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## Improved variety of pigeon pea BDN 711 confronted constraints and suggestions assimilated by growers in Marathwada region

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### Abstract

The present study was undertaken in Marathwada region of Maharashtra state during the year 2021-22. In purposively selected three districts on viz., Aurangabad and Jalna districts of Marathwada region of Maharashtra state on the basis of maximum number of farmers following cultivation of BDN 711 were found in these two districts. The findings with regard to the selected profile characteristics of the respondents indicate that of the respondents i.e personal, psychological, socio-economic characteristics were belonged to education, family size, occupation, land holding, farming experience, marginal area under pulses crop in 2022 -23, cropping pattern, sources of irrigation, annual income, social participation, information seeking behaviour, scientific orientation, economic motivation, innovativeness, knowledge. The present study was undertaken in Marathwada region of Maharashtra state during the year 2018 and 2022. In purposively selected two districts on viz., Chhatrapati Sambhajanagar (Aurangabad), Jalna districts of Marathwada region of Maharashtra state on the basis of maximum number of farmers cultivating red gram BDN 711 were found in these two districts. The study concluded the constraints faced by the farmers after cultivation of BDN 711 improved variety. The statistical tool used for concluding result the frequency and percentage of the respondents conferring to cultivation practices problems identified by them. Ex-post facto research design was adopted in this study. The data were collected with the help of pretested interview schedule from the respondents as per their convenience at their home or farms.

**Keywords:** Red gram, BDN 711, Socio-economic impact of BDN 711, Pigeonpea

### Introduction

Red gram (*Cajanus cajan* (L.) is a perennial legume from the family *Fabaceae* since its domestication in the Indian subcontinent at least 3,500 years ago, its seeds have become a common food in Asia, Africa and Latin America. It is consumed on a large scale mainly in south Asia and is a major source of protein for the population of the Indian subcontinent. Red gram is the most important pulse crop widely cultivated in all tropical and subtropical regions. Pulses are an important food in Indian people's diet. It is used for food, feed, making huts and for fuel. It has more diverse uses than any other pulse crop. It is the principle source of dietary protein for more than billion people most of whom are vegetarian and poor. Its seed contains about 21 per cent protein and rich in essential amino acids, carbohydrate, minerals and vitamin A and C, also it helps to increase productivity and fertility of soil.

The total world acreage under pulses is about 93.18 (Mha) with production of 89.82 (Mt) at 964 kg/ha yields level. India, with >28 Mha pulses cultivation area, is the largest pulse producing country in the world. It ranks first in area and production with 31 per cent and 28 per cent respectively. During 2020-21 our productivity at 885 kg/ha, has also increased significantly over last 05 year.

India is the largest producer and consumer of pulses in the world. Pulses are 20 to 25 per cent protein by weight which is double the protein content of wheat and three times that of rice. Major pulses are grown chickpeas (Gram/Chana), Pigeon pea (Tur/Arhar), Mungbeans, Urdbeans (Blackgram), Masur (Lentil), Peas and various kinds of Beans (Minor Pulses). The main regions with high productivity are Madhya Pradesh, Rajasthan, Maharashtra, Karnataka, Uttar Pradesh, Coastal Andhra Pradesh, Gujarat, Tamil Nadu, Jharkhand, Odisha,

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Chhattisgarh, Telangana, Bihar and West Bengal delta region. India is the second most populous country in the world with >1/6th of the world's population. The stock of population changed from 102 crore in 2001 to 121 crore in 2011, the exponential population growth rate being 1.64 during 2001 to 2011. Although, India occupies only 2.2% of the world's land area, it supports approximately 18% of the world's population. The census projection report has further revealed that the proportion of the working age population between 15 and 59 years is likely to increase from 58% in 2001 to > 64 per cent by 2021. Such a trend would make the country one of the youngest nations in the world. To work out a suitable strategy to improve the productivity of pigeon pea, it is imperative to assess the potential yield in the region of interest and gap between the potential and actual yield obtained by the average farmers.

