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RESEARCH ARTICLE :

Comparative study of BDN 711 with other varieties of pigeonpea

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SUMMARY : The present study was undertaken in rainfed area of Marathwada region of Maharashtra state. Beed district was selected for the purpose of study as a rainfed area, in which Ambajogai and Kaij tehsil has purposively selected. From Ambajogai tehsil three villages namely Jawalgaon, Ghatnandur, Kumbephal and in Kaij tehsil three villages namely, Borisawargon, Bansarola, Jawalban were selected purposively. Minimum five respondents from each village thus comprising of fifty pigeonpea growing farmers were selected by proportionate random sampling method. The sample predominantly comprised of middle aged (36 to 55 years) (58.00%). As regards of education majority of the respondents (52.00 %) were having graduate and above level education. Large majority (90.00 %) were having farming as main occupation with nearly equal percentage (38.00 % and 34.00 %) were in small and semi medium land holding. 88.00 per cent had medium level of annual income, 86.00 per cent had medium level of social participation and 68.00 per cent had medium contacts. With concern to knowledge and information all respondents (100.00 %) were knew BDN 711 variety. 66.00 per cent were purchased seed from farmers. 60.00 per cent were sown BDN 711 and 2.00 per cent were sown ICPH 2740 on irrigated land whereas 42.00 per cent were sown BDN 711 as rainfed crop in *Kharif* 2016. large majority (90.00 %) of the respondents were adopted insecticide, followed by 82.00 per cent were used weedicide and 80.00 per cent were used growth regulator for cultivation of pigeonpea. (78.00 %) had medium (13.61 to 40.64 q) level of productivity and 86.00 per cent had medium level (Rs.1744 to Rs. 1147) of expenditure.

KEY WORDS :
Comparative study, Pigeonpea, BDN 711

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BACKGROUND AND OBJECTIVES

Pigeonpea is the most important pulse crop widely cultivated in all tropical and subtropical regions. Pulses are an important food in Indian peoples diet, Pigeonpea is used for food, feed, and fuel. It has more diverse uses than any other pulse crop. It is the principal source of dietary protein for more than billion people most of whom are vegetarian and poor. Its seed contains about 21% protein and rich in essential amino acids, carbohydrate , minerals and vitamin A and C. (Singh *et al.*, 2016). Also it helps to increase productivity and fertility of soil. World production of pigeonpea is estimated at 4.98 million tons. About 77% of this is grown in India. In India pigeonpea is cultivated in 14

per cent of the gross cropped area under pulses providing 20 per cent of the national pulse production (Siddayya *et al.*, 2016).

In Maharashtra in 2013-14 area under pigeonpea was 11.41 lakh hectors and productivity was 906 kg /ha. Majority of the farmers cultivated pigeonpea as a cash crop, but it cannot see to all farmers due to dry land cultivation with using long duration and local varieties.

Recently in 2011-12 VNMKV Parbhani has developed BDN 711 new variety of pigeonpea to overcome the problems and increasing the productivity of pigeonpea in Maharashtra. Now this variety has very popularized in the farmers field level, therefore, the present investigation on "Comparative study of BDN 711 and other varieties of pigeonpea crop" was undertaken with following objectives.

Objectives:

– To study the profile of the respondents.

– To study the knowledge and information about pigeonpea cultivation by the respondents.

– To know the technologies used for pigeonpea cultivation and level of horizontal spreading of BDN 711 variety in Marathwada.

RESOURCES AND METHODS

The present study was undertaken in purposively selected Beed district, in which Ambajogai and Kaij tehsil has purposively selected as the RAEEC and KVK has been in operation in this area. From Ambajogai tehsil three villages namely Jawalgaon, Ghatnandur, Kumbephal and Kaij tehsil three villages namely, Borisawargon, Bansarola, Jawalban were selected purposively. Minimum five respondents from each village thus comprising of fifty Pigeonpea growing farmers from these villages were selected by proportionate random sampling method. The respondents were interviewed with the help of structured interview schedule prepared for the study. The statistical tools like Mean, Standard deviation, Frequency and Percentage were used to analyze the data.

OBSERVATIONS AND ANALYSIS

The results obtained from the present study as well as discussions have been summarized under following heads:

Profile of the respondents :

The data with regards to profile of the respondents are presented in Table 1. The sample predominantly comprised of middle age (36 to 55 years) (58.00%), followed by 22.00 per cent and 20.00 per cent in old (56 and above) and young (18 to 35 years) age category, respectively.

