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A study on knowledge level of plant protection measures by the paddy and cotton growers in Karimnagar district of Telangana state

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Abstract
The study was conducted in Karim nagar district of Telangana State during 2018-19 to Study farmers Knowledge and Adoption of Plant Protection Measures by The Paddy and Cotton growers. Sixty each paddy and cotton growers were selected by using simple random technique. Thus, making a total sample size of 120. The data was collected through personal interview method and analysed by using appropriate statistical tools. The findings revealed that, 45.00 per cent of the paddy growers come under medium knowledge category followed by high (30.00%) and low (25.00%) categories. Further, 30.00 percent of the cotton growers had medium knowledge. Whereas, equal percentage (35.00%) of respondents come under high and low knowledge categories.

Keywords: Knowledge, plant protection measures, paddy and cotton

Introduction
Paddy (*Oryza sativa*. L) One of the significant cereal crops in the world and an important staple food crop for more than half of the world population, is known as "king of cereals". The United Nations General assembly, declared the year of 2004 as the "International Year of Rice", which has great significance to food security. World production of rice increased steadily from 200 million tonnes in 1960 to 501 million tonnes in 2016-17. The top two producers of rice are China and India. The major three exporting countries are India (1300mt), Thailand (1000mt) and Vietnam (5800mt), whereas the largest three importers are China (5000mt), Nigeria (1900mt) and European Union (1850mt) in 2016-17 (Anon, 2017) [1].
Rice in India is important to the national economy. India is the world's second largest producer with approximately 43 million hectares planted area, accounting for 23% of the world's share in production. Rice is a basic food crop and being a tropical plant, it flourishes in hot and humid climate. It is grown in assured irrigated areas and in rain fed areas that receive assured rainfall. Hence, it can be grown in both Kharif & Rabi seasons. In India, the highest area under paddy is in Uttar Pradesh (5.86mha), followed by West Bengal (5.46mha) and Orrisa (3.94mha). Production-wise, West Bengal stands first (15.75mt), followed by Uttar Pradesh (12.5mt) and Punjab (11.82mt). The highest yield is observed in the state of Punjab (3870 kg/ha), followed by Andhra Pradesh (3360 kg/ha). In Telangana the area under rice is 20.00lakh ha and production is 66.22 lakh tones. In Telangana, Karim nagar district top in rice production compared to west Godavari in Andhra Pradesh. Karim nagar district referred to as "rice bowl" of Telangana. Area under rice in Karim nagar is Nearly 2,06,100 tonnes paddy was produced by sowing crop in 32,976 ha in kharif 2016. In Rabi, 4,20,961 tonnes of yield was produced from 61,906 ha. Similarly, Cotton is cultivated in 77 countries across the globe and 105 countries consumes cotton, of which larger consuming countries include China, India, Pakistan, Bangladesh and Turkey. Countries - United States, Australia, Brazil, India and Uzbekistan, are the major exporters of the Cotton. The world cotton production is estimated at 121.37 million bales of 480 LB (USDA, Feb 2018), there is an increase of 14.81% than last year. Although, India is maintaining the position of leading cotton producer in the world, China and United States has increased cotton production around 23% as compared to last year (2017-18). It was just 5.56% increase in cotton production this year (2017-18), though larger area brought under cotton cultivation in India. It is also estimated that the area under cotton increased from 292.23 to 333.85 lakh hectare this year (2017-18) at an increase of 14.24%. In India Cotton is one of the most main fiber and cash crop in India and it plays a leading role in the industrial and agricultural sectors of the country. It affords the rudimentary raw material (cotton fiber) to cotton textile industries. Cotton in India provides nonstop livelihood to 6 million farmers and about 40 -50 million people are engaged in cotton trade and its processing.

In India, there are ten main cotton growing states which are distributed into three zones, *viz*. North zone, central zone and south zone. North zone consists of Punjab, Haryana, and Rajasthan. Central zone includes Madhya Pradesh, Maharashtra and Gujarat. South zone comprises Andhra Pradesh, Telangana, Karnataka and Tamil Nadu. Besides in these ten States, cotton cultivation has gained momentum in the Eastern State of Orissa. Cotton is also cultivated in small areas of non-traditional States such as Uttar Pradesh, West Bengal & Tripura. Telangana is the third highest in terms of cotton cultivation and production in India, after Gujarat and Maharashtra. There was substantial increase (22%) in area under cotton crop assessed in South zone this year, particularly in Telangana extra 4.15 lakh hectare enlarged under cotton cultivation. Still the cotton productivity reduced at 8.29%, cotton production significantly augmented in Telangana from 48 to 57 lakh bales with growth rate of 19% related to last year. In 2014-15, Telangana cultivated 16.93 lakh hectares of cotton, and produced 35.83 lakh bales. The following year, the state's cultivation increased to 17.78 lakh hectares and production jumped to 37.33 lakh bales in 2015-16. Plant protection measures are very important in modern agriculture as most of the crop loss is due to pest and diseases. So in order to protect the crop from pest and disease attack to get more yield, farmers are over using plant protection chemicals without having awareness and knowledge on recommended Plant Protection Measures. In demand to rise the crop yields, adoption level of plant protection measures has to be improved. Knowledge about recommended plant protection measures is significant to adoption process. Even India has competent agricultural research and extension system, but the adoption of advanced technologies by the farmer limited to some extent. It is knowledge of the extension workers that many of the technologies are not used by the farmers. Therefore, it is a problem that why one practice is more adopted willingly, than the other by growers. One of the possible solution is that simple use and understanding of technology, which may accelerate or impede its rate of adoption in the society.

