

## Constraints Faced by Farmers in Adoption of Super Seeder Technique in Haryana State

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### ABSTRACT

The study evaluates the constraints faced by farmers in adopting super seeder and conventional techniques in Haryana during 2021-22. A sample of 100 paddy-growing farmers from two purposively selected districts, namely Karnal and Kaithal, were chosen to collect data. Multistage random sampling was employed to select blocks, villages, and respondents. Garret ranking technique was employed for measuring constraints. Weed infestation was found to be most severe constraints followed by ineffectiveness of prescribed weedicide in conventional technology. While in adoption of super seeder, less germination and lack of seed treatment were found as main constraints. In super seeder, a high initial cost followed by high hiring charges was observed. Therefore, in addition to super seeder, tractors should also be made available in custom hiring centers. Krishi vigyan kendra's/state agricultural universities/state government should facilitate best use of this machine through skilled training. Timely subsidies can also reduce prevailing constraints.

**Keywords:** Super seeder, Conventional technique, Weed infestation, High hiring charges

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### INTRODUCTION

A vital crop grown worldwide is wheat (*Triticum aestivum* L.). The world's total area under wheat cultivation was 224.49 million hectares, and 792.40 million tonnes of wheat were produced in 2020–21 (Annual report of DA&FW, 2021). In India, the whole area under wheat cultivation is 31.76 million hectares, and production is 109.52 million tons, with an average national productivity of 3464 kg/ha during 2020-21 (Anonymous, 2021). Haryana is the country's fourth most crucial wheat-cultivating state, followed by Uttar Pradesh, Madhya Pradesh, and Punjab. Haryana is a major wheat growing state in India, with an area occupying 2.56 million hectares with a production of 12.39 million tonnes in the year 2020-21 (Anonymous, 2021). Nonetheless, farmers in Haryana faced numerous constraints, the most significant of which were weed infestation (70%) and weedicide ineffectiveness (50%) in the rice-wheat cropping pattern, and farmers also mentioned a need for more money to purchase new machines and inputs-lack of appropriate loose straw management and high tillage costs (Singh et al., 2020). The major challenges to wheat production in Haryana are enhancing its productivity and profitability. Saving input cost, fuel consumption and irrigation water use have been reported due to the adoption of super seeder in wheat cultivation. Every farmer cannot use happy seeders since they require very high capacity tractors to function, and most farmers did not consider the happy seeder practicable because it required a high horsepower tractor. (Choudhary et al., 2022). Although there are numerous

options available to farmers, none of them are widely used. Happy seeder technique was developed to address the issue of paddy straw burning. (Singh et al., 2021). Farmers in rice residue management (RRM) encountered a variety of challenges, including leaf yellowing, pink stem borer attack, water stagnation, and straw loading, among others. Farmers identified a lack of high HP tractors and a lack of experience in using new technologies as restrictions in RRM, according to CHCs and co-operative societies. (Singh et al., 2016). Although the super seeder is the next generation or improved version of happy seeder so it also used as direct sowing of wheat in the presence of paddy straw and similar constraints were observed under super seeder technology in our study.

### MATERIALS AND METHODS

The research was conducted in the Karnal and Kaithal districts of Haryana. The districts and villages were chosen using a purposeful and multistage random sampling process because in these districts, most areas under several forms of resource conservation wheat crops establishment techniques such as conventional technique, turbo happy seeder, and super seeder techniques. After the village's selection, a list of farmers who adopt various resource conservation establishment strategies in the cultivation of wheat crops was generated and classified into two size groups: conventional and super seeder techniques. Five blocks were chosen at random from each district, namely Karnal, Gharaunda, Nissing, Indri, Nilokheri

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from Karnal district and Pundri, Kaithal, Kalayat, Guhla, Siwan blocks from Kaithal district. From each selected block, one village was selected randomly. From each selected villages ten farmers were chosen randomly from which five adopters and five non adopter of super seeder techniques. Thus, the study sample consisted of a total of fifty farmers from each district, out of which twenty-five adopters and twenty-five non adopter of super seeder techniques. Thus, a total of 100 farmers were interviewed.