Majority of the respondents (52.00 %) were having graduate and above level education while 22.00 per cent of the respondents were possessing higher secondary level and 18.00 per cent of the respondents were educated upto secondary level, whereas 8.00 per cent of the respondents fell in primary category of education. No any respondents in the category illiteracy

Large majority (90.00 %) of the respondents were having farming as main occupation, while 6.00 per cent and 4.00 per cent respondents were engaged in farming plus service and farming plus business occupation, respectively.

Nearly equal percentage (38.00 %) and (34.00 %) of the respondents were in small and semi medium land holding, respectively also equal percentage (14.00 %) of the respondents in the medium and marginal category of land holding.

Large majority (88.00 %) of the respondents were having medium level of annual income and 12.00 per cent of the respondents were having high level of annual income, whereas, zero per cent of them were having low level of annual income.

More than four-fifth (86.00%) of the respondents were having medium level of social participation, while 8.00 per cent and 6.00 per cent respondents were having high and low social participation, respectively.

With regards to extension contacts it is observed that maximum number (68.00 %) of the respondents had medium contacts with the extension agencies, followed by 18.00 per cent and 14.00 per cent respondents were in low and high extension contact categories, respectively.

Knowledge and information about pigeonpea cultivation by the respondents:

The data presented in Table 2 it is observed that all (100.00 %) the respondents were knew BDN 711 variety, whereas 74.00 per cent and 64.00 per cent knowing BSMR 736 and BSMR 853 variety of pigeonpea, respectively, followed by 26.00 per cent knowing ICPH 2740 variety and meager percentage (4.00 %) were

known BDN 708 and BDN716 variety of pigeonpea.

With concern to sowing period four-fifth (80.00 %) of the respondents sown between 16 -30 June, while 20.00 per cent of the respondents were sown between 1-15 June.

Further it was noticed that majority (68.00 %) of the respondents were sown pigeonpea crop between 1.01 to 2.00 ha of land, whereas 32.00 per cent of the respondents sown upto 1.00 ha of land.

Three-fifth (60.00) of the respondents cultivated pigeonpea crop as a rainfed crop, while 40.00 per cent cultivated as irrigated crop. Near about all (96.00 %) the respondents cultivated as cash crop and 4.00 per cent of the respondents cultivated as a general crop.

With regards to risk in pigeonpea cultivation majority (90.00 %) of the respondents were stated insect/ pest attack risk, followed by 56.00 per cent of the respondents were stated change in climatic condition risk, while 12.00 per cent and 10.00 per cent were stated input availability and diseases attack risk, respectively.

Technologies used for pigeonpea cultivation and level of horizontal spreading of BDN 711 variety in Marathwada :

The data pertaining to source of seed availability (BDN 711) were collected under six sub areas, which are presented in Table 3. For *Kharif* 2016, it was observed that two-third (66.00 %) of the respondents purchased seed from farmers, followed by 16.00 per cent were purchased seed from University, 8.00 per cent of them they were used seed from last year produce, whereas meager percentage (4.00 %) were purchased

Table 1 : The profile of the respondents

Sr. No.	Age (years)	Frequency	Per cent
1.	Young (18 to 35)	10	20.00
	Middle (36 to55)	29	58.00
	Old (56 and above)	11	22.00
2.	**Education**		
	Primary	4	8.00
	Secondary	9	18.00
	Higher secondary	11	22.00
	Graduate and above	26	52.00
3.	**Occupation**		
	Farming	45	90.00
	Farming + business	2	4.00
	Farming + service	3	6.00
4.	**Land holding**		
	Marginal (Upto 1.00 ha)	7	14.00
	Small (1.01 to 2.00 ha)	19	38.00
	Semi-medium (2.01 to 4.00 ha)	17	34.00
	Medium (4.01 to 6.00 ha)	7	14.00
5.	**Annual income**		
	Low (upto Rs. 0.46 lakh)	0	0.00
	Medium (Rs.0.47 to 5.70 lakh)	44	88.00
	High (Rs. 5.71 lakh and above)	6	12.00
6.	**Social Participation**		.
	Low (score upto 1.71)	3	6.00
	Medium (score 1.72 to 3.17)	43	86.00
	High (score 3.17 and above)	4	8.00
7.	**Extension contact**		
	Low (score upto 7.08)	9	18.00
	Medium (score 7.09 to 13.32)	34	68.00
	High (score 13.33 and above)	7	14.00

