

LEVEL OF ADOPTION OF HIGH DENSITY PLANTING SYSTEM IN COTTON AT WARANGAL DISTRICT OF TELANGANA

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ABSTRACT

The study was conducted in Warangal District of Telangana during the year 2022. The main purpose of this study is to measure the Adoption of improved cultivation practices through high density planting system in cotton growers at Warangal District of Telangana. A total 120 respondents were selected purposively from six villages under Gessugonda block because most of the respondents were cotton growers. Descriptive research design was adopted for the study and data were collected by personal interview method by using pre structured interview schedule. The findings of the study revealed that where as the respondents have the mostly highly /fully adopted recommended time of sowing in cotton. The data from high density planting system cotton growers were collected by personal interview method. Relatively higher proportion of high density planting system cotton growers (50%) were in medium adoption level followed by more than one fifth of them (29.67%) were in low level of adoption of recommended package of practices whereas, (20.83) per cent Bt cotton growers who were in high level of adoption of recommended package of practices by high density planting cotton growers.

KEYWORDS: Knowledge, Adoption, High Density Planting System in Cotton (HDPS)

Article History

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INTRODUCTION

Cotton is one of the most important fibre and cash crop of India and plays a dominant role in the industrial and agricultural economy of the country. Cotton is the most important fibre crop not only of India but of the entire world. It provides the basic raw material (cotton fibre) to cotton textile industry, Cotton in India provides direct livelihood to 6 million farmers and about 40-50 million people are employed in cotton trade and its processing. India has the largest area under cotton cultivation in the world though it is the world's third largest producer of cotton after China and the USA. Currently it is grown over 6 per cent of the net sown area.

Cotton is one of the vital commercial fibre crops, play a prominent role in the national and international economy due to its high commercial value, it is also popularly known as 'White Gold. In India, it is important cash and commercial crop valued for its fibre and vegetable oil. It is a source for earning the valuable foreign exchange by providing employment to millions of people and hence plays a significant role in the national economy. The diverse products obtained from cotton include textile raw material, cotton seed is a major source of vegetable oil and cotton cake as a rich source of high quality protein for livestock feed. Cotton is primarily grown as a fibre crop. It is harvested as 'seed cotton,

which is then 'ginned to separate the seed and lint. The long lint fibres are further processed by spinning to produce yarn that is knitted or woven into fabrics. (Kalidasan 2020).

Cotton is an immensely important crop for the sustainable economy of India and livelihood of the Indian cotton farming community. It is cultivated in about 312 lakh hectares across the world and in around 117 lakhs hectares in the country. Thus, India accounts for around 37.5% of the global cotton area and contributes to 26% (i.e. 6.20 Million MT) of the global cotton produce of 23.92 Million MT. Cotton continues to enjoy a pre-eminent and the most favoured fibre status among the Indian textile mills, as the major raw material for the textile industry (Chockalingam 2016)

Cotton Cultivation in Telangana

In Telangana state during 2021-22 area under cotton as on 29th September was 46,42,695 acres as against 60,17,992 acres during 2020-21. Among the districts, Nalgonda stood first with (6,54,667 acres) followed by, Warangal (5,56,228 acres) Adilabad (3,87,311 acres), Sangareddy (3,61,213 acres), Nagarkurnool (3,52,619 acres) and Asifabad (2,97,280 acres).

High Density Planting System in Cotton

With the advent of Bt technology and the release of hybrids during 2002, cotton productivity had a momentum. However, considering the duration, cost involved in manual harvesting etc., farmers were looking for alternate option improved cultivation practices through High-Density Planting System (HDPS) offered a promise in this direction. Farmers were looking for that could yield better under higher planting densities with fewer bolls per plant, synchronized maturity with uniform bursting. Efforts have been taken all over the World in this direction Nevertheless, India is the largest producer cum leading consumer of cotton in the World. It's very clear now that albeit having higher area under cotton, the productivity of cotton is very low compared to many of the Countries which warrants attention mainly on developing newer genotypes that would yield better on higher management condition. Strategies that could maximize the per unit area yield in cotton and India is not an exception. Handful of varieties fitting to this situation has been released from many of the Universities through interventions and the futuristic requirements for achieving at least 700 kg of lint per hectore

