ROLLING BRUSH STEM APPLICATOR FOR THE MANAGEMENT OF SUCKING PESTS IN COTTON

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ABSTRACT

The present study on the evaluation of the use of rolling brush stem applicator in comparison with normal traditional method of hand spraying in cotton for sucking pests' management. The study revealed that rolling stem applicator was more effective than spraying as it is ecofriendly, low cost, input saving and drudgery reducing tool. Rolling brush method required one labour for three times application at the time of 30, 45 and 60 days after sowing. Total investment for rolling brush was Rs. 650-1500 against spraying which required two labour for five times (local farmers practice) with cost of Rs. 1400-3500 as observed in three years period. The cost for monocrotophos was Rs.105/ application with rolling stem applicator and Rs.420/ l for spraying. With the small quantity of spray fluid, the application by rolling brush was easy and with reduced labour, saving cost of cultivation.

Key words: Cotton, sucking pests, rolling brush stem applicator, sprays, cost benefit, labour, drudgery reduction, environmental pollution, ease of application, yield, monocrotophos

Cotton (Gossypium hirsutum) is an important fibre and cash crop in India (Praveen and Sudharani, 2018) In Telangana, it is cultivated in 17.73 lakh ha, with a productivity of 358 kg/ ha (Agriculture at a glance, 2016). After introduction of Bt cotton in 2002, most of the pesticide sprays got reduced with increased productivity (Sharma and Rampathy, 2006), but sucking pests are serious (Kalkal et al., 2009; Murugesan et al., 2009). Though Bt cotton has been found successful against bollworms, sucking pests have increased due to reduction in pesticide sprays at early stage (Jeyakumar et al., 2009). In an unprotected field, the effect on yield losses in Bt cotton due to sucking pests was about 26.21% (Makwana et al., 2018). The repeated use of insecticides poses hazards to environment, humans, and resistance. Newer molecules such as pyridine carboxamide control sucking pests in cotton (Gourkhede et al., 2015). Farmers mainly go for spraying of such insecticides and it is a tedious and laborious process, increase cost of cultivation and not ecofriendly. Non-availability or shortage of labour adds to the problems of farmers (Kumar et al., 2019). With a gender mainstreaming perspective in agriculture men and women farmers need to be involved equally. Spraying operation by men involves more drudgery for women farmers. Krishi Vigyan Kendra (KVK), Wyra, Khammam designed a rolling brush for stem application in cotton for the control of sucking pests as an ecofriendly, low cost, input saving and drudgery reduction technology for both men and women. The KVK, Rudrur conducted On Farm Trail (OFT), Front Line Demonstration (FLD) and entrepreneurship activity from the period 2015-16 to 2019-20, and the results are presented herein.

MATERIALS AND METHODS

The study was conducted in the adopted villages viz. Suddulum, Takli, Sunkini and Hegdoli of Krishi Vigyan Kendra, Rudrur, Nizamabad district, Telangana state. Feedback of beneficiaries on the use of rolling brush for stem application and farmers normal practice of spraying were consolidated and compared. The cost involved and quantity of insecticide required in hand spraying and rolling stem applicator were assessed. The rolling stem applicator bought from the KVK, Wyra, Khammam consisted of a pipe of 2.5 ft x 2.5 cm dia, a foam holder with high density foam (sponge), with its weight being 250 g. As per the recommendation of Professor Jayashankar Telangana State Agricultural University (PJTSAU) Vyavasaya Diksuchi for sucking pests in cotton, monocrotophos and water (1:4) at 30, 45 days of sowing and imidacloprid and water (1:20) at 60 days of sowing were used. The procedure of mixing of chemical was mixing of 250 ml monocrotophos in 1 l water in a bucket and dipped rolling stem applicator into the spray fluid bucket. The spray fluid gets absorbed
in the high-density foam (sponge) used, which can be applied to the base of the stem for about 15-20 plants. With one rolling stem applicator by hiring one labour, the chemical can be applied to 10500 plants in 1 ha. The applicator can be again reused for many crop seasons. The control plot was maintained with traditional hand spraying. The parameters evaluated include - quantity of insecticide required, time taken for application, cost of chemical and labour, ease of application evaluated. From 2015-16 to 2019-20, Krishi Vigyan Kendra, Rudrur has been promoting the stem application method in cotton through trainings and method demonstrations in FLD fields. During first and second year difficulties in the adoption and spread of this technology were experienced.

