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Tools for Pest Management

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“Spray and pray” was how your father handled insects and diseases, as did his father before him. But that method of pest management no longer makes sense for many reasons: cost (in chemicals and labor), worker safety, environmental regulations and resistance management, to name a few.

Left: An Agra Tech positive-pressure greenhouse. You can clearly see the insect-screened “lung” at the right end of the greenhouse, and a screened vestibule around the main entrance.

Thankfully, you’ve got tools at your disposal that dad and granddad couldn’t imagine—technologies that aid with prevention, detection and control.

Prevention

Prevention is the best medicine, they say, and they’re right. There are several proven tools for keeping insects out and diseases from getting a foothold. The first is insect screening. In use since integrated pest management (IPM) became a thing in the 1980s and ’90s, insect screening physically prevents insects from entering the greenhouse (through fans, vents or other entry points) by having an extremely fine mesh—from 17 mesh (1,100-1,200 microns) for fruit flies to 75 mesh (177 microns) for thrips. The downside? A mesh that is fine enough to stop nearly invisible insects will also restrict airflow—by as much as 90% for ultra-fine thrips screens. This challenge is solved by building screened corridors or boxes at the ends of greenhouse with a large surface area combined with accordion-style screening attached to vents. A well-designed screening system can exclude 95% of insect pests, say growers who make use of them.

If your older screening is due for replacement, the latest offerings, such as Xsect from Svensson, feature extremely thin engineered yarns and proprietary weave geometries that retain a fine mesh while maximizing airflow. Some screens, such as Opti-Net from Green-Tek in Wisconsin, are now incorporating “optical additives” that “blind and repel insects” before they reach the screening, allowing the use of a more free-flowing 40- or 50-mesh for thrips control.

A positive-pressure greenhouse, in conjunction with insect screening, can take you from 95% physical exclusion to nearly 100%. A standard fan-ventilated greenhouse is negative-pressure: fans at one end pull air through a vent or evaporative cooling pad at the other end. As that happens, the suction from the fans also pulls air in through every vent, crack and doorway in the greenhouse, potentially sucking insects in, too.



Positive-pressure, conversely, uses fans to push air into the greenhouse. This makes the static pressure inside higher than outside, so any air leaks outward, not inward, preventing insects from entering. To work effectively, it requires good insect screening at the inlet side of the greenhouse as well as on the exhaust vents.

Left: Trap-Eye uses a camera to read sticky cards and AI to analyze the findings.

Agra Tech, based in California, has been building positive-pressure greenhouses for more than 25 years. CEO/president Adam Pound told us his company's positive-pressure greenhouses not only can restrict 99% of insects (he's reluctant to boast 100% only because an insect can come in on a plant or a worker), but they can also maintain a very uniform temperature from one end to the other. That's because their design utilizes evaporative cooling pads and multiple small jet-fans connected to poly convection tubes that distribute screened and

cooled air throughout the greenhouse. The environmental control system can even monitor and adjust fan speed and vent openings to optimize the static pressure being generated. The cost for a positive-pressure greenhouse isn't outlandish—just 10 to 15% more than a standard fan-ventilated house, Adam said. It's also possible to retrofit an existing greenhouse with positive-pressure equipment.

For disease prevention, the best defense remains old-fashioned sanitation, which every greenhouse should practice scrupulously. For advanced surface sanitation at a price level reachable by even the smallest operation, consider foam. Why? Foam (proper thick foam, not suds) lasts longer than liquid sprays, improving contact time, and it also clings to vertical surfaces, for better disinfection of greenhouse walls, bench legs, etc.

Dramm offers several models of compression foamers, from small 8-liter hand pump models (the Foam 8L) to the FM line of cart-mounted 20-, 50- and 100-gallon foamers. Each uses compressed air to generate and propel a thick, aerated foam that sticks to surfaces.

