Adoption of recommendedpackage of practices of chickpea varieties(JG-11 and JAKI 9218) in Dharwad district of Karnataka, India

ABSTRACT

Chickpea (Cicer arietinum L.) is mainly a rabi season crop of India grown in diverse agroclimatic conditionsunder various cropping systems and a major pulse crop in Karnataka state. JG-11 and JAKI-9218 are two prominent chickpeavarieties cultivated by farmers in Dharwad district along with Annigeri-1 (local variety).The study throws light on profile characteristics and level of adoption of recommended package of practices of the above chickpea varieties. The study was conducted in Dharwad,Navalgund and Kundagol taluks of Dharwad district of Karnataka state during 2020-21 with a sample of 135 chickpea farmers. “Ex-post facto” research design was employed for the study. The data was elicited through personal interview method. Nearly half (48.89 %) of chickpea farmers belonged to low adoption category of recommended chickpea package of practicesfollowed by medium (36.30 %) and high (14.81 %) categories. The probable reasons for low to medium adoption of recommended practices because majority of the farmers are not aware of the recommended package of practices and also farmers expressed disbelief towards the recommended package of practices because if they practice other methods, they have a fear of losing the yield.

Keywords:Adoption level, profile, Package of practices, recommended, chickpea, varieties,

1. INTRODUCTION

Indian agriculture has undergone various revolutions that changed the scenario of how agriculture is practiced. The green revolution, blue revolution, yellow revolution, and white revolution have been decisive point in Indian agriculture. The advancement of technology is the main driving force for these revolutions to take place. Technology led agriculture has put India on the global platform as one of the leading production hubs for food commodities.The green revolution of the sixties would not have taken place without the use of high yielding varieties of wheat and paddy hence for us at present time to replicate such a revolution in any other crop, variety plays a substantial role. All other factors like higher crop productivity, decreased use of water quantity, fertilizer and pesticides, reduced impact on natural ecosystem etc. depend on variety.

Chickpea or Bengal gram or gram (Cicer arietinum L.) is a premier crop of India grown in diverse agroclimatic conditions under various cropping systems. In the world, chickpea is cultivated in an area of 14.97 million hectares with an annual production of 16.22 million tonnes with productivity of 1252 kg/ha (FAOSTAT, 2019). India contributes 71 per cent of global area with 70 per cent of global production of chickpea as it ranks 1st in area and production but lags behind several countries in terms of productivity because of poor adoption of improved varieties and production technologies by farmers.

Chickpea is the major pulse crop in Karnataka state and occupies a prominent place in the economy of the farmers in the recent years, particularly in the rainfed ecosystem. It is mainly a

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rabi season crop, seeded in the months of October to November. In Karnataka, the most popular earliest desi cultivar cultivated by the farmers was Annigeri-1. This cultivar was spread on a large area across districts in the state and for long years. Farmers were cultivating this cultivar in the absence of alternative improved cultivars. The chickpea variety which in recent times has gained attention among the chickpea farmers is JG11 is a Desi chickpea variety developed by Jawaharlal Nehru Krishi Vishwavidyalaya (JNKVV) in the year 1999 and framers' preference for JG11 is because of its attributes such as its early maturity (95-100 days), high yield (up to 2.5t/ha in rainfed and up to 3.5t/ha in irrigated), attractive large seed (22g/100seeds) and high resistance to fusarium wilt (< 10% mortality) (Anon., 2008).

Another desi chickpea variety JAKI-9218 developed by Dr. Panjabrao Deshmukh Krishi Vidyapeeth (PDKV) Akola in the year 2006, carries a wide range of attributes such as average yield of 18-20 q/ha, early maturity (95-125 days), large light brown bold, seed size (20-27 g/100 seeds), with semi spreading and profuse branching, smooth surface, resistant to lodging shattering and resistant to diseases such as wilt, root rot and collar rot (http://dpd.gov.in/). Hence by considering that these above varieties are a boon to many chickpea farmers hence UAS, Dharwad has been taking diligent role in spreading these varieties to chickpea farmers under its jurisdiction.

In 2007, University of Agricultural Sciences (UAS) Dharwad implemented TL-II project in collaboration with ICRISAT, Hyderabad. Dharwad and Gulbarga districts were selected in Karnataka for study under the project. The project was implemented initially with the identification of appropriate chickpea cultivars suitable for the region. In Dharwad, among the improved cultivars JG-11 is one of the best desi varieties which was identified by the farmers. The next best variety preferred by the farmers was JAKI-9218.