A list of all the crucial constraints affecting production was prepared with the help of wheat growers. The constraints score of each respondent and all the respondents for each item on production constraints in conventional and super seeder techniques were worked out. The garret's mean score and rank order were also computed. Garret's ranking technique was used to analyze the constraints in the farmer's adoption of super seeder technology in the study area. The study of constraints faced by the farmers is an essential aspect of research from the policy point of view. The respondents were asked to rank (in the order of severity) the constraints, and these ranks were converted to scores by referring to Garret's table. The order of the merit that respondents will give will be changed into ranks by using the formula given in equation (1):

$$\text{Percent proportion} = \frac{100(R_{ij}-0.5)}{N_j} \tag{1}$$

Where,

$R_{ij}$  = Ranking given for  $i^{\text{th}}$  item by  $j^{\text{th}}$  individual

$N_j$  = Number of items ranked by  $j^{\text{th}}$  individual

The percent position of each rank will be converted to scores by referring to tables given by Garret and Woodworth (1969). Then, for each factor, the scores of individual respondents were summed up and divided by the total number of respondents for whom scores were gathered. The mean scores for all the factors were ranked, following the decision criterion, that the higher the score more important the constraint to the farmers.

## RESULTS AND DISCUSSION

Table 1 revealed that the major constraint in the conventional technique in the study area was the problem of weed infestation, mainly Phalaris minor (137.31, 138.08 and 140.39) for Karnal, Kaithal, and Haryana, respectively, followed by

non-effectiveness of recommended weedicides (clodinafop, metasulfon, and pinoxaden) (100.38, 105.77 and 105.10) for Karnal, Kaithal, and Haryana, respectively. The minor constraint in the conventional technique in the study area was the non-adoption of seed treatment (75.00, 67.31 and 72.55) for Karnal, Kaithal, and Haryana, respectively. Our study's findings were relevant to the findings of (Ahmed *et al.*, 2011; Chhokar *et al.*, 2018; Kumar *et al.*, 2013; Singh, 2016; Singh *et al.*, 2020) in their studies.

Table 2 revealed that the major problems of super seeder technology in the study area were the problem of problems of less germination (134.31, 140.23 and 139.96) for Karnal, Kaithal, and Haryana, respectively, followed by non-adoption of seed treatment (119.31, 114.54 and 119.21) for Karnal, Kaithal, and Haryana, respectively. The minor constraint in the super seeder technology in the study area was the weed infestation problem (56.46, 55.54 and 57.09) for Karnal, Kaithal, and Haryana, respectively. The finding of our study was relevant to the findings of (Sidhu *et al.*, 2015; Yogi *et al.*, 2015; Singh *et al.*, 2018) in their studies. Weed infestation problem was found to be common in both techniques of wheat. However, the infestation was more in conventional technique as compared to super seeder technology. Non-effectiveness of recommended weedicide is higher in the case of conventional technique as compared to super seeder technology in both the districts and Haryana because weedicide applications are higher in the case of the conventional technique, so weed resistance to weedicides is high in the conventional technology. Overuse of nitrogenous fertilizers and seed treatment problems are high in super seeder technology than in conventional technique. The problem of poor germination was found more in the super seeder technology as compared to the conventional technique. In Haryana, the high initial cost of super seeders was found to be a significant problem.

Table 2 revealed that the farmer's major problems in adopting super seeder machinery in the Karnal district were the high hiring charges for the sowing of wheat per hectare, average of all respondent were found 138 and garret mean score of it 78, followed by the requirement of a high horsepower tractor, average of all respondent were found 126 and garret mean score of it 66 For running a super seeder machine, there is a

**Table 1:** Production constraints in conventional technique in Karnal and Kaithal districts of Haryana

Sl. No.	Constraints	Karnal	Kaithal	Haryana	Rank
		Average	Average	Average	
1	Weed infestation	137.31 (75)	138.08 (75)	140.39 (75)	1
2	Non effectiveness of recommended weedicide	100.38 (60)	105.77 (60)	105.09 (60)	2
3	Overuse of nitrogenous fertilizers	99.62 (50)	87.31 (50)	95.29 (50)	3
4	High cost of phosphatic fertilizers	68.46 (39)	82.31 (39)	76.86 (39)	4
5	Non-adoption of seed treatment	75.00 (24)	67.31 (24)	72.59 (24)	5

