GROWERTALKS

Features

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The 1-2 Pest Punch

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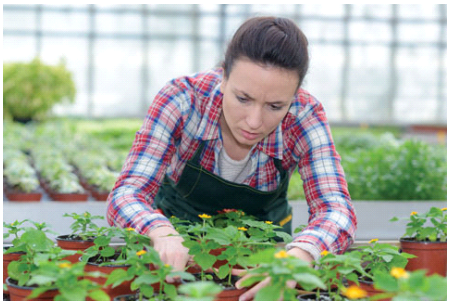
The tiny hordes are on their way. They want to take your hard-earned work and gobble it up for themselves without a thought of you.

You fight back! You hit 'em where it hurts or so you thought … they just keep munching and destroying. It's a nightmare! They're unstoppable!

But don't worry—Integrated Pest Management (IPM) can help you get a handle on this nightmare and salvage your hard work before it's too late.



First, monitor and scout your crop. There's a chance that the infestation can be treated in isolated areas or spots. Many insects have a more limited dispersal range when young and the dispersal capabilities often increase as they mature. Therefore, if you catch an infestation when it first begins and before it spreads too far, you may be able to spot treat for a localized problem instead of having to treat the entire crop. This can be especially true if you use a trap crop system.

Pictured: Monitoring and scouting is the first step in a good Integrated Pest Management program.

However, be careful if you decide to implement that strategy. It's possible to bring in more pests and make the problem worse if it's not implemented properly. Pesticides provide a valuable tool for managing pest populations; however, the more sparingly you can use a pesticide, the better chance you have to avoid a pest population developing resistance. But don't take that to mean using a watered-down dilution of a pesticide. Applying a sub-lethal dose to a pest population is actually a great way to increase the chances of developing resistance and not gain the control that you need.

When you do find an infestation or a potential problem, make sure to correctly identify it. Treating a pest with a pesticide that may not work well or at all on that species is just a bad idea. If you treat for a pest without knowing exactly what it is you may be inadvertently causing other problems.

Let's say you have something tiny crawling around … maybe thrips? So you apply imidacloprid, which is broad spectrum and systemic, expecting it to kill whatever it is. However, imidacloprid is known to cause outbreaks of spider mites in some circumstances, which is what you happened to have had infesting your plants. Now you have a bigger problem and have wasted precious time and money.

In some cases, it may not be a pest at all, but a predator or other biological control agent, which are generally more sensitive to insecticides. You certainly wouldn't want to get rid of those! Correct identification is a must in any pest control situation so identify that pest before you do anything else. Most universities with entomology departments or local extension agents can help you identify the species if you aren't exactly sure what pests you're dealing with.

Try non-pesticide control methods first. After identifying the pest and confirming that it does indeed need to be controlled, what next? See if there are any non-pesticide control methods that you can use, such as biological controls like predatory mites and parasitoids, physical removal, a cultural change such as removing any weed harborage areas, reducing water leakage that may be adding to conducive conditions for that pest, and physical controls like adding mesh to the ventilation area to enhance exclusion of pests.

Rotating crops can aid in reducing the likelihood of pesticide resistance. If the same crop is grown in the same area for multiple seasons in a row, the same pest populations are likely to remain even if at low levels or reoccur frequently from the same sources. Changing the crop species in a location can alter the pest species present and reduce the amount of time and selection pressure put on one pest population in a given area.

However, like all things biology, nothing is quite as straightforward as that. This doesn't really apply to long-distance migratory species, but only to things with limited dispersal behaviors, like soil-dwelling pests and pathogens, and those that may have overwintered nearby.

If you can't rotate crops, you can at least try to grow resistant cultivars of that crop. Resistant cultivars can reduce the amount of pesticides needed by using the plants' own defenses. Plant breeders are working hard to increase the positive traits of many plant species, often including resistance to pests and diseases. Look into what new cultivars may be available.

When you do use pesticides, it's important to rotate the mode of action (MOA). If you rotate to a different chemical in the same group, such as another sodium channel modulator like bifenthrin (Group 3A), that continues the same selection pressure for building resistance in the insect. However, if you rotate to an insecticide in another group, such as imidacloprid—a nicotinic acetylcholine receptor (a different part of the nervous system and Group 4A)—then it puts a different selection pressure on the insect and reduces the likelihood of resistance development.

All labels should have the number for the MOA class at the top of the label for easy identification. The key is to rotate MOA numbers in your pesticide applications. For more information about rotating insecticide groups and modes of action, go to the Insecticide Resistance Action Committee (IRAC) website: www.irac-online.org/modes-of-action. All the known active ingredients and classifications are there along with many other pieces of useful information.

Follow up after an application. If you perform a treatment, whether it's insecticide or biological control or something else, always follow up to make sure it worked. Evaluate the efficacy. If the treatment worked, great! How well did it work—90% effective, 95% or 100%? Make sure you're aware of exactly what's going on with your plants and pest problem. If it didn't work, find out why. What could have gone wrong? Were the mix rates wrong? Is the nozzle sprayer clogged and not enough product is getting out? Did the sprinklers go off soon after application and wash all the insecticide off? Troubleshoot as best you can to see if it was user error, mechanical error or an unforeseen event.

Ultimately, we want to know if it was the physiology of the insect or something related to the application causing the failure of control. One of the ways to monitor application is to position spray cards at various locations throughout the treatment area and monitor coverage, especially in large-scale operations. Another monitoring technique is to sample freshly treated leaves and plants or flag plants with known infestation and go back to assess those areas specifically.

If you've determined the application wasn't the problem, there's a possibility it might be resistance. You

can find out for sure by sending some insects to a lab for resistance testing. Whether your pest population is resistant or susceptible, take steps not to spread that problem. It's the neighborly thing to do.

Remember, while pesticide resistance is global, individual pest populations can be local, so growers can create their own local population of a pest species that responds to their management approach. There is, of course, a challenge of an already resistant population moving into the greenhouse, but under good phytosanitary conditions, this can be avoided.

Managing pest populations in as sustainable a way as possible is important for a grower's future operations. If resistance develops, that increases production costs by needing more treatments and products having less efficacy leading to poor control. Resistant pests can also decrease income by lowering the quality and sometimes quantity of plants and plant products as the plants sustain more damage. So, if increasing costs and decreasing revenue isn't your goal (and I'm betting it isn't), then take care to manage pest populations to reduce the likelihood of resistance developing. **GT**

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