Western Flower thrips: A serious pest of floricultural crops

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In the past few decades, the western flower thrips, ***Frankliniella occidentalis*** (Pergande) has spread from western North America to become a major worldwide pest of agricultural and horticultural crops. It has recently become one of the most serious pest problems facing the ornamental industry in Kenya causing greater economic impacts.

Thrips cause considerable damage to floricultural crops through direct feeding, oviposition and transmission of topoviruses. Damage thresholds for floricultural crops are low as they attack the flower, which is the most important aesthetic part of the crop. These effects cause reduced crop yields and a reduction in market value.

Thrips are not strong fliers and adults are easily dispersed by wind and carried into greenhouses through openings such as open doors and vents. Thrip populations can build up in greenhouses within a short time due to their high reproductive rate. Numerous crops and weeds also serve as hosts of western flower thrips outside the greenhouses and these populations can migrate into the greenhouses if the original host plants senesce or are harvested.

Monitoring of the Western flower thrips can be done using blue or yellow sticky traps as these are the most attractive to the western flower thrips. Yellow sticky traps are widely used to monitor the population of thrips s because they are also highly attractive to many other pests of ornamental crops including whiteflies, aphids and leafminers.

Control Strategies

Good chemical management of the western flower thrips can be extremely difficult to achieve due to the thigmotactic behaviour of the insect that causes it to feed deep inside the flowers and buds where they are sheltered from chemicals. Its propensity to develop resistance is another factor which complicates control. Re-infesting populations through migration of thrips into the greenhouses further complicates the problem.

Based on the biology and behaviour of this pest, several management strategies have been developed. An integrated approach has been proven to be effective in the management of the insect as individual strategies may not be appropriate for every situation.

An Adult western flower thrip (Frankliniella occidentalis)

Physical controls

Thrips exclusion

The most effective strategy for thrips control is prevention. Many greenhouse structures have open sides or vents for increased ventilation. However, this offers no impediment to thrips movement into these greenhouses. Therefore screening over vents and doorways can greatly reduce this movement into greenhouses and greatly reduce thrip populations

Isolation of propagation areas

One of the most important factors in managing thrips is to start with clean plant material. Isolation of stock and propagation areas is crucial. Physical barriers, such as screening or distance from production areas can serve to isolate propagation areas.

Cultural controls

Weed control around greenhouses

Western flower thrips have a broad host range, including weeds. Removal of weeds around the greenhouses is critical as weeds serve as a refuge for western flower thrips. Moreover, weeds can act as a reservoir for the tomato spotted wilt virus.

Disposal of plant residues

Remove plant residues or debris away from the production areas as these may support large populations of thrips.

Monitoring of thrips population levels

Greenhouse conditions are suitable for F. occidentalis development throughout the year. Once established in the greenhouse, control may be difficult to obtain, so early detection is important. Thus, knowledge of F. occidentalis movement into and within the greenhouse is crucial to the utilization of integrated pest management strategies. The use of yellow sticky traps affords early detection permitting remedial action before populations can reach damaging levels.

Chemical Control

When monitoring indicates that chemical control is necessary, two applications can be made five days apart to reduce high populations of western flower thrips. Good coverage and penetration into the dense flowers, buds and terminal foliage is essential and is enhanced with smaller droplet sizes.

The development of pesticide resistance is a serious concern with western flower thrips control. Therefore it is important to rotate classes of insecticides. A rotation of classes every 4-6 weeks, based on two-three generation times of western flower thrips at greenhouse temperatures has been suggested.

Conclusion

The best approach to the control of western flower thrips is the integration of various management strategies, including cultural, physical and biological control alternatives. An integrated approach alleviates the constant insecticide pressure on ***F. Occidentalis*** and helps retard the development of insecticide resistanc