

## ASSESSMENT OF KNOWLEDGE AND ADOPTION OF CROP PRODUCTION TECHNOLOGY OF CHICKPEA

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### ABSTRACT

The present study was conducted in Dhule District of Maharashtra. Two tehsils viz., Sakri and Shindkheda were selected purposively from Dhule district on the basis of higher area under cultivation of the chickpea crop. By using simple random sampling method total 80 respondents were selected for the study. Nearly half (45.00 percent) of the respondents belonged to old age group (51 and above), 36.25 per cent of the respondents had secondary level of education. Nearly half (46.25 percent) of the respondents had small family size (up to 5 members) and majority (61.25 per cent) respondents had nuclear type family. Regarding annual income it is observed that 43.75 per cent of the respondents had high annual income. Regarding chickpea production technology cent percent respondents had knowledge about soil, land preparation operations, sowing time, inter-culturing operations, flood irrigation, use of bird stakes, harvesting and threshing of chickpea. Regarding micro irrigation system cent per cent of the farmers had lack of knowledge about it. Nearly about one fifth (17.50 per cent) of the respondents had complete knowledge about spraying of HaNPV. However very meager (3.75 per cent) of the respondents had complete knowledge about sowing 200 gm jowar for biological control of pod borer. The data in respect to adoption of IPM shows that near about half (48.75 per cent) of the respondents spraying Chlorantraniliprole for control of pod borer. Near about one fifth (17.50 per cent) of the respondents spraying 5% NSKE solution to control pod borer. Very meager (3.75 per cent) of the respondents use HaNPV, bird stakes (3.75 per cent) and Pheromone traps (3.75 per cent) for biological control of pod borer. No one respondents sowing 200 gm jowar for biological control of pod borer.

**Keywords:** adoption, chickpea, knowledge and production technology

### INTRODUCTION

Chickpea is a major pulse crop in India, widely grown for centuries and accounts for nearly 40.00 percent of the total pulse production. India is the major growing country of the world, accounting for 61.65 percent of the total world area under Bengal gram and 68.13 percent of the total world production. Chickpea, one of the major pulses (commonly called daals) cultivated and consumed in India, is also known as Bengal gram or gram. Chickpea is a major and cheap source of protein compared to animal protein. Chickpea seeds contain about 17-20% of protein. It is scientifically known as Ciceraritinum and is reportedly originated from western Asia (Turkey). Chickpea is cultivated for its seeds. Gram in India is cultivated in Madhya Pradesh, Rajasthan, Uttar Pradesh, Maharashtra and Haryana. India is the largest producer, with about 8 million tons, accounting for about 70% of total world production. Chickpea is one of the major crops grown by farmers in Dhule district, considering this; it was decided to undertake the research study on “Assessment of Knowledge

and Adoption of Crop Production Technology of Chickpea”

### OBJECTIVE

To assess the knowledge and adoption of crop production technology of chickpea

### METHODOLOGY

To Study was conducted in Dhule District of Maharashtra. Two tehsils viz. Sakri and Shindkheda were selected purposively from Dhule district on the basis of higher area under cultivation of the chickpea crop. Four villages from each tehsil were selected for study. From each selected village, 10 chick pea growers were selected randomly. Thus, making a sample of 80 chickpea growers for the study. The data were collected from the respondent with the help of personal interview schedule especially structured for the purpose and data were analyzed by using statistical methods frequency and percentages.