### Materials and Methods

The present study was undertaken in Marathwada region of Maharashtra state during the year 2021-22. In purposively selected three districts on viz., Chhatrapati Sambhajnagar (Aurangabad) and Jalna districts of Marathwada region of Maharashtra state on the basis of maximum number of farmers following cultivation of BDN 711 were found in these two districts. The talukas also selected purposively on the basis of maximum number of farmers cultivating red gram BDN 711. So from Chhatrapati Sambhajnagar (Aurangabad), district two talukas were selected namely Paithan and Gangapur, from Jalna district two talukas namely Ambad and Badnapur were selected. Thus, total four talukas were selected. From each selected taluk 4 villages were selected purposively on the basis of maximum number of farmers cultivating red gram BDN 711 for that purpose list obtained from NARP and KVK Aurangabad and Jalna, VNMKV, Parbhani hence sixteen villages were selected for conducting the study. So from each village ten respondent organic

following farmers were selected randomly from that list and we considered them as respondents, thus making a sample of 240 respondents. Ex-post facto research design was adopted in this study. The findings with regard to the selected profile characteristics of the respondents indicate that of the respondents i.e personal, psychological, socio-economic characteristics were belonged to education, family size, occupation, land holding, farming experience, marginal area under pulses crop in 2022 -23, cropping pattern, sources of irrigation, annual income, social participation, information seeking behaviour, scientific orientation, economic motivation, innovativeness, high knowledge The present study was undertaken in Marathwada region of Maharashtra state during the year 2018 and 2022. For socio-economic impact of red gram BDN 711 selected as dependent variable for study. The statistical methods and tests such as mean, standard deviation, frequency and percentage, Pearson's coefficient of correlation, multiple regression analysis and path analysis was used for the analysis of data. For this constraints and suggestions the statistical tools was used i.e. frequency, percentage and rank given as per the highest responded respectively.

Due to erratic climatic changes more impacting on the production of pigeon pea and socio-economic status of farmers in Marathwada region. The improved variety developed by ARS, Badnapur, and white seeded BDN 711 which has increased assured higher production after following the recommended cultivation practices by the farmers. Also while interview the BDN 711 cultivated farmers given suggestions, requirements to overcome the constraints in BDN 711 cultivation.

### Results and Discussions

#### 1.1 Constraints confronted by red gram BDN 711 growers in Marathwada region

**Table 1:** Distribution of the respondents according to the constraints faced on before and after cultivation of the BDN 711

Sr. No.	Constraints	Frequency	Percentage	RANK
<b>I) Related to improved pulse production technologies</b>				
1	Improved varieties	180	75.00	IV
2	Recommended seed rate	192	80.00	II
3	Recommended measures for disease management	189	78.75	III
4	Seed production techniques	127	52.91	VIII
5	Appropriate spacing for optimizing yield	120	50.00	IX
6	Recommended measures for insect pest management	128	53.33	VII
7	Not utilizing recommended fertilizer dose	146	60.83	VI
8	Weed management	176	26.66	V
9	Critical stages of irrigation	208	86.66	I
<b>II) Related to improved postharvest technologies</b>				
1	Improved storage techniques	211	87.91	IV
2	Recommended post-harvest handling technologies	216	90.00	II
3	Drudgery reduction in post-harvest operations	183	76.25	VIII
4	Effect of climatic change	112	60.00	XIII
5	Low knowledge of improved technology	128	53.33	XV
6	Timely availability of inputs	128	53.33	XVI
7	Unavailability of recommended chemicals	138	57.50	XIV
8	All farmers are not interested to do deep summer ploughing once in 3 years	158	65.83	XII
9	Many farmers did not apply of fertilizer based on soil test value.	170	70.83	XI
10	Sometimes seed treatment not done before sowing.	183	76.25	IX
11	Susceptibility to Fusarium wilt and sterility mosaic diseases are major constraints limiting the Red gram production and productivity	179	78.58	VI
12	Using local seeds	189	78.25	VII
13	Unaware about improved varieties	193	80.41	V
14	Weed control not doing timely	182	75.83	X
15	All farmers are not utilizes integrated approach for plant protection.	213	88.75	III
16.	In November- December wilting problem increased	227	94.58	I