Concept of HDPS in Cotton

concept of high density planting system in cotton its is new, modern and advanced method of cultivation practices in cotton rather than old and traditional cultivation practices, this method of improved cultivation practices include sowing of cotton before July 10 on kharif season, spacing is RR 80 cm and PP 20 cm and per acre with planting population is 25000 per acre in new cultivation practice, using fertilizer per hectare with 20 kg of N and 60 kg of P and 60 kg of K per hectare, and application of growth regulator Mepiquat chloride at two regular intervals between first time at time of flowering 45 interval with dosage of 1.5 ml per litre of water and at second time at time of formation of bolls 60 days interval with dosage of 2.0 ml per litre of water. Mepiquat chloride provides the plant with retards its growth and size of plant equally formation of flowers and bolls at an equal intervals with synchronous maturity thus the all bolls will burst at equal interval and cotton picking is easy and single picking is followed, yield has been increased per acre with 10-12 Q/acre and alternatively decreased cotton growing in acres has decreased and pink boll worm effectiveness and peast surveillance has decreased in next kharif crop, harvesting cotton before the last week of November thus again rabi crop has grown alternatively with other crops like sesamum and groundnut.

OBJECTIVES OF THE STUDY

- To assess the level of knowledge of the respondents towards high density planting system in cotton.
- To determine the level of adoption of high-density planting system in cotton.

RESEARCH METHODOLOGY

The study was conducted in Telangana state District of Warangal on improved cultivation practices through high density planting system in cotton. Descriptive research design was adopted for the study as it describes the characteristics or phenomena that are being studied. A total number of 120 respondents were selected purposively from six villages under Gessugonda block to measure and to know the adoption level of improved cultivation practices in cotton through high density planting system. The data was collected by personal interview method by using pre-structured interview schedule and latter appropriate statistical analysis (i.e. frequency, percentage.) was done to draw logical conclusion.

RESULTS AND DISCUSSIONS

Table 1: To Assess the Level of Knowledge of the Respondents towards High Density Planting System in Cotton

S.No	Knowledge in HDPS in cotton	A (AGREE)		UD (UNDECIDED)		DA (DISAGREE)	
		F	%	f	%	F	%
1	Soil suitable for HDPS cotton cultivation	48	40	30	25	42	35
2	Crop duration	42	35	40	33.3	38	31.6
3	Time of sowing	35	29.16	28	23.3	57	47.5
4	Recommended spacing (PxP 20 cm and RxR 80cm)	55	45.83	15	12.5	50	41.66
5	Cultivars used for HDPS	38	31.66	32	26.66	50	41.6
6	Gap filling	48	40	28	23.3	44	36.67
7	Crop duration	28	23.33	52	43.33	40	33.3
8	Pre- emergence herbicides	17	14.16	86	71.66	17	17.16
9	Post - emergence herbicides	54	45	48	40	18	15
10	Recommended dose of NPK fertilizers	58	48.3	14	11.66	48	40
11	Critical stages of irrigation	33	27.5	48	40	39	32.5
12	Methods of irrigation	20	16.66	88	73.33	12	10
13	Intercropping	35	29.16	25	20.83	60	50
14	Recommended dose of FYM	26	21.66	72	60	22	18.3
15	Pest identification in HDPS cotton(sucking pest like jassid, thrips and whitefly) (Bollworm pest like American ,spotted and pink boll worm etc)	26	30	52	43.3	32	26.67
16	Disease observed in HDPS in cotton(anthraxnose, fusarium wilt etc)	33	27.5	60	50	27	22.5
17	Micro nutrient deficiencies	31	25.83	24	20	65	54.16
18	Recommended dosage of PGR	44	36.67	30	25	46	38.33
19	Harvesting	16	13.33	86	71.66	18	15
20	Yield (hybrids 12-15q/a and varieties with 7-8 q/a)	39	32.5	44	36.66	37	30.83
21	Marketing	17	14.17	89	74.16	14	11.66
22	Using PGR mepiquat chloride in regular intervals used	26	21.66	56	46.66	38	31.66
23	In HDPS mechanization can reduce the labour problem	33	27.5	24	20	63	52.5

