



Western Flower Thrips

Western Flower Thrips (WFT), *Frankliniella occidentalis*, is one of the most damaging pests to confront the Australian vegetable industry. WFT causes damage by feeding on fruit buds (eg. cucumbers) and spreading Tomato Spotted Wilt Virus (TSWV) in many vegetable crops like lettuce, capsicum, potato and tomato.



A Western Flower Thrips.

This difficult pest often develops resistance to insecticides and is spreading into new growing regions and a wider range of crops, including stone and pome fruits.

Horticulture Australia (previously HRDC) has been funding research into the management of WFT and TSWV since 1995. Research work has included the following:

- monitoring the frequency of WFT resistance to commonly used insecticides
- generating data to support new chemical permit applications
- developing biological strategies for controlling WFT
- studying transfer of TSWV from infected plants to new crops
- surveying common weeds and native vegetation for their ability to host WFT and TSWV
- studying TSWV epidemics in potatoes
- observing seasonal changes in WFT levels in commercial crops



WFT damaged cucumber.

Australian vegetable producers have received the key outcomes of this research through a National WFT and TSWV newsletter and a three-year pilot extension project at Virginia.

Recommended WFT management strategies have been trialled 'on-farm', at Virginia and then transferred to growers through workshops and demonstrations.

The same basic management principles apply to greenhouses and field crops. However, well designed greenhouses are able to exclude some of the local environmental pest pressure, opening the way for additional management options including the introduction of biological control agents.

Greenhouse and field crops can benefit greatly from area-wide strategies to limit WFT and TSWV levels, in a growing region at critical times. This is achieved by eradicating weeds and old crops before they become pest and virus hosts for other crops.

Results you can expect

Most growers gained immediate benefits from recommended practices, but all found they had to adopt a routine program for checking results and comparing with management records. Many of these growers have also substantially reduced their chemical use.

The bottom line

- Remove weeds and plants that host TSWV and WFT, including infected crop plants
- Assess and correct aspects of spray programs that can weaken insecticide effectiveness or encourage resistance
- Monitor pest and disease levels closely
- Improve greenhouse design to exclude pests while maintaining adequate ventilation
- Work together, as a region, to tackle WFT and TSWV control

Trials at Virginia combined chemical and non-chemical strategies. Positive results required regular pest and virus monitoring and diagnosis. This enabled clear and early identification of threats, as well as assessment of the effects of changes to management practices.

Basic Pest Management Cycle



Farm hygiene:

Thorough hygiene practices can prevent WFT and TSWV contamination of crops. Five frontiers must be protected:

- Only seedlings and plant material free of pests and disease can be brought into the area
- Vegetation near the crop (weeds or old crops) should be cleared at least 2 weeks before planting unless it is pest and virus free
- TSWV infected plants found in the crop should be detected early and removed without spreading the thrips
- Neighbours should communicate to help each other with their planting, clearing and spraying times to maximise crop protection
- Regional action may be needed to deal with uncontrolled weeds or green waste disposal

Note: if infested plants or weeds are pulled out or sprayed off any pests will seek new homes nearby.

Spray program:

Improved pest control depends on ensuring the following things are completed:

- Planning to ensure effective spray timing and resistance control
- Maintaining spray equipment (fine jets and good pressure)
- Correct preparation of spray mixes (calibration, pH levels and chemical compatibility)

- Application of spray mixture for best coverage
- Checking spray coverage results using dyes
- Recording chemicals used and results achieved

Monitoring:

Regular monitoring using yellow sticky traps or leaf and flower checks enables:

- Pest Identification
- A quick check of spray results
- Assessment of the success of pest program changes



This information helped growers achieve:

- Accurate, timely and effective use of all management strategies
- Better pest control outcomes
- A better handle on further problem solving
- Frequent reduction in chemical use

Greenhouse design:

Fine mesh, to exclude flying pests, helps reduce the entry of thrips (and whitefly). However, fine mesh can increase disease problems if ventilation is dramatically reduced. If WFT do enter they may breed rapidly, especially in warm weather. Double entry doors also assist in reducing pest entry.

Biological control of WFT:

A native predatory mite, investigated by NSW Agriculture, has successfully controlled WFT in several greenhouse crops including capsicum, cucumber and tomato. It requires very careful management to work effectively.

Further Information

For more information regarding this edition of *VEGEnotes*, please contact your State Vegetable Industry Development Officer.

Acknowledgements

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