Keepingthisinview,thestudywasdesignedonadoptionofchickpea varieties JG-11 and JAKI 9218 in Dharwad district of Karnataka state with the following specificobjectives. Toassesstheprofilecharacteristicsof farmers and tomeasurethe adoption of recommended chickpea package of practices by farmers.

2. METHODOLOGY

2.1 Selectionof studyareaandrespondents

The research study was conducted in Dharwad district of Karnataka during 2020-2021. This district was purposively selected as it has area under chickpea cultivation.Among the eight taluks of Dharwad district, keeping the criteria of maximum area under chickpea cultivation, three taluks viz., Navalgunda (40,042 ha), Dharwad (25,877 ha) and Kundagol (13,726 ha) were selected. Based on highest area under chickpea cultivation, 3 villages were selected from each selected taluk. Thus, total of 9 villages were selected for the study.From each of the selected villages, farmers who have cultivated chickpea in minimum of one acre were listed, fifteen chickpea growers from each village were selected for the study by adopting simple random sampling. Thus, one hundred and thirty-five

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respondents constituted sample for the study.

2.2 Adoptionofrecommendedcultivation practices

Adoption is a decision to make full use of an innovation as the best course of actionavailable.It refers to the extent of adoption of recommended and improved chickpea variety and production practices by chickpea farmers as mentioned and recommended by the University of Agricultural Sciences (UAS), Dharwad package of practicesbook.

Respondents were asked questions to know whether they have adopted each of recommended package of practices in chickpea or not. The answers elicited from the farmers were quantified by giving “1” score to adoption and “0” to non-adoption. The total score obtained by the respondents from all practices was the adoption score of the individual respondent.

Based on the total score, the respondents were grouped into three categories namely, ‘low’, ‘medium’ and ‘high’ using mean and standard deviation as a measure of check.

List 1 : Cultivation practices score

Category	Score
Low	Lessthan(Mean-0.425SD)
Medium	Between(Mean±0.425SD)
High	Morethan (Mean +0.425 SD)

3. RESULTSANDDISCUSSION

Thefindingsofthepresentstudyaswellasrelevantdiscussionhavebeensummarizedunder followingheads:

3.1 Profilecharacteristicsofchickpea farmers

The data represented in Table-1 gives a detailed view of profile characteristics ofchickpeafarmers.

3.1.1 Age

TheresultspresentedinTable 1revealedthatmajority of the chickpea farmers (57.78 %) belong to middle age followed by old age. Young farmers with better educational background opt to get a job in the cities or work on other enterprises. Middle and old age farmers in the village perceive farming as main occupation. Further farmers of middle age are motivated, possess physical strength and carry the responsibility of the family. These might be the reasons to find majority of the respondents belonging to middle age group.The results are in line with findings of Lohare (2017).

3.1.2 Education

The results from the Table 1 showed that more than three fourth of the farmers had formal education

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this is due to the fact that large majority of rural population have realized the importance of education and now most of the rural areas have access to high school, along with government policies to provide free education up to high school. These might be the reasons for the increase in education level. The results are in conformity with findings of Tulshiram (2019).

3.1.3 Land holding

More than sixty per cent of the chickpea farmers belong to the semi-medium and medium land holding categories followed by big, small, and marginal land holding categories. This can be due to inheritance of land from ancestors and division of land among the family members. Another reason might be that main occupation of chickpea farmers in the study area is farming hence they tend to possess more acres of land.The similar results are reported by Bansilal (2015)

3.1.4 Farming experience

Nearly sixty per cent of the chickpea farmers had medium to high farming experience. Farming experience largely depends upon age and education of the farmers. It is also evident that majority of the farmers belong to middle age and old age and more than three fourth of the farmers received formal education. Since farming is the main occupation of chickpea farmers in the study area and they would have started practicing agriculture during their school and college days and might have taken up agriculture as main occupation after their formal education.The findings are in line with Arjun (2015).