**Table 2:** Production constraints in super seeder in Karnal and Kaithal districts of Haryana

Sl. No.	Constraints	Karnal	Kaithal	Haryana	Rank
		Average	Average	Average	
1	Less germination	134.31 (77)	140.23 (77)	139.96 (77)	1
2	Non-adoption of seed treatment	119.31 (63)	114.54 (63)	119.21 (63)	2
3	Overuse of nitrogenous fertilizers	114.62 (54)	98.85 (54)	108.82 (54)	3
4	High cost of phosphatic fertilizers	81.54 (46)	83.38 (46)	84.07 (46)	4
5	Non effectiveness of recommended weedicide <sub>s</sub>	71.15 (37)	83.08 (37)	78.62 (37)	5
6	Weed infestation	56.46 (23)	55.54 (23)	57.09 (23)	6

\*Figure in the parenthesis represents garret mean score according to their rank

need for a high horse-powered tractor (more than 50 hp). Therefore, the government must provide the facility of purchase/subsidies to get more tractors, at least in a custom hiring center. The minor constraint was the difficulty in sowing, average of all respondent were found 58.85 and garret mean score of it 22 because most farmers needed to be aware of how to handle the machinery for the proper wheat sowing. There is some technical problem in the handling of the super seeder machine. For the best use of the machine, skill-based training must be provided to the farmers using the super seeder machine.

In the Kaithal district, the major problem related to using the super seeder machinery was the placement of seed at the proper depth of, average of all respondent were found 144 and garret mean score of it 78. There should be some technical adjustments from the engineering department for correctly

placing seeds in soil for better germination. Secondly, requirement of skill to operate machinery, average of all respondent were found 126 garret mean score of it 66. The minor constraint was the high initial cost of the super seeder machine, average of all respondent were found 88.31 and garret mean score of it 22. As the cost of a super seeder machine is too high for the purchase of small and marginal farmers, the government may ease in providing subsidies, and other than subsidy, the farmer should get easy finance individually from the financial institutions.

In overall basis, the major problem related to super seeder machinery was the high cost of super seeder average of all respondent were found 140.24 and garret mean score of it 78 followed by high hiring charges for machinery, average of all respondent were found 136.91 and garret mean score of it 66. The minor constraint was the requirement of skill to operate

**Table 3:** Constraints faced by the farmers in the adoption of super seeder machine in Karnal and Kaithal districts of Haryana

Sl. No.	Constraints	Karnal		Kaithal		Haryana	
		Average	Rank	Average	Rank	Average	Rank
1	High hiring charges for machinery	138.00 (78)	1	121.85 (58)	3	136.91 (66)	2
2	High horsepower requirement of a tractor (above 55 hp.)	126.00 (66)	2	97.85 (35)	6	106.47 (35)	6
3	High cost of super seeder	117.15 (58)	3	88.31 (22)	7	140.24 (78)	1
4	Lack of placement of seed at the proper depth	92.69 (50)	4	144.00 (78)	1	112.04 (50)	4
5	Delay in disbursement of the subsidy process	77.85 (43)	5	100.46 (43)	5	118.82 (58)	3
6	Requirement of technical training to operate the machinery	63.46 (35)	6	126.00 (66)	2	93.18 (22)	7
7	Difficulty in sowing	58.85 (22)	7	107.08 (50)	4	110.04 (43)	5

\*Figure in the parenthesis represents Garret mean score according to their rank

machinery, average of all respondent were found 93.18 and garret mean score of it 22. It was similar to the findings of (Kathpalia *et al.*, 2020; Singh *et al.*, 2021; Singh *et al.*, 2020) in their respective studies.

## CONCLUSION

Weed infestation problem was found to be common in both techniques of wheat. However, the infestation was more in conventional technique (Garret mean score = 75) as super seeder technique (23). Seed treatment knowledge was found less in the farmers doing super seeder (63) than in the conventional technique (24). The problem of poor

germination (77) and high hiring charges (66) for machinery for sowing was found more in the super seeder. To operate heavy machinery, access to high-horsepower (more than 55 hp) tractors is required, and the availability of machinery during the short harvest season is limited, with monetary incentives available for only some of the possibilities. Direct subsidies or awards to farmers who do not burn residue could be an essential instrument for residue management. Direct sowing of wheat by super seeder technique provided timely sowing operation with better net return of wheat as compared to conventional techniques.

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