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## Constraints in adoption of recommended Isabgol production technology in Jodhpur region of Rajasthan

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### Abstract

Isabgol is the most important medicinal crop of Rajasthan. In recent years, interest of this crop has increased in the western countries because of the blood cholesterol lowering property of its husk. The seeds without husk are used as cattle feed which contains 17 to 19% protein. Other than medicinal uses, it is used in dyeing calico printing and ice-cream industries as a stabilizer. The present study was conducted in Jodhpur region of Rajasthan comprising two districts namely Barmer and Jodhpur. Since these two are leading districts in terms of area production of Isabgol in Rajasthan. Two panchayat samities from each district were identified based on area production of Isabgol and eight Isabgol growing villages were selected randomly from each panchayat samities. In this way from Jodhpur district Phalodi and Bap Panchayat samities and from Barmer district Sadwa and Dhorimanna Panchayat samities were selected for the study purpose. Eight Isabgol growing villages were selected randomly villages namely Jagriya, Padiyal, Jaisla, Nokda Bhatiyani, Ajani ki dhani, Jambh Shakti dham udaser, Bhawar, Harpalia. The sample comprised of a total 120 respondents. The data were collected with the help of interview schedule through personal interview method by the investigator himself. Frequency, mean, percentage, rank, correlation and other appropriate methods were used for this study. The present research work would also helpful and useful for giving feedback to Agriculture University about farmers marketing of Isabgol crop and constraints faced by the farmers. The results show that among the enlisted Input constraints most important constraints "Unavailability of high yielding varieties seeds at the time of sowing" (80.83 MPS) and in Technical constraints most important constraint were "Lack of knowledge about improved varieties of Isabgol" (78.88 MPS). The results show that in Financial constraints most important constraint were "High cost of seeds of high yielding varieties" (75.00 MPS) and in Marketing constraints most important constraint were "High price fluctuation" (80.27 MPS).

**Keywords:** Adoption, constraints, isabgol growers, production, technology

### Introduction

Among all the medicinal crops, Isabgol is the most important medicinal crop of Rajasthan. In recent years, interest of this crop has increased in the western countries because of the blood cholesterol lowering property of its husk (Taneja *et al.* 1989). The seeds without husk are used as cattle feed which contains 17 to 19% protein. Other than medicinal uses, it is used in dyeing calico printing and ice-cream industries as a stabilizer. (Upadhyay *et al.* 1978)

Jodhpur region of Rajasthan is the highest producer region. To assess the type of constraints faced by the Isabgol growers like input constraints, marketing constraints, technical constraints, etc.

Knowledge of recommended Isabgol production technology by the farmers and how it is marketed are essential for the development of Isabgol cultivation package for our economy. This is not possible without enough knowledge of recommended practices.

The present research work would also helpful and useful for giving feedback to Agriculture University about farmers marketing of Isabgol crop and constraints faced by the farmers. By these feedbacks they can give more weightage to overcome the problems according to priority. The total export value of medicinal and aromatic plants in India was ` 2008 94.08 lakhs in the year 2019-20. (Reference: Ministry of Commerce & Industry, New Delhi)

India ranks first in Isabgol production and the sole supplier of seeds and husk in the international market. India is the largest exporter of Isabgol husk in the world. India exported Isabgol husk of ` 135366.34 lakh during the year 2019-20. At present Gujarat and Western Rajasthan, part of Madhya Pradesh and Northern belt and the Malwa tract are the major Isabgol growing areas in the India. (Reference: Ministry of Commerce & Industry, New Delhi)

**Research Methodology**

Jodhpur region comprises of two districts Barmer and Jodhpur. Both the districts were selected purposively due to the reason that they have highest area and production. From Jodhpur and Barmer district 2 panchayat samities in relation to Isabgol from each district were selected as they are having highest area and production. In this way from Jodhpur district Phalodi and Bap Panchayat samities and from Barmer district Sadwa and Dhorimanna Panchayat samities were selected for the study purpose. From the selected panchayat samities, 8 Isabgol growing villages were selected randomly. In this way a total of 8 villages namely Jagriya, Padiyal, Jaisla, Nokda Bhatiyar, Ajani ki dhani, Jambh Shakti dham udaser, Bhawar, Harpalia were selected randomly. From the selected village, a sample of 15 respondents from each village was chosen. In total a sample of 120 respondents were selected from 8 Isabgol growing villages. For research study an interview schedule specially constructed with the help of experts.