3.1.5 Extension contact

Nearly forty per cent of chickpea farmers had medium extension contact followed by low and high. Large majority of the farmers had contact with Assistant Agriculture Officer, Agriculture Officer, input dealers, and agriculture scientists who were working at field level. Various subsidies provided under government agriculture programs made the farmers to be in touch with the extension personnel and to avail various benefits and information. Also, large majority of the farmers were in touch with the progressive farmers as they regarded them highly for their knowledge and experience to provide necessary information.The findings are in line with Ramhari (2014)

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Table1.Profilecharacteristicsof chickpeafarmers

(n = 135)

Sl. No.	Variables	Respondents	
		f	%
1.	**Age**		
	Young (< 31 years)	16	11.85
	Middle (31-50 years)	78	57.78
	Old (>50 years)	41	30.37
2.	**Education**		
	Illiterate	2	1.48
	Functionally literate	5	3.70
	Primary school (1^{st} to 4^{th})	7	5.19
	Middle school (5^{th} to 7^{th})	17	12.59
	High school (8^{th} to 10^{th})	34	25.19
	PUC (11^{th} to 12^{th})	43	31.85
	Graduation and above	27	20.00
3.	**Land holding**		
	Marginal farmer (up to 2.50 acres)	1	0.74
	Small farmer (2.51-5.00)	16	11.85
	Semi-medium farmer (5.01-10.00)	29	21.48
	Medium farmer (10.01-25.00)	56	41.48
	Big farmer (> 25.00 acres)	33	24.44
4.	**Farming experience**		
	Low (< 20.10)	55	40.74
	Medium (20.10 - 29.86)	29	21.48
	High (> 29.86)	51	37.78
	Mean = 24.98	SD = 11.49	

Sl. No.	Variables	Respondents	
		f	%
5.	**Extension Contact**		

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	Low (< 5.27)	46	34.07
	Medium (5.27 – 6.55)	53	39.26
	High (> 6.55)	36	26.67
	Mean: 5.93	SD: 1.55	
6.	**Organizational participation**		
	Low (< 3.189)	49	36.30
	Medium (3.189– 4.929)	22	16.30
	High (>4.929)	64	47.40
	Mean: 4.06	SD: 2.04	
7.	**Mass media exposure**		
	Low (< 13.83)	39	28.89
	Medium (13.83 – 16.63)	51	37.78
	High (> 16.63)	45	33.33
	Mean: 15.23	SD: 3.21	
8.	**cropping intensity**		
	Low (< 177.82)	44	32.59
	Medium (177.82 – 194.28)	29	21.48
	High (> 194.28)	62	45.93
	Mean: 186.50	SD: 19.35	

3.1.6 Organizational participation

It is clear from Table1 that less than half of the farmers (47.40 %) belong to high category of organizational participation followed by low (36.30 %) and medium (16.30 %) categories. The possible reason attributed to the high and medium level of organizational participation was due to farmers expectation of enhanced exposure, exchange of new ideas, gaining experience and information of the development agencies.

Majority of the farmers participated in the gram panchayat activities due to their political inclination and interest for the development of the community. More than one fourth of the farmers were members in village cooperative societies has it is working at grass root level to assist the farmers by facilitating all types of agricultural credit and marketing facilities.The findings are in conformity with Kangali (2012).

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3.1.7 Mass media exposure

Nearly two fifth of the chickpea farmers had medium mass media exposure followed by high and low categories. Television was the most common medium which was possessed by cent per cent of the farmers because of its high audio-visual impact on the viewers. Even after tiring work in the field farmers were still inclined to view news and agriculture programs as the programs were telecasted early in the morning or late evenings. Mobile phone was the most usual and practical medium which was possessed by all the farmers because of its effective and interactive way of accessing information. Newspaper was also subscribed by more than seventy per cent of the farmers for accessing information and to know the current happenings in the local area, state and across the globe. This is due to the fact that majority of the farmers have undergone formal education.The results are in line with the findings of Dhakad (2016)

3.1.8Cropping intensity

More than two-fifth of the chickpea farmers had high cropping intensity (> 194.28 %) followed by low (< 177.82 %) and medium (177.82 – 194.28 %) cropping intensity.

This is due to the area under rainfed condition with rainfall from 539.70 mm to 1037.20 mm, well established from April - May to September – October hence there is sufficient water availability for the crops, the farmers cultivate crops in the seasons of kharif and rabi and also take up crop rotation by suitable arrangement of successive crops in such a way that the different crops draw nutrient in different proportion from different strata. These might be the reasons to find majority of the respondents in high cropping intensity group.The findings are contradictory to the findings of Kumar (2011).