## RESULTS AND DISCUSSION

## Profile of respondents

Table 1: Distribution of respondents according to their profile

(n= 80)

Sr. No.	Characteristics	No. of respondents	Percentage
1	<b>Age</b>		
	i. Young (up to 35 years)	13	16.25
	ii. Middle (36-50 years)	31	38.75
	iii. Old (51 years & above)	36	45.00
2	<b>Education</b>		
	i. Illiterate	05	6.25
	iii. Primary	07	8.75
	iv.. Secondary	29	36.25
	v. Higher secondary	20	25.00
	vi. Graduaty & above	19	23.75
3	<b>Family size</b>		
	i. Small (up to 5 members)	37	46.25
	ii. Medium (6 to 9 members)	30	37.50
	iii. Big (above 9 members)	13	16.25
4	<b>Family type</b>		
	Joint	31	38.75
	Nuclear	49	61.25
5	<b>Size of land holding</b>		
	i. Marginal (Up to 1.00 ha)	12	15.00
	ii. Small (1.01 to 2.00 ha)	27	33.75
	iii. Semi Medium (2.01 to 4.00 ha)	22	27.50
	iv. Medium (4.01 to 10.00 ha)	17	21.25
	v. Large (10.00 above ha)	02	2.50
6	<b>Annual income</b>		
	i. Low ( up to ₹ 1.00 Lakh)	13	16.25
	ii. Medium (₹ 1.01 to 2.00 Lakh)	32	40.00
	iii. High (Above ₹ 2.00 Lakh)	35	43.75
7	<b>Farming Experience</b>		
	i. Up to 10 years	07	8.75
	ii. 11 to 20 years	25	31.25
	iii. Above 20 years	48	60.00
8	<b>Mass media used</b>		
	i. Low (up to 10 score)	07	8.75
	ii. Medium (up to 11 to 2score)	46	57.50
	iii. High (21 to 30 score)	27	33.75

It is observed from the data given in Table1 that nearly half (45.00 percent) of the respondents belonged to old age group (51 and above) followed by 38.75 percent to middle age group (36-50 years). However, only 16.25 percent of them belonged to the young age group (up to 35 years). 36.25 per cent of the respondents had secondary level of education. However one fourth (25.00 per cent) had higher secondary level of education followed by graduation and above (23.75 percent), primary level of education (8.75 percent) and illiterate (6.25 per cent). It is observed from Table 1 that 46.25 percent of the respondents had small family size (up to 5 members) and majority (61.25 per cent)

respondents had nuclear family.

It is noticed that one third (33.75 per cent) of the respondents possessed small land holding (1.01 to 2.00 ha) followed by semi medium land holding (27.50 per cent) and medium land holding (21.25 per cent). However 15.00 percent of the respondents having marginal land holding and very meager (2.50 per cent) having large land holding. Regarding annual income it is observed that 43.75 per cent of the respondents had high annual income followed by medium (40.00 per cent) and low (16.25 per cent).

It is revealed that 60.00 percent of the respondents had above 20 years' experience in farming followed by 31.25 percent respondents had 11- 20 years of experience whereas 8.75 percent respondents had experience up to 10 years in farming.

The data in respect to mass media used by the chick pea growers was medium level (57.50 per cent), high level (33.75 percent) and very meager (8.75 per cent) respondents used low level of mass media.

**Knowledge level of chickpea growers**

**Table 2: Practice wise knowledge of chickpea growers**

(n= 80)

