Managing Aphids in the Greenhouse

Introduction

Aphids can be serious and persistent pests in the greenhouse. They are difficult to control due to their high reproductive capability and resistance to many different insecticides. Aphids are sucking insects that can cause curling and distortion of tender young growth. The presence of aphids, their white shed skins and honeydew reduces the aesthetic quality of a wide range of greenhouse crops.

Identification

Aphids are small (less than 1/8 of an inch long), soft-bodied, pear-shaped insects with long legs and antennae. Look for cornicles, or "tail pipe like" protrusions at the rear of their abdomen.

Some of the most common species found in greenhouses include the green peach aphid (*Myzus persicae*), the melon or cotton aphid (*Aphis gossypii*) and the foxglove aphid (*Aulacorthum solani*). Potato aphids (*Macrosiphum euphorbiae*) and tobacco aphids (*M. persicae* subsp. *nicotianae*) may also occur.

Other species that growers may encounter include the gray cabbage aphid (*Brevicoryne brassicae*), the bright yellow-orange oleander aphid (*Aphis nerii)*, and the host specific reddish-brown chrysanthemum aphid (*Macrosiphoniella sanborni*). Tulip bulb aphids (*Dysaphis tulipae)* can infect many different bulbs in storage. Some aphids feed on plant roots.

Proper identification is important in order to choose the most effective management option. Aphids vary in color depending upon the plants they are feeding on, so do not rely upon color to identify species.

Green peach aphids have red eyes and vary in color from pale yellow to green to pinkish-red. The pear-shaped adults are approximately 1/14 of an inch long. They have long cornicles that are approximately the length of their body that are slightly darkened at their tip. Green peach aphids also have a pronounced indentation between the bases of the antennae with protrusions that aim toward each other.

Figure 1: Green Peach aphids on new terminal growth and close-up of a green peach aphid. Photos by L. Pundt

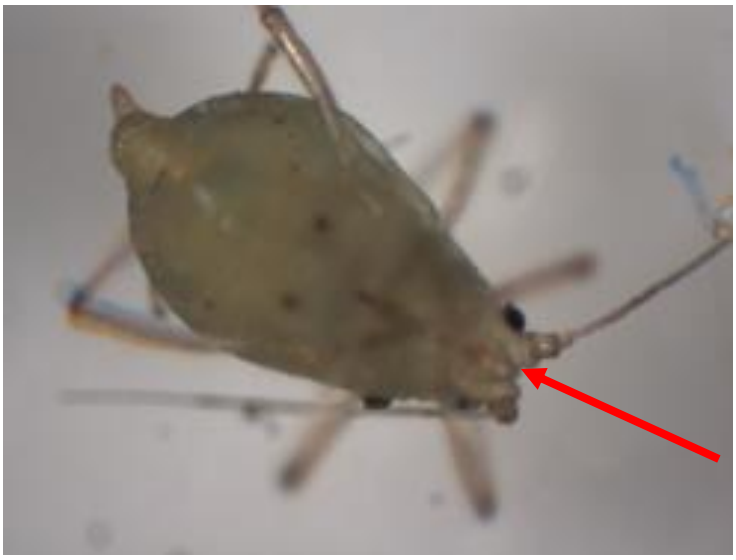

Figure 2: Green peach aphid. Note indentation between antennae. Photo by L. Pundt

Melon or cotton aphids are generally smaller (less than 1/16 of an inch long) than green peach aphids. There is more variation in color within the same aphid colony. Melon aphids may be yellow to green to purplish-gray to black with distinctive white patches on their abdomen. Their short (approximately 1/3 of an inch long) cornicles are completely black. Melon aphids have antennae that are shorter than their body. Melon aphids do not have a distinct indentation are the base of their antennae like green peach aphids. Growers frequently refer to melon aphids as "black aphids."

Figure 3: Melon aphids. Photos by L. Pundt

Foxglove aphids are also known as the glasshouse potato aphid. The pale green, shiny foxglove aphids have large dark green spots at the base of their cornicles. They also have black markings on their leg joints and antennae. Foxglove aphids also have an indentation between their antennae.

