Indian Journal of Entomology 85(2): 480-482 (2023) DoI. No.: 10.55446/IJE.2021.380

EFFICACY OF COLOURED STICKY TRAPS AGAINST THRIPS IN COTTON

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ABSTRACT

Colour sticky traps are used in several crops for monitoring and mass trapping. This study evaluated coloured sticky traps for mass trapping of thrips *Scirtothrips dorsalis* (Hood), *Thrips tabaci* (Lindeman) and *Thrips palmi* (Karny) in cotton. The attractiveness of six colours viz., blue, yellow, orange, green, red and white in traps was evaluated during 2018 to 2020. Number of thrips captured in differed coloured traps was significantly different, with the blue-coloured sticky trap attracting more thrips followed by yellow. These observations reveal that blue and yellow- coloured traps can be used for monitoring and mass trapping of thrips as a component of IPM programme in cotton.

Key words: *Scirtothrips dorsalis* (Hood), *Thrips tabaci*, *Thrips palmi*, management, sticky traps, yellow, blue, white, attraction, monitoring, IPM

Bt cotton hybrids have become highly susceptible to sucking pests viz., thrips, leafhoppers and whiteflies which result in increased crop damage (Nagrare et al., 2014). Due to climate change thrips *Scirtothrips dorsalis* (Hood), *Thrips tabaci* (Lindeman) and *Thrips palmi* (Karny) (Thysanoptera) have become major sucking pests, due to direct feeding and transmitting viral diseases. Among the viral disease Tobacco Streak Virus (TSV) transmitted by thrips causes more significant damage to cotton (Vinodkumar et al., 2017). The polyphagous nature, high reproductive capacity, short generation time, cryptic living habit, parthenogenetic reproduction and its insecticide resistance mechanisms altogether have made thrips serious in cotton (Diaz Montano et al., 2011). For managing these thrips farmers use many insecticides, which results in many hazards, making non-chemical pest management as the need of the hour. Monitoring and assessment of pest population are important for decision making in any IPM strategy. Coloured sticky traps provide effective tools for monitoring and mass trapping of sucking pests and for reducing pesticide load on cotton. Although many studies have explored colour preference by thrips, still there is ambiguity in precise colour preference by thrips. The present study evaluates this by different colour sticky traps under field conditions.

MATERIALS AND METHODS

The field experiment was conducted in the cotton fields at ICAR-CICR, Regional Station, Coimbatore, Tamil Nadu during kharif 2018-19, Summer 2019 and kharif 2019-20, with cv.Suraj. The crop was planted with the spacing of 60x45cm. Six coloured sticky traps viz., yellow, blue, red, orange, green and white of uniform size were used. Traps were prepared with the respective coloured polythene sheets of size 45x 25 cm, and erected across the wind direction with bamboo stacks, with their height adjusted each time @ one foot above the plant canopy. Transparent white grease was applied (at 15 days interval) uniformly as a thin layer on both sides of the colour surfaces. No insecticides were sprayed and randomized block design was followed with three replications. Six colour traps with replication of three, totally eighteen coloured traps were installed. Mean number of thrips stuck on traps were counted using zoom lens from 30 days onwards at 15 days interval up to 105 days after sowing (DAS). Thrips species were got taxonomically confirmed by Dr Rachana, ICAR-NBAIR, Bengaluru, Karnataka, India. Data were subjected to ANOVA and treatment means differentiated by LSD (p=0.05) in Agres software.

RESULTS AND DISCUSSION

The observations revealed that dominant thrips species prevalent are *Scirtothrips dorsalis* (Hood), *Thrips tabaci* (Lindeman) and *Thrips palmi* (Karny), Observations on number of thrips during 2018-19 revealed that, the blue colour sticky traps attracted more thrips followed by yellow sticky traps; blue colour traps attracted 48.33, 63.00 and 76.33/ trap on 30, 45 and 60 DAS, respectively. Thus, blue colour sticky traps

