Leafhoppers Were Hopping This Summer

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There are over 2000 different species of leafhoppers that can feed on a wide variety of plants. Leafhoppers are sucking insects that withdrawal plant sap as they feed. Pale foliage, white stippling on the upper leaf surface and stunting may then occur. Aster and potato leafhoppers are of particular concern to growers of annual and perennial cut flowers and herbaceous perennials. This article will focus on these types of leafhoppers that were so prevalent this summer.

Aster Leafhopper

The aster leafhopper, *Macrosteles fascifrons*, is a small (less than 1/8 inch long), greenish yellow insect with six black spots on its head. It migrates from the south each year. Four to five generations may then occur in Connecticut. In addition to direct feeding damage, the aster leafhopper may vector (spread) aster yellows.

Aster Yellows

Leafhoppers need to feed on diseased plants for 9 to 21 days before transmission (spread) to uninfected plants. Symptoms of aster yellows may be seen from 10 to 40 days after an infected leafhopper feeds on a plant. The disease may be more serious during periods of dry weather when leafhoppers migrate from surrounding weeds to irrigated plant material. The amount of aster yellows is also related to disease incidence occurring in the southern US at the time of migration. Disease incidence can vary from year to year with aster yellows occurring very sporadically.

Over 300 different plant species in 40 different families may become infected. Ornamentals such as aster, annual statice, anemone, calendula, centaurea, china aster, chrysanthemum, clarkia, cockscomb, coreopsis, cosmos, delphinium, gaillardia, gomphrena, hydrangea, marigold, nemesia, periwinkle, petunia, phlox, rudbeckia, scabiosa, snapdragon, statice, strawflower,

veronica, and zinnia are reported as hosts in the literature. Common weed hosts for aster yellows include: thistle, fleabane, wild lettuce, sow thistle, chicory, wild carrot, galinsoga, dandelion, plantain, and cinquefoil.

Symptoms of aster yellows include yellowing of the foliage; greening of the flowers (known as virescence), distorted growth, and plant stunting. Infections are systemic. Once an infection occurs, there is no control. Rogueing of infected plant material may help to reduce disease spread.

Management

Management is aimed at controlling the aster leafhopper, which will in turn reduce the aster yellows infection. Weekly monitoring is needed in order to detect and control populations early. Removal of infected plants and susceptible weed hosts is an important management tool. Screening of small, valuable plantings with netting may be an option to exclude the insect vector because insecticides may not provide sufficient control.

Potato leafhopper

The potato leafhopper, *Empoasca fabae,* is a small, (less than 1/8 of an inch long), bright green wedge-shaped insect. It has six white spots on its blunt shaped head. This identifying characteristic may be easiest to see when adults are trapped on yellow sticky cards because the adult leafhoppers are so mobile and fly readily. The potato leafhopper does not overwinter in the North because its eggs are sensitive to cold temperatures. It is blown northward on storm fronts from the south and lives year round in the Gulf States. Its flight patterns are variable from year to year. This year, high populations were reported from Ohio to New Brunswick, Canada. In the Midwest, high populations were first detected in mid to late June. Depending upon the host availability, time of arrival, and temperature there may be 3 to 4 generations a year. Potato leafhoppers can develop from egg to nymph to adult in about three weeks.

Plant Damage

Leafhoppers are sucking insects that insert their stylets into the phloem thereby disrupting cell contents. You may first see whitening of the veins two days after the leafhoppers begin feeding. Potato leafhoppers also inject a salivary toxin as they feed. Older leaves will then turn yellow and then brown around the edges, which is known as "hopperburn." Leaves may also curl and become distorted. As photosynthesis is reduced, plants can become stunted. Damage may be more severe when plants are suffering from drought stress.

Potato leafhoppers have a wide host range of over 200 hosts and feed on such crops as potatoes, alfalfa, and beans, and ornamentals such as dahlias, hollyhock, lupine, and malva. High numbers have been seen in container grown chrysanthemums outdoors, but little feeding damage has been seen. When the migrating leafhoppers first arrives, they may feed on such woody plants as Norway and sugar maples, birches and apples. This year, in container nursery production, high populations have been seen on wisteria, hamamelis and fothergilla. Leafhoppers may feed on these woody hosts near mixed hay fields that include alfalfa. After the hay is cut, leafhoppers may then migrate to fields where annual or perennial flowers are grown.