Sr. No.	Practice	Knowledge		
		Complete	Partial	No
1	<b>Soil</b> Medium to deep clay loam with good drainage soil	80 (100.00)	-	-
2	<b>Land preparation</b>			
	i. Deep ploughing up to 30 cm depth and one to two harrowing	80 (100.00)	-	-
	ii. Mix 5 tons FYM/Compost per hectare	54 (67.50)	26 (32.50)	-
3	<b>Sowing time</b>			
	i. Under rainfed Condition- End of September to beginning of October	80 (100.00)	-	-
	ii. Irrigated- Second fortnight of October to first week of November	80 (100.00)	-	-
4	<b>Improved varieties</b>			
	i. Vijay	27 (33.75)	53 (66.25)	
	ii. Vishal	24 (30.00)	56 (70.00)	-
	iii. Digvijay	15 (18.75)	34 (42.50)	31 (38.75)
	iv. Virat	13 (16.25)	33 (41.25)	34 (42.50)
	v. PKV- 2	22 (27.50)	39 (48.75)	19 (23.75)
	vi. PKV-4	22 (27.50)	39 (48.75)	19 (23.75)
	vii. Krupa	-	06 (7.50)	74 (92.50)
5	<b>Seed rate</b>			
	(60-100 Kg/ha)	53 (66.25)	06 (7.50)	21 (26.25)
6	<b>Seed treatment</b>			
	i. Seed treated with 2 gm Thirum + 2 gm Bavistin or 5 gm trichoderma powder per kg of seed	51 (63.75)	29 (36.25)	-
	ii. 250gm Rhizobium culture with jaggery solution per 10 kg seed.	33 (41.25)	20 (25.00)	25 (31.25)
7	<b>Seed sowing by Two bowl seed drill</b>			
	i. 30x10 cm (Desi) and 45x10 cm (Kabuli)	54 (67.50)	26 (32.50)	-
8	<b>Chemical fertilizers</b>			
	i. 25:50:30 Kg/ha. (N:P:K) (125 Kg DAP and 50 Kg MoP at the time of sowing)	09 (11.25)	06 (7.50)	65 (81.25)
	ii. Spraying of 2% urea solution at flowering stage.	07 (8.75)	-	73 (91.25)

Sr. No.	Practice	Knowledge		
		Complete	Partial	No
9	<b>Interculturing/Weed control</b>			
	i. First hoeing- 20days Second hoeing- 30 days	80	-	-
	ii. One weeding after hoeing	80		
	iii. Pre emergence application of herbicide such as Pendiamethalin 2.5 Lit + 500 Lit. Water/ha.	05 (6.25)	08 (10.00)	67 (83.75)
10	<b>Irrigation</b>			
	For Medium soil First irrigation- 20 to 25 days Second irrigation- 45 to 50 days Third irrigation- 65 to 70 days	80 (100.00)	-	-
	Sprinkler Irrigation	-	-	80 (100.00)
11	<b>Plant protection : Integrated pest management of Pod borer</b>			
	i. Spraying of 5% Neem Seed Extract solution after 3 weeks	53 (66.25)	27 (33.75)	-
	ii. After 10 to 15 days spraying of 500 ml HaNPV +500 Lit. Water/ ha.	14 (17.50)	11 (13.75)	55 (68.75)
	iii. Spraying of 100 ml Chlorantraniliprole (Coragen) + 500 Lit. water per ha.	39 (48.75)	13 (16.25)	28 (35.00)
	iv. Sowing 200 gm Jowar	03 (3.75)	-	77 (96.25)
	v. Bird stakes	80 (100.00)	-	-
	vi. Pheromone traps- 5/ha.	26 (32.50)	47 (58.75)	07 (8.75)
12	<b>Harvesting</b>			
	After 110 to 120 days	80 (100.00)	-	-
13	<b>Threshing</b>			
	Sun drying, threshing, winnowing,	80 (100.00)	-	-
14	<b>Average yield</b>			
	25 to 30 qt/ha.	51 (63.75)	16 (20.00)	13 (16.25)

(Figures in parentheses indicate percentages)

From Table 2 it is observed that Cent percent respondents had knowledge about soil, land preparation operations, sowing time, inter-culturing operations, flood irrigation, use of bird stakes, harvesting and threshing of chickpea. Majority of the respondents had complete knowledge about seed rate (66.25 per cent), seed treatment (63.75 per cent), spacing (67.50 per cent), and average yield (63.75 per cent).