3.2 Adoption of Recommended chickpea package of practices

It is evident from the findings in Table 2 that majority of chickpea farmers had adopted the recommended land preparation and season of sowing, as land preparation is the simple and basic cultivation practice that farmer generally practice irrespective of any crop to make sure that land is ready to take up sowing of seeds. Chickpea is a rabi season crop hence farmers take up sowing from October to November and another reason for high adoption of recommended season of sowing is that majority of farmers posses' medium to high farming experience, also farmers very well know when to take up sowing by considering rainfall, soil moisture and other climatic conditions which are congenial for sowing. The findings are in conformity with Manjushree (2018).

Regarding recommended seed rate just more than one third of all the farmers had adopted the recommended seed rate of 20 kg/acre. Traditional method of measuring the quantity of seeds instead of kilograms, doubting of low population due to low germination percentage of some seeds and inadequate knowledge regarding the recommended seed rate are possibly the reason for high seed rate than recommended. Similar findings are reported by Kumar (2011).

With respect to spacing more than half of the chickpea farmers had not adopted the

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recommended spacing, according to farmers for practices like spraying, hand weeding, inter-cultivation and harvesting require wider spacing for smooth operation of these practices. Thus, wider spacing was adopted by majority of farmers than recommended spacing. Similar findings are reported by Manjushree (2018).

Regarding recommended seed treatment only one fifth of the farmers had adopted, reason for low adoption is due to lack of knowledge, technical guidance of extension personnel, complex nature of the practice and farmers perceive that it is not an important measure in chickpea cultivation. The findings are in line with Brunda (2018).

With respect to application of organic manures nearly ninety per cent of farmers apply FYM at 2 tonnes/acre to their field as they very well know the importance of FYM for the crops.

Whereas the application of FYM 2-3 weeks before sowing only five per cent of farmers apply at the recommended time, as majority of the farmers apply FYM in summer (March to April) because farmers do not take up summer crop and hence, they are free at that time, during rabi season it is difficult to take tractor to the field due to wetness of the land. Another possible reason might be due to non-availability of FYM in time. The findings are in conformity with Manjushree (2018).

Regarding application of recommended dosage of chemical fertilizer more than half of the farmers are not following the recommended dosage (4:10:0 NPK). They are applying high dosage than recommendation, this might be due to lack of knowledge, non-availability of FYM in time, lack of technical guidance from extension personnel and belief of higher benefit by applying high dosage. Similar findings are reported by Garg (2010).

In case of weed control majority of chickpea farmers had adopted manual weeding and almost cent per cent of farmers had not adopted chemicals for weed control. Less incidence of weed in rabi season compared to kharif season and it can be easily removed by simple hand weeding and inter-cultivation, another reason given by majority of farmers is that the fear of chemical spraying for weed control will affect the chickpea crop growth and pod formation. Similar findings are reported by Manjushree (2018).

Regarding inter-cultivation majority of the farmers had adopted two-time inter-cultivation, since farmers are familiar with the importance of inter-cultivation to keep the field free from weeds and prevents moisture evaporation. Another reason is the timely availability of bullocks for inter-cultivation of chickpea crop. With respect to nipping almost all the farmers had not adopted this practice as it is a traditional practice meant for increasing the vegetative growth of the crop, since it is manually intensive process, time consuming and it’s a burden on the cost of cultivation. Similar findings are reported by Manjushree (2018).

With respect to inter-cropping, linseed is cultivated by small number of farmers in sample area mainly due to non-availability of seeds. In case of safflower only one third of the farmers have adopted inter-cropping with safflower, as farmers expressed that intercropping with safflower will make it difficult for manual harvesting of safflower due to presence of thorns and non-availability

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of labour at the time of harvesting. Negligible number of farmers had adopted inter-cropping with sorghum because farmers expressed that inter-cropping with sorghum affects the yield due to shadow of the sorghum crop. The findings are in conformity with Brunda (2018).

With respect to plant growth regulators usage more than half of the chickpea farmers had adopted spraying of 20 ppm of NAA at 35 days after sowing. It might be due to the technical guidance of input dealers to take up spraying of growth regulators but cent per cent of farmers had not adopted spraying of Cycocel at 10 ml/100 litre of water due to lack of knowledge of growth regulators. It was evident that more than eighty per cent of farmers had not adopted spraying of two per cent of urea at flowering stage to get higher yield. Lack of knowledge regarding the practice might be the reason for non-adoption. The findings are in conformity with Manjushree (2018).

