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Research Notes

# Management of mulberry thrips *Pseudodendrothrips mori* (Nawa) by chemical method

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Mulberry (*Morus* spp.) leaf is the only natural food for the silkworm, *Bombyx mori* L. It is a perennial, evergreen, luxuriant crop cultivated in all types of soils, both under rainfed and irrigated conditions. The crop is prone to depredation of diverse organisms, because of its fast growth and green foliage throughout the year, in varying proportions either for space, food or both. So far, over 300 insect and non-insect species of pests are known to infest mulberry in varying intensities during different stages of the crop and seasons (Naik, 1997). Among the sap feeders infesting mulberry, incidence of thrips was the highest (42.55%) followed by mealy bugs (20.80%), jassids or leaf hoppers (20.28%) and scale insects (1.65%) (Sathyaprasad and Manjunath, 1993).

In Tamil Nadu, thrips was considered as less important pest of mulberry earlier. But during January 2000, leaf damage by *Pseudodendrothrips mori* (Nawa) ranged from 14.02 to 49.14 per cent in 24 mulberry genotypes at TNAU campus, Coimbatore (Subramanian, 2000). During August - September 2001, the variety, S54 showed very high level of thrips damage (upto 70%) with hundreds of nymphs and adults in each leaf, showing characteristic symptom of leaf cupping. Due to severe infestation of thrips, there was loss in leaf weight ranging from 14.71 to 27.94 per cent among six mulberry varieties *viz.* Kanva2, MR2, S36, S54, DD and V1. Realizing the importance of this sucking pest, investigation was made to find out the effective insecticides for its management.

A field experiment was conducted in Kanva 2 mulberry crop at Tamil Nadu Agricultural University, Coimbatore during 2000-2001 to evaluate the efficacy of four chemical insecticides *viz.* malathion 50 EC 01.% dichlorvos 76 WSC 0.15%, triazophos 40 EC 0.08% and endosulfan 35 EC007% and three botanicals *viz.* TNAU neem oil 60 EC (A) 2% and TNAU neem oil 60 EC (C) 2% and *Thuja* 30 (alcohol extract to *Thuja occidentalis*) 0.03% in comparison with untreated control against mulberry thrips. The trial was conducted in Randomized Block Design with three replications. The plot size used was 20 x 10m. The above treatments were given in the respective plot using a high volume knapsack sprayer with a spray fluid of 500 litres/ha on 30th day after pruning. Neem oil of desired concentration was preparation with 1% soap solution.

Population of thrips was recorded one day prior to and three days after treatment. In each plant, three leaves at random were selected for observation and 10 plants were observed in each plot. Based on the pretreatment and post treatment count on thrips population,

**Table 1.** Evaluation of insecticides and botanicals against mulberry thrips, *P. mori*

| Treatment | Mean population of thrips/leaf at 3 days after treatment | Per cent reduction in thrips population over control |
|---|---|---|
| Malathion 50 EC (0.1%) | 2.43 | 77.53 (61.72)[a] |
| Dichlorvos 76 WSC (0.15%) | 2.11 | 80.41 (63.75)[a] |
| Triazophos 40 EC (0.08%) | 2.34 | 78.18 (62.19)[a] |
| Endosulfan 35 EC (0.07%) | 3.40 | 68.33 (55.84)[b] |
| TNAU neem oil (A) 60 EC (2%) | 4.37 | 59.61 (50.55)[c] |
| TNAU neem oil (C) 60 EC (2%) | 3.92 | 63.47 (52.86)[bc] |
| Thuja 30 (0.03%) | 3.40 | 60.81 (51.26)[c] |
| Control | 10.88 | |

Figures in the parentheses are arcsin transformed values.
Means followed by a common letter are not significantly different at 5% level by DMRT

percentage reduction was worked out. The mean values were compared using Duncan's Multiple Range Test (DMRT), (Duncan, 1955).