It is revealed that more than one tenth (11.25 per cent) of the respondents had complete knowledge about proper dose and 8.75 per cent of the farmers had knowledge

of spraying of 2% urea solution at flowering stage. Regarding micro irrigation system cent per cent of the farmers had lack of knowledge about it. The data in respect to IPM shows that more than two third (66.25 per cent) of the respondents had complete knowledge about spraying of NSEK solution followed by spraying of Chlorantraniliprole (48.75 per cent). Near about one fifth (17.50 per cent) of the respondents had complete knowledge about spraying of HaNPV. However very meager (3.75 per cent) of the respondents had complete knowledge about sowing 200 gm jowar for biological control of pod borer

**Extent of adoption of chick pea cultivation practices by chickpea growers**

**Table 3: Practice wise adoption of chickpea growers**

(n= 80)

Sr. No.	Practice	Adoption		
		Complete	Partial	No
1	<b>Soil</b> Medium to deep clay loam with good drainage soil	53 (66.25)	-	27 (33.75)
2	<b>Land preparation</b>			
	i. Deep ploughing upto 30 cm depth and one to two harrowing	80 (100.00)	-	-
	ii. Mix 5 tons FYM/Compost per hectare	06 (6.25)	-	74 (92.50)
3	<b>Sowing time</b>			
	i. Under rainfed condition- End of September to beginning of October	-	-	80 (100.00)
	ii. Irrigated- Second fortnight of October to first week of November	66 (82.50)	-	14 (17.50)
4	<b>Seed rate</b>			
	i. 60-100 Kg/ha	54 (67.50)		26 (35.50)
5	<b>Seed treatment</b>			
	i. Seed treated with 2 gm Thirum + 2 gm Bavistin or 5 gm trichoderma powder per kg of seed	07 (8.75)	-	73 (91.25)
	ii. 250gm Rhizobium culture with jaggery solution per 10 kg seed.	03 (3.75)	-	77 (96.25)
6	<b>Seed sowing by Two bowl seed drill</b>			
	ii. 30 cm x10 cm	54 (67.50)	-	26 (32.50)
	iii. 45 cm x10 cm	-	-	-
7	<b>Chemical Fertilizers</b>			
	i. 25:50:30 Kg/ha. (N:P:K) (125 Kg DAP and 50 Kg MoP at the time of sowing)	09 (11.25)	-	71 (88.75)
	ii. Spraying of 2% urea solution at flowering stage.	7 (8.75)	-	73 (91.25)
8	<b>Interculturing/Weed control</b>			
	i. First hoeing- 20days Second hoeing- 30 days	80 (100.00)	-	-
	ii. One weeding after hoeing	80 (100.00)	-	-
	iii. Pre emergence application of herbicide such as Pendiamethalin 2.5 Lit + 500 Lit. Water/ha.	-	-	80 (100.00)
9	<b>Irrigation</b>			
	For Medium soil First irrigation- 20 to 25 days Second irrigation- 45 to 50 days Third irrigation- 65 to 70 days	80 (100.00)	-	-
	Sprinkler irrigation	-	-	80 (0.00)
10	<b>Plant protection Integrated pest management of Pod borer</b>			
	i. Spraying of 5% Neem Seed Extract solution after 3 weeks	14 (17.50)	-	66 (82.50)

Sr. No.	Practice	Adoption		
		Complete	Partial	No
	ii. After 10 to 15 days spraying of 500 ml HaNPV +500 Lit. Water/ ha.	03 (3.75)	-	77 (96.25)
	iii. Spraying of 100 ml Chlorantraniliprole (Coragen) + 500 Lit. water per ha.	39 (48.75)	-	41 (51.25)
	iv. Sowing 200 gm Jowar	-	-	80 (100.00)
	v. Bird stakes	03 (3.75)	-	77 (96.25)
	vi. Pheromone traps- 5/ha.	03 (3.75)	-	77 (96.25)
12	<b>Harvesting</b>			
	After 110 to 120 days	80 (100.00)	-	-
13	<b>Threshing</b>			
	Sun drying, threshing, winnowing	80 (100.00)	-	-
14	<b>Average yield</b>			
	25 to 30 qt/ha	-	-	80 (100.00)

(Figures in parentheses indicate percentages)

From Table 3 it is noticed that the practices which are adopted by cent per cent of the respondent farmers were deep ploughing, intercropping operations, flood irrigation, harvesting and threshing practices. The practices which were adopted by majority farmers were cultivating chick pea on proper soil type (66.25 per cent), proper sowing time (82.50 per cent), seed rate (67.50 per cent), recommended spacing (67.50 per cent). The adoption is very low in practices such as application of FYM (6.25 per cent), chemical seed treatment (8.75 per cent), seed treated with Rhizobium (3.75 per cent), proper dose of chemical fertilizers (11.25 per cent), spraying

of 2% urea solution at flowering stage (8.75 per cent).