Regarding with the help of constraints faced by the farmers in adoption of recommended Isabgol production technology, all constraints were enlisted in interview schedule after taking advice and recommendation of experts and response of respondents were recorded on three-point continuum namely most important, important and least important constraints respectively.

Based on mean and standard deviation so obtained, the respondents were categorized into low, medium and high level.

Frequency, mean, percentage, rank, correlation and other appropriate methods were used for this study:

- (i) Percentage – Simple comparisons were made on the basis of frequency and per centage.
- (ii) Mean score- It was obtained by dividing the total score of each practice statement by total number of respondents.
- (iii) Mean Per cent score (MPS) –

$$MPS = \frac{\text{Total score obtained by the respondent}}{\text{Maximum obtainable score}} \times 100$$

- (iv) Rank – Ranks were accorded in the descending order according to the MPS obtained. This was used to find out the severity of constraint in order of priority.

- (v) Standard Deviation - The Standard deviation (S.D.) measures the absolute dispersion of variabilities of distribution. Here mean and S.D. were used in categorization of respondents in different categories.

**Standard deviation**

$$SD = \sqrt{\frac{\sum x^2}{n} - \left(\frac{\sum x}{n}\right)^2}$$

Where,  
S.D.= Standard deviation

$\sum x^2$ = Sum of squares of x observations

$\sum x$ = Square of sum of x observations

n= Size of sample

**Correlation:** The correlation coefficient (r) is a measure of the degree of association. To study the relationship between any two variables, correlation techniques was frequently used in study.

$$r = \frac{\sum x_i y_i - (\sum x_i)(\sum y_i)/n}{\sqrt{\sum x_i^2 - (\sum x_i)^2/n} \sqrt{\sum y_i^2 - (\sum y_i)^2/n}}$$

Where,

R = Coefficient of correlation

$x_i$  = Values of x variable for  $i^{th}$  pairs

$y_i$  = Values of y variable for  $i^{th}$  pairs

n = Number of pairs of x and y values.

The significance of ‘r’ values was tested by using ‘t’ test with the help of following formula:

$$t = \frac{r \sqrt{n - 2}}{\sqrt{1 - r^2}}$$

d.f. = n – 2

**Results and Discussion**

**1. Assessment of the constraints perceived by the farmers in adoption of recommended Isabgol production technology.**

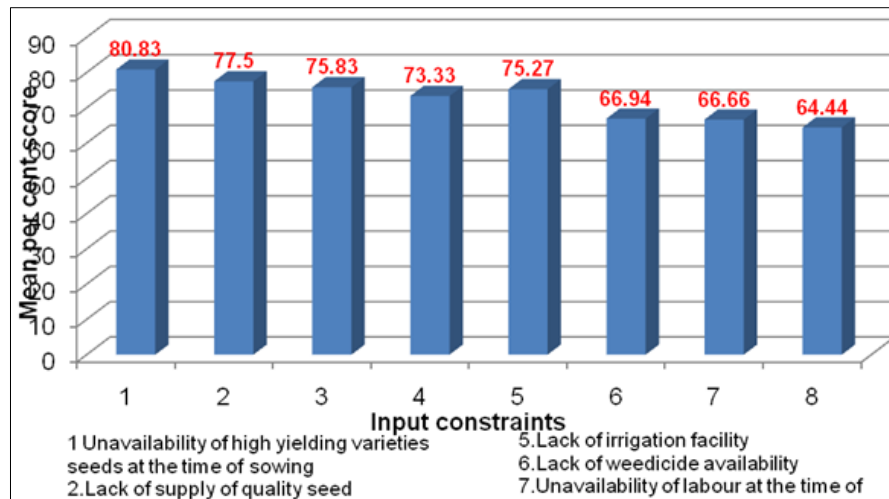
The MPS score of individual constraints were assigned and were ranked in descending order. The constraints encountered by the respondents were categories into four categories namely, input constraints, technical constraints, financial constraints and marketing constraints. The findings regarding these constraints have been presented in below Table.

