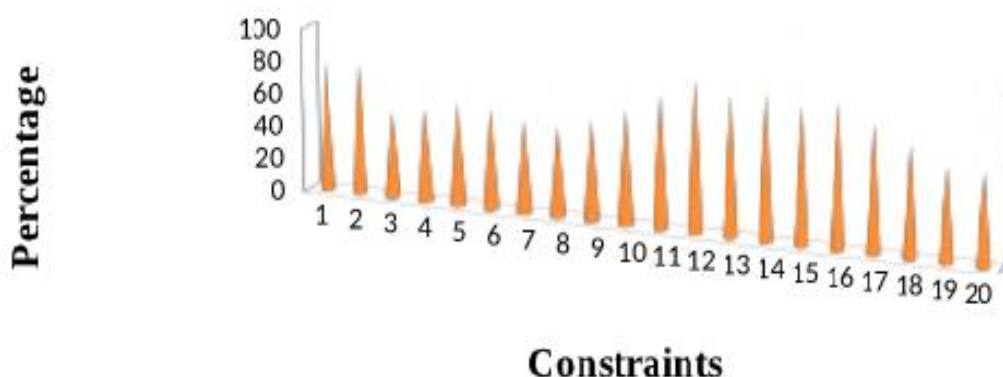
Figure 2 Factors affecting productivity of wheat crop

Constraints in higher productivity of wheat

The data revealed in **Table 4** that majority of respondents (91%) agreed that ‘High cost of agro-chemical and inputs’ was barrier in productivity, 87 percent respondents said that ‘Low risk bearing capacity’ was another constraint and 86 percent respondents agreed that ‘Irregular rainfall’ was also a problem in production. Other constraints which 84 percent and 80 percent of respondents agreed were that the ‘Farmers are unaware about harvesting time’ and ‘Control of diseases and pests’. 79 percent of farmers were agreed that ‘Lack of awareness about varieties released for particular area’ and 78 percent respondents agreed that ‘Lack of awareness about new varieties’ was constraint in productivity of wheat crop. 76 percent of respondents agreed that ‘High/low wind velocity’ was constraint in productivity, 69 percent respondents agreed that ‘Non- availability of fertilizers at required time’, 66 percent respondents agreed that ‘High/low evaporation rate’, 62 percent respondents agreed that ‘Lack of awareness about seed treatment’ and 60 percent of the respondents agreed that ‘Lack of awareness about dose of fertilizer application’ was constraint in productivity of wheat (**Figure 3**).

Table 4 Constraints in higher productivity of wheat, N=100

Sr. No.	Statements	Response	
		Yes (%)	No (%)
1.	Unaware about the new releases varieties	78	22
2.	Unaware about varieties releases for particular area	79	21
3.	Non availability of new and improved variety seeds	52	48
4.	Barriers in the distribution of required seed	56	44
5.	Unaware about of seed treatment	62	38
6.	Unaware about the depth of seed sowing	60	40
7.	Unaware about the irrigation timing	56	44
8.	Less availability of irrigation facility	54	46
9.	Unaware about dose of fertilizers application	60	40
10.	Non availability of fertilizers at required time	69	31
11.	Unaware about the control of diseases and pests	80	20
12.	High cost of agro – chemical inputs	91	9
13.	Unaware about the harvesting time	84	16
14.	Less risk bearing capacity of farmers	87	13
15.	Unfavourable temperature	82	18
16.	Irregular rainfall	86	14
17.	High/low wind velocity	76	24
18.	High/low evaporation rate	66	34
19.	High/low relative humidity	56	44
20.	Untimely and inadequate availability of credit from the formal sources	55	45

**Figure 3** Constrsints in higher productivity of wheat**Conclusion**

Majority of the farmers in Haryana followed the rice – wheat and cotton – wheat crop rotation with 68 percent and 61 percent, respectively. 59 percent of the respondents were follow wheat with crops like Bajra, Jawar and Guar. Among constraints, most serious constraint was ‘High cost of agro-chemical and inputs’ (91%) followed by ‘Low risk bearing

capacity' (87 %) and 'Irregular rainfall' (86 %), 'Farmers are unaware about harvesting time' (84 %), 'Control of diseases and pests' (80 %), 'Lack of awareness about varieties released for particular area' (79%), 'Lack of awareness about new varieties' (78%), 'Non-availability of fertilizers at required time' (69%), 'High/low evaporation rate' (66 %), 'Lack of awareness about seed treatment' (62 %) and 'Lack of awareness about dose of fertilizer application' (60 %). Most of the farmers were agreed with the statement 'Very less availability of recently released varieties' and ranked 1st with mean score (2.78) followed by 'Unavailability of desired varieties' (2.71), 'Unavailability of farm inputs at required time' was 3rd in rank. Among factors for low productivity of wheat 'Seed rate at the time of sowing' (95%) followed by knowledge regarding 'Selection of varieties according to area and weather condition' (94%), 'Climatic conditions' affecting productivity (91%), 'Timely availability of herbicide and their quality' affects productivity (88%), 'Time and method of sowing' (87 %), 'Diseases and pest control affects' productivity (86 %) and knowledge that 'Field preparations', 'Irrigation schedule, and 'Rainfall' (83%) affects productivity of wheat crop.

References

- [1] Lallu and Dixit, R.K. (2005). Salt tolerance of mustard genotype at seedling stage. *Indian J. Pl. Physiol.*, 14(2): 33-35.
- [2] Ghannadha, M.R., Omid, M., Shahi, R.A. and Poustini, K. (2005). A study of salt tolerance in genotypes of bread wheat using tissue culture and germination test. *Iranian J. Agri. Sci.*, 36(1):75-85.
- [3] Bera, A.K., Pati, M.K. and Bera, A. (2006). Bassionolide ameliorates adverse effect on salt stress on germination and seedling growth of rice. *Indian J. Pl. Physiol.*, 11(2):182 - 189.
- [4] Agnihotri, R.K., Palni, L.M.S. and Pandey, D.K. (2006). Screening of land races of rice under cultivation in Kumaun Himalayan for salinity stress during germination and early seedling growth. *Indian J. Plant Physiol.*, 11(30): 262-272.
- [5] Francios, L.E., Mass, E.V., Donovan, T.J. and Young, V.L. (1986). Effect of salinity on grain yield, quality, vegetative growth and germination of semi dwarf and durum wheat. *Agron. J.*, 78(6): 1053-1058.
- [6] Asha and Dhingra, H.R. (2007). Salinity mediated changes in yield and nutritive value of chickpea seeds. *Indian J. Pl. Physiol.*, 12(3): 271-275
- [7] Rathod, Anshuman D., Hadiyal, Satish T. and Rajawat, Singh B. (2016). Adoption behaviour and constraints in wheat production technologies in saline area of Gir Somnath district of Gujarat. *International journal of forestry and crop improvement*. 7(1): 52-56, DOI:10.15740/HAS/IJFCI/7.1/52-56.
- [8] Sreekanth, M., Hakeem, A.H., Peer A.J.Q. and Rashid, I. (2017). Low productivity of Indian agriculture with special reference on cereals. *Journal of pharmacognosy and phytochemistry*. 6(5): 239-243.

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