Table 2 : Distribution of the respondents by knowledge and technologies used for pigeonpea cultivation

Sr. No.	Category	Frequency	Per cent
1.	**Varieties of pigeonpea crop**		
	BDN 711	50	100.00
	BSMR-736	37	74.00
	BSMR-853	32	64.00
	BDN-708 (Amol)	2	4.00
	BDN-716	2	4.00
	ICPH 2740	13	26.00
2.	**Specific period of sowing**		
	1 -15 June	10	20.00
	16-30 June	40	80.00
3.	**Land utilization pattern (ha)**		
	Upto 1.00	16	32.00
	1.01 to 2.00	34	68.00
4.	**Cultivation pattern**		
	Rainfed	30	60.00
	Irrigated	20	40.00
	Cash crop	48	96.00
	General crop	2	4.00
5.	**Risks in pigeonpea cultivation**		
	Insect/ pest attack	45	90.00
	Diseases attack	5	10.00
	Climatic conditions	28	56.00
	Input availability	6	12.00

Table 3 : Distribution of the respondents according to source of seed availability (BDN 711)

Sr. No.	Source of seed	*Kharif* 2016		*Kharif* 2015	
		Frequency	Per cent	Frequency	Per cent
1.	Last year produce	4	8.00	--	--
2.	University	8	16.00	2	4.00
3.	Purchased from market	2	4.00		
4.	Purchased from farmers	33	66.00	--	--
5.	Gifted by farmers	2	4.00	--	--
6.	Received from relatives	1	2.00	--	--
7.	KVK	--	--	2	4.00
	Total	50	100.00	–	--

Table 4 : Distribution of the respondents according to Pigeonpea crop varieties used for sowing

Sr. No.	Varieties	*Kharif* 2016				*Kharif* 2015			
		Rainfed		Irrigated		Rainfed		Irrigated	
		Frequency	Per cent	Frequency	Per cent	Frequency	Per cent	Frequency	Per cent
1.	BDN 711	21	42.00	30	60.00	2	4.00	2	4.00
2.	BSMR-736	-	-	-	-	21	42.00	-	--
3.	BSMR-853	-	-	-	-	-	--	-	----
4.	BDN-708 (Amol)	-	-	-	-	-	--	-	--
5.	BDN-716	-	-	-	-	-	--	-	--
6.	ICPH 2740	-	-	1	2.00	--	–	--	--
	Other					27	54.00	--	--

seed from market as well as gifted by farmers and 2.00 per cent of the respondents had received seed from relatives.

With concern to *Kharif* 2015 season equal percentage (4.00 %) of the respondents were taken seed from University as well as KVK.

It was delineated from Table 4, that 60.00 per cent of the respondents were sown BDN 711 and 2.00 per cent were sown ICPH 2740 on irrigated land whereas 42.00 per cent were sown BDN 711 as rainfed crop in *Kharif* 2016.

In *Kharif* 2015, it was found that majority (54.00) of the respondents were sown other varieties on rainfed area, while 42.00 per cent and 4.00 per cent were sown BSMR 736 and BDN 711 variety, respectively. Only 4.00 per cent of the respondents were sown BDN 711 on irrigated area.

As for as the comparative assessment of technology used by respondents for different varieties of pigeonpea, with concern to BDN 711 variety, it is observed from

Table 5 : Comparative assessment of technology used by respondents for different varieties of pigeonpea

