

IPM TOOLBOX: EXCLUSION

Often, we're lulled into a false sense of security that comes with a "fresh" crop in the greenhouse. When IPM becomes an afterthought, pests or pathogens often become much more serious problems when they are a front-and-center issue. Your best IPM approach is always exclusion. Let's discuss ...



IPM Approach #1—Exclusion

The strongest IPM programs focus most heavily on exclusion of pests and pathogens and preventative control measures. The more you can keep pests and diseases from establishing a foothold, the easier it is to minimize crop losses or remediate an issue if something slips into your greenhouse. Be sure to manage the following components in your greenhouse IPM plan.

Sourcing. Always purchase seed and young plants from trusted suppliers. While this is never a 100% guarantee that a pest or disease won't be present on incoming material, the likelihood of getting a problem shipped to your greenhouse is greatly reduced when buying from a reputable source.

- Don't choose a supplier strictly based on low cost. Buying simply because one supplier's product is cheaper could end up costing you more in the end to remediate a pest or disease issue, especially if it spreads to other crops.
- Develop good relationships with your suppliers and communicate potential issues regarding incoming plants or cuttings as soon as possible. Always have your order number, crop and cultivar info, a timeline of events, a detailed description of symptoms and high-quality photos at the ready when reporting pest or disease concerns on plant inputs.

Material inspection. Any plant material entering your greenhouse comes with a potential pest or disease risk, even if purchased from a reputable supplier. The easiest way to catch a pest or disease early is to thoroughly inspect cuttings and young plants *before* they hit the bench. Designate an area outside of the greenhouse to be your inspection station and thoroughly survey all incoming material.

While this is a time commitment and may feel like a low priority during the busy season, this is your first-line defense against lurking critters and diseases. Your inspection area should include:

- **Ample lighting:** If your inspection area is as dark as most North American greenhouse offices or headhouses (can barely see your hand in front of you with an outstretched arm), install additional lighting. An adjustable lamp that can be raised and lowered is a cheap and easy way to increase light levels. LEDs with adjustable light color/temperature can also be helpful to increase contrast and make insects or disease symptoms easier to spot.
- **Cleanable surfaces:** To avoid transmitting disease or pests between batches of plant material, only inspect young plants and URCs on hard, impermeable surfaces. A stainless-steel table or countertop is ideal but avoid using porous materials like wood or foam as an inspection surface. Thoroughly clean and sanitize the inspection surface between crops to avoid cross contamination.
- **Magnification capability:** Many pests and disease symptoms can be seen easily with the naked eye, but some cannot (like broad mites). A dissecting microscope or computerized scope like a [Dino-Lite](#) is an excellent tool to zoom in quickly and get an up-close view of anything suspicious. At the very least, have hand lenses with several levels of magnification (or a compound lens) to help get a closer look.

Physical barriers. Whenever possible, physically prevent pests and diseases from entering your operation. Inspection is the best way to catch “hitchhikers” from other greenhouses or cutting farms, but local pest and pathogen populations near your facility also pose a major risk. Be sure to judiciously manage:

- **Greenhouse doors:** Pedestrian connections to the outside and between adjoining greenhouse sections should be managed carefully. Keep doors closed to reduce the chance of pests flying in or passing between production areas, and pathogen-infected plant debris from blowing into the greenhouse from outside. Air curtains installed at primary doors and between sections can help push back airborne pests when doors are opened. Flexible, raised threshold plates can also help keep crawling pests out or prevent disease-infested debris from blowing in underneath.
- **Side and roof vents:** Much like doors, side vents can serve as entry points for pests and pathogens. Thrips screening can be fastened over vents to help exclude flying insects. Clean screens regularly to avoid air flow reduction and patch or repair if any damage occurs. Manage weeds around fans and vents regularly, as they can serve as reservoirs and sources of continuous reintroduction for pests all season long.
- **Hand and clothing sanitation.** People are some of the most notorious vectors of pests and diseases in the greenhouse. Handling an infected crop and moving to another area is a very easy way to transmit diseases and pests on clothing can easily pass undetected from one greenhouse to the next.
- **Install hand wash stations** throughout your operation at strategic points—namely high-traffic areas and between larger sections or greenhouses. Establish a “clean hands policy” where workers thoroughly wash hands and/or change gloves between growing areas to reduce the chances of spreading pathogens.
- **Install boot and shoe cleaning stations** at main entry points. This will reduce the risk of employees tracking pathogens in on soil stuck in their footwear or unknowingly carrying them

between greenhouses. Ensure that adequate equipment to clean (such as a shoe brush stand), wash (for example a rinse bath) and sanitize (like dip trays, foamers or sponges) footwear is present and regularly maintained or replenished.