

Identification of the Big Five – Mites, Thrips, Whiteflies, Aphids and Mealybugs

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This handout includes some information included in the entitled presentation at the 2022 Great Lakes/Greenhouse Growers Expo. Pest management program begins with accurate identification of the pest. This presentation will help you become more familiar with the major insects and mites that infest greenhouse-grown ornamental crops and provide you with tips on scouting and management of the five most important and commonly encountered groups of insect and mite pests.

MITES

The most important family is the spider mites, or Tetranychidae. The twospotted spider mite is one of the most common and devastating pests. Lewis mite is an occasional pest of poinsettia. Another important family is the Tarsonemidae, or the tarsonemid or thread-footed mites, which include broad mite and cyclamen mite. Eriophyidae, which includes many species of eriophyid mites, russet mites and rust mites, is another important family. Rose rosette mite is a species of eriophyid mite. Refer to this free document (<https://lgpress.clemson.edu/publication/phytophagous-mites-and-their-management-on-ornamental-plants/>) for detailed descriptions of these families and information on how to scout and manage infestations by mites.

APHIDS

Green peach and melon (or cotton) aphids are the most common species, but foxglove, potato, rose, chrysanthemum and cabbage aphids can also be problematic in some locations and crops. The most distinctive characteristic of aphids is a pair of cornicles (tailpipes) at the rear end of their abdomens. Each species has other distinctive characteristics to help with identification, but color is not a good characteristic to separate aphid species because there are many color forms within a species. Aphids are normally wingless but winged forms (alates) can be produced when population level is high.

Aphids use a long straw-like mouthpart to suck plant sap. Aphids expel the processed sap, called honeydew. Honeydew causes shiny and sticky surfaces, is a growing media for black sooty mold, and traps silvery aphid cast skins. Aphid-transmitted viruses are rare in greenhouse system.

Early detection of aphid population (using yellow sticky cards and plant inspection) is the key to successful management. Cast skins, honeydew, and sooty mold are indicators of aphid infestation. Invasion or influx of winged aphids from surrounding fields can be reduced with exclusion screens placed over vents and intakes. Biological control agents are commercially available for releases or as part of a banker plant system. Some biological control agents only attack certain aphid species; therefore, correct aphid species identification is important for choosing the right agent. Insecticides of many modes of action are available, and often repeated applications are needed. Insecticide rotation program that incorporates different modes of action must be employed to prevent the development of pesticide resistance.

THRIPS

Western flower thrips (WFT) is the most important species, damaging plants not only through direct feeding but also by vectoring viruses. Onion thrips and echino thrips can also be problematic in some

locations and crops. Adult WFT are approximately 1 mm long. Thrips vary in color from yellow to dark brown to black depending on species. Both larvae and adults feed on leaves and flowers. Mature larvae pupate on benches and in growing media or concealed plant parts. Eggs develop to adults in 10 to 14 days. Thrips feed by sucking out cell contents, resulting in spots on leaves or flower petals. Greenish-black feces are often left near the stippling. Feeding to growing tips can distort plant tissues as the tissues expand.

Scout for thrips using yellow or blue sticky cards and by inspecting leaves and flowers for larvae and adults. Remove weeds, unsold plant, old stock plants, plant debris, and spent growing media can help reduce sources and refuges of thrips. Use exclusion screen to prevent adult thrips from entering the greenhouse. Several predatory insects and mites, and entomopathogenic nematodes and fungi are available for managing thrips, either through sprays, releases or banker plant system. The key to a successful management program is to detect infestation early so that biological control agents or insecticides can be applied before damage is done. It is important to rotate insecticides with different modes of action to reduce the risk of pesticide resistance development.

WHITEFLIES

Sweetpotato whitefly is the primary species, replacing the once common greenhouse whitefly and bandedwinged whitefly. Adults are small (about 1/16 inch long), moth-like, covered with white, waxy powder, and hold their wings tent-like over the bodies. Nymphs look like small scale insect, i.e., they are flat and oval, light yellowish or greenish, with a fringe of short wax filaments. Whiteflies complete development in 2.5 to 3 weeks and lay up to 400 eggs. Whiteflies feed by sucking plant sap through a straw-like mouthpart and excrete large quantities of honeydew onto which sooty mold grows. Sap removal reduces plant vigor, and chlorosis and shedding may occur on leaves.

Adults are monitored with sticky cards and nymphs through inspecting of leaves. Whitefly infestations often begin with infested plant materials; therefore, buying cuttings from reputable propagators, keeping greenhouse clean, and performing pre-transplant insecticide dip can help reduce the initial population. Whiteflies can be successfully managed when biological control is used as a preventive management tool, i.e., when the biological control agents are released before the whitefly population become established or grow. Media drench with systemic insecticides and foliar sprays are also more effective when initiated soon after detection. Insecticide rotation must be practiced.

MEALYBUGS

Mealybugs are among the most serious and difficult-to-control pests. Citrus mealybug is the most common, but Madeira mealybug, longtailed mealybug, root mealybugs and striped mealybug can also be problematic in some locations. Mealybug body is generally oval, 1 to 4 mm long, and usually covered with white wax dusts and have marginal wax filaments. Citrus, Madeira and root mealybugs produce egg sacs, which are cottony and fluffy. Longtailed and striped mealybugs produce live crawlers; hence, they do not have egg sacs. A generation is completed in a month, and each female can product 300 eggs or nymphs. Mealybug damage plants through sap sucking, honeydew, sooty mold and reduction in plant vigor.

Mealybugs can only be detected through visual examination of plants. There are very few biological control agents against mealybugs. Mealybugs are difficult to manage because the waxy deposits on their bodies hinder the penetration of insecticide solutions. The crawler stage is most susceptible to control because it has no wax deposits. Media drench with systemic insecticides can be effective, particularly when drench is followed by foliar sprays. Foliar insecticide treatment must be applied repeatedly on a weekly or biweekly basis to achieve control. The addition of a spreader-sticker and using a high-volume spray will achieve better control of mealybugs.