Table 1. Attraction of thrips to sticky traps in cotton

Seasons	Treatments	Mean number of thrips/ trap*						Mean
		Vegetative phase			Flowering and boll developmental phase			
		30 DAS	45 DAS	60 DAS	75 DAS	90 DAS	105 DAS	
Kharif 2018-19	Yellow sticky trap	34.67	52.67	63.67	81.33	136.33	104.67	78.89
	Blue sticky trap	48.33	63.00	76.33	85.33	163.67	125.33	93.67
	Red sticky trap	13.00	13.00	17.67	25.33	43.67	33.67	24.39
	Orange sticky trap	11.67	11.67	17.00	24.33	43.67	32.33	23.44
	Green sticky trap	27.00	34.33	36.33	43.67	82.33	65.67	48.22
	White sticky trap	21.33	21.33	31.67	38.33	75.67	52.33	40.11
	S.Ed	0.509	0.495	0.519	0.441	0.506	0.493	0.272
	CD (0.5%)	1.149	1.117	1.171	0.995	1.142	1.114	0.615
Summer 2019	Yellow sticky trap	45.67	63.33	75.67	90.67	146.00	117.33	89.78
	Blue sticky trap	58.00	73.67	76.67	98.00	174.00	136.67	102.83
	Red sticky trap	25.67	25.67	28.33	37.00	57.00	46.67	36.72
	Orange sticky trap	25.00	24.67	31.00	38.00	57.00	45.67	36.89
	Green sticky trap	38.33	44.67	46.67	55.00	95.67	77.67	59.67
	White sticky trap	43.67	47.33	55.33	61.33	100.33	78.67	64.44
	S.Ed	0.270	0.481	0.444	0.402	0.458	0.416	0.220
	CD (0.5%)	0.610	1.085	1.001	0.907	1.034	0.939	0.497
Kharif 2019-20	Yellow sticky trap	16.33	35.00	48.33	65.00	121.33	92.00	63.00
	Blue sticky trap	32.33	47.00	61.67	71.33	142.00	114.00	78.06
	Red sticky trap	9.00	10.00	14.67	18.67	34.33	22.00	18.11
	Orange sticky trap	11.00	9.33	16.00	17.67	31.00	25.33	18.39
	Green sticky trap	14.33	21.67	23.33	33.33	65.00	51.67	34.89
	White sticky trap	15.33	28.00	38.33	49.00	95.00	74.00	49.94
	S.Ed	0.474	0.395	0.397	0.424	0.445	0.390	0.147
	CD (0.5%)	1.069	0.891	0.896	0.957	1.005	0.880	0.332

*Mean of three replications; DAS- Days after sowing

attracted maximum (93.67/ trap) followed by yellow sticky traps (78.89/ trap) and green sticky trap (48.22/ trap). Blue sticky traps were the most significantly attractive for onion thrips *T. tabaci* in onion (Liu and Chu, 2004). Similar was the case with *Frankliniella occidentalis* (Chen et al., 2004a). Blue traps were the most attractive to *Thrips fuscipennis* and *T. tabaci*, followed by yellow and white trap (Maria et al., 2020). Similarly, the other findings (Chen et al., 2004b; Ren et al., 2020; Sandra et al., 2018) confirm that blue colour traps are the most attractive for *F. occidentalis*. During summer, more thrips got attracted compared to kharif season, and again similar to that of previous season blue colour attracted 58 thrips/ trap at 30 DAS, 73.67 at 45 DAS, 76.67 at 60 DAS, 174 at 90 DAS and 136.67 at 105 DAS. The results show that after 90 DAS the number of thrips trapped got reduced. The overall means indicate that blue sticky traps attracted more thrips (102.53/ trap) followed by yellow sticky trap (89.78/ trap) and white (64.44/ trap). Similar trend was observed during kharif 2019, with blue colour attracting more thrips (78.06/ trap) followed by yellow (63.00/ trap) and white ones (49.94/ trap) (Table 1). The performance of colour traps was in the order of blue > yellow > white > green > red > orange. Minimum thrips catches were recorded during the cotyledon stage (30 DAS), which gradually increased during the vegetative and flowering stage (45 to 90 DAS). High chlorophyll content during the vegetative stage attracted more thrips towards cotton (Atakan and Ozgur, 2000). Thus, blue sticky traps were the most effective for monitoring thrips in cotton.

ACKNOWLEDGEMENTS

The authors thank the Director and Project Coordinator and Head of Central Institute for Cotton Research, Nagpur for providing facilities.

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(Manuscript Received: October, 2021; Revised: December, 2021;
Accepted: December, 2021; Online Published: April, 2022)
Online First in www.entosocindia.org and indianentomology.org Ref. No. e21212