

Diurnal activity of New Zealand flower thrips on stonefruit in spring and at harvest

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Introduction

Adults of New Zealand flower thrips *Thrips obscuratus* (Crawford) feed on flowers and small fruit of nectarines causing damage to the fruit (McLaren 1992). Adults of *T. obscuratus* are also attracted to ripening stonefruit causing quarantine problems for export fruit. Control measures are required to prevent infestation for up to 8 weeks from flowering to shuck fall and just prior to harvest. Under an integrated fruit production (IFP) programme, insecticides are applied when spray thresholds are exceeded in spring. Thresholds have been developed for thrips populations sampled from nectarine trees over this period (McLaren and Fraser 2000). Sources of variation in this sampling practice were investigated with the aim of reducing sampling errors.

Methods

In spring, New Zealand flower thrips were sampled on 5 occasions from 8 nectarine trees every 2 hours during daylight. The branches were tapped with a metal pipe over a 25cm diameter yellow plastic plate. At harvest time, thrips were recorded at 2-hourly intervals as the fruit were being picked from apricot ('CluthaGold') and peach ('Flamecrest' and 'White Lady'). The trees were divided into 6 sectors (North, South, East, West, Centre in the lower tree, and top > 1.8 metres).

Results

The level of thrips infestation varied with the stage of growth of the tree (Fig. 1). Thrips were attracted to the nectarine flowers, but their numbers declined as the flowers reached petal fall. Numbers increased again within a few weeks and reached a peak 4 weeks after petal fall. On each of the 5 sampling occasions, more thrips were found in the top of the tree rather than the lower branches, and were uncommon in the

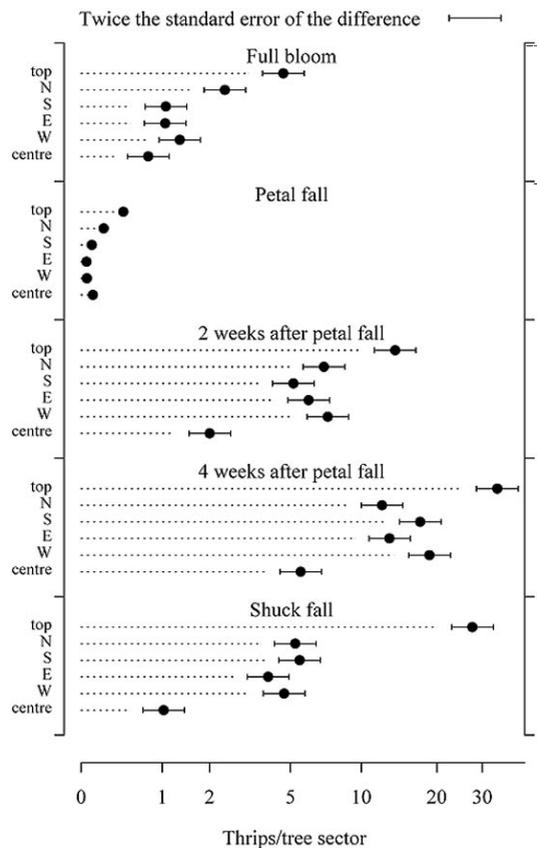


Fig. 1. New Zealand flower thrips per tree sector sampled over the period from full bloom to shuck fall on nectarine cv. 'Fantasia'.

centre of the tree after petal fall. No difference was found between the number of thrips sampled from branches facing North, South, East or West.

More thrips were found in the top of the tree in the early morning than at the end of the day in spring (Fig. 2). There was little effect of time-of-day on the number of thrips per tree recorded when samples were collected

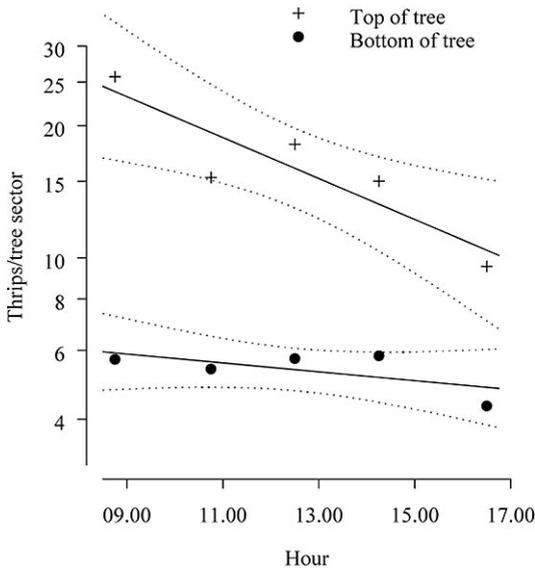


Fig. 2. Distribution of New Zealand flower thrips sampled from trees of nectarine cv. 'Fantasia' over a day. Dotted line indicates 95% confidence intervals of means.