Table 1.1 revealed that Constraints faced by the red gram (BDN 711) growers the finding categorized in two i.e. I) Related to improved pulse production technologies majority of the growers were faced the problems to 'Critical stages of irrigation Rank I, 'Recommended seed rate Rank II, 'Recommended measures for disease management Rank III, access improved varieties (75%) Rank IV, 'Weed management Rank V, 'Not utilizing recommended fertilizer dose Rank VI, Recommended measures for insect pest management Rank VII, Seed production techniques VIII, Appropriate spacing for optimizing yield IX. II) Related to improved postharvest technologies- In November- December wilting problem increased Rank I, Recommended post-harvest handling technologies Rank II, All farmers are not utilizes integrated approach for plant protection. Rank III, Improved storage techniques Rank IV, Unaware about improved varieties Rank V, Susceptibility to Fusarium wilt and sterility mosaic diseases are major constraints limiting the Red gram production and productivity Rank VI, Using local seeds Rank VII, Drudgery reduction in post-harvest operations Rank VIII, Sometimes seed treatment not done before sowing Rank IX, Weed control not doing timely Rank X, Many farmers did not apply of fertilizer based on soil test value Rank XI, All farmers are not interested to do deep summer ploughing once in 3 years Rank XII, Effect of climatic change Rank XIII, Timely availability of inputs Rank XIV, Low knowledge of improved technology Rank XV, Timely availability of inputs XVI.

The present investigation has similar finding related with the findings of Puri *et al.* (2017) <sup>[3]</sup> shows that two-fifth (40.00 %) of the respondents expressed the constraints that low knowledge of improved technology, whereas equal percentage (20.00%) respondents faced effect of climatic change and unavailability of recommended chemicals and only 10.00 per cent of them faced to the timely availability of inputs constraints. Umesh C. *et al.* (2017) <sup>[6]</sup> studied on production problems in pigeon pea cropping systems. The major constraints to low productivity of pigeon pea are in adequate availability of seeds of improved varieties, biotic and a biotic stresses and poor crop management. seed treatment with *Rhizobium* + *PSB* is beneficial to get higher yield, ridge sowing/planting method gives higher grain yield and helps in overcoming the *Phytophthora blight* during water logging and avoids wilt disease. Sowing before 15<sup>th</sup> July helps in getting higher yields by avoiding heavy infestation of insect pests, pre-emergence application of pendimethalin @ 1.00 kg a.i. ha<sup>-1</sup> + One HW at 50 DAS controls weeds and given higher pigeon pea grain yield. The purpose of this is to examine the literature reports that what are all the ways to fill the yield gap between traditional and modern practices which are very much play an important role in minimizing the constraints in cropping systems and achieved sustainable yield level in Pigeon pea crop.

Also the present investigation has similar finding related with the findings of David *et al.* (2002) <sup>[2]</sup>, Suhasini *et al.* (2009) <sup>[5]</sup>, Rimal N.S. (2014) <sup>[4]</sup>.

