

Original Research Article

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Stem Application Technique in Cotton is Made Easy Sucking Pest Management in Cotton Cultivation in Vizianagaram District of North Coastal Zone of Andhra Pradesh

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ABSTRACT

Keywords

Stem application, cotton, farmers, sucking pest management, Front Line Demonstrations (FLDs), Yield and yield attributes, B:C Ratio

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Cotton is one of the most important fiber and cash crop of India and plays a dominant role in the industrial and agricultural economy of the country. Nearly 65 percent of cotton area is under rainfed and mainly in the Central and Southern States Cotton crop is highly prone to pests and diseases. In Bt cotton era sucking pests are becoming more serious, inviting indiscriminate use of pesticides. To control sucking pests effectively, stem application technique is cost effective and eco-friendly technology. In this method, sucking pest incidence was controlled by the stem application of systemic insecticides of Monocrotophos 1:4 ratio at 20 days after sowing and Imidacloprid 200 SL with water in 1:20 ration at 40 and 60 days after sowing. Within three days of application the population of sucking pests was reduced. This technique is being demonstrated and documented for two years in 6 locations of Vizianagaram district of Andhra Pradesh. Stem application in cotton showed better performance when compared to the farmers practice in terms of no.of bolls and kapas yield in the demo plots. On an average both years cotton kapas yield (2111kg/ha) under Front Line Demonstrations (FLDs) was higher by 19.76% percent as compared to farmer's practices. The results from the study showed that the farmers realized the Rs.17,260 additional net income due to increased cotton kapas yield by 19.76% with reduction of cost of cultivation by Rs.3300, it could be attributed to reduction in manual labour requirement for stem application and also increase in yield attributes and yield.

Introduction

Cotton as a crop as well as commodity has a unique place in the economy of India as it plays an important role in the agrarian and industrial activities of the nation, In Andhra Pradesh, the total area under cotton is 6.66 lakh hectares and the production is 18.17 lakh bales with the productivity of cotton is 464 kg

ha⁻¹ in 2015-16 (Agriculture Statistics at a Glance, 2016-17). Vizianagaram district is the one of the cotton growing districts in Andhra Pradesh. Farmers grow cotton in 13774 ha during Kharif with the productivity of cotton is 361 kg ha⁻¹ in 2015-16. After introduction of Bt cotton, the sucking pest complex is increasing season by season. More over farmers are facing the problem for water

availability near by their fields at the initial stages of cotton growing areas to mix spray fluid, because cotton is growing in rainfed areas in Vizianagaram District. Besides that, cost of cultivation is rising year by year due to many reasons i.e social reasons, situational factors and input cost. At present, cost of cultivation per hectare is between Rs.30,000/- to Rs 35000/-. This is mainly due to escalation of labour wages and scarcity of labour in villages during agricultural season, labour requirement is very intense at the time of rice transplanting season and co incidence of weeding in cotton.

To overcome this problem, DAATT Centre, Vizianagaram is promoting the stem application of systemic insecticides of Monocrotophos 1:4 ratio with water at 20 days after sowing and Imidacloprid 200 SL in 1:20 ratio with water at 40 and 60 days after sowing found effective in controlling the sucking pest like aphids, leafhoppers etc., in initial stages of crop growth. The stem application method is popularizing through trainings and method demonstrations in FLD fields as well as in other farmer fields for the control of sucking pests and simultaneously tested the modified tools (Stem application bottles) under FLD for the better adoption.

During the first and second year we have faced difficulties in the adoption and spread of this technology even though it is an effective. We have collected feedback from the farmers in which most of the farmers expressed that, the application with brushes is laborious and women labour is refusing to work for this due to chemical smell and contamination. Here we have taken a simple intervention of using Plastic pipes inserted with brush which can overcome drudgery reduction for the application of chemical. Stem applicators were distributed to the farmers under demonstrations by the DAATT Centre, Vizianagaram district. Wide publicity

was given through electronic and print media on this stem application technology and farmers were well educated about the stem application technology through method demonstrations.

