

Effectiveness of sticky traps in monitoring insects

Muhammad Amjad Bashir^{*1}, Abid Mahmood Alvi¹ and Hina Naz¹

¹Department of Entomology, Faculty of Agricultural Sciences, Ghazi University, Dera Ghazi Khan

Abstract: Sticky traps are used as one of the effective IPM strategy for monitoring different types of the insects. They provide an easy method for estimation of pest population density and require low cost and less skilled labor and are helpful for developing an eco-friendly control strategy. In current study, effectiveness of different colors sticky traps in monitoring insect's population was determined at field area of our institute. Sticky traps of seven different colors (red, brown, green, white, light blue, dark blue and yellow) were installed at the height of 140 cm at different locations in field which gave significant indication of population abundance and the results showed that the most attractive and efficient color in our monitoring trial was the brown color followed by light blue, dark blue, red, green, yellow and the sticky trap having low population was white.

Key words: Color attraction, insect monitoring, sticky traps.

Received June 10, 2014; Revised June 23, 2014, July 9, 2014; Accepted July 25, 2014

*Corresponding author: Muhammad Amjad Bashir; Email: amjadhajbani@hotmail.com

1. Introduction

Sticky traps are used as a one of effective IPM strategy for different insect pests in most parts of the world. They provide an easy method for estimation of pest population density. In monitoring program before the observation of damage to plant sticky traps provide an early warning of pest presence which is helpful for developing an environment friendly and safer control strategy (Webb and Smith, 1980; Patti & Rapisarda, 1981; Sharaf, 1982). As a result of estimation from sticky traps there is generally a reduction in pesticide use which further lead to less input cost, less workers exposure to pesticides and ultimately less pesticides induced phyto-toxicity and less expenses directly affect quantity and quality of the yield. Sticky traps are economically affordable due to their less cost and less requirement of technical labor. Keeping in view the importance of sticky traps an experiment was designed to study the color preference of insects. The objectives of the study were to determine the effectiveness of colored sticky traps and to study the color preference of insects. A great diversity of insect was observed in the locality due to minimum human interference through different ways. For example no pesticide use because in that area vegetation is totally natural in the form of different shrubs, herbs. Weeds and wild plant species etc. Effectiveness of sticky traps also depends upon meteorological conditions (Byrne 1991) during this trial the relative humidity was 45%. The objective of conducting this trial was to study the effectiveness of sticky traps and to study the efficiency of the different colors among sticky traps. Normally brown color is not preferred by insects but in

our experiment brown color was found to be the most attractive to insects.

2. Material and Methods

2.1 Study Site

The study was carried out at College of Agriculture D G Khan, Pakistan, in October 2012 which lies between latitudes 28.30° to 31.15° north and longitude 69.31° to 70.50° east.

2.2 Trap Design and dimensions

It was conducted to evaluate the attractiveness of red, green, white, light blue dark blue and yellow sticky traps in monitoring insect population. The sticky traps were made of art paper smeared with sticky glue .during the experiment traps were fixed about 140cm above ground level. The size of each sticky trap was different (table 1).

The length of red, brown, green, white, light blue, dark blue and yellow sticky traps was 15", 14.5", 14", 13", 14", 14", 14.5" and width was 10", 9", 9.5", 8.5", 9", 9.5" and 9.5" respectively. Sticky traps of Red, brown, green, white, light blue, dark blue and yellow color were used in four replications 60cm apart from each other. All study was conducted at the same place.

2.3 Data Collection

The data was taken on daily basis at evening time. On each day data was taken by counting the number of insects on traps. Traps were also replaced to avoid the glue material to dry up.

3. Results and discussion

Total four observations were taken from sticky traps shown in the Table 1.