The per cent reduction in the population of thrips over control ranged from 59.61 to 80.41 in various treatments. Maximum reduction (80.41%) was recorded in dichlorvos 76 WSC followed by triazophos 40 EC (78.18%) and malathion 50 EC (77.53%). Endosulfan 35 EC could reduce the population by 68.33 per cent. Among the three plant products, the highest reduction (63.47%) was recorded in TNAU neem oil (C) followed by *Thuja* (60.81%) and TNAU neem oil (A) (59.61%) (Table 1).

Three insecticides *viz.* dichlorvos, triazophos and malathion which could reduce thrips population to 2.11 from 10.88/leaf were on par and significantly superior to endosulfan and three botanicals. Endosulfan was intermediate in efficacy. All the three plant products, *viz.* TNAU neem oil (A), TNAU neem oil (C) and Thuja, though not comparable with three effective insecticides, could reduce the population by 60 per cent.

The effectiveness of dichlorvos (DDVP) against thrips on mulberry confirms earlier findings of Anon, (1975). Kariappa and Narasimhanna (1978), Sharma (1989), Anon (1990) and Ali *et al.* (1991). In severe thrips infestation, endosulfan (2 ml/lit) was recommended by Reddy and Kotikal (1988).

The present investigation reveals the effectiveness of malathion and triazophos which were on par with dichlorvos. Botaniacls *viz.* TNAU neem oil (A) and (C) and Thuja have shown promise against thrips.

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# Studies on heterosis for yield and quality parameters in brinja (*Solanum melongena* L.)

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In India, brinjal is cultivated in an area of about 5.0 lakh hectares with an annual production of 78.8 lakh tonnes (Anon. 2001). In Tamil Nadu, the area is estimated around 8006 ha with an annual production of 97,550 tonnes. The productivity of eggplant in India is very low (15.80 t/ha) as compared to 300 tonnes in the Netherlands, where the $F_1$, hybrids constitute most of the economical cultivars. In egg plant, the consumer preference is region specific and as such there is a need to develop $F_1$ hybrids for different regions. With these views as the background, the investigations was carried out at the College Orchard, Horticultural College and Research Institute, Coimbatore during 2000-2001.

Seven lines *viz.* $L_1$-EP 45, $L_2$-EP 65, $L_3$-EP 113, $L_4$-CO 2, $L_5$-SM 8, $L_6$-APAU Bagmathi, $L_7$- Pusa Anupam were crossed with four testers *viz.* $T_1$ Aruna, $T_2$- Arka Nidhi, $T_3$- Surya and $T_4$-Pusa Uttam and the resultant twenty eight hybrids were evaluated to study the per se performance and heterosis over better parent (heterobeltiosis) for various characters and presented in the Table 1.

The results indicated that higher percentage of long styled flowers was observed in the parents $L_7$ (44.55), $L_6$ (44.05) and $L_1$ (41.70) and $L_1$ (51.20) $L_7$ (50.55) and $L_2$ (48.55) produced comparatively more number of fruits per plant. The yield per plant was high in $L_1$ (3.20kg), $L_6$ (3.10 kg) and $L_3$ (2.61 kg). The fruit borer incidence was very less in $L_6$ (35.7), $L_7$ (36.55) and $L_4$ (36.55).

Among the parents, high ascorbic acid content was observed in $L_4$ (12.53 mg), $L_2$ (12.25 mg) and L3 (12.17 mg). The parents $L_1$, $L_6$ and $T_3$ showed lower total phenol. Based on per se performance, the line $L_3$ and $L_7$ and the testers $T_2$ & $T_4$ could be considered superior.

The hybrid $L_3$ x $T_1$ accounted for the highest heterobeltiosis for percentage of long styled flowers. Similar results were reported by Ponnuswami (1990) and Jerard (1996). Among the crosses, significant positive heterobeltiosis observed in $L_2$ x $T_4$ for fruits per plants. These results conform to the earlier findings