Monitoring

Monitoring for leafhoppers is difficult for many reasons. The first influx of leafhoppers is predominately determined by wind and storm fronts. Migrating leafhoppers may show a preference for legume hosts, i.e. alfalfa, so may first be noticed near areas where alfalfa is grown. Leafhoppers can feed on many hosts and will easily migrate after the hay is cut. Every few days you can walk though your production area to look for the easily mobile leafhoppers. Look on the underside of the lowermost leaves for the bright green nymphs which do not fly as readily as the adults. Leafhopper damage (stippling) is easily confused with damage from other sucking pests including two-spotted mites and lacebugs. Look for white shed skins to alert you to the presence of leafhoppers. If lacebugs are present you may see black fecal spots or droppings on the underside of the leaves. If mites are present you can see the empty white eggshells or mites themselves on the underside of the leaves. Yellow sticky cards can also be used along the edges of fields to detect adults, however plant inspection may be more reliable.

Management

Systemic materials tend to be more effective than non-systemic materials. Control is more effective before you see the feeding damage. By the time you see hopperburn, irreversible damage has already occurred. Merit (imidacloprid) is labeled for the control of leafhoppers on flowers and ground covers in and around commercial buildings and residental areas. Orthene T&TO is labeled for leafhoppers on trees and shrubs. Some materials suggested for annuals and herbaceous perennials include azadirachtin, Beauveria (Naturalis-O), chlorpyrifos (DuraGuard), cyfluthrin (Decathlon), fenpropathrin (Tame), fluvalinate (Mavrik), insecticidal soap, permethrin, pyrethrins, and resmithrin.

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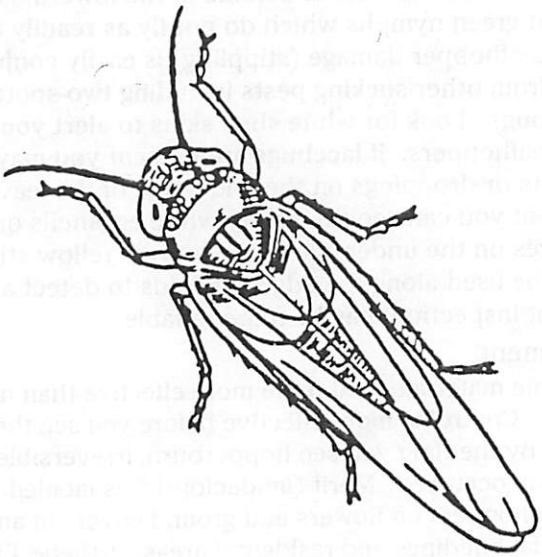

Get Uniform Watering With a Boom Irrigator

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One key to successful plug and cell pack production is uniform watering. This cannot be achieved with hand watering or conventional overhead irrigation using nozzles with a pattern. Advances in boom irrigation technology give the grower a production tool that can be applied to existing greenhouses or new construction.

A boom system consists of one or more pipes containing nozzles that apply water as the system moves over the plants. It may be suspended from an overhead rail system or from a cart that moves down the aisle. water is supplied by a trailing hose and powered by a battery pack or electric supply cable.

The simplest systems are grower built. The first one in Connecticut was built by a tobacco grower producing seedlings in cell trays. It used a lawnmower frame with a folding, double boom supported above the plants. The cart was guided down the center aisle by an arm riding on a pipe attached to the floor.

Power to move the cart was an electric winch mounted on the cart. In operation, the winch cable was unwound and attached to a hook at the opposite endwall. When activated, the winch pulled the cart at an even speed from one end of the greenhouse to the other. A microswitch stopped the cart when it reached the far end.

One advantage was that the cart could be easily moved between greenhouses. With the double boom, the first set of nozzles wet the surface with about 1/3 the required water, and the second set with larger nozzles provide a heavier application.

Hand pulled boom systems have been developed by several growers. These consist of a boom supported by a frame and a trailing hose. These can be mounted to an overhead conveyor track system or supported on the ground with bicycle wheels. Although operation is not as uniform as with a power unit, the savings in time and the more uniform watering offer some advantages.

The least expensive commercial units cost about $2500. They can be adapted to most free-standing and gutter-connected