IPM Insect and Mite Scouting for Greenhouses — Joanne Lutz, GGSPro
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There are numerous benefits that can be realized by setting up an Integrated Pest Management (IPM) Scouting program. One goal is risk mitigation. Insects and diseases can dramatically reduce a plant’s quality and market value. There are also cultural and nutritional practices that influence a plant’s susceptibility to pest attack and its ability to fend off those attacks. Before you grow any crop educate yourself on the ideal growing conditions, irrigation and fertility requirements. Be aware of potential pests and be prepared in advance for how you will respond if trouble starts. Scouting requires time and time is money, so prioritize those crops that need more attention than others.

Another benefit of IPM is to optimize pest control in an economically, socially and ecologically sound way. Early detection of pests allows for greater use of cultural and biological control measures. It is through weekly scouting, good record keeping and treatment evaluation that you will learn how to quickly identify pest problems and make effective control decisions.

A motivated and dedicated person is needed to take ownership of the IPM Scouting Program. Whether it is dedicated employees or professional IPM Scouts, their top priority should be scouting for early detection of pests. Scouting involves inspecting the crop for eggs, and all life stages as well as determining if beneficial insects or mites are present. After the scouting is completed, the information must then be formalized and recorded to provide the grower with a clear, accurate picture of what, where and how many pests are present. Lastly, an informed decision can be made to treat the predominant life stage present.

There are various methods that can be employed to help growers identify changes in pest populations. The most common approaches are explained in detail below:

1) Install yellow or blue sticky cards
2) Whole plant inspections
3) The “Beat Test”
4) Indicator/Trap Plants
5) Potato Discs
Sticky cards are used to monitor flying insects such as thrips, whitefly, fungus gnats, shoreflies, winged aphids and several beneficial insects. The most important component of using sticky cards is that they be examined and changed each week to provide you with up-to-date information. Cards allowed to stay in place for weeks or longer yield little useful information. Place cards at 1 - 2 /1,000 sq. ft. for most crops and 2 - 4 / 1,000 sq. ft. for highly sensitive crops. Place cards near vent openings and attach them so the bottom 1/3 of the card is in the crop canopy. Attach cards on bamboo stakes using clothespins and place them vertically in the crop. Don’t forget to number and date each card and location. This will help when transferring the information onto data sheets and assist in tracking pest population trends. Be sure to also utilize both sides of cards to determine directional movement of flying insects. Remember, insects caught on sticky cards may look different that living insects. A good reference picture ID sheet is available from GGSPro to assist those learning to ID the primary insects caught on sticky cards. Sticky cards can be messy to handle but by storing these cards in the refrigerator, makes them easier to handle. When it is time to take counts from the cards stretching saran wrap over the card will allow you to get close with a hand lens without getting stuck to the card.

During whole plant inspections, a common rule of thumb is to inspect 10 – 20 plants per 1,000 sq. ft., walking down an isle in a zig-zag pattern. Not all pests will be found equally through a crop, so target inspections to examine plants in the beginning, middle and end of a bench; along the aisle ways and from the middle of the bench. Pick up at least 3 plants from each bench and examine them plant starting at the crown. Inspect the entire foliage canopy; examine both leaf surfaces, growing tips, buds and blooms. Include an examination of the root zone in your routine for soil dwelling insects and mites. Use a 16X hand lens or OptiVisor to assist in identification of immature insects and/or mites. If identification on the spot is not possible collect a sample for further investigation. Digital images can be saved to help in future diagnostic work. During this visual inspection, think carefully about what a normal, healthy plant looks like. Take notice if there is a problem and note any specific symptoms or signs visible. Observe if there’s an overall injury pattern and what portion of the plant is affected.

A beating tray, which is a piece of white paper on a clip board, can be used to help identify and quantify insect. Gently tap the plants
foliage with your hand over the beating tray to dislodge any insects and mites present. Then lightly blow any debris off the paper to leave behind the insects to identify. The most common insects found using the beat test are aphids, spider mites, and thrips.

Aphids can range in color from green, light yellowish green, orange, reddish-brown, pink to red. They have pear-shaped soft bodies with two (2) cornicles (tailpipes) at the rear abdomen. The legs and antennae are typically long and winged or wingless forms may be present.

Western Flower Thrips, are fast moving and small, about 1-2 mm in length, and vary in color from yellow to brown or black depending on the species. They may be obvious on open flowers or found hidden in tight parts of the plants. Adults have tubular bullet shaped bodies, with narrow, pointed fringed wings held folded over its back. The two larval stages that feed on plant parts above ground may be recognized as wingless, yellowish, maggot-like body.

Spider mites are small in size and may appear as speckles of pepper against the white paper that will eventually move. The easiest mite to identify will be the two spotted spider mite, based on the one or two large black spots seen on each side of the body. Adults will have 4 pairs of legs while nymphs will have 3 pairs. These mites cause a whitish stippling of foliage that may appear similar to a nutrient deficiency. If they become well established, they can cause webbing over flowers, stems and foliage. Pay special attention to areas of higher movement such as near intake louvers and doors when scouting.

Indicator or trap plants are plants that are highly attractive to certain insects and can be used to detect insect and mite populations early while populations are still low. Chrysanthemum, fuchsia, sunflower, gazania, portulaca and pepper plants should be inspected carefully for aphids. Cast skins, as well as “honey dew”
may be present on a plant, providing a clue that aphids are present. Spider mites love hot and dry weather and prefer crops such as: marigolds, roses, dracaena, fuchsia, dahlias and ipomoea. Thrips threshold for treatment is usually low because of the potential for them to spread viruses. Plants such as: marigolds, dracaena, verbena, impatiens, petunias, and fava beans plants should be used to monitor for their presence. Whiteflies can build quickly and are found often on indicator plants such as: tomato, lantana, gerbera daisy, poinsettia and eggplant.

Potato discs have been used as a monitoring tool for determining if biological control or insecticide drenches have been effective in reducing fungus gnat larvae populations. Potatoes are cut into 1” x 1” slices and pressed into the soil until flush with the soil surface. If larvae are present, they will migrate to the underside of the potato. A time saving tip is to place flags in plants where you are using potato discs so they can be easily located, results recorded and the potato discs changed out.

The ultimate goal is to effectively manage pest populations. The next step after recording whole plant inspections, beat tray counts and sticky card counts is to determine what control tactic to use based on current pest levels populations. Ask yourself these key questions: Is the population increasing, decreasing or staying the same? Am I positive on my diagnosis? What will happen in a week if I do nothing? Are there any environmental or cultural practices that I can change? Have previous treatments been effective? If not, why?

There are many considerations that weigh into a pesticide decision. Label requirements, crop safety, rotation by mode of action, life stages treated, etc. The GGSPro Technical Department is available to help you with the decisions. GGSPro has also created a Reference Guide and Posters to help you make informed choices. Learning to establish insect thresholds will vary by pest, crop, time of year, stage of crop, development in production and the intended market. A threshold can be thought of as a level of pests that triggers the need for control measures to be taken. Well timed, effective and appropriate applications can reduce the expense of pest control while providing superior results.