The data in respect to IPM shows that near about half (48.75 per cent) of the respondents spraying Chlorantraniliprole for control of pod borer. Near about one fifth (17.50 per cent) of the respondents spraying 5% NSKE solution to control pod borer. Very meager (3.75 per cent) of the respondents use HaNPV, bird stakes (3.75 per cent) and Pheromone traps (3.75 per cent) for biological control of pod borer. No one respondents sowing 200 gm jowar for biological control of pod borer.

#### Variety grown by the chickpea growers

Table 4: Variety grown by the chickpea growers

(n=80)

Sr. No.	Variety	Frequency	Percentage
1	Local Variety (Chafa)	46	57.50
2	Vijay	14	17.50
3	Digvijay	09	11.25
4	Gulak- 1	08	10.00
5	Jaki 9218	03	03.75

It is revealed from Table 4 that more than half (57.50 per cent) of the respondents cultivated local variety followed by Vijay (17.50 per cent), Digvijay (11.25 per cent), Gulak-1 (10.00 per cent) and very meager (3.75 per cent) cultivated Jaki 9218 Variety.

#### Use of Chemical fertilizers by the farmers

From table 5 it is observed that regarding nitrogenous fertilizers more than three fourth (78.75 per cent) of the respondents over adopted the N than recommended

dose, 15.00 per cent of the respondents gave proper dose and 6.25 per cent of them gave lower dose than recommended dose. Regarding P<sub>2</sub>O<sub>5</sub> component, 86.25 per cent of the respondents gave lower doses than recommended and more than one tenth of them given proper dose. The data in respect

to K<sub>2</sub>O component shows that three fourth (75.00) of the respondents gave lower dose than recommended and nearly about one fifth (17.50 per cent) of them gave proper dose of fertilizers.

**Table 5: Distribution of respondents according to use of chemical fertilizers**

(n= 80)

Sr. No.	Component	Under adoption	Over adoption	Recommended
1	N	05 (6.25)	63 (78.75)	12 (15.00)
2	P <sub>2</sub> O <sub>5</sub>	69 (86.25)	00 (0.00)	11 (13.75)
3	K <sub>2</sub> O	60 (75.00)	06 (7.50)	14 (17.50)

(Figures in parentheses indicate percentages)

**Micro irrigation system use in chick pea by the farmers:**

increase in yield by using sprinkler irrigation system. Cent per cent of the respondent farmers not adopted sprinkler irrigation system.

The data in respect to micro irrigation status shows that cent per cent of the farmers had no knowledge about

**Table 6: Micro irrigation system used in chickpea by the farmers**

(n= 80)

Sr. No.	Salient Features	Knowledge			Adoption		
		Complete	Partial	No	Complete	Partial	No
1	Increase in Yield	-	-	80 100.00	-	-	80 (100.00)
3	Weed problem is less and weeding operation becomes very easy for the control of weeds	66 (82.50)	14 (17.50)	-			
4	Provide exact quantity of water	80 (100.00)	-	-			
5	Adequate aeration of the soil and prevents the root rot.	66 (82.50)	14 (17.50)	-			
6	The fertilizers given to the crop are made available for the crop growth efficiently	80 (100.00)	-	-			

(Figures in parentheses indicate percentages)

**CONCLUSION**

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Most of the farmers not adopted IPM technology, Micro irrigation system in Chickpea and application of proper chemical fertilizers; it is strongly recommended that SAUs and State Department of Agriculture has to aware farmers particularly on these practices by organizing training programmes, FLDs, Result demonstrations and group discussions at village level.

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