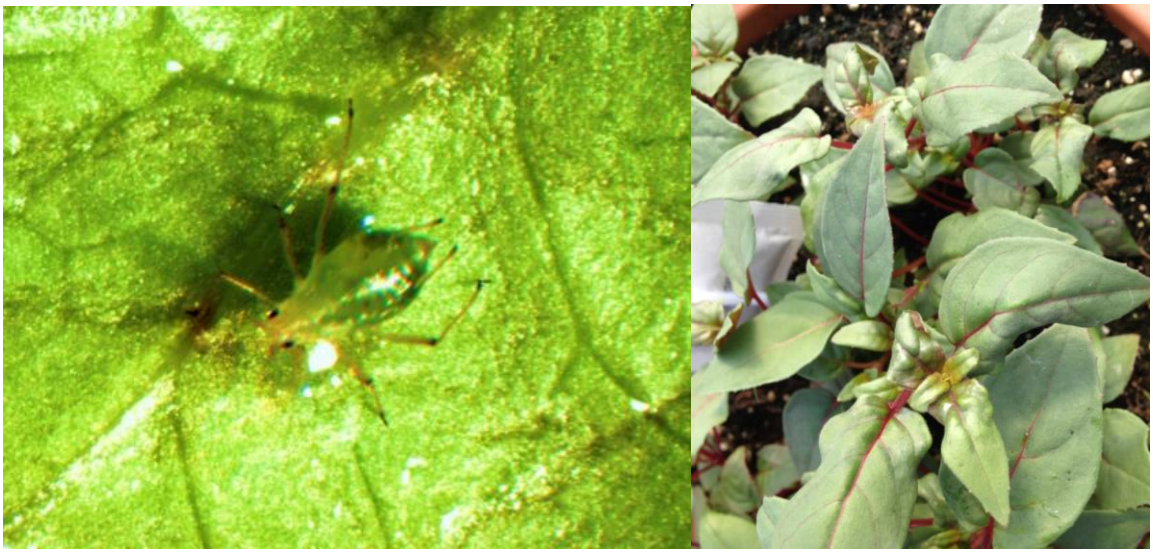

Figure 4: Foxglove aphid and typical feeding damage of distorted leaves. Photos by L. Pundt

Potato Aphids are long slender aphids with antennae that are longer than their body. They are usually green but may be pink or red with a dark longitudinal stripe down their back. Potato aphid's long cornicles are light brown in color with a dark tip.


Figure 5: Potato aphids. Photo by J. Allen

Chrysanthemum aphids are only found on chrysanthemum. This shiny, reddish-brown to blackish brown aphid has short, dark cornicles.


Figure 6: Chrysanthemum aphids. Photo by L. Pundt

Root aphids resemble root mealybugs because they are covered with white wax but they are smaller than root mealybugs. Look for their reduced ring-like cornicles that are located on the end of their abdomen.

Figure 7: Root aphids. Photo by L. Pundt

Feeding Damage

Aphids feed by inserting their stylet-like, sucking mouthparts directly into the phloem and removing plant sap. When high aphid populations develop, plants become stunted with curling and twisting of the young leaves. As aphids feed, a sugary plant sap, known as "honeydew" is excreted.

Figure 8: Shiny honeydew (left) and black sooty mold (right). Photos by L. Pundt

Honeydew promotes the growth of black sooty mold fungi that can then reduce photosynthesis.

As aphids molt, their whitish cast skins may also detract from the aesthetic quality of many crops. Growers may mistake these shed skins as whiteflies. Occasionally, ants may be associated with aphid-infested plants.

Figure 9: White, cast skins of aphids. These are not whiteflies! Photos by L. Pundt

Transmission of Viruses
In agricultural production, aphids are responsible for the transmission of a number of plant-infecting viruses. In the greenhouse, direct feeding damage is generally of more concern. However, aphids have been reported to transmit cucumber mosaic virus that can cause flower break and distortion on cyclamen, lisanthus and vinca.