Regarding installation of bird perches or at the time of sowing mix 20g of sunflower or sorghum seeds to control pod borer. Less than two per cent of farmers had adopted this practice since effective control of pod borer by pesticides and its easy availability might be the reason for the result, further it is a time and labour consuming work might also be the reason for non-adoption. With respect to chemical control of pod borer almost all the farmers have adopted the chemical spraying of recommended pesticides. Easy availability, good farming experience and guidance from input dealers might be the reason for high adoption of this recommended practice. Similar findings are reported by Garg (2010).

In case of chemical control of cut worm cent per cent of farmers had not adopted spraying of any pesticides, because of low occurrence of cut worm infestation and more than half of the farmers had adopted crop rotation as it is a simple and basic practice which requires no technical skill.

More than seventy per cent of farmers had adopted field sanitation measure, as it is a simple practice and farmers perceive that it is important to control fusarium wilt. More than ninety per cent of the farmers had adopted seed treatment with Trichoderma harzianum at 4-6 g/kg of seeds, possible reason for adoption of this practice is its high availability at the RSK along with the seeds, good technical guidance regarding its usage and importance to control fusarium wilt. Similar findings are reported by Arjun (2015).

Further almost all the farmers had taken up early sowing in the month of October to escape rust infection. As rust disease requires mild and moist conditions, farmers might have good amount of experience about rust infection hence resulting in high adoption of this recommended practice. More than half of the farmers had not adopted chemical control of rust, this might be due to non-availability of required chemical and also lack of knowledge regarding this practice to control rust disease. Similar findings are reported by Kumar (2011).

Regarding harvesting cent per cent of the farmers harvest chickpea crop at recommended time of harvesting. This might be due to shattering nature of chickpea crop which gives an indication for farmers to know about the correct time to harvest the crop. Similar findings are reported by Manjushree (2018).

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Table 2: Adoption of recommended chickpea package of practices by farmers

n = 135

Sl. No	Practices	Adoption							
		JG-11 farmers n_1=45		JAKI-9218 farmers n_2 =45		Annigeri-1 farmers n_3 =45		Total n=135	
		f	%	f	%	f	%	f	%
1.	**Land preparation:** 2-3 times ploughing before sowing	37	82.22	43	95.56	43	95.56	123	91.11
2.	**Season of sowing:** October-November	41	91.11	43	95.56	44	97.78	128	94.81
3.	**Seed rate:** 20 kg/acre	22	48.89	24	53.33	10	22.22	56	41.48
4.	**Spacing:** 30x10 cm	22	48.89	24	53.33	18	40.00	64	47.41
5.	**Seed treatment:** Soak the seeds in 2.00 per cent $CaCl_2$ solution for half an hour or with 25.00 per cent cow urine for 8 hrs then shade dry for 7 hrs, after that treat the seeds with Rhizobium and Phosphate Solubilizing Bacteria (PSB)	11	24.44	14	31.11	5	11.11	30	22.22
6.	**Application of organic manures** i. Apply FYM @2 tonne/acre	42	93.33	39	86.67	40	88.89	121	89.63
	ii. Apply FYM before 2-3 weeks of sowing	4	8.89	00	0.00	3	6.67	**7**	5.19
7.	**Application of chemical fertilizers (kg/acre)** i. Total dose of recommended fertilizer- 4:10:0 NPK/acre	20	44.44	13	28.89	21	46.67	54	40.00
	ii. Method of application: Placement method	45	100.00	45	100.00	44	97.78	134	99.26
8.	**Weed control:** i. Manual weeding: 2 times hand weeding	42	93.33	39	86.67	43	95.56	124	91.85
	ii. Use of chemicals: Pendimethalin 30 EC @ 1.3 litre/ 300 litres of water	01	2.22	1	2.22	0	0.00	2	1.48
9.	**Inter-cultivation**: 1st – 25-30 days after sowing	45	100.00	44	97.78	45	100.00	134	99.26
	2nd – 50 days after sowing	35	77.78	40	88.88	42	93.33	117	86.67
10	**Nipping** (35-40 DAS)	01	2.22	00	0.00	1	2.22	2	1.48
11.	**Inter cropping.** Chickpea+linseed (4:2)	00	0.00	1	2.22	1	2.22	2	1.48
	Chickpea + safflower (3:1)	14	31.11	22	48.89	13	28.89	49	36.30
	Chickpea+rabi sorghum (2:1)	3	6.67	7	15.56	8	17.78	18	13.33
12.	**Plant Growth regulators (PGR) usage**	33	73.33	25	55.56	20	44.44	78	57.78

