Modification of Simple Yellow Sticky Trap for Monitoring Insects in Poly-tunnels in Sri Lanka

스리랑카 시설작물재배 하우스에서 발생되는 해충 모니터링용 황색끈끈이트랩 제작보급

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Introduction

KOPIA Sri Lanka Center donated number of poly tunnels and rain shelters under different research project to Sri Lanka farmers. We observed small insects, such as aphid, trips and leaf minor problem as well as virus diseases on crops grown in poly-tunnels. Modified simple sticky traps using commercially available Hit glue and evaluated with Grease sticky trap introduced by DOA and the other trap tested was a Korean product commercially available there. Insect population were tested out side as well as inside poly-tunnel. Developed methodology for apply glue material uniformly on yellow Bristol board. Also found the efficiency of newly developed sticky trap were better than the grease traps.

Objectives

To develop low cost, more strong and simple sticky traps

To find better method for pest control in poly tunnel

Material and methods

Material required:-

Yellow color Bristol board, Rat Trap Glue and Electric iron

Fig. 1. Material used for sticky trap development and handling

Method

Apply rat control trap glue on 65cm x 50cm size and 25cm x 15cm size yellow color Bristol boards. Recorded the small insects such as white fly, trips, aphid, leaf miner, grass hoppers and small flys(Less than about 5mm body length of insect) attraction using grease trap and the commercial available sticky trap an open area at KOPIAcenter, HORDI, Gannoruwa as well as chilli grown farmer's poly-tunnel at Kothmale. Recorded insect count 7~10 days interval in both places using 25cm x 15cm size traps. Trap glue applied on large size Bristol board(64cm x 50cm) using hot iron. One set of trap, curved and tied keeping cylinder-shape using binding wires. Install cylinder-shape sticky traps and plate like sticky traps inside the chilli cultivated poly-tunnel randomly at Kothmale farmer field.

Table 1. Cost of production of yellow large size(64x50cm) sticky trap

Material	Cost per Trap[3)]	Remarks
Yellow paper[1)]	$0.22/Sheet	Stationery shop
Sticky gel[2)]	$0.21/Pack	Hardware shop
Labour	$0.034Sheet	16$/daY
Iron	-	Free(Used)
Total	**$0.77**	-

Results and Discussion

Distribution of Insect in inside poly tunnel and open field

The total no. of large and small insects, inside the poly-tunnels were 4-6 times lower than that of out side the poly-tunnel.

However, the no. of large and small insects inside the poly-tunnel were almost similar.

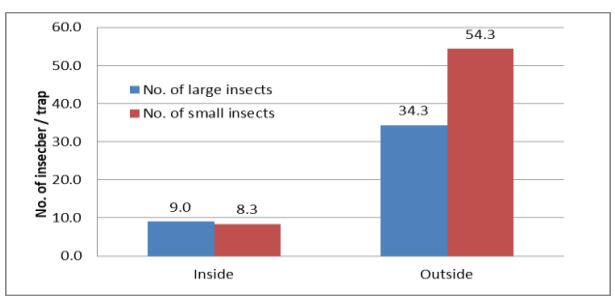

Fig.2. Evaluation of insect population in and out side of the poly-tunnel, Trap size is 25cm x 15cm, observed 19DAT, installed on May 19. 2020

Application of trap glue on Bristol board

In the process of developing sticky traps, We found that, using heated domestic iron is appropriate and higher efficient method for sticky material application on Bristol board (fig. 3 & 4).

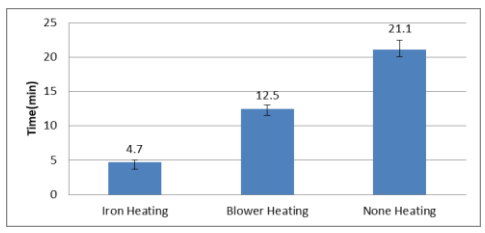

Fig.3 Time spent for applied sticky glue for making sticky traps

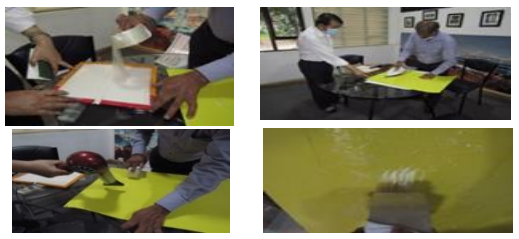

Fig. 4. Stages of developing sticky trap

Evaluation of sticky trap

Compared newly develop sticky trap in size with commercial available yellow color 25cm x 15 cm size trap using as control. The number of insects attraction in newly develop sticky trap was higher than control and grease trap throughout the evaluated period of 9 days (fig. 5 & 6).