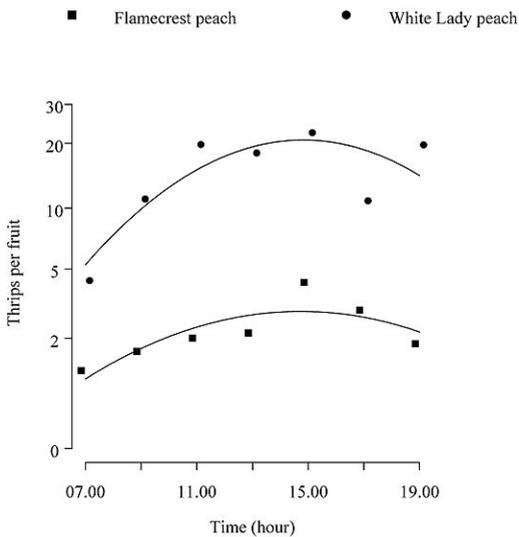


Fig. 3. New Zealand flower thrips per ripe peach fruit sampled at 2-hourly intervals through the day (peach cv. 'White Lady' sampled 19 February 1997, peach cv. 'Flamecrest' sampled 19 February 1997).

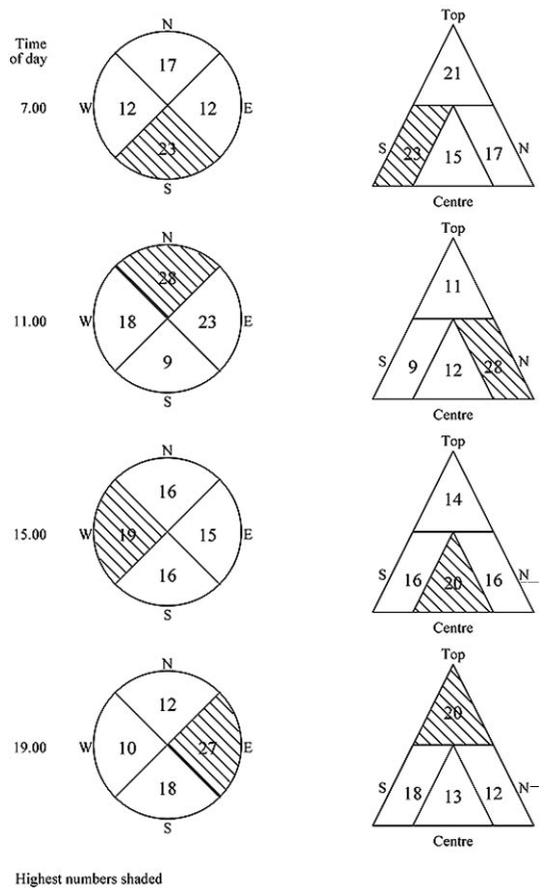


Fig. 4. Percentage distribution of thrips on peach trees of cv. 'White Lady' through the day ($n = 30$ fruit/ sector). Highest numbers on each occasion shaded.

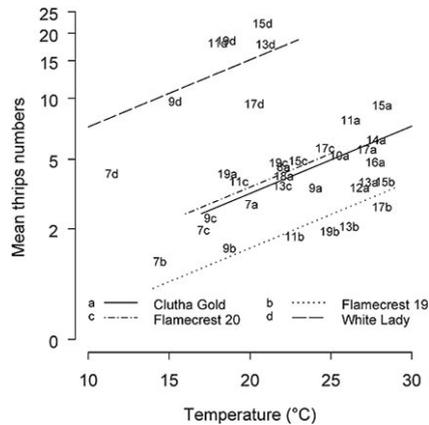


Fig. 5. Effect of temperature on thrips numbers per fruit on 'CluthaGold' apricot, 'Flamecrest' peach on two consecutive days and 'White Lady' peach.

in the lower sectors (where most sampling takes place), except at 17.00 when numbers were low. There is a discrepancy between the total number of thrips per tree found at 08.00 and those found at 17.00 with a large number of thrips not accounted for at the end of the day.

In contrast, at harvest time, thrips numbers were low at both the beginning of the day as well as the end (Fig. 3). High numbers were found from noon to mid afternoon. More thrips were found on the white-fleshed 'White Lady' peach than on the yellow-fleshed 'Flamecrest' throughout the day. Within the tree, thrips moved around at different times of the day (Fig. 4). Temperature affected the number of thrips found per fruit and a positive correlation was found between temperature and thrips numbers at harvest (Fig. 5) but the relationship was also influenced by the crop and possibly other daily weather factors.

Conclusion

Thrips are highly mobile. Their distribution within the tree varies with the stage of development of the host plant, time of day and temperature. If the beating technique is to be used by growers as a basis for decision-making in spring, conditions for sampling will need to be defined with care. Samples will need to be taken from a defined height on the tree (1.5-1.8 metres), from the outer branches and before 15.00. Spray thresholds will need to be related to specific growth stages of the host plant.

References

- McLaren GF. 1992. Thrips on nectarines in the spring. *45th New Zealand Plant Protection Conference*: 111-115.
- McLaren GF and Fraser JA. 2000. Development of thresholds for insecticidal control of New Zealand flower thrips on nectarines in spring. *New Zealand Plant Protection* **53**, 194-199.