Detection

Based on a discovery in 1921, yellow sticky cards (and blue to attract thrips) have been the standard for monitoring flying insects in greenhouses since the 1960s. In 2026, cameras and AI are automating the monitoring of sticky traps. Trap-Eye, offered by biological crop protection specialist Biobest, automatically takes pictures of your sticky traps and uses AI to identify, count and map the insects in your greenhouse. Developed in collaboration with Dutch technology company PATS, 40 column-mounted Trap-Eyes can monitor 100,000 sq. ft. of greenhouse, taking pictures of the sticky traps at regular intervals and using a cloud-based AI to give you an overview of your pest (and beneficial insect) population development.



Right: Boom-mounted UV lights by CleanLight to help control mildew, botrytis, xanthomonas and more.

Head Grower Laurie Conlon of Michael's Greenhouses in Connecticut tested Trap-Eye on her poinsettia crop during the 2025 season. "Trap-Eye helped us pinpoint exactly where whitefly populations were increasing, allowing us to apply biological control in a higher concentration where it was most needed," Laurie said. She believes the system identified whiteflies one to two weeks earlier than her staff would have during their routine scouting.

The Dutch company PATS eliminates the sticky card altogether with their PATS-C cameras, which monitor the airspace above your crops, looking for flying insect activity. AI identifies the insects by their unique characteristics.

The benefits of both system? Labor savings, no missed scouting, standardization of pest counts compared to humans, and a web-based dashboard that lets you analyze results and see insect hotspots, from anywhere, anytime.

At the top end of the monitoring spectrum we find robotic scouts like EVA Scoutr by Viscon Group. Working day or night, EVA Scoutr is an autonomous robot that roams the greenhouse guided by geolocation, finding and mapping pests and diseases (currently 15 of them). One robot can cover more than 400,000 sq. ft. of greenhouse in a day.

Control

You have pests—now what?

Well, if you are using PATS-C to monitor for insects, you can also use PATS-X—tiny little mini drones that kill target insects with their propellers (seriously). But if you are not quite ready for that, you can fine-tune your applications.

The art and science of releasing predatory insects and mites has been made easier by the companies producing the little critters. Both Koppert and Biobest offer battery powered blowers that are designed to gently release just the right amount of natural enemies across an entire growing space or into hotspots.

Powered by a 12V battery, Koppert's Natutec Airobreez uses a blower to distribute the carrier material hosting the beneficials up to 4 meters from the device. Entomatic is Biobest's brand of powered applicators; they offer a small handheld 18V unit as well as larger tractor-mounted dispensers with 1 to 16 release points, to truly mechanize the application of beneficial insects. Biobee offers Bugflow, which connects to standard handheld cordless blowers from DeWalt, Makita and Milwaukee. And Ecobotix of Denmark also offers beneficial insect dispensers that can be deployed in a variety of ways: on irrigation booms, a tractor or ATV, or even by drone.



Let there be light

There are many more tech options for insect and disease management, but we'd be remiss if we didn't mention ultraviolet (UV) light, which has long been known to be effective for disinfection (see the

1903 Nobel Prize in Medicine). UV-C is becoming more widely used in greenhouses for sanitation and disease management, either stationary (with crops passing over or under the fixtures), mounted on booms, on autonomous robots, or as part of your irrigation system. UV is one of the best add-on preventative tools you can deploy in your greenhouse. The only caveat is worker safety; UV-C is dangerous to humans, so it has to be deployed with the proper guards and protections.

Left: Koppert's Natutec Airobreez dispenses beneficials gently and at the correct rate.

Right: Biocaptur is the modern version of the bug zapper that used to hang on dad's back porch.

But another option is much simpler: light to attract pests to traps. Anyone with a backyard bug zapper has seen that at work. ATG Ingenieria in Almeria, Spain, has developed a product called Biocaptur that uses precise wavelengths from LED lights to lure tomato leaf miners (*Tuta absoluta*) and other pests to a suction trap that captures and contains them. It operates only during the hours that coincide with the leaf miners' biological cycle, protecting beneficials and pollinators. One Biocaptur unit can protect 50,000 sq. ft., they say. Next up from the company: light traps for western flower thrips and pepper thrips. They say they've already determined the exact spectrum to attract the insects, and an automatic incinerator to eradicate them. With about 80,000 acres of covered vegetable production, Almeria is the perfect testing ground. **IG**