Life Cycle of Aphids
Most types of aphids found in greenhouses do not mate. All of the aphids present are females that can give birth to live nymphs. There is no egg stage (except for the cannabis aphid). An adult female may live for up to one month. During this time, she may give birth to 60 to 100 live nymphs. Migratory winged aphids may appear when the colony becomes overcrowded or when the food supply is depleted so they can find a new food source. Outdoors, aphids overwinter in the egg stage.

Prevention
Inspect incoming plant material and cuttings for signs of aphids. Many aphid outbreaks occur when herbaceous perennials are introduced into the greenhouse from the overwintering cold frames. Aphids may also be carried inside on worker's clothing or blown into the greenhouse through doors or vents.

Aphid-infested weeds under the benches are frequently a source of recurring aphid problems. Inspect and remove weeds promptly. Use a weed mat barrier to prevent weed growth under the benches. The use of excessive nitrogen promotes lush growth that is favorable to aphid development.

Monitoring
Regular, weekly scouting is needed to detect aphids early before populations explode.

Focus on random plant inspections of susceptible crops and cultivars to detect the wingless aphid nymphs. Look for whitish-cast skins and honeydew. Green peach aphids tend to be spread more evenly throughout the crop whereas melon aphids tend to be found in isolated hot spots. Melon aphids are also less likely to form winged adults. They usually stay on the lower leaves and along the plant stem. Foxglove aphids inject toxic saliva as they feed leading to curled and distorted leaves, and early leaf drop. Foxglove aphids also tend to drop off the leaves so may be hard to find. Because foxglove aphids reproduce faster at 50˚ to 60˚ F than at 77˚, F they are more of a problem when spring crops are grown cool.

Look on the leaf undersides and buds of aphid-susceptible crops. Some key bedding plants prone to aphids include ageratum, alyssum, celosia, chrysanthemum, dahlia, gerbera daisy, herbs (many types), fuchsia, hydrangea, garden impatiens, pansy, pepper, portulaca, primula, salvia, snapdragon, tomato, verbena and zinnia. Some key pot plants prone to aphids include aster, dahlia, Easter lilies, mandevilla, snapdragon and poinsettia. Some key aphid-susceptible herbaceous perennials include arabis, aubrietia, bellis, chrysanthemum, heuchera, monarda, penstemon, phlox, salvia and viola.

Figure 10: Look on the underside of leaves for aphids. Photos by L. Pundt

Yellow sticky cards will only attract winged aphids that have entered the greenhouse from outdoors, especially during the spring and early summer. They may also indicate an aphid infestation within the greenhouse that resulted in winged aphids.

Biological Controls
In outdoor production, natural enemies, including ladybird beetles, lacewings, syrphid or hover flies, small parasitic wasps and fungal diseases, may provide a degree of control. Outdoor environmental conditions, such as wind, rain and freezing temperatures, can also reduce aphid populations.

Commercially available natural enemies may include **predators, parasitoids** and **pathogens**. Repeated releases of natural enemies are needed in order to keep pace with the aphids' high reproductive rate in the greenhouse. For more see Biological Control of Aphids.

Chemical Controls
Aphids are difficult to control with insecticides for a number of reasons. Control failures may be due to poor spray techniques, inadequate coverage or high pH in the spray tank. If aphids are present on flowers, systemic insecticides will not be able to move into the flowers. Aphids may be difficult to reach if they are on the underside of the lowest leaves (common with foxglove aphids). Among green peach aphid populations, resistance to organophosphates, carbamates and pyrethroid insecticides has been reported.

Use pest-infested plants as indicators to monitor the effectiveness of treatments in your individual situation. Systemic materials may be more effective because aphids tend to ingest large quantities of plant sap, especially if applied before plants are in flower. Thorough coverage of the underside of leaves is needed for contact materials. Two applications of contact sprays may be more effective than one treatment.

Consult the most recent edition of the *New England Greenhouse Floriculture Guide: A Management Guide for Insects, Diseases, Weeds and Growth Regulators* available from the Northeast Greenhouse Conference and Expo.

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