**1.1 Input constraints**

It is clear from table below that finding of input constraints reported by the farmers for the recommended Isabgol production technology. The data in table below that on the whole “Unavailability of high yielding varieties seeds at the time of sowing” (80.83 MPS) was most perceived constraints and hence it was assigned first rank. The second most perceived constraints was “Lack of supply of quality seed” (77.50 MPS) followed by “Unavailability of fertilizers and manures for Isabgol crop ” (75.83 MPS), “Lack of irrigation facility” (75.27MPS), “Unavailability of chemical for plant protection measures” (73.33 MPS), “Lack of weedicide availability”(66.94 MPS), Unavailability of labour at the time of harvesting” (66.66 MPS), and “Lack of implement required for Isabgol crop production (64.44 MPS) were perceived as third, fourth, fifth, six, seven and eight ranked most perceived constraints respectively

**Table 1:** Input constraints perceived by the farmers in adoption of recommended Isabgol production technology. n=120

S. No.	Input constraints	MPS	Rank
1.	Unavailability of high yielding varieties seeds at the time of sowing	80.83	I
2.	Lack of supply of quality seed	77.50	II
3.	Unavailability of fertilizers and manures for Isabgol crop	75.83	III
4.	Unavailability of chemical for plant protection measures	73.33	V
5.	Lack of irrigation facility	75.27	IV
6.	Lack of weedicide availability	66.94	VI
7.	Unavailability of labour at the time of harvesting	66.66	VII
8.	Lack of implement required for Isabgol crop production	64.44	VIII

**Fig 1:** Input constraints perceived by the farmers in adoption of recommended Isabgol production technology

## Discussion

The important constraints reported by majority of farmers were “Unavailability of high yielding varieties seeds at the time of sowing” (80.83 MPS), “Lack of supply of quality seed” (77.50 MPS), “Unavailability of fertilizers and manures for Isabgol crop ” (75.83 MPS), “Lack of irrigation facility” (75.27MPS), “Unavailability of chemical for plant protection measures” (73.33 MPS), “Lack of weedicide availability” (66.94 MPS), Unavailability of labour at the time of harvesting” (66.66 MPS), and “Lack of implement required for Isabgol crop production (64.44 MPS) respectively.

This might be due to input dealers and market facility far away from village in the research area so, that farmers face problems for purchase quality seeds, fertilizers, plant protection measures, weedicide etc.

However, the findings of this study got support from the findings of Singh (2007) [21] and Bheemudada and Natikar (2016) [3].

### 1.2 Technical constraints

It is clear from Table 2 below that finding of technical

constraints reported by the farmers for the recommended Isabgol production technology. The data in table below that on the whole “Lack of knowledge about improved varieties of Isabgol” (78.88 MPS) was most perceived constraints and hence it was assigned first rank. The second most perceived constraints was “Lack of skill for seed treatment” (76.38 MPS) followed by “Water quality” (74.72 MPS), “Availability of electricity for irrigation” (72.50 MPS), “Lack of knowledge about adequate quantity and methods of fertilizers application”(71.38 MPS), “Lack of knowledge about critical stages of irrigation in Isabgol”(69.44 MPS), “Lack of knowledge about major insect pest & diseases control (68.33 MPS) “Lack of knowledge about plant protection measures” (65.00 MPS), were perceived as third, fourth, fifth, sixth, seventh and eighth ranked most perceived constraints respectively.

The constraints “Lack of knowledge about weed control (64.16 MPS), “Shattering losses” (62.50 MPS) and “Damage by rains at harvesting” (61.11 MPS) were perceived as 9<sup>th</sup>, 10<sup>th</sup> and 11<sup>th</sup> ranked most perceived constraints

**Table 2:** Technical constraints perceived by the farmers in adoption of recommended Isabgol production technology. n=120

S. No.	Technical constraints	MPS	Rank
1.	Lack of skill for seed treatment	76.38	II
2.	Lack of knowledge about improved varieties of Isabgol	78.88	I
3.	Lack of knowledge about adequate quantity and methods of fertilizers application	71.38	V
4.	Lack of knowledge about critical stages of irrigation in Isabgol	69.44	VI
5.	Lack of knowledge about weed control	64.16	IX
6.	Lack of knowledge about major insect pest & diseases control	68.33	VII
7.	Lack of knowledge about plant protection measures	65.00	VIII
8.	Water quality	74.72	III
9.	Availability of electricity for irrigation	72.50	IV
10.	Shattering losses	62.50	X
11.	Damage by rains at harvesting	61.11	XI

