

**Original Article**

Management of thrips (*Thrips palmi*) infesting water melon var. Kanak in Cooch Behar district of West Bengal, India

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INTRODUCTION

Water melon, *Citrullus lanatus* (Thunb.) Matsum & Nakai. is a vine plant belonging to the family cucurbitaceae. The species consists of various cultivars across the world. Among the Indian states, Uttar Pradesh ranked first in production with 706.65 million tonnes and the state West Bengal ranked sixth with production value of 230.17 million tonnes (Anonymous, 2022). Cooch Behar, Uttar Dinajpur, South 24 Parganas, Bankura and Purulia are the major water melon growing districts of West Bengal. In Cooch Behar, water melon is being grown particularly in Torsha and the Mansai river basin. Mainly cultivars like Kanak, madhuri from icebox segments are being cultivated in the region. The water melon farmers in the region are frequently facing the infestation of water melon thrips, *Thrips palmi* Karny, Thripidae, Thysanoptera. *T. palmi* tend to live and feed on the plant leaves. After extensive thrips feeding, the leaf margins curl upward, and severe damage frequently happens in the early stages of the crop. They feed by puncturing or piercing the host plants' cells and sucking the cell sap, which causes the plant tissues to become discolored and causes the plant and fruit to become distorted. *T. palmi*, both adults and larvae, injected poisonous saliva, which caused plant tissue and epidermal cells to give silvery appearance (Aishwarya and Mawtham 2020). A number of sprays are to be advocated against the pest as the pest infestation results swelling of the apical portion of growing shoot which won't produce any fruit in the future. Cooch Behar Krishi Vigyan Kendra under the aegis of Uttar Banga Krishi Viswavidyalaya conducted on farm trial to minimise the pest menace with an aim to study the field efficacy of three different insecticides along with farmers practice considered as control plot. The trials are being conducted in farmer's fields.

MATERIALS AND METHODS

For selection of farmers a group meeting was organized from where a few farmers were selected considering the production system and farming situation. Ultimately 24 numbers of farmers were selected from primary list after in situ visit of the farmer's field with a plot size of 0.13 hectare each. Water melon variety Kanak was taken under the study during 2022-23. Prior to planting, the seeds were kept in a gunny bag close to a warm location and drenched in water for entire night time to

break the dormancy in November,2022. In roughly three to four days, the seeds began to sprout. The seeds were treated with *Trichoderma viride* @ 20 grams per kg of seed and *Pseudomonas fluorescens* @ 5 ml mixed with 50 ml of water and applied for each kilogram of seeds. The raised beds were prepared with holes drilled at 1m x 1m distance to receive the water melon seed. The raised beds were spaced 1.5 meters apart from one another and covered with 25 to 30 micron polyethylene mulches with a black and a silver side. After 30 days of seed sowing, seeds began to germinate. Fertilizer application rate was 100:50:50 NPK kg/ha. When preparing raised beds, a full dose of fertilizer and FYM @ 20 t/ha were applied in field. Water soluble fertilizers, including 19:19:19, 0:0:50, humic acid, micronutrients like calcium, magnesium, and seaweed extract were also sprayed on the crop leaves at the required dosages during the growing season. Insecticidal spray were given with a 16 L tank-capacity Knapsack sprayer on the 15th, 45th and 65th days after sowing and post-treatment observations were then made at regular intervals by direct counting of thrips population using magnifying lens. Three insecticides were taken under the study:

Table 1: Treatment details of the experiment

Sl. No.	Name of the treatments	Treatment number
01	Acephate 75% SP @ 0.75 gmL ⁻¹	Farmer's practice (FP)
02	Spinetoram 11.7% SC @ 1 mL ⁻¹ + Sticker @ 0.5 ml L ⁻¹	Technology option 1 (To1)
03	Thiamethoxam 30% FS @ 2.33 ml L ⁻¹ + Sticker @ 0.5 ml L ⁻¹	Technology option 2 (To2)
04	Imidacloprid 40% + Fipronil 40% WDG @ 1gm L ⁻¹ + Sticker @ 0.5 ml L ⁻¹	Technology option 3 (To3)

RESULTS AND DISCUSSION

Data on mean percent values of thrips incidence as affected by the different insecticidal treatments at three spraying periods has been presented in Table 2. The data indicated that all the three insecticidal molecules evaluated resulted lower thrips incidence as compared to farmers practice (FP). Among the technologies evaluated TO1: Spinetoram 11.7% SC @ 1 mL⁻¹+ Sticker @ 0.5 ml L⁻¹ resulted lowest thrips incidence of 4.45 % with highest yield of 78.89 tonnes/ha. The next best treatment was To2: Thiamethoxam 30% FS @ 2.33 ml L⁻¹ + Sticker @ 0.5 ml L⁻¹. Spinetoram along with sticker provided good control of thrips during the study. Seal (2010) reported that new molecules like rynaxypyr, cyazypyr, spinetoram, Clothianidin and tolfenpyrad have the potentiality to be incorporated against thrips in water melon. Tan *et al.* (2021) mentioned that he resistance ratio (RR) of the *T. palmi* populations against spinetoram was found to be 1.69 indicating low resistance of *T. palmi* against this insecticide.

Table 2: thrips incidence in water melon var. Kanak during 2022-23

Treatment	No. of trial	Thrips incidence (%)	Yield (tonnes/ha)	Gross cost	Gross return	Net return	Benefit cost ratio
FP	06	10.33	47.9	175500	383200	207700	2.18
To1	06	4.45	78.89	184500	631120	446620	3.42
To2	06	5.71	73.5	180000	588000	408300	3.27
To3	06	6.14	71.2	179600	569600	390000	3.17
CD at 5%	-	-	7.77	-	-	-	-

CONCLUSION

From the study it was concluded that all the management options evaluated are equally applicable to manage thrips population in water melon var. Kanak. Continuous application of same insecticidal molecules is to be avoided so as to prevent quick resistance development. IPM modules can be tested along with insecticidal application for sustainable management of thrips in water melon. Farmers in the Cooch Behar district are growing water melon since it is a lucrative crop that requires relatively little labor. Therefore, with assistance from the State Agricultural University and the district line department, an appropriate management strategy against the melon thrips *T. palmi* will be required.

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