The prime concern is to enhance productivity and with reduced cost. In order to reduce the cost of cultivation DAATT Centre, Vizianagaram took initiatives in collaboration with Department of Agriculture to promote Stem application in Vizianagaram district the following objectives include to popularize the stem application technology cotton in the Vizianagaram District through Front Line Demonstrations(FLDs) for management of sucking pest in cotton. To analyze the parameters for contributing to yield and economics of stem application technology in cotton in Vizianagaram District. And to educate the farmers on stem application for management of sucking pests by organizing FLDs and follow-up of extension programmes

Materials and Methods

Scientists in DAATT Centre, Vizianagaram District of ANGRAU in collaboration with Department of Agriculture, Vizianagaram District has introduced stem application technology (Anonymous, 2002) in cotton with comparing normal method of cultivation through organizing Front Line Demonstrations (FLDs) during Kharif,2015-16 and Kharif,2016-17 in 6 locations. The Scientist of DAATT Centre, Vizianagaram interacted with farmers and imposed the treatments of stem application as per the designed methodology. Data pertaining to number of bolls per plant and yield of kapas were recorded. Yield per 5x5m² was collected and calculated per hectare area was recorded. Mean of yield attributes, yield and cost of cultivation were calculated in demonstrations and farmers practice methods. The statistical tools like average yield, percentage increase,

average cost of cultivation was used. Percentage yield increase over normal method was calculated and comparative analysis of cost benefit ratio per hectare was arrived and presented in the tables.

Results and Discussion

No of Bolls per plant

The main yield attribute, during all the years were recorded better in in demonstration plots than farmers practice (Table.1). During the two seasons of two years of demonstrations and in all the locations recorded the number of boll per/plan 140 are more than normal practice 101 (Table 1). In the farmers practice

observed more number of aphids, jassids, thrips and whiteflies. The management of sucking pests of cotton by stem application with Monochrophos (1:4) dilution 20 and imidacloprid 200 SL (1:20) using small brush at 40 and 60 DAS keep the crop free from sucking pests up to 75 days without harming natural enemies(Gaur *et al.*,1999). Similar results were found as effective treatment with imidacloprid as stem smearing against sucking pests of cotton (Barkhade and Nimbalkar, 2000). This could be attribute that, managing sucking pests, more photosynthetic area of leaves are active and helped in more squares formation and resulted in more bolls per plant.

Table.1 Mean data on Yield and Yield attributes of Front Line Demonstrations (FLDs) on Stem application technology in cotton conducted during Kharif-2015-16 and Kharif, 2016-17

Season	No.of Locations	No.of Bolls per plant		Cotton Kapas Yield Kg/ha		Percentage Increase over Check
		Stem Application Method	Farmers Practice	Stem Application Method	Farmers Practice	
Kharif-2015-16	3	140	110	2150	1780	20.79
Kharif-2016-17	3	141	92	2073	1746	18.73
	Average	140	101	2111	1763	19.76

Table.2 Economics of the Stem application technology in cotton vs Normal cotton cultivation method recorded during Kharif-2015-16 and Kharif, 2016-17

Sl.No	Particulars	Stem Application Method	Farmers Practice	Difference
1	Kapas Yield Kg/ha	2112	1763	349
2	Kapas Value (Rs.40/kg)	84480	70520	13960
3	Total cost of cultivation Rs./ha	34500	37800	-3300
4	Net income Rs./ha	49980	32720	17260
5	C:B ratio	2.45	1.87	0.58

Organsing Method Demo on Stem Application Technique in Cotton during 2015-16 & 2016-17



Kapas Yield

On an average, cotton kapas yield (2111kg/ha) in Front Line Demonstrations (FLDs) was higher by 19.77% percent as compared to farmer's practices (1764kg/ha). The results indicated that the demonstration has given good impact in terms of yield and it could be due to more number of bolls per plant contributed to more kapas yield (Table 1).

Economics

The results indicated that the demonstration has given good impact in terms of yield and income with a gross income of Rs.84480/-, net income of Rs.49980/-, and cost benefit ratio of 2.45 as compared to farmers practice (gross income of Rs.70520/-, net income of Rs.32720/-, and cost benefit ratio of 1.87).

Impact of the technology revealed that the additional net income realized by Rs.13960 over the farmer's practice (Table 2). This could be attributed to that, stem application in cotton showed better performance when compared to the farmers practice in the kapas yield in the demo plots and also the number of sprayings required for control of sucking pests were reduced by 3-4 sprays and an amount of Rs.3300/- was reduced on purchase of systemic insecticide.

In conclusion the FLDs taken up and implemented by DAATT Centre, Vizianagaram helped the farming community in many folds. Stem application is an eco-friendly, cost effective technology, reduced the cost on number of sprays and labour usage in cotton crop. The technology was handed over to the Department of Agriculture for further popularization and handholding after

conducting field days, through T&V meetings regular interaction meetings with officers of Department of Agriculture.

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