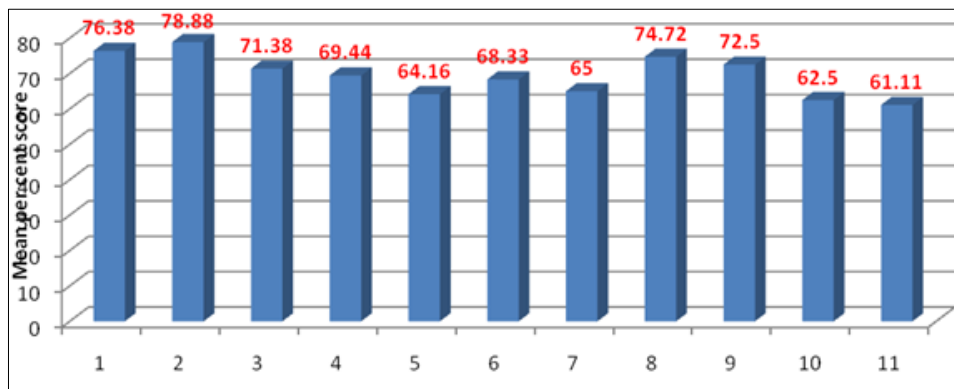


Fig 2: Input constraints perceived by the farmers in adoption of recommended Isabgol production technology

**Discussion**

The important constraints reported by majority of farmers were “Lack of knowledge about improved varieties of Isabgol” (78.88 MPS), “Lack of skill for seed treatment”(76.38), “Water quality” (74.72 MPS), “Availability of electricity for irrigation” ( 72.50 MPS), “Lack of knowledge about adequate quantity and methods of fertilizers application”(71.38 MPS), “Lack of knowledge about critical stages of irrigation in Isabgol”(69.44 MPS), “Lack of knowledge about major insect pest & diseases control (68.33 MPS), “Lack of knowledge about plant protection measures” (65.00 MPS), “Lack of knowledge about weed control (64.16 MPS), “Shattering losses” (62.50 MPS) and “Damage by rains at harvesting” (61.11 MPS). This might be due to lack of technical guidance, latest information and knowledge from expert is improper was more.

However, the findings of this study got support from the findings of Jaitawat *et al.* (2007) [6] Singh (2007) [21], Tavethiya (2010) [24] and Sharma and Sharma (2017) [20].

**1.3 Financial constraints**

Table 3 below incorporate the findings of financial constraints as perceived by the farmers in adoption of recommended Isabgol production technology. Data in table below indicated

that on the whole “High cost of seeds of high yielding varieties”, “High cost of labours” were reported by 75.00 and 73.88 MPS and as such these were ranked at first and second places, respectively. The other constraints like “Unavailability of credit at low interest rates”, “Unavailability procurements prices of the product”, “High cost of fertilizers” and “High cost of plant protection measures”, were reported by 72.50 MPS, 71.11 MPS, 69.44 MPS and 68.88 MPS and as such these were ranked at third, fourth, fifth and sixth ranked respectively.

From the below Table 3 results it may be concluded that “High cost of seeds of high yielding varieties”, “High cost of labours” was perceived by the farmers as most important financial constraints.

Table 3: Financial constraints perceived by the farmers in adoption of recommended Isabgol production technology. n=120

S. No.	Financial constraints	MPS	Rank
1.	High cost of seeds of high yielding varieties	75.00	I
2.	High cost of fertilizers	69.44	V
3.	High cost of plant protection measures	68.88	VI
4.	High cost of labours	73.88	II
5.	Unavailability of credit at low interest rates	72.50	III
6.	Unavailability procurements prices of the product	71.11	IV

