

## Ways Microbial Insecticides Can Fit in Your Plant Pest Program



Here is a spider mite five days after a Velifer treatment. Photo: BASF

The number of microbial insecticides labeled for greenhouses and nurseries continues to expand. Why consider microbial insecticides? The list of attributes is attention-getting:



Good plant safety

Low mammalian toxicity

0-day pre-harvest interval

Generally good compatibility with biological control agents (BCAs)

Modes of action that are different from conventional insecticides

All of the products in the table below are labeled for use on herbs, fruits, spices, and vegetables.

With such an impressive list of attributes, why are we not seeing more of them being used in commercial greenhouses? Microbial insecticides are similar to insect growth regulators (IGRs) in that

they take some time to work. Often multiple applications are needed to achieve sufficient infection levels and high rates of control. Growers naturally prefer products that work faster when they are available.

Microbial insecticides work differently than most conventional pesticides, so a discussion of application strategies is needed. All of the listed insecticides except for Grandevo CG and Venerate CG work by way of infective fungal spores. The best control is achieved by a series of three or more sprays at three to seven-day intervals, depending on pest pressure. The idea is to maintain a high level of viable spores for long enough to achieve a high pest infection rate.

#### Creating the Right Environment

In general, microbial insecticides need warm, moist conditions for a period of time after the application to maximize effectiveness. Late afternoon or evening applications typically allow for a longer period of higher humidity. Maintaining good cultural conditions in production areas should allow growers to make occasional late day spray applications without encouraging foliar disease problems.

There are a number of foliar fungicides that are compatible with some or all of the microbial insecticides mentioned in the table here when additional protection is desired.

The addition of an azadirachtin-based IGR such as Aza-Direct, AzaGuard, Azatin O, or Molt-X can also make these microbial insecticides more effective. They slow down the molting process, making it less likely that the spores will be lost through molting before they have an opportunity to penetrate the insects. Below is an example of a spray program for pests such as aphids, thrips, or whiteflies:

- Day 1: Microbial insecticide tank mixed with azadirachtin IGR
- Day 4: Microbial insecticide
- Day 8: Microbial insecticide tank mixed with azadirachtin IGR

The addition of an approved surfactant is recommended.

Grandevo CG and Venerate are based on bacteria and work by different modes of action than the products just covered. However, they also benefit from a similar strategy of a series of consecutive sprays at intervals of three to 10 days depending on pest pressure. They would also benefit from the addition of an azadirachtin IGR. Best success is achieved for all microbial insecticides when applications are started when pest populations are low.

Despite some unique challenges, microbial insecticides are likely to continue to play an increasingly important role controlling insects and mites in commercial greenhouses and nurseries

*Read and follow all label directions. Pesticides other than those mentioned may be safe, legal, and effective.*