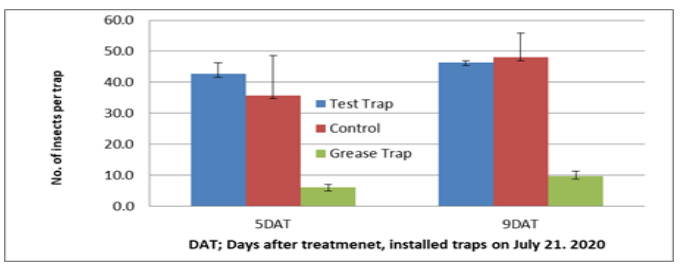

Fig. 5. Comparison of insects attraction on cylinder-shape and plate like sticky traps

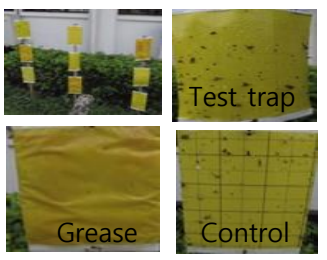

Fig. 6. Different stages of insect monitoring

Comparison of efficiency of shape of traps

Compare the shapes of sticky trap using small size (25cm x 15cm) traps, the higher no of insects attraction observed in cylinder-shape than plate like trap. (fig. 7 & 8).

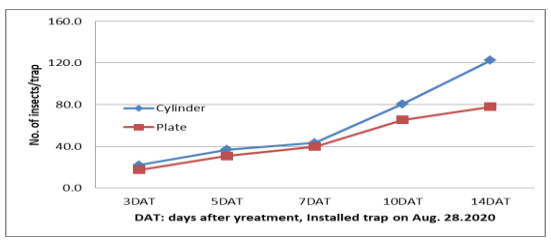

Fig. 7 Comparison of insects attraction with different shape of sticky traps

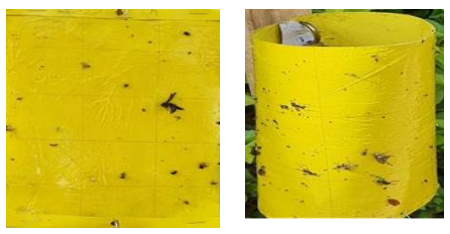

Fig.8. Two different shapes of traps tested

Conclusion

- Iron method is best for sticky material application
- Cylinder-shape trap is better than plate type trap
- Newly modified glue trap is similar to commercial trap and better than grease trap
- The cylinder-shaped trap is recommended for poly tunnels specially in early stages

Extension

Fig.9. New cylinder-shape type traps(65cm x 50cm) distributed among two research institutes and two farmers

Summary

망실, 하우스 등 시설작물 재배지에서는 바이러스 매개충이나 그을병을 유발하는 진딧물, 총채벌레, 온실가루이 등의 미소곤충 모니터링 수단으로 황색 유인 점착판이 많이 활용되고 있다. 스리랑카에서는 해외로부터의 값비싼 유인트랩 시판품을 구입하기가 어려워 저비용 고효율 트랩을 자체 개발하고자 하였다. 황색종이와 쥐끈끈이 트랩을 이용하여 트랩을 만들었고 제작 과정 중 가장 핵심인 끈끈이 도포하는 방법을 일반 다르미의 고온를 이용하여 점착액을 얇고 고르게 도포하여 트랩 시제품을 만들었다. 시제품의 곤충 유인효과는 전용 유인트랩 시판품(25cm x 15cm)과 비슷하였고 관행(그리이스오일액)보다는 유인효과가 더 좋았다. 또한 트랩모양은 평면형보다는 원통형에서 유인충수가 더 많았다. 이상의 결과를 농가 현장에 적용시키기 위해서 보다 큰 황색점착트랩 시제품(64cm x 50cm)을 개발하였다. 시제품을 고추, 파프리카 등 시설재배하는 시험장과 농가 현장에 보급하였다. 트랩 설치시기는 작물재배 초기에 설치해 모니터링뿐만 아니라 발생억제 효과도 높일 수 있도록 지도하였다.