Methodology

The research study was conducted in Karim nagar district of Telangana during the year 2018-19 by using ex-post-facto research design. The study was carried out purposively in Karim nagar district because the district is considered as rice bowl of Telangana state. Karim nagar district comprises of sixteen mandals. Out of which, three mandals namely, Manthani, Ramagundam and Pedhapally were purposively selected, because highest area under paddy and cotton. The list of paddy and cotton farmers were taken from Department of Agriculture. A list of villages was prepared for the selected mandals and two villages from the list were randomly selected in each mandal. From each village, 20 respondents were selected constituting a total sample of 120 respondents. Based on the objectives of study, knowledge of Plant protection measures in paddy and cotton. A list of knowledge items was prepared by discussing with the experts from Entomology, agricultural extension and by referring to the package of practices published by agricultural university at Hyderabad. An interview schedule was prepared. The collected data were then analysed using appropriate statistical tools like frequency and percentage, arithmetic mean (X), standard deviation and co- efficient of correlation. Based on obtained scores the respondents were grouped into low, medium and high knowledge categories using mean and standard deviation. The Schedule contain 20 statements with respect to plant protection measures in paddy and cotton crop based on the judgement of specialists. The relevant answers for these items were obtained with the help of experts of agricultural university in Rajendra nagar Hyderabad. And respondents were asked the reaction about these statements by representing true or false on two-point continuum with the scores of 1 and 0 respectively. Thus, the maximum score obtainable was 20 and the minimum was zero. The total knowledge score so obtained for each respondent was summed up and respondents were categorized into low, medium and high groups based on the mean and standard deviation.

Results and Discussion

The data in Table 1 shows that majority of respondents (40.00%) had medium knowledge, followed by high (30%) and low (25%) knowledge in paddy. Further 30.00 percent of the cotton growers had medium knowledge. Whereas, equal percentage (35.00%) of respondents come under high and low knowledge categories. Similar findings are reported by vinay kumar (2005) [6] and Praveen Babu (2014) [5].

Table 1: Overall knowledge level of the Paddy and Cotton growers with respect to Plant Protection Measures. n=120

Sl. No	Crop	Growers Knowledge level			Mean	SD
		Category	F	%		
1.	Paddy n_1=60	Low (<10.68)	15	25.00	12.17	2.98
		Medium (10.68 to 13.65)	27	45.00		
		High ((>13.65)	18	30.00		
2.	Cotton n_2=60	Low ((<9.37)	21	35.00	10.50	2.27
		Medium (9.37 to 11.63)	18	30.00		
		High(>11.63)	21	35.00		

Component wise knowledge level of the paddy and cotton growers regarding Plant Protection Measures.

The results of Table 2 clearly shows that knowledge level of farmers in identifying different symptoms of pest and diseases of paddy crop and its chemical management practices. In case of pests, 53.33 percent of the farmers knew about the stem borer and BPH symptoms. 55.00 percent of the respondents had absolute knowledge about Rice hispa, 41.67 per cent of farmers had knowledge of rice leaf folder. With regard to pesticides, 58.33 and 48.33 per cent knew about chlorypyriphos used for rice hispa and leaf folder control, 53.33 per cent they did know about Acephate for control of brown plant hoppers and stem borer. In case of diseases, 53.33 and 45.00 per cent of them knew about Sheath blight and rice blast respectively. Whereas 48.33 per cent of farmers had knowledge about brown spot and bacterial blight. Regarding fungicides, 50.00 per cent of the farmers knew about Propioconazole and Tricylazole in case of blast and sheath blight, whereas 56.67 and 55.00 per cent of them had the knowledge of Mancozeb for bacterial bight and brown spot respectively.