F= frequency, % percentage

A = AGREE, UA = UNDECIDED, DA= DIAGREE

HDPS (HIGH DENSITY PLANTING SYSTEM IN COTTON)

Knowledge indicates the present status of using of the recommended package of practice in the high density planting system in cotton growers. The results obtained after analysis of data about knowledge of recommended practices by the respondents of the high density cotton growers are presented in the table 1 From the above table it can be observed that among dependent variables of the knowledge most (48.3%) of the respondents are completely agreed that application of recommended dose of NPK fertilizers are used by their knowledge only, followed by (45.83) of the respondents are agreed that recommended spacing is given in between(PxP 20cm)and (RxR 80), (45%) Of the respondents are agreed that having knowledge on post emergence herbicides names, (40%) Of the respondents are agreed that their soil is suitable for high density planting system, and having deep knowledge on gap filling, (36.67%) of the respondents are agreed that they have knowledge on recommended dosage of PGR . (74.16%) of the respondents undecided that they are have exact knowledge on marketing prices and price fluctuations, (73.33%) of the respondents undecided methods of irrigation practices, (71.66%) of the respondents undecided that at what timing should pre emergence herbicides should be applied, (50%) of the respondents have undecided that they have observed disease in HDPS cotton, (46.66%) of the respondents un decided that know that using of PGR (mepiquat chloride) in regular intervals, (54.16) of the respondents have disagreed that their soil is with micro nutrient deficiency, (52.5%) of the respondents have disagreed that through HDPS can reduce the labour problem, 50% of their respondents have disagreed that intercropping not used in HDPS, (47.5) of the respondents have disagreed that time of sowing before July 10th last date for sowing, (41.66%) of the respondents have disagreed cultivation practices and cultivars.

Table 2: Overall Level of Knowledge of Respondents about High Density Planting System in Cotton

S.No	Knowledge	Frequency	Percentage
1.	Low	38	31.67
2.	Medium	42	35
3.	High	40	33.33
	Total	120	100.00

Distribution of the Respondents according to their Overall Knowledge Level

From the above table it can be observed that most of the respondents(35%) have the high knowledge level towards the high density planting system cultivation cotton. followed by (33.33%) medium and low (31.67) have knowledge in high density planting system cotton cultivation.

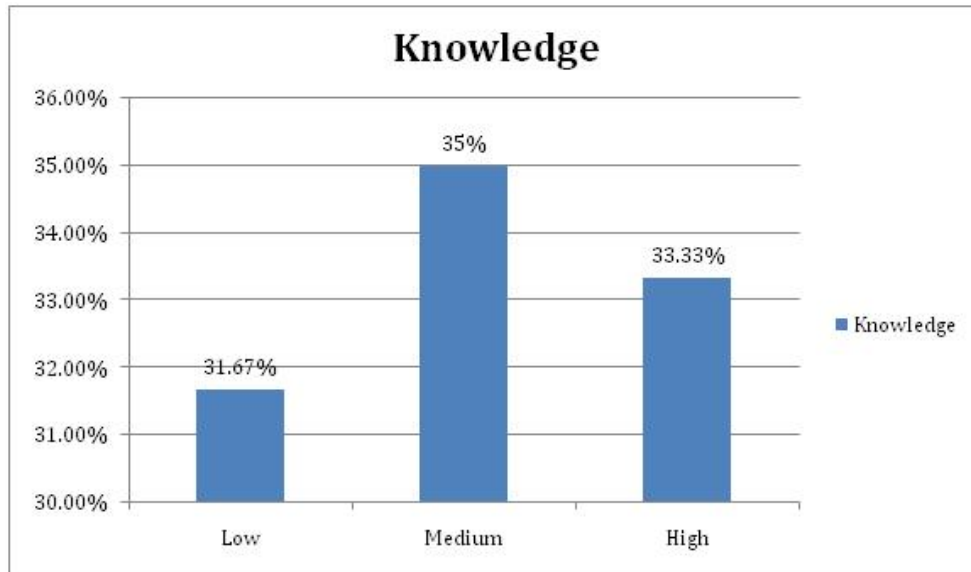


Figure 1: Distribution of the Respondents according to their Overall Knowledge Level of Improved Cultivation Practices through High Density Planting System in Cotton.

