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Two-spotted mite control in Perilla crops

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Introduction

Perilla is a herb grown in poly-houses by mainly Vietnamese growers. It is a member of the mint family, Lamiaceae. Under polyhouse conditions Perilla can grow up to a height of 60–80 cm. There are both green-leafed and purple leafed varieties but the purple leafed varieties are grown in Australia. The crop is harvested before flowering for its leaves. A crop is generally cut few times allowing the plants to regrow, before ploughing in and replanting.

The only pest encountered in Perilla crops that is causing serious damage is two-spotted mite (TSM), *Tetranychus urticae* Koch. Feeding by all stages of the mite from the under surface of the leaves can cause white or greyish spots on the leaves making most of the leaves unmarketable.

A mite infested Perilla crop

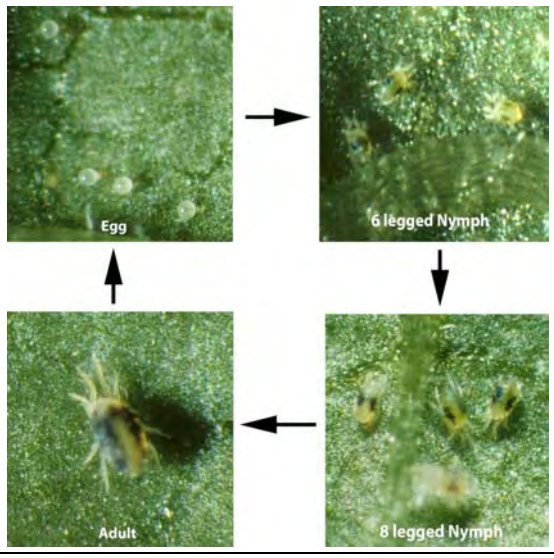
As most of the Perilla crops are grown under cover, the warm condition inside the polyhouses suits the mite to breed throughout the year.

TSM is often an ‘induced’ pest, which is a pest that is encouraged by insecticide sprays. This is because it can rapidly develop resistance to insecticides and the predators that would normally feed on the mite are killed by the same insecticides. Routine insecticide applications are the worst management option.

Spraying crops on a weekly basis, irrespective of whether the crops are infested or not can create problems rather than solving problems. As a result of such practices, predatory insects like ladybird beetles feeding on the mites are killed, leading to outbreaks of two-spotted mites.

Two-spotted mites are not insects but are related to spiders and therefore common insecticides used to control other insect pests are not effective in controlling them. For efficient control of two-spotted mites, miticides like Vertimec® have to be used.

Life cycle



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Life history of the mite and the damage caused

The females are oval shaped, about 0.5 mm long, and just visible to the naked eye. Usually females are far more numerous than the males in a colony. Males are slightly smaller and more elongated. The adults are pale green or yellowish with a dark spot on each side of the body. The spots are more prominent in the females.

Two-spotted mites feed mostly on the underside of the leaves, usually protected by quantities of webbing they produce. Females lay translucent spherical eggs individually on the underside of the leaves, usually under webbing. An individual female can lay up to 100 eggs but 70 eggs per female is considered average.

The egg hatches into a six-legged whitish translucent larva. This larva passes into a resting stage from which emerges an eight-legged protonymph. This is followed by another resting stage and the emergence of a final nymphal stage, or deutonymph which in turn passes through a further resting stage before it becomes an adult. The nymphs are similar in appearance to the females, but smaller in size.

The life cycle from egg to adult occupies about 7–14 days depending on the temperature (shorter in warmer weather). Therefore in warmer weather populations can build up rapidly.

Under outdoor situations the females change colour from green to orange in late autumn and become inactive, overwintering in this condition. However, under cover two-spotted mite can remain active throughout the year.

Spider mites feed by piercing the surface tissues of the leaves and sucking up the sap. The first sign of injury is the appearance of greyish spots peppered over the leaves. These spots soon coalesce and the leaves become grey all over. Under heavy infestations the under surface of the leaf will be covered with webbing and mites and the leaf surface will appear bronzed. The leaves yellow and wither from the edges; the most heavily infested leaves become papery and fall, leaving the plant with only the top healthy looking and the lower part bare of leaves. Besides crawling from plant to plant, the mites may be spread from infested crop to healthy crop on clothing of people working in the farm or they could be blown on the wind.

Management of the pest

Crop monitoring

Early detection of two-spotted mite is critical for good management. When greyish spots appear on leaves, the under surface of these leaves should be examined. A binocular magnifier is very helpful at this stage to detect the presence of the mites. Predatory mites can manage TSM populations and monitoring for their presence is also needed. If only one or two plants are infested with TSM these could be removed to avoid spreading the mites. Because TSM populations can increase so quickly if TSM are found on several randomly selected plants within a planting, and no predatory mites are observed then action needs to be taken.