RESULTS AND DISCUSSION

Cotton is an important crop and sprayings done by the farmers for control of sucking pests require number of labour and more quantity of chemical required which increases the cost of cultivation of the farmers for growing the crop and also risk of exposure to human beings and beneficiaries is increased. Even, the drudgery produced during spraying is more which cause pain to the labour engaged for application. For a small and marginal farmer, it will be a more burden when the cost of cultivation increases. Rolling stem application will serve as as effective ecofriendly tool in the IPM strategy of cotton as it is very easy to handle and apply, less risk to human beings, environment and beneficial insects. (Kumar et al., 2019). With respect to time consumption for stem application, 18 hr time required in a crop season with a quantity of 250 ml of monocrotophos, the application can be done easily by the rolling brush whereas with spraying, time of 30 hr with quantity of 1 l monocrotophos required. As the quantity of chemical required for application by rolling brush was very less, subsequently the cost was also reduced. With regard to labour charges, rolling brush method required one labour for three times i.e. during 30, 45 and 60 days after sowing. So, total investment for rolling brush was Rs. 650-1500/-. But spraying of chemical required 2 labours for 5 times (local farmers practice) during crop period then total investment was Rs. 1400-3500.

Rolling brush stem application technique is being practiced for three years in 15 locations of Rangareddy district. Stem application showed better performance when compared to the farmer’s practice of spraying in the kapas yield in the demo plots. (Praveen and Sudharani, 2018). The cost incurred for the monocrotophos was Rs.105/- for application by rolling stem applicator and Rs.420/- per 1 litre for spraying. With the small quantity of spray fluid, the application by rolling brush was easy and the number of labour required for application was very less. The number of sprays required for control of sucking pests were reduced by 3-4 sprays and an amount of Rs. 1970/- to Rs. 2170/- was reduced on purchase of systematic insecticide for three years. (Praveen and Sudharani, 2018). The time of application by rolling stem applicator was very less and within a short time more number of area can be covered i.e within a span of 6 hrs of time by rolling stem applicator 1.5 – 2 ha can be covered in a day whereas 1-8 ha/ day can be covered in the span of 3 hr by spraying. Thus, more area can be covered in a short time which enables the farmer to go for timely plant protection measures of a larger area in a shorter time period. Hence, in overall the application by rolling stem applicator reduces the cost of cultivation to farmer, drudgery, input saving and safe to natural enemies.

The results are in contrast with the findings of Nemade (2017), who concluded that three sprays of flonicmid 50 wp@100gd a.i.ha⁻¹, floniamid 50 wp@75g a.i.ha⁻¹, buprofezin 25% SC@250g a.i.ha⁻¹ and difenthiuron 50 wp @ 300g a.i.ha⁻¹ were very effective in controlling major sucking pests of Bt cotton and also gave higher yields. The FLD on stem application in cotton of farmers for sucking pest management taken up and implemented by District Agriculture Advisory and Technology Transfer Centre (DAATTC), Rangareddy PJTSAU helped the farming community. The area under stem application for management of sucking pest has increased 400 ha all over the district. Stem application is an ecofriendly, cost effective technology, reduced the cost on number of sprays and labour usage in cotton crop gained wide popularity with the cooperation of KVK, CRIDA, ATMA and the State Department of Agriculture (Praveen and Sudharani, 2018).

Farmers expressed the following benefits of rolling stem applicator:

1. Labour saving because the application can be done easily as the requirement of water is less, quantity of chemical is less and once the spray fluid is ready, it can be applied.
2. Insecticide saving because the chemical will be absorbed into the sponge will be directly applied to the plant without any wastage as like hand spraying where the chemical wasted because of drift and more requirement of water.
3. No environmental pollution because the chemical is not exposed to environment.
4. No drudgery because the applicator can be
easily carried without much energy and not require to bag it on the shoulders.
5. No drift hazards as like spraying the chemical will be drifted when applied to the plants because of wind and other factors.
6. Easy in application because the equipment is light in weight.
7. It does not need any costly equipment and involves no skill.
8. No harm to natural enemies as the chemical is not exposed to the wind.
9. Risk of exposure to human beings is less because the chemical is not drifted or not exposed to the wind.
10. Cost incurred is very less as the amount of chemical reduced.
11. The technique is well suited for areas where there is severe water scarcity because small quantity of water is required.

Basing the feedback from men and women farmers that, women experienced safe and smooth performance while spraying chemical for the control of sucking pests in cotton and also seeing and observing the benefits as furnished in the table. Krishi Vigyan Kendra, Rudrur believed in the success of the technology and identified Smt. G. Shilpa, the most needy, economically poor and interested farm women to start entrepreneurship on Rolling brush marketing for her livelihood promotion. One rolling brush making charges is Rs. 150, one rolling brush selling price is Rs.180, profit on one rolling brush is Rs.30. Smt G. Shilpa total profit earned after selling of 30 rolling brush in a year is Rs. 900. Cotton is a premier commercial crop in India, and in Bt era sucking pests are becoming more serious. Stem application in cotton with monocrotophos (1:4) is an effective method of control of sucking pests and also compatible with IPM.

**REFERENCES**


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