

# Phenology of New Zealand flower thrips (*Thrips obscuratus*) in vineyards



K. Schmidt<sup>1</sup>, D.A.J. Teulon<sup>2</sup>, M-C. Nielsen<sup>2</sup>, S.D. Wratten<sup>1</sup> and M.V. Jaspers<sup>1</sup>

<sup>1</sup> National Centre for Advanced Bio-Protection Technologies, PO Box 84, Lincoln University, Canterbury, New Zealand  
<sup>2</sup> New Zealand Institute for Crop & Food Research Limited, Private Bag 4704, Christchurch, New Zealand  
Corresponding author: schmidt@lincoln.ac.nz

## Introduction

The New Zealand flower thrips (NZFT), *Thrips obscuratus* Crawford, is endemic to New Zealand and is widespread in vineyards at flowering (Fig. 1). During spring, thrips adults (1.5-2mm) are abundant on many flowering plants and this species can achieve densities of up to 2 million per hectare of vines.



Fig. 1. Adult *Thrips obscuratus* on a grape flower

In wine grapes, thrips are considered to cause little direct economic damage. However, they have been shown to vector diseases of fruit crops and to carry conidia of *Botrytis cinerea* Persoon (Fig. 2). Since the incidence of *B. cinerea* at flowering is believed to influence the amount of disease at harvest, thrips may contribute to yield and quality losses in New Zealand vineyards.



Fig. 2. NZFT carrying spores of *Botrytis cinerea* (SEM)

## Methods

The first step in investigating the interactions between the fungus and the insect was to determine thrips abundance in vineyards. At a vineyard field site in the Waipara Valley (Canterbury House Winery), aerial populations of adult thrips were monitored from three weeks before flowering until harvest (27.11.03 to 01.04.04) with white water traps (18 in total) placed at three different heights (15, 80 and 140 cm).

## Results

- Thrips numbers increased during flowering and decreased thereafter (Fig. 3).
- Thrips identified were *T. obscuratus*, *Limothrips cerealium* Haliday, *Thrips australis* Bagnall and some species from the sub-order Tubulifera.

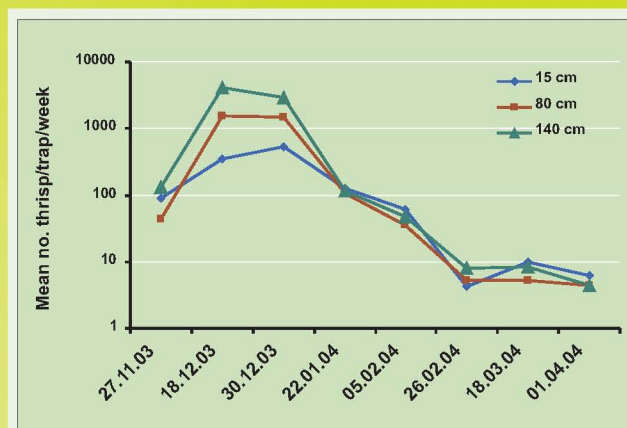


Fig. 3. Mean numbers (log scale) of thrips caught in a vineyard in water traps at 15, 80 and 140 cm above ground during the growing season

- During flowering and early berry development (18.12.03 to 22.01.04) NZFT was the most common thrips species in water traps at 80 and 140 cm height, whereas at ground level (15 cm) other species were more common (Fig. 4).
- Towards the end of the growing season the percentage of NZFT caught in the traps steadily decreased, whereas subsequently the percentage of other thrips species increased (Fig. 4).

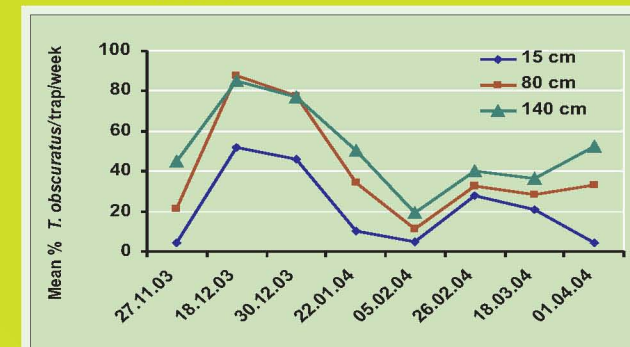


Fig. 4. Mean percent of *T. obscuratus* caught in a vineyard in water traps at 15, 80 and 140 cm above ground during the growing season

## Conclusion

Since there were high levels of NZFT in vineyards at flowering, thrips are likely to pick up *B. cinerea* spores from infected flowers and could transfer them to uninfected flowers, causing loss of flowers and latent infection of ripening fruit.

## Acknowledgements

This research is supported by the National Centre for Advanced Bio-Protection Technologies, a Centre of Research Excellence funded by the Tertiary Education Commission, New Zealand.

We are grateful for the support of Neudorf Vineyards and Canterbury House Winery by providing their vineyards for this work. Many thanks also to Virginia Marroni for providing the photographs.

## Future Research

The overall goal of this research is to improve understanding of the tritrophic dynamics and interactions between the grapevine *Vitis vinifera*, *B. cinerea* and *T. obscuratus* in vineyards. This will include:

- Field trials in two New Zealand wine regions with different microclimates to investigate the
  - biology and population dynamics of NZFT
  - effects of thrips on levels of *B. cinerea*
- Greenhouse and laboratory studies on the mechanisms of the interaction.