When to take action

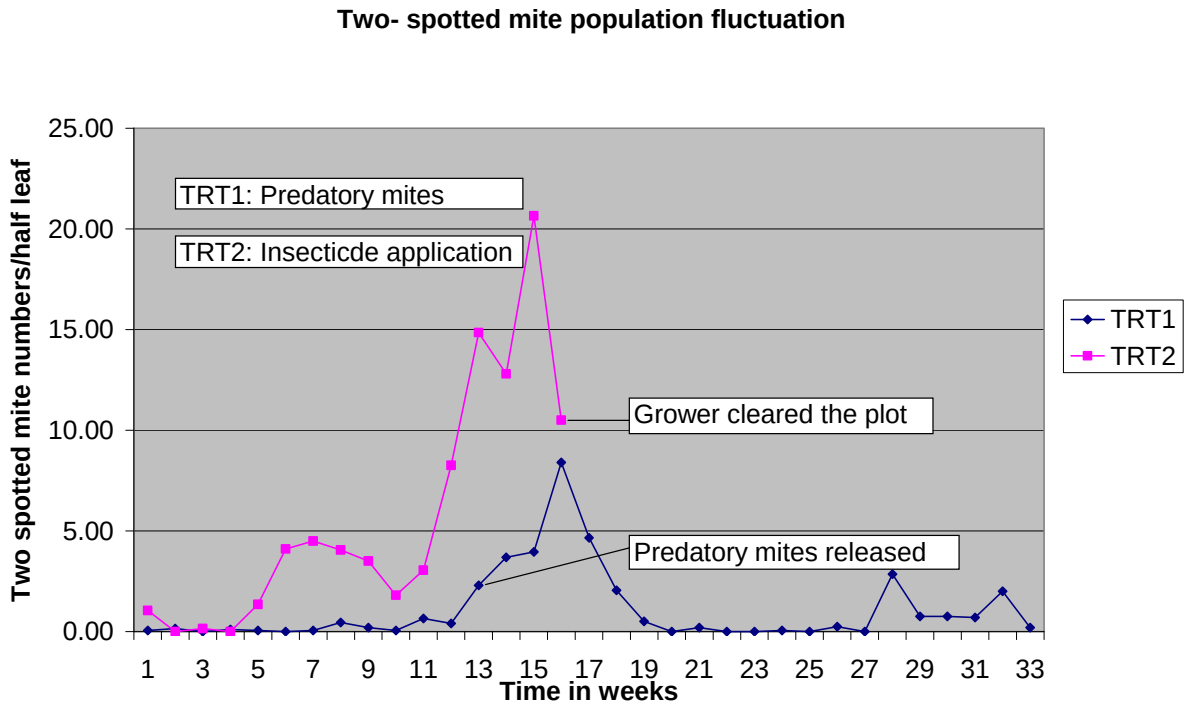
If predatory mites are present then monitor the populations. Usually the predatory mite population will increase and reduce the TSM population, although initially the TSM population will increase more quickly. If predatory mites are not present then purchasing some from an insectary to release in the crop is the best option.

Although insecticide like dimethoate and miticide/insecticide like Vertimec® can be used successfully against two-spotted mites no insecticide or miticide are registered specifically to be used on Perilla crops. Frequent use of insecticides can select for resistance and make the problem worse.

The Chilean predatory mite *Phytoseiulus persimilis* is the most common commercially available predatory mite to the growers. The predatory mites feed on all the stages of the two-spotted mites and do not feed on the plants.

Predatory mite feeding on a two-spotted mite

This predatory mite could be purchased locally and they can be distributed easily among the Perilla crop as they are supplied on bean leaves. By spreading the bean leaves randomly among the



Perilla crop to cover the entire plot, predatory mites could be distributed easily and from there the predatory mites will spread to the entire crop.

In trials in 2006–07, using a supply of predatory mites containing 5000/bucket on bean leaves, which costs around $75.00, released when populations reached approximately 4–10/leaf, good control was achieved for the whole life of the crop in trial plots of 1 m x 25 m in size.

Therefore, predatory mites should be released before the two-spotted mite population exceeds 10/leaf, and preferably when it is between 4 and 10 for successful control. If left for later when populations are greater, then it will take longer for the predatory mites to control the TSM populations and more leaf damage will occur.

Care should be taken not to allow drift of broad spectrum chemicals sprayed for other crops onto Perilla crops as it is more likely to kill the predators than the TSM.

Always read the label

Users of agricultural chemical products must always read the label and any Permit, before using the product, and strictly comply with the directions on the label and the conditions of any Permit. Users are not absolved from compliance with the directions on the label or the conditions of the permit by reason of any statement made or omitted to be made in this publication.

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