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Sl. No	Practices	Adoption							
		JG-11 farmers n_1=45		JAKI-9218 farmers n_2 =45		Annigeri-1 farmers n_3 =45		Total n=135	
		f	%	f	%	f	%	f	%
	i. 35 DAS, Spray the crop with 20 ppm of NAA @ 2ml/100 litre of water								
	ii. At flowering stage, Spray the crop with 100 ppm of Cycocel @ 10ml/100 litre of water	00	0.00	0	0.00	0	0.00	00	0.00
13.	To get higher yield, spray 2.00 per cent Urea (20g/litre of water) at the flowering stage	5	11.11	6	13.33	7	15.56	18	13.33
14.	**Plant protection measures** **i) Pest Management** **a) Pod Borer** i. Installation of bird perches or at the time of sowing mix 20 gm of sunflower seeds or 20 gm of sorghum seeds with chickpea seeds and later at the stage of pod development cast 10 kg of puffed rice per acre to encourage bird to feed on insects.	2	4.44	00	0.00	0	0.00	2	1.48
	ii. Spray 0.075 ml of Flubendiamide 39.35 SC or 0.15 ml of Chloranthrinaliprole 18.5 SC or 0.2 gm of Emamectin benzoate 5 SG or 0.1 ml of Spinosad 45 SC or 0.3 ml of Indoxacarb 14.5 SC or 4 gm of Carboryl 50 DWP or 1 ml of Methyl parathion 50 EC or 2 ml of Quinalphos 25 EC or 2 ml of Methomyl 40 SP or 2 ml of Prophenophos 50 EC or 1 gm of Acephate 75 SP or chilli garlic extract @ 20 ml per litre of water.	45	100.00	44	97.78	44	97.78	133	98.52
	b) Cutworm i. Intercropping with linseed	0	0.00	1	2.22	1	2.22	2	1.48
	ii. Adopt crop rotation	32	71.11	28	62.22	30	66.67	90	66.67
	iii. Spray Deltamethrin 2.8 EC @ 0.5 ml or Quinalphos 25 EC @ 2 ml per litre of water	00	0.00	0	0.00	0	0.00	00	0.00
	Disease Management **a) Fusarium wilt** i. Field sanitation	36	80.00	30	66.67	32	71.11	98	72.59
	ii. Seed treatment with carboxin 37.50 %+ Thiram 37.50% @ 2.5g/kg or captan 80 WP @ 2g/kg or carbendazim @ 2g/kg	43	95.56	42	93.33	39	86.67	124	91.85

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Sl. No	Practices	Adoption							
		JG-11 farmers n_1=45		JAKI-9218 farmers n_2 =45		Annigeri-1 farmers n_3 =45		Total n=135	
		f	%	f	%	f	%	f	%
	or Trichoderma harzianum @ 4-6 g/kg								
	iii. Adopt resistant chickpea cultivar JG-11	45	100.00	3	6.67	6	13.33	54	40.00
	b) Rust i. Early sowing on the month of October may escape infection	43	95.56	43	95.56	44	97.78	130	96.30
	ii. Spray hexaconazole @ 1 ml or propiconazole @ 1 ml per litre of water	19	42.22	26	57.78	20	44.44	65	48.15
15	**Harvesting:** 90 – 100 days	45	100.00	45	100.00	45	100.00	135	100.00

f-Frequency,%-Percentage

3.2 Overall adoption of recommended chickpea package of practices

The results presented in the Table3 indicated that 48.89 per cent of the respondents belong to low category followed by 36.30 per cent and 14.81 per cent of respondents belong to medium and high adoption respectively.

