

INTEGRATED PEST MANAGEMENT IN AN INDOOR PLANT NURSERY

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Integrated pest management (IPM) has been defined as... "the combining of biological controls and cultural manipulations to minimise dependency on pesticides."

Despite the widely publicized advantages of IPM, and the pressure to reduce the use of synthetic pesticides around the globe, many growers still have not accepted that IPM can work for them. Many lack confidence in IPM programmes and quite often they are satisfied with their present chemical control methods. My own experience with IPM has been in controlling two-spotted mite (*Tetranychus urticae*), or TSM for short.

In the winter of 1982 we leased a greenhouse that had several large specimen plants permanently planted in it. There were cultivars of *Ficus*, *Schefflera*, *Codiaeum*, and some palms. Within a few weeks we realised that we had inherited a healthy collection of assorted pests, namely, mealy bug, aphids, and TSM.

A routine spray programme soon had the situation under control through spring and early summer, or so I thought. As summer progressed I found that I was constantly battling TSM. The problem was the large stock plants, it was impossible to achieve good spray penetration because of the size and spread of foliage.

In the winter of 1983 I attended a field trip organised by the Department of Scientific and Industrial Research (DSIR), Mt. Albert, Auckland, where I learned that they were trialling the mite predator, *Phytoseiulus persimilis*. Though there were several greenhouse vegetable and cut flower growers taking part in the trial little work with ornamentals was in progress. I discussed my particular problem with them and soon we had a trial set up.

The predator was introduced when the population of TSM was high enough to support it, and then the nerve racking part began. It is hard for a grower to stand back and watch while mites crawl apparently unchecked around the greenhouse. I watched the population of TSM increase daily while *Phytoseiulus* seemed to be struggling to establish itself. Then on the advice of the DSIR I sprayed with Torque (fenbutatin oxide) which is effective against TSM but does not harm *Phytoseiulus*. After a while it became obvious that the TSM population was on the decrease and that the predator was winning. Mid-summer that year we were totally free of TSM. The predator even over-wintered and the following

summer we had no difficulty controlling TSM with an occasional application of Torque. *Phytoseiulus* had the situation under control.

Phytoseiulus is orange-red in colour and is pear-shaped, with front legs longer than TSM. It moves considerably faster than its prey and can be seen on the undersides of leaves where TSM is most abundant. Female predators' eggs are twice the size of TSM eggs, the young hatch out after a few days and prey upon the TSM eggs. *Phytoseiulus* does best at 18° to 35° C in 60 to 90% relative humidity. Since moving to our new premises we find that we have to reintroduce the predator every second year, usually around January or February when the hot dry conditions favour TSM. The important features of using biological control in our case have been:

1. A change in attitude to insects and other pests in the greenhouse, realising that there are acceptable levels of mite populations.
2. A change in the range of chemical used to control secondary pests and fungi.
3. Learning to correctly identify insects.

Biological control of TSM in our case has proved to be more efficient than chemical sprays and also cheaper. We have better pest control with less spraying, which is a step in the right direction both economically and environmentally.