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INFLUENCE OF COLOUR AND HEIGHT OF STICKY TRAPS IN ATTRACTION OF THRIPS ON GLADIOLUS

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ABSTRACT

Thrips are very cryptic in nature and difficult to trace and initiate control measure under field condition till damage symptom appears. Thrips generally move long distances by floating with the wind and get trapped on the sticky board while moving between rows of plants as traps are better indicators of thrips activity. Coloured sticky traps are used for mass trapping and monitoring. This study assessed the effectiveness of coloured sticky traps for mass trapping of *Scirtothrips dorsalis* (Hood) in gladiolus. The attraction of three colours blue, yellow, and white at four different heights (25, 50, 75 and 100 cm) was assessed. The number of thrips caught in the various coloured traps varied greatly, with the blue sticky trap attracting the most, followed by yellow and white. These findings suggest that blue-colored traps can be utilised for mass trapping and monitoring of thrips in gladiolus.

Key words: Attraction, blue, colour, evaluation, *G. grandiflorus*, height, management, monitoring, population, *Scirtothrips dorsalis*, sticky traps, white, yellow

Gladiolus is a beautiful and glamorous bulbous flowering plant known for its beautiful and versatile flowers (Serek et al*.,* 1994) hence, also called as "Queen of Bulb". It is perennial cormous flowering plant that belongs to family Iridaceae (Ahmed et al., 2002). It is one of the most important cut flowers, however, its quality and productivity is being affected by several factors viz., climate, cultivar, nutrient management, diseases, and pests. Among the insect pests, the sucking type are the most important ones with greater damage caused by thrips which pierce the stem, leaves and feed on the cell sap of the gladiolus. The attack of this pest coincides with peak flowering stage and ultimately the market value of the flowers is reduced. Internationally, thrips have become a limiting factor in hampering gladiolus production, vectoring tomato spotted wilt virus (TSWY) causing damage to leaves, flowers and buds, and in severe cases, decreasing the regeneration ability of the corms in the next season (Zeier and Wright, 1995; Kindt et al., 2003). Thrips generally move long distances by floating with the wind and get trapped on the sticky board while moving between rows of plants as traps are better indicators of thrips activity (Waiganjo et al., 2008). Evaluation of colour preference of thrips may help to develop traps using various attractive colours, thus providing opportunities for the control of this pest by integrating specific colours into crop management methods. This can help to minimise the use of synthetic insecticides and therefore, helping to prevent the build-up of insecticide residues in the environment and food.

MATERIALS AND METHODS

The investigation was carried out at Faculty of Agriculture, SKUAST-K Wadura, (34°20′ N, 74°24′E, 1610 masl). All the required agronomical practices were adopted for raising the crop in open field conditions. No insecticide was sprayed throughout crop period. The interaction of trap colour with different heights was determined for trap capture of thrips. Three differently coloured sticky traps, blue, yellow and white (measuring 25x 10 cm), were installed at four different heights viz., 25 cm, 50 cm, 75 cm, and 100 c and factorial (randomized block design) was followed with three replications. Traps were placed randomly, and the traps were attached to a wooden stake so that their bottom edge was 10-15 cm below the top of the plants. The traps were monitored and replaced at 7 days interval (i.e., sampling period) from the gladiolus plant emergence (May) until harvest (October). Upon the removal of the coloured sticky traps, they were wrapped with clear plastic cling film and transferred to the laboratory to determine number. The effect of

Table 1. Influence of colour and height of sticky trap on population of thrips

Sticky trap	Height of trap (cm)				
	25	50	75	100	Mean
Yellow	*17.53± 0.19^{fg}	22.87± 0.54^{e}	37.47± 0.39^{ab}	31.23± 0.61^{c}	27.27± 4.64^{b}
Blue	19.47± 0.58^{ef}	26.5± 0.41^{d}	39.37± 0.09^{a}	34.6± 0.15^{bc}	29.98± 3.84^{a}
White	12.13± 0.23^{h}	14.83± 0.54^{gh}	26.97± 0.39^{d}	20.93± 0.61^{ef}	18.71± 4.68^{c}
Mean	16.37± 0.50	21.40± 0.76	34.60± 0.93	28.92± 1.00	
C.D. ($p \leq 0.05$)	Colour (C) = 1.78 Height (H) = 2.05 Colour* Height (C:H) = 3.56				

*Mean of 5 replications

colour as well as height of sticky trap for thrip capture was evaluated in each treatment. Weekly counts were taken during the plant growth period (May-October). Data generated during the experiment was analysed using R software. Significant results were compared based on critical differences.

RESULTS AND DISCUSSION

Three different coloured sticky traps (yellow, blue and white) were installed at four different heights viz., 100 cm, 75cm, 50cm and 25cm to check the most effective colour and height for installation of sticky traps against *S. dorsalis* (Hood) on gladiolus. The data on the influence of colour and height of sticky trap on population of thrips, *S. dorsalis* (Hood) is presented in Table 1. The effect of colour and height of sticky trap had a significant difference on the population of *S. dorsalis* (Hood). The perusal of data revealed maximum population of *S. dorsalis* (Hood) on blue coloured sticky trap (39.37± 0.09 thrips/trap) when installed at 75 cm followed by yellow sticky trap installed at 75 cm (37.47± 0.39 thrips/trap). The maximum cumulative mean population (29.98± 3.84 thrips/ trap) of *S. dorsalis* (Hood) was observed on blue coloured sticky trap followed by yellow and white sticky traps with cumulative mean population 27.27± 4.64 and 18.71± 4.68 thrips per trap, respectively.

Hossain et al. (2020) observed that blue coloured trap was more effective in trapping *S. dorsalis* as compared to yellow, white and green and pink trap in chilli. Pobozniak et al. (2020) found the blue coloured sticky traps were the most effective for monitoring thrips in pea fields than yellow. Chen et al. (2004) found that blue coloured sticky trap was the most effective for monitoring western flower thrips. Sridhar and Naik (2015) found that the blue colour sticky traps attracted more number of adult *S. dorsalis* on rose, Gharekhani et al. (2014) that found sticky traps installed at 70 cm above ground surface attracted maximum thrips. Allen et al. (2005), who studied the population of thrips on onion found sticky traps installed between 70 and 95 cm above the ground surface being the most effective in attracting *Thrips tabaci*. Devi and Roy (2017) on red onion plants observed maximum population of thrips on blue colored sticky card and Ranamukhaarachchi and Wickramarachchi's (2007) on tomatoes, revealed blue was the thrips favorite colour. Mahalakshmi (2022) also observed maximum number of thrips on blue coloured sticky trap in greengram. Thus, blue coloured traps installed at 75-100 cm above ground were the suitable choice for monitoring thrips, *S. dorsalis*. Minimum thrips catches were recorded during the initial stage (30 DAS), which subsequently increased during the vegetative and blooming stages (45 to 90 DAS). More thrips were attracted during vegetative and flowering stage because of high nutritive value in the plant (Amutha, 2022). Thus, blue sticky trap can be used for effective and ecofriendly management of thrips in gladiolus.

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AUTHOR CONTRIBUTION STATEMENT

Conceptualization, S, S.I and M.Y.; methodology, M.Y; software, F.J.W; validation, S.S.I, M.Y. and F.J.W.; formal analysis, M.Y.; investigation, M.Y, S.H.M; resources, data curation, F.J.W, L.A.; writing—original draft preparation, S.S.I.; L.A, M.S and Z.F; writing—review and editing, S.S.I.; L.A; visualization, M.Y, and

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CONFLICT OF INTEREST

No conflict of interest.

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