Table 3: To Determine the Level of Adoption of High-Density Planting System in Cotton

S.No	Adoption of HDPS in Cotton	Fully Adoption (FA)		Partial Adoption (PA)		No Adoption (NA)	
		F	%	F	%	F	%
A)	Land preparation						
1)	Summer ploughing and harrowing	16	13.33	95	79.16	9	7.5
2)	Cultivation of HDPS in recommended soil	22	18.33	87	72.5	11	9.16
B)	Selection of varieties						
3)	Non Bt	32	26.66	45	37.5	43	35.83
4)	Bt and HYV varieties	12	10	98	81.66	10	8.33
C)	Soil treatment						
5)	Use of chlorpyrifos	37	30.83	58	48.33	25	20.83
6)	Use of phorate	33	27.5	42	35	45	37.5
D)	Seed Treatment						
7)	Use of streptomycin	42	35	20	16.66	58	48.33
8)	Use of agromycin	18	15	15	12.5	87	72.5
E)	Recommended time of sowing						
9)	In case of irrigated conditions	56	46.66	44	36.66	20	16.66
10)	In case of Rainfed conditions	20	16.66	58	48.33	42	35
F)	Seed rate and spacing						
11)	In case of seed rate irrigated(1.5-2.2 Kg/ha) and rainfed conditions(2.5 – 3 Kg/ha)	38	31.66	66	55	16	13.33
12)	In case of spacing PP x RR (20 x 80) cm	42	35	69	57.25	9	7.5
G)	Macro and Micro nutrients Fertilizer application						

13)	Recommended dose of N fertilizers	12	10	98	81.66	10	8.33
14)	Recommended dose of P fertilizers	22	18.33	92	76.66	6	5
15)	Recommended of K fertilizers	16	13.33	96	80	8	6.66
16)	Recommended dose usage of Micro nutrients.	20	16.66	88	73.33	12	10
H)	Weed management						
17)	Manual weeding	18	15	94	78.33	8	6.667
18)	Use of pre emergence herbicides	33	27.5	79	65.83	8	6.667
19)	Use of post emergence herbicides	22	18.33	87	72.5	11	9.16
I)	Irrigation management						
20)	Application of 1 st irrigation timing	12	10	102	85	6	5
21)	Application of 2 nd irrigation timing	46	38.33	56	46.66	18	15
22)	Application of 3 rd irrigation timing	17	14.16	93	77.5	10	8.33
J)	Plant protection measures and growth promoters						
23)	Exact Recommended dose on time	46	38.33	63	52.5	11	9.16
24)	Use of insecticides	28	23.33	15	12.5	77	64.16
25)	Use of fungicides	18	15	88	73.33	14	11.66
K)	Plant growth regulators(PGR)						
26)	Only usage of mepiquat chloride PGR	35	29.16	22	18.33	63	52.5
27)	Application time of PGR exact 45 and 60 days interval only	52	43.33	44	36.67	24	20
L)	Pickings						
28)	Appropriate No. of days for picking for HDPS cotton(150-165 DAS) & total No. of picking in single crop (only 1 time)	43	35.83	36	30	41	34.17
M)	Other practices						
29)	Bio fertilizers and FYM	17	14.16	88	73.33	15	12.5
30)	Traps (pheromone trap and sticky traps)	19	15.83	87	72.5	14	11.667
31)	Mechanical harvesting	10	8.33	105	87.5	5	4.16

F=frequency, %=percentage

(FA = FULLY ADOPTED, PA = PARTIALLY ADOPTED, NA = NO ADOPTION)

HDPS (HIGH DENSITY PLANTING SYSTEM IN COTTON)