Table 1: Insect population observed on sticky traps

Color	Frequency	Number of Insects per Observation				Total
		1 st	2 nd	3 rd	4 th	
Red	4	11	50	89	135	285
Brown	4	63	114	135	223	535
Green	4	7	29	64	104	204
White	4	4	3	3	2	12
Light blue	4	28	68	135	191	422
Dark blue	4	6	60	116	184	366
Yellow	4	16	21	29	34	100

As the table indicates on red color sticky trap in first observation 11 insects, in second observation 50, in third observation 89 and in fourth observation 135 insects were counted. The total insects observed on red color sticky traps were 285. On brown color sticky trap in first observation 63, in second observation 114, in third observation 135 and in fourth observation 223 insects were observed. The total insects observed on brown color trap were 535. On green color sticky trap in first observation 7, in second observation 29, in third observation 64 and in fourth observation 104 insects were counted. The total insects on green trap were 204. On white color sticky trap in first observation 4, in second observation 3, in third observation 3 and in fourth observation 2 insects were counted. The total insects on white trap were 12. On light blue sticky trap in first observation 28, in second observation 68, in third observation 135 and in fourth observation 191 insects were counted. The total insects on light blue were 422. On dark blue color trap in first observation 6, in second observation 60, in third observation 116 and in fourth observation 184 insects were counted. The total insects on dark blue trap were 366. On yellow color sticky trap in first observation 16, in second observation 21, in third observation 29 and in fourth observation 34 insects were counted. The total insects on yellow trap were 100.

In this experiment brown color was found to be most attractive sticky trap to monitor insect's population. This is surprising because in general brown color is not considered to be attractive.

Mostly yellow sticky trap is considered most attractive (Prokopy & Owens, 1983). Vaishampayan *et al.* (1975) and South-wood (1978) reported that yellow was found to be an efficient color used in trapping insects. However this trial would provide the scientists

a new gateway to work upon the effectiveness of brown color sticky trap to attract the insects.

Conclusion

From the above mentioned results it is concluded that sticky traps are an alternative tool for the monitoring of the insects which are one of the cheaper and almost equal effective for small insects especially midges for mango orchards. While among sticky traps, the effectiveness of the color depends on the vegetation of the ecosystem. In current study, brown color was found most effective due to the flora of investigated desert ecosystem.

Acknowledgement

Authors thank all the staff at College of Agriculture, Dera Ghazi Khan, for their support in the completion of this work.

Competing Interests

Authors declare that they have no competing interests and commercial names and details of machines and equipments are for the guidelines only.

4. References

- Lu Y, Bei Y, Zhang J. 2012. Are yellow sticky traps an effective method for control of sweet potato whitefly, *Bemisia tabaci*, in the greenhouse or field? *Journal of Insect Science* 12:113.
- Prokopy, R. J., & Owens, E.D. (1983). Visual Detection of Plants by Herbivorous insects. *Annals Review of Entomology*, 28, 337-364.
- Southwood, T. R. E. (1978). *Ecological methods with particular reference to the study of insect populations*. 2nd Edition. London, UK: Chapman and Hall.
- Thein Mu, Jamjanya T, Handboonsong Y. 2011. Evaluation of color traps to monitor insect vectors of sugarcane white leaf phytoplasma. *Bulletin of Insectology* 64 supplement. S117-S118.
- Vaishampayan, S. M., Kogan, M., Waldbauer, G. P., & Woolley, J. T. (1975). Spectral specific responses in the visual behavior of the greenhouse whitefly *Trialeurodesva parviorum* (Homoptera: Aleyrodidae). *Entomologia Experimentalis et Applicata*, 18(3), 344-356.

Cite this article as:

Bashir et al., 2014. **Effectiveness of sticky traps in monitoring insects**. *Journal of Environmental and Agricultural Sciences*. Volume 1, Article No. 5.

INVITATION TO SUBMIT ARTICLES

Journal of Environmental and Agricultural Sciences (JEAS) is an Open Access, Peer Reviewed online Journal, which publishes Research articles, Short Communications, Review articles, Methodology articles, Technical Reports in all areas of Environmental Sciences and Agricultural Sciences. For information dr.rehmani.mia@hotmail.com.