Table 2: Component wise Knowledge level of the paddy growers on Plant Protection Measures. (n_1:60)

Sl. No	Components	Knowledge		No knowledge	
		F	%	F	%
1.	**Pests symptoms**				
	a. Stem Borer	32	53.33	28	46.67
	b. Brown Plant Hopper	32	53.33	28	46.67
	c. Rice Hispa	33	55.00	27	45.00
	d. Rice Leaf Folder	25	41.67	35	58.33
2.	**Pesticides/insecticide**				
	a. Carbofuran or Acephate (Stem borer)	32	53.33	28	46.67
	b. Chlorypyriphos or Acephate (Brown Plant hopper)	32	53.33	28	46.67
	c. Monocrotophos or Chlorypyriphos (Rice hispa)	35	58.33	25	41.67
	d. Monocrotophos or Chlorypyriphos(Rice Leaf folder)	29	48.33	31	51.67
3.	**Disease symptoms**				
	a. Rice Blast	27	45.00	33	55.00
	b. Bacterial Blight	29	48.33	31	51.67
	c. Sheath Blight	32	53.33	28	46.67
	d. Brown Spot	29	48.33	31	51.67
4.	**Fungicides**				
	a. Tricyclazole (Rice Blast)	30	50.00	30	50.00
	b. Mancozeb (Bacterial Blight)	34	56.67	26	43.33
	c. Propioconazole (Sheath Blight)	30	50.00	30	50.00
	d. Mancozeb (Brown Spot)	33	55.00	27	45.00

In case of cotton crop from Table 3 it is clear that knowledge level of farmers regarding Plant Protection Measures on pests, 53.33 and 46.66 per cent of farmers had knowledge about white fly and Aphids. Followed by 41.67 and 36.67 per cent of the farmers had knowledge about jassids and mealy bug respectively. With regard to pesticides, 48.33and 45.00 per cent of the farmers had knowledge about polo used for whitefly and jassids control, followed by 36.67 per cent of the farmers knew about Imidaclopride and Profenophos for control of aphids and mealybugs respectively. In case of diseases, 61.67 and 51.67 per cent of the respondents had knowledge about Anthracnose and Bacterial wilt respectively. Followed by 46.67 and 36.67 per cent of farmers had knowledge on bacterial rust and leaf spot. Regarding fungicides, 46.67 per cent had the knowledge about mancozeb and copper oxychloride for anthracnose and rust, whereas 41.67 and 36.67 per cent of the farmers knew about Carbendizm and Mancozeb for bacterial wilt and leaf spot respectively.

Table 3: Components wise knowledge level of Cotton growers with regard to Plant Protection Measures. (n_2=60)

Sl. No	Components	Knowledge		No knowledge	
		F	%	F	%
1.	**Pests symptoms**				
	a. White fly	32	53.33	28	46.67
	b. Jassids	25	41.67	35	58.33
	c. Aphids	28	46.67	32	53.33
	d. Mealy bug	22	36.67	38	63.33
2.	**Pesticides/insecticides**				
	a. Polo	27	45.00	33	55.00
	b. Polo	29	48.33	31	51.67
	c. Imidaclopride	22	36.67	38	63.33
	d. Profenophos	22	36.67	38	63.33
3.	**Diseases symptoms**				
	a. Anthracnose	37	61.67	23	38.33
	b. Bacterial wilt	31	51.67	29	48.33
	c. Bacterial rust	28	46.67	32	53.33
	d. Leaf spot	22	36.67	38	36.67
4.	**Fungicides**				
	a. Mancozeb (anthracnose)	28	46.67	32	53.33
	b. Carbendizam	25	41.67	35	58.33
	c. Copper oxychloride (rust)	28	46.67	32	53.33
	d. Mancozeb (leaf spot)	22	36.67	38	36.67

Conclusion

Knowledge refers to the body of information understood and retained by the farmers about recommended plant protection measures in paddy. It refers to the farmers understanding of the different recommended plant protection measures of paddy cultivation. It was concluded from the study that, 45.00 per cent of the paddy growers come under medium knowledge category. Whereas, equal percentage (35.00%) of cotton growers come under high and low knowledge categories. The possible cause might be due to their medium economic motivation, risk orientation and farming experience. The respondents want to raise their annual income, this might have motivated them to augment their knowledge on Paddy and cotton cultivation. The further reason for this could be due to majority of the farmers had small land holdings with medium mass media exposure, medium extension contact and medium innovativeness. The outcome of the study showed that only 30.00 and 35.00 per cent of paddy and cotton grower's respondents respectively, had high knowledge level about Plant Protection Measures of paddy and cotton crop. Hence it is overbearing that State Department of Agriculture, state agricultural universities and other NGOs should sort out combined and intensive extension efforts to provide prerequisite knowledge about Plant Protection Measures to paddy and cotton growers.

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