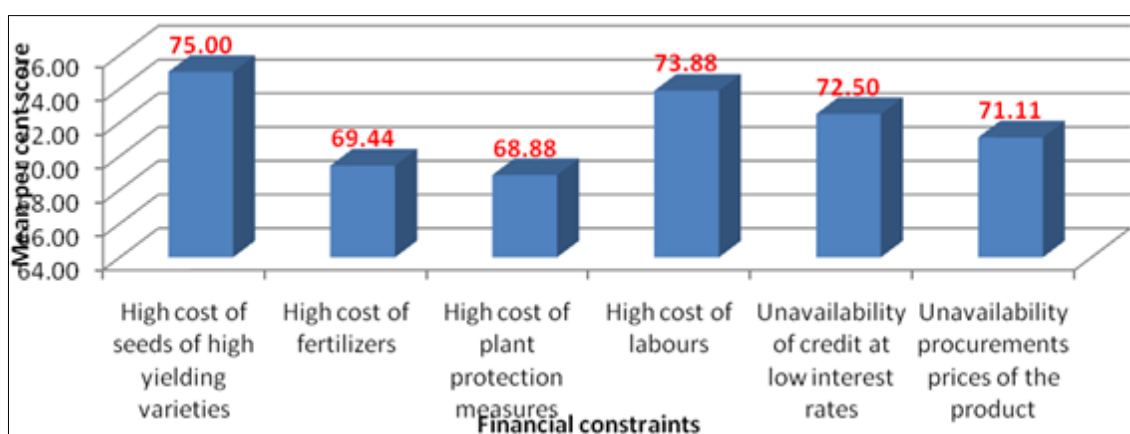


Fig 3: Financial constraints perceived by the farmers in adoption of recommended Isabgol production technology

**Discussion**

The important constraints reported by majority of farmers were “High cost of seeds of high yielding varieties” (75.00 MPS), High cost of labours (73.88 MPS) as most important financial constraint, “Unavailability of credit at low interest rates”, “Unavailability procurements prices of the product”, “High cost of fertilizers” and “High cost of plant protection

measures”, were considered as constraints by 72.50 MPS, 71.11 MPS, 69.44 MPS and 68.88 MPS, respectively. This might be due to the facts majority of farmers were medium to large farmers possessed big land holding had low capacity to purchase production inputs and unavailability of credit at low interest rate.

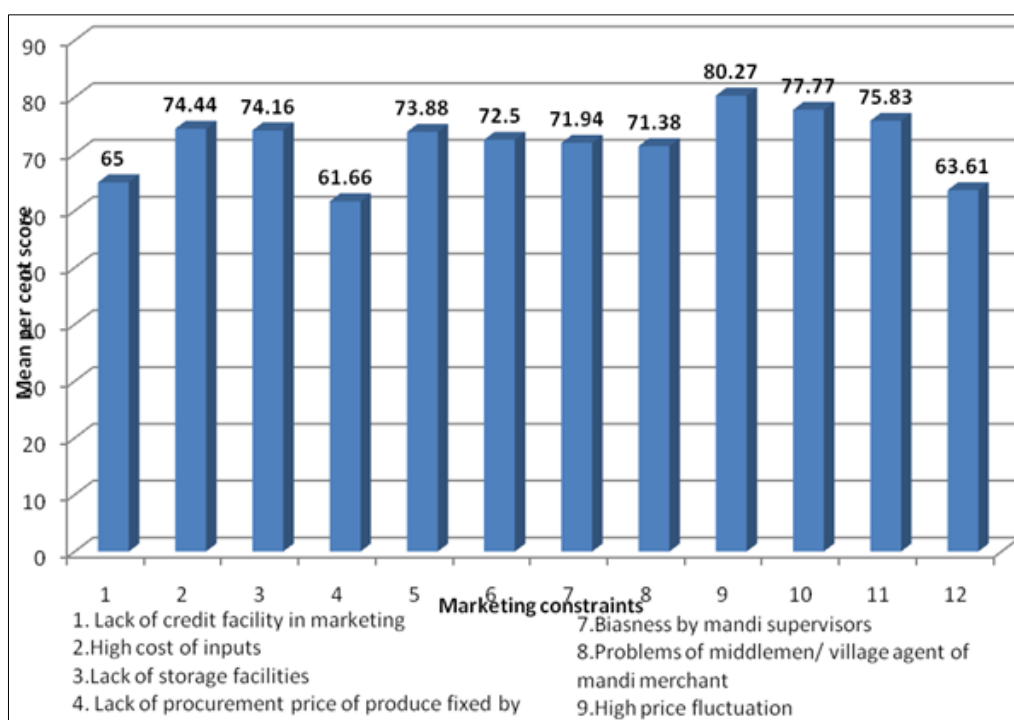
The findings of the study were in Jaitawat *et al.* (2007) [6], Singh (2007) [21], Bheemudada and Natikar (2016) [3] and Shanmugaraja *et al.* (2020) [18].