The probable reasons for low to medium adoption of recommended practices because majority of the farmers are not aware of the recommended package of practices given by UAS Dharwad. Even though the majority of the farmers have medium to high extension contact they only use this contact to avail seeds, chemical fertilizers, pesticides and other subsidies. They are not receiving any technical guidance regarding the recommended practices. A clear yield gap was noticed in both the varieties, with nearly eight per cent in JG-11 and twenty-five per cent in case of JAKI-9218. Also, farmers expressed disbelief towards the recommended package of practices because if they practice other methods, they have a fear of losing the yield.Similar findings are reported by Garg (2010).

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Table3:Distribution of chickpea farmers based on overall adoption of recommended package of practices

(n=135)

Sl. No.	Category	f	%
1	Low (< 14.71)	66	48.89
2	Medium (14.71- 16.31)	49	36.30

3	High (>16.31)	20	14.81
Mean=15.51		SD=1.88	

4. CONCLUSION

Nearly half of the chickpea farmers belong to low category of adoption of recommended package of practices. Hence this indicates sustained efforts are required by the extension personnel to provide technical guidance and instill confidence among the chickpea farmers about the recommended package of practices. Further it is imperative that integrated and coordinated efforts of State Agriculture universities, State Department of Agriculture, FPOs, NGOs etc., for reducing the yield gap noticed in both the varieties, with nearly eight per cent in JG-11 and twenty-five per cent in case of JAKI-9218 and improving the adoption of recommended practices.

5. REFERENCES

Anonymous, 2008, One better than the other. ICRISAT's monthly News lett. 87:1.

Anonymous (2019) Food and Agriculture Organization of United Nations. FAOSTAT Statistical Database [Rome]: FAO, 2019.

Arjun, S. P., 2015, Knowledge and adoption of recommended chickpea production technology by the grower. *M.Sc. (Agri). Thesis,* Vasanthrao Naik Marathwada Krishi Vidyapeeth, Parbhani, Maharashtra (India).

Bansilal, A., 2015, A study on knowledge and adoption of recommended cultivation practices of black gram growers in north eastern region of Karnataka. *M.Sc. (Agri). Thesis,* Univ. Agric. Sci., Raichur, Karnataka (India).

Brunda, S., 2018, Study on economic impact of bengalgram technologies developed by UAS, Raichur in NEK region. *M.Sc. (Agri). Thesis,* Univ. Agric. Sci., Raichur, Karnataka (India).

Dhakad, S. K., 2016, A study on training needs of chickpea growers in Morena block of Morena district M.P. M.Sc. (Agri). Thesis, Rajmata Vijayaraje Scindia Krishi Vishwa Vidyalaya, Gwalior, Madhya Pradesh (India).

Garg, R. P., 2010, A study on technological gap about recommended chickpea production technology among growers of sehore block of Jabalpur district of Madhya Pradesh.

Kangali, S., 2012, A study on impact of front-line demonstration of chickpea in Sehore district of Madhya Pradesh. M. Sc. (Agri.) Thesis, Rajmata Vijayaraje Scindia Krishi Vishwa Vidyalaya, Gwalior, Madhya Pradesh (India).

Kumar, D.U., 2011, Adoption Behaviour of chickpea growers in Kaushambi district of Uttar Pradesh. M.Sc. (Agri). Thesis, Mahatma Phule Krishi Vidyapeeth, Rahuri, Maharashtra (India).

Lohare, R., 2017, A study on knowledge and adoption of chickpea production technology among the farmers in Tirla block of Dhar district M.P. M.Sc. (Agri). Thesis, Rajmata Vijayaraje Scindia Krishi Vishwa Vidyalaya, Gwalior, Madhya Pradesh (India).

UNDER PEER REVIEW

Manjushree, S., 2018, Diffusion of chickpea cultivars among farmers in Dharwad district. M.Sc. (Agri). Thesis, Univ. Agric. Sci., Dharwad, Karnataka (India).

Ramhari, D. A., 2014, Knowledge and adoption of improved black gram production practices by the farmers. *M.Sc. (Agri). Thesis,* Vasanthrao Naik Marathwada Krishi Vidyapeeth, Parbhani, Maharashtra (India).

Tulshiram, K. S., 2019, Knowledge and adoption of recommended cultivation practices of gram by the farmers. *M.Sc. (Agri). Thesis,* Dr. Panjabrao Deshmukh Krishi Vidyapeeth, Akola, Maharashtra (India).

www.dpd.gov.in/VARIETIES

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