## 1.2 Suggestions assimilated by BDN 711 growers intended for impact on socioeconomic status

Table 1.2 conclude that suggestions feels after socio-economic impact of red gram (BDN 711) growers for cultivation i.e The recommended varieties need to be make it available with hologram of University on packaging to make it identification mark/LOGO, authentication of University developed varieties RANK I, Reducing wilting problem which occurs in November- December RANK II, Adopt integrated approach for plant protection as per recommendations of university RANK III, Recommended inputs may be timely available RANK IV, Red gram growers should follow on soil fertility status, agricultural practices and local climatic Situation RANK V, Provide effective insecticide spraying schedule RANK VI, Seed treatment should be done before sowing RANK VII, Application of fertilizer should be based on soil test value VIII, Weed control should be done at right time RANK IX, Use hybrid varieties RANK X, Use wilt and Sterility Mosaic disease (SMD) resistant /tolerant varieties RANK XI, Wilt resistant varieties BDN-711, VL Arhar -1, Vipula, JKM -189, G.T.-101, Pusa 991, Azad (K-91- 25), BSMR-736, MA-6 etc RANK XII, More and more use of latest University recommended production technologies with high yielding varieties by red gram growers RANK XIII, Deep summer ploughing once in 3 years RANK XIV.,etc.

Promote BDN 711 growers to produce seed to meet the demand of other farmers in village by organizing awareness campaign. Strip cropping system with soybean + pigeon pea intercrop may be adopted. Provide one or two irrigations, it helps increasing productivity than other varieties of Pigeonpea. Organize training on improved technology of BDN 711 to increase knowledge and adoption level of farmers. Extension functionaries should made available in time the effective insecticide spraying schedule to BDN 711.

From above data shows that nearly one-third (74.16%) of the respondents suggested to provide effective insecticide spraying schedule while 75 per cent and 76.25 per cent of the respondents had suggested knowledge about Red gram growers should follow on soil fertility status, agricultural practices and local climatic Situation for Pigeonpea cultivation is essential and recommended inputs may be timely available and Adopt integrated approach for plant protection as per recommendations of university., respectively.

The result shows similar with the findings of Puri *et al.* (2017) <sup>[3]</sup> shows that one-third (34.00 %) of the respondents suggested to provide effective insecticide spraying schedule while 30.00 per cent and 20.00 per cent of the respondents had suggested knowledge about improved technology for pigeonpea cultivation is essential and recommended inputs may be timely available, respectively. Chavhan (2019) <sup>[1]</sup> reported that, majority (95.41%) of the respondents said provide accurate and timely weather advisory, followed by improvisation of network and connectivity 94.58 per cent. In other major suggestion was providing timely credit for smooth agricultural operations 92.08 per cent, followed by arrangement of proper transportation facilities 82.50 per cent, provide accurate and timely market information 73.15 per cent was also the bigger suggestion followed by provide new technologies on farmer's field 71.66 per cent was another suggestion and regular visit of extension personnel 59.58 per cent.

**Table 2:** Distribution of the respondents according to the Suggestions feels on before and after cultivation of the BDN 711

Sr. No.	Suggestions	Frequency	%	Rank
1	The recommended varieties need to be made available with hologram of University on packaging to make it identification mark/LOGO, authentication of University developed varieties.	191	79.58	I
2	Reducing wilting problem which occurs in November- December.	191	79.58	II
3	Adopt integrated approach for plant protection as per recommendations of university.	183	76.25	III
4	Recommended inputs may be timely available	180	75	IV
5	Red gram growers should follow on soil fertility status, agricultural practices and local climatic Situation.	180	75	V
6	Provide effective insecticide spraying schedule	178	74.16	VI
7	Seed treatment should be done before sowing.	165	68.75	VII
8	Application of fertilizer should be based on soil test value.	161	67.08	VIII
9	Weed control should be done at right time.	156	65	IX
10	Use hybrid varieties	152	63.33	X
11	Use wilt and Sterility Mosaic disease (SMD) resistant /tolerant varieties	148	61.66	XI
12	Wilt resistant varieties BDN-711, VL Arhar -1, Vipula, JKM -189, G.T.-101, Pusa 991, Azad (K-91-25), BSMR-736, MA-6 etc.	143	59.58	XII
13	More and more use of latest University recommended production technologies with high yielding varieties by red gram growers	143	59.58	XIII
13	Deep summer ploughing once in 3 years.	128	53.33	XIV

Also the similar result shows with the findings of Anonymous (2013-A).

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