### 1.4 Marketing constraints

Table 4 below incorporate the findings of marketing constraints as perceived by the respondents in adoption of recommended production technology.

**Table 4:** Marketing constraints perceived by the farmers in adoption of recommended Isabgol production technology. n=120

S. No.	Marketing constraints	MPS	Rank
1.	Lack of credit facility in marketing	65.00	X
2.	High cost of inputs	74.44	IV
3.	Lack of storage facilities	74.16	V
4.	Lack of procurement price of produce fixed by the government	61.66	XII
5.	Lack of transport facilities	73.88	VI
6.	Undue mandi taxes on the poor product	72.50	VII
7.	Biasness by mandi supervisors	71.94	VIII
8.	Problems of middlemen/ village agent of mandi merchant	71.38	IX
9.	High price fluctuation	80.27	I
10.	Lack of latest market information	77.77	II
11.	High-cost transportation	75.83	III
12.	Lack of grading of the produce	63.61	XI



**Fig 4:** Marketing constraints perceived by the farmers in adoption of recommended Isabgol production technology

Data in below Table 4 indicated that on the whole “High price fluctuation”, “Lack of latest market information”, “High-cost transportation”, “High cost of inputs”, “Lack of storage facilities”, were reported by 80.27 MPS, 77.77 MPS, 75.83 MPS, 74.44 MPS and 74.16 MPS respectively and as such these were ranked at 1<sup>st</sup>, 2<sup>nd</sup>, 3<sup>rd</sup>, 4<sup>th</sup> and 5<sup>th</sup> place respectively. The other constraints “Lack of transport facilities”, “Undue mandi taxes on the poor product”, “Biasness by mandi supervisors”, “Problems of middlemen/ village agent of mandi merchant”, “Lack of credit facility in marketing”, “Lack of grading of the produce” and “Lack of procurement price of produce fixed by the government” were also reported by 73.88 MPS, 72.50 MPS, 71.94 MPS, 71.38 MPS, 65.00 MPS, 63.61 MPS, and 61.66 MPS respectively and these were ranked at 6<sup>th</sup>, 7<sup>th</sup>, 8<sup>th</sup>, 9<sup>th</sup>, 10<sup>th</sup>, 11<sup>th</sup> and 12<sup>th</sup> place respectively. From the above results it may be concluded that “High price fluctuation” and “Lack of latest market information” were perceived by the farmers as the most important marketing constraints.

### Discussion

The important constraints reported by majority of farmers were “High price fluctuation”(80.27 MPS), “Lack of latest market information”(77.77 MPS), “High-cost transportation”(75.83 MPS), “High cost of inputs”(74.44), “Lack of storage facilities”(74.16 MPS), “Lack of transport facilities”(73.88 MPS), “Undue mandi taxes on the poor product”(72.50 MPS), “Biasness by mandi supervisors”(71.94 MPS), “Problems of middlemen/ village agent of mandi merchant”(71.38 MPS), “Lack of credit facility in marketing”(65.00 MPS), “Lack of grading of the produce”(63.61 MPS) and “Lack of procurement price of produce fixed by the government” (61.66 MPS) respectively. This might due to high transportation charge because mandi is far away from village, lack of facilities for storage of produce in village, problem of middlemen, high price fluctuation of produce at the time of harvesting and no knowledge about latest market information.

The findings of the study were in Singh (1994)<sup>[23]</sup>, Jaitawat *et al.* (2007)<sup>[6]</sup>, Paul (2000) Tavethiya (2010)<sup>[24]</sup>, Kanwat *et al.* (2017)<sup>[8]</sup> and Pagaria and Sharma (2019)<sup>[16]</sup>.

### Conclusion

- (i) The results show that among the enlisted Input constraints most important constraints “Unavailability of high yielding varieties seeds at the time of sowing” (80.83 MPS) and followed by “Lack of supply of quality seed” (77.50 MPS) and in Technical constraints most important constraint were “Lack of knowledge about improved varieties of Isabgol” (78.88 MPS) and “Lack of skill for seed treatment” (76.38 MPS).
- (ii) The results show that in Financial constraints most important constraint were “High cost of seeds of high yielding varieties” (75.00 MPS) and “High cost of labours” (73.88 MPS) and in Marketing constraints most important constraint were “High price fluctuation” (80.27 MPS) and “Lack of latest market information” (77.77 MPS).

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