Adoption indicates the present status of using of the recommended package of practice by the high density planting system in cotton growers. The results obtained after analysis of data about adoption of recommended practices by the respondents of the high density cotton growers are presented in the table 1. They cultivate the cotton on the land available by high density planting system growing trend. Regarding the land preparation respondents (46.66%) have fully adopted the land preparation practices like ploughing and harrowing, (43.33%) of the respondents have fully adopted application on time PGR on exact 45 - 60 days, (38.33%) have fully adopted the

From the above table it can be observed that among most (46.66%) of the respondents are fully adopted the exact recommended dose of pesticides and fungicides on time,(35.83%) of the respondents have fully adopted the appropriate no. of days for picking of HDPS cultivation cotton and only picked through singe time,(35%) of the respondents have fully adopted the equal spacing in between PP and RR with 20 x 80 cm, (87.5%) of the respondents have partially adopted the mechanical harvesting in cotton picking to reduce the labour problem and increase the mechanization ,(81.66%) of the respondents have partially adopted the exact dose and recommended N fertilizers to the soil on time,(79.16%) of the respondents have partially adopted the summer ploughing and harrowing,(78.33%) of the respondents have partially adopted the manual weeding because of the labour problem,(72.5%) of the respondents have partially adopted cultivation on HDPS of cotton in recommended soil only,(72.5%) of the respondents have not adopted the agromycin for the soil treatment,(64.16%) o the respondents have not adopted the use of sucking and boll worm pesticides like emamection benzoate and fonic amid through partially, (52.5%) of the respondents have not adopted the usage of the mepiquat chloride (PGR) plant growth regulator at between two intervals , (48.33%) of the respondents have not adopted the use the steptocycln for the soil treatment, (35.3%) of the respondents have not adopted the non Bt seeds for the cultivation.

Table 4: Overall Adoption by Respondents of High Density Planting System in Cotton.

S.No	Adoption	Frequency	Percentage
1.	Low	35	29.67
2.	Medium	60	50
3.	High	25	20.83
	Total	120	100.00

Distribution of the Respondents according to their Overall Attitude Level

From the above table it can be observed that most of the respondents(50%) medium have the attitude level towards the high density planting system cultivation cotton. followed by (20.83%) medium and low (29.67%) having in high density planting system cotton attitude in cultivation

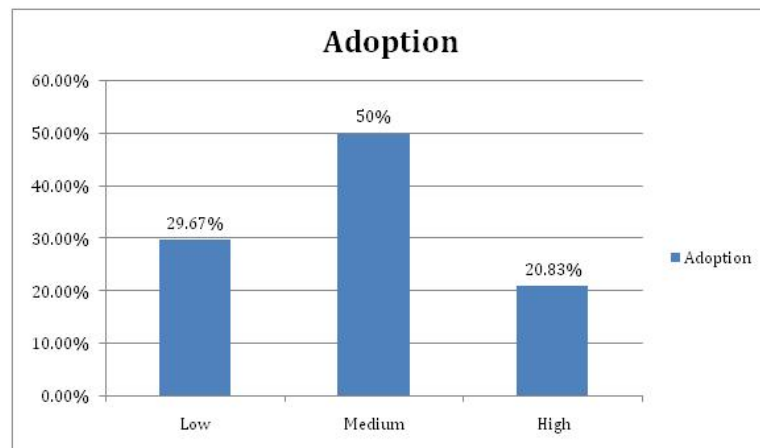


Figure 2: Distribution of the Respondents According to their Overall Adoption of Improved Cultivation Practices through High Density Planting System in Cotton.

CONCLUSION

It was concluded that the majority of the high density planting system Cotton growers had medium level adoption of improved cultivation practices in Cotton cultivation practices. Higher adoption level was observed in land preparation, planting related practices, nutrient management practices, harvesting practices; whereas lower adoption was observed in irrigation and FYM, micro nutrient, weedicide, bio pesticide application. Different factors viz. In view of the above findings, the study recommends that efforts should be made by extension agencies through their various programmes to highlight the economic benefits of improved cultivation practices in cotton to promote awareness among the high density planting system growers. Study tours, exposure visits, more village level meeting should be conducted and well trained farmers with better cultivation practices, participation in fairs and exhibitions could be the ideal methods and the government or non-government authorities give proper training on cotton for HDPS cultivation and conduct the training programmes to awareness

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