

GROWERTALKS

Columns

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Biocontrol for Thrips and Spider Mites

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In my August column I listed several compelling reasons to consider incorporating beneficial insects, or biocontrols, into your IPM program.

The first and foremost thing to consider when putting together a crop protection program is resistance management, i.e. the proper rotation of chemical modes of action and the use of other options such as biocontrols to extend the effective life of the chemicals currently available. As mentioned previously, chemical controls and biocontrols are not mutually exclusive. Our goal here at our greenhouse is to incorporate biocontrols by periodically releasing predators into the crops at

relatively low rates so that we always have some protection in place. We hope to establish a low-level reproducing population of predators and spray only as needed—like hotspots or as a final cleanup before shipping.

Here's what we've done so far. For spider mite control we've been using a combination of the predatory mites *Phytoseiulus persimilis* and *Neoseiulus californicus*, which we release at two- to three-week intervals. Both of these predators do the same thing: they eat spider mites and their eggs. However, the two predators have different attributes that make combining them perhaps more effective. *P. persimilis* is a faster, more aggressive mite and is good at cleaning up an existing problem. However this predator cannot exist without prey; it basically eats itself out of a job and then dies out, so it doesn't fit into a long-term goal of establishing a reproducing population. It's also genetically weak and can't tolerate low levels of pesticide residue. Lastly, it only feeds on spider mites and their eggs.

On the other hand, *N. californicus* can survive for two to three weeks in the absence of prey, and it's a tougher mite that can withstand low levels of pesticide residues. Its diet is more varied, as it will eat broad mites as well as spider mites, and it can also survive on pollen if that's present. However, it's somewhat slower than *P. persimilis* and can be overrun if the spider mite population is too high. For these reasons, we release the two together, usually at a ratio of 25% *N. californicus*/75% *P. persimilis*. However, we vary this depending on the pest population. We have been using this approach on one particular crop for the past 10 months with good results, and at this point we feel confident enough to expand the program.

More recently, we have started using beneficials to control thrips on one of our crops. As with the spider mite

control, here we are also using two different biocontrol agents. *Amblyseius swirskii* is a relatively new introduction of predatory mite native to the Mediterranean countries. It's primarily used against thrips; however, it's also active against whitefly. It has also been known to feed on the eggs of other predatory mite species, so this is something to consider when deciding if and where to use this mite. It feeds on the immature stages of thrips, and due to its small size, it's able to get to the hard-to-reach areas such as folded leaves and flower buds, where other predators or chemicals can't reach. With the *A. swirskii* mites, we combine *Orius insidiosus*, commonly known as the minute pirate bug. This is a member of the true bug family, large enough to see without magnification and, like the other true bugs, is a generalist feeder. In the absence of thrips it will eat spider mites and other small soft-bodied insects but its preferred menu is thrips. They are voracious. A bonus with this predator is that it's winged and a strong flyer, increasing its range and effectiveness.

We're less than a year into using biocontrols, and overall, I think we've been successful, but we've also had our share of mixed results. I believe that's a reflection of where we are on the learning curve. As we move forward and accumulate experience and knowledge we'll get better. I've heard it said that the use of biocontrols is more of an art than a science. This could be true; I don't know, but if it is, I'd say there's a lot of science wrapped up in the art. If you're considering trying biocontrols, I'd recommend starting small, learning as much as you can about the target pests and associated predator(s), and moving forward in small steps. I believe it'll pay off in the long run.

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