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Evaluation of IPM module for the management of sucking pest of cotton in Prakasam district

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Abstract
The study on evaluation of IPM module for the management of sucking pest of cotton in Prakasam district was carried out during *Kharif*, 2018-19 in farmer's fields of cotton growing tracts of Prakasam district. The experiment was carried out in 4.0 ha with active participation of farmers with an objective to assess the integrated management module for the management of sucking pest in cotton. In IPM module, reduced the incidence of leafhopper and thrips with in the range of 1.90 to 4.83 leaf hoppers / 3 leaves and 6.3 to 11.8 thrips/ 3 leaves, respectively over farmer practice (6.33 leaf hoppers /3 leaves and 13.2 thrips/3 leaves, respectively). IPM module recorded 6.31 q/ha (C:B ratio of 1: 0.5) which is 9.56 per cent higher than that obtained in farmers practice (5.25 q/ha with C:B ratio of 1:0.4).

Keywords: Cotton, IPM module, *Kharif*, sucking pests and yield

1. Introduction
Cotton (*Gossypium hirusutum* L) is a fibre crop. It is popularly called as friendly fiber because of its versatility, appearance, performance and above all its natural comfort. About 1326 pests have been reported to damage the cotton crop. In India around 162 insect pests have been reported to cause damage to the cotton crop. Among them, only a dozen are major and half of them are key production constraints which cause losses to the extent of 30-80 per cent. Cotton is an excellent reproductive host for many sucking insects such as leafhoppers, *Amrasca devastans* (Distant); aphids, *Aphis gossypii* (Glover); thrips, *Thrips tabaci* (Lindeman) and whiteflies, *Bemisia tabaci* (Gennadius). The estimated loss due to sucking pests is up to 21.20 % [1]. Cotton growers depend heavily on synthetic pesticides to combat sucking pests. Atleast 2-3 sprays are directed against sucking pests. Due to Continuous and indiscriminate use of synthetic insecticides, there is resistance and hence increase in production cost, toxicity to natural enemies. So, potential solution is adoption of IPM strategies plays a key role. Keeping these things in view IPM module was formulated and assessed in farmers fields for the management of sucking pest in cotton during 2018-19 season.

2. Materials and Methods
The present study was carried out, in *Kharif* season in the fields of Basireddypalli village (Kurchedu mandal), Prakasam District Andhra Pradesh during 2018-19 by the Krishi Vigyan Kendra, Darsi. In this study, 10 farmers were selected under front line demonstration of cotton. The improved technology consisting installation of yellow sticky traps (20 traps/acre) and blue sticky traps (20traps/acre), intercropping with blackgram, spraying with neem oil @ 1000 ml/acre, spraying with diafenthiuron 50% WP @ 250 g/ac against leaf hoppers and whiteflies, flonicamid 50% WG @ 60 g/ac against leaf hoppers. Farmers practice includes indiscriminate spraying of different insecticides like acephate, imidacloprid, fipronil, monocrotophos at different crop stages.

Data recorded
a) No. of leaf hopper/3 leaves
b) No. of thrips/3 leaves
c) Seed cotton yield
d) Cost benefit ratio

3. Results and discussions
During the evaluation, in IPM module reduced the incidence of leafhopper and thrips with in the range of 1.90 to 4.83 leaf hoppers / 3 leaves and 6.3 to 11.8 thrips / 3 leaves, respectively

over farmer practice (6.33 leaf hoppers /3 leaves and 13.2 thrips/3 leaves, respectively) Table 1.

The mean number of aphids, jassids, thrips and whitefly were less in IPM module as compared to farmer practice and this because of adoption of IPM strategies, effectively reduced the population of thrips, jassids and aphids and also resulted in higher B:C ratio in IPM module compared to farmer practice [4]. Less incidence of jassids were reported when intercropped with greengram and blackgram [7]. Lesser incidence of jassids and whiteflies per leaf were reported in IPM module [6].

Spraying of dinotefuran 20 SG @0.008 per cent, fipronil 5SC @ 0.015 per cent, acetamiprid 20 SP @0.004 per cent and flonicamid 50 WG @ 0.02 per cent successfully checked the incidence of leafhopper and thrips within the range of 0.63 to 0.93 leaf hoppers/leaf and 2.59 to 3.60 thrips/leaf at thrid spray [2]. Present studies are in conformation with earlier studies who reported that the spraying of flonicamid 50% WG @ 100 g a.i/ha were found promising to manage the major sucking pests of Bt cotton followed by flonicamid 50%WG @ 75 g a.i/ha, buprofezin 25%SC @250 g a.i/ha and diafenthiuron 50%WP @ 300 g a.i/ha [3].

Table 1: Yield and economic analysis of demonstration in cotton

S. No	No. of Farmers	No. of leaf hoppers per three leaves	No. of thrips per three leaves	Seed cotton yield (q/ha)	Cost of Cultivation	Gross Income (Rs.)	C: B ratio
		4.14	8.55	6.8	72000	34000	1:0.5
2	Farmer 2	4.83	11.8	6.5	70000	32500	1:0.5
3	Farmer 3	3.45	10.8	6.5	69000	32500	1:0.5
4	Farmer 4	2.58	7.29	5.5	68000	27500	1:0.4
5	Farmer 5	2.35	8.1	6.5	70000	32500	1:0.5
6	Farmer 6	3.40	6.3	5.5	68500	27500	1:0.4
7	Farmer 7	4.25	7.2	6.5	71000	32500	1:0.5
8	Farmer 8	2.72	6.3	6.8	72000	34000	1:0.5
9	Farmer 9	1.90	8.0	6	65000	30000	1:0.5
10	Farmer 10	3.55	7.0	6.5	70500	32500	1:0.5
Average		3.31	8.1	6.31	69600	31550	1:0.5
Control		6.33	13.2	5.25	72000	28750	1:0.4

3.1 Yield impact

The information regarding the impact of FLD in terms of increase in yield have been presented in table 1.

The data in table 1 revealed that the yield of cotton increased by 9.56 per cent in FLD plots. Economic performances of cotton under front line demonstration were depicted in (Table-1).

3.2 Economic impact

In this study, the economic impact of technology was worked out by calculating total cost of cultivation, gross return, net return and C:B ratio of IPM module followed plot and farmer practice plot. Total cost was calculated by total sum of expenditure of land preparation, seed, irrigation and labour component.

The data in table 1 revealed that the yield of IPM module followed plot was 6.31 q/ha whereas farmer practice plot the yield was 5.25 q/ha.

The economic analysis results revealed that the cotton recorded higher gross returns from IPM module were 31550 Rs ha^{-1} as compared to 28750 Rs ha^{-1} in farmers practice. The C:B ratio in IPM module was 1:0.5 while in farmer practice plot was 1:0.4. IPM module proved beneficial in respect of yield and economics of cotton.

It was evident from the results that C:B ratio of cotton crop in IPM module was higher than the farmer practice. The factor responsible for lower C:B ratio in farmer practice because of non adoption of IPM module for sucking management in cotton crop. However, increase in C:B ratio in treatment plot was due to the adoption of IPM module. Present results are in confirmation with the earlier studies, who reported that higher seed cotton yield in IPM module (C: B ratio 1:5.3) compared to farmers practice with C:B ratio 1:2.5 [5].

4. Conclusion

IPM practices were found effective in comparison to farmer practice of indiscriminate use of pesticides. So, the above said management practices must be followed by the cotton growing farmers.

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