Sr. No.	Technology	Varieties							
		BDN 711		BSMR 736		BSMR 853		ICPH 2740	
		Frequency	Per cent	Frequency	Per cent	Frequency	Per cent	Frequency	Per cent
1.	Dibbling	32	64.00	--	--	--	--	1	2.00
2.	Intercropping								
	Pigeonpea+Soybean	28	56.00	--	--	--	--	--	--
	Pigeonpea+Cotton	7	14.00	--	--	--	--	1	2.00
	Other	15	30.00	--	--	--	--	--	--
3.	Spacing			--	--	--	--	--	--
	3 x 3 feet	28	56.00	--	--	--	--	1	2.00
	4 x 2 feet	4	8.00	--	--	--	--	--	--
	Strip Cropping	19	38.00	--	--	--	--	--	--
4.	Weedicide	41	82.00	--	--	--	--	1	2.00
5.	Insecticide	45	90.00	--	--	--	--	1	2.00
	More than four spray	3	6.00	--	--	--	--	--	--
	Two-three spray	32	64.00	--	--	--	--	1	2.00
	one spray	10	20.00	--	--	--	--	--	--
6.	Top branching (Deheading)	25	50.00	--	--	--	--	--	--
7.	Use of growth retardant	30	60.00	--	--	--	--	--	--
8.	Use of growth regulator	40	80.00	--	--	--	--	1	2.00
9.	Sustainability for water stress	50	100.00	--	--	--	--	--	--

Table 6 : Distribution of the respondents according to productivity

Sr. No.	Technology	Varieties							
		BDN 711		BSMR 736		BSMR 853		ICPH 2740	
		Frequency	Per cent	Frequency	Per cent	Frequency	Per cent	Frequency	Per cent
1.	Low (Upto 13.60 q)	5	10.00	--	--	--	--	--	--
2.	Medium (13.61 to 40.64 q)	39	78.00	--	--	--	--	--	--
3.	High (above 40.65 q)	6	12.00	--	--	--	--	--	--
	Total	50	100.00	--	--	--	--	--	--

Table 7 : Distribution of the respondents according to expenditure on inputs for pigeonpea cultivation

Sr. No.	Category	Frequency	Per cent
1.	Low (upto Rs. 1743)	0	0.00
2.	Medium (Rs.1744 to Rs. 1147)	43	86.00
3.	High (Rs. 10148 and above)	7	14.00
	Total	50	100.00

Table 5, large majority (90.00 %) of the respondents were used insecticide, followed by 82.00 per cent were used weedicide, 80.00 per cent were used growth regulator, 60.00 per cent were adopted growth retardant, 50.00 per cent were top branching (beheading) operation was carried out.

Further it was noticed that equal percentage (64.00 %) of the respondents were used dibbling method of sowing and two to three spraying of insecticides, whereas 20.00 per cent were used one spray and 6.00 per cent were used more than four spray to control insect and pests, while 56.00 per cent, 30.00 per cent and 14.00 per cent and of the respondents were used Pigeon pea plus Soybean intercropping, other cropping system and Pigeon pea plus cotton intercropping, respectively.

In case spacing it is found that significant number (56.00 %) were adopted 3 x 3 feet spacing, followed by 38.00 per cent were adopted strip cropping and 8.00 per cent adopted 4 x 2 feet spacing.

With regards to ICPH 2740 meager percentage (2.00 %) of the respondent they were sown this ICPH 2740 variety and they were adopted dibbling method, pigeonpea plus cotton intercropping with 3 x 3 spacing, also used weedicide, three spaying of insecticides and growth regulators.

The data presented in Table 6 indicates three-fourth (78.00 %) of the respondents had medium (13.61 to 40.64 q) level of productivity, while 12.00 per cent and 10.00 per cent respondents had High (above 40.65 q) and Low (Upto 13.60 q) productivity, respectively. Average productivity was 23.12 q/ha.

Table 7 indicates that large majority (86.00 %) of the respondents had medium level (Rs.1744 to Rs. 1147) of expenditure, while 14.00 per cent respondents had high level (Rs. 10148 and above) of expenditure. Average expenditure was Rs. 5945/-.

Conclusion :

The respondents had middle aged having graduate and above level of education with farming as main occupation and possessed small and semi-medium land holding with medium annual income, social participation and extension contacts.

Regarding knowledge and information, it is revealed that all the respondents knew BDN 711 variety, sowing pattern between 16 -30 June on 1.00 to 2.00 ha of land as a rainfed crop and they cultivated pigeonpea crop earlier stated insect/ pest attack risk in pigeonpea cultivation.

It is also concluded that main source of seed was the farmers, sown on irrigated land, used insecticide (two to three spraying), weedicide, growth regulator, dibbling method, Pigeon pea plus cotton intercropping, 3 x 3 feet spacing and strip cropping for pigeonpea plus soybean intercrop system.

Yield will be increased if followed the different technologies in which drip irrigation system and use of micro nutrients was the major technologies.

Three-fourth had medium level of productivity and expenditure.

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