New disease on Geraniums

Much of February and March was spent looking at geraniums that were suspected of being contaminated with Ralstonia solanacearum race 3 biovar 2. Ralstonia is a bacterial wilt disease that can be transmitted through soil, contaminated irrigation water, equipment, or personnel. Ralstonia is also very easily spread by transplanting infected plants and propagative materials.

Some races of Ralstonia solanacearum are present in the United States but the Ralstonia solanacearum race 3 biovar 2 is a newly detected, serious pathogen that could affect other important agricultural crops. Other hosts include tobacco, tomato, peppers, eggplant, potato, beans, bittergourd and beet. Weed hosts include black nightshade, climbing nightshade, horse nettle, jimson weed, purslane, mustards, lambsquarters and bittergourd.

Ralstonia wilting symptoms are similar, and can be confused with, other pathogens on geraniums such as Xanthomonas pelargonii (the agent of Bacterial Blight). The primary symptom of Ralstonia solanacearum race 3 biovar 2 is wilting of leaves and/or abnormal yellowing leaves. This disease is deadly to geraniums.

Detections of Ralstonia solanacearum race 3 biovar 2 were confirmed in several states and have been traced to shipments that occurred during certain time periods from Glass Corner Greenhouses in Grand Rapids, MI and Pleasant View Gardens, Loudon, NH rooting and distribution stations. These facilities were apparently the recipients of infected geraniums from a Goldsmith Plants, Inc. facility in Kenya.

One greenhouse in Kentucky has tested positive for Ralstonia. All geraniums from the contaminated shipment have been destroyed.
Surveys for 2003
Joe Collins & John Hartman

During the spring and summer of 2003, two important pest surveys will be conducted. Beginning sometime in May, we will be surveying nurseries for Sudden Oak Death. This is a new fungal disease that has been found in California the past several years. Contrary to the name, the disease is not sudden, affects other woody plants as well as oaks and does not necessarily kill oaks. The survey is needed for several reasons: to determine if the fungus is present in Kentucky, has it been introduced on nursery stock, and to see if it has escaped into nearby forests.

This disease is a phytophthora disease but differs from other phytophторas in that it attacks the above ground portions of the plant. Most other phytophthora attack the roots of plants. It is also important to know that this disease expresses itself differently on different hosts. In California, oaks have girdling cankers on the trunks while on some needle evergreens there is shoot dieback and on many species of plants the disease shows itself as only tip blight and leaf spots.

In laboratory tests northern red, pin, and English oaks have been found to be susceptible. Other potential hosts include lilac, English holly, mountain laurel, blueberry, hornbeam, cotoneaster, English ivy and others.

Another survey we will be conducting will be for Inula britannica, a new weed that has been found in hostas that come from the Netherlands. Inula is an aggressive, difficult-to-control weed, that has been found in several nurseries in Michigan. It was first reported in 1990.

Black Vine Weevil
Eric Day, Manager, Insect Identification Laboratory
Virginia Tech University

Coleoptera: Curculionidae, Otiorhynchus sulcatus Fabricius
Plants Attacked
The adults feed on a wide variety of evergreen, deciduous, and herbaceous plants. This insect is also destructive in the larval form on the following plants: Yew (taxus); hemlock; rhododendron; and several other broad-leaved evergreens. It will sometimes feed on strawberry or impatiens.

Description of Damage
Two kinds of damage are conspicuous: Adults chew marginal notches in leaves; larvae, the most destructive form, feed on roots. When large numbers of larvae are feeding on the roots, the plants will wilt, turn brown, and die. Quite often, the damage is confused with a disease or chemical injury. The adults feed from the outer margin of the leaf inward, creating characteristic notches, and these notches can be used as an early indicator of potential larvae in the soil. Adults cut notches on the margins only; they never create holes on the center of the leaf. On yew, needles nearer to the main trunk, down inside of the shrub, show notching and feeding scars. Broad-leaved evergreens exhibit notching similar to that caused by the two-banded Japanese weevil and Fullers rose beetle.

Identification
Black Vine Weevil adults are black, 1/4" long weevils with short, broad snouts. The head is narrow, the thorax is medium and rounded, and the wing covers are broad and well rounded. The wing covers have fine yellow hairs and conspicuous corrugations which appear as lines down the back. Adults cannot fly; their wing covers are fused together. The larvae are white with a well developed head, but have no legs.

Life History and Habits
Overwintering larvae feed on roots deep in the soil and pupate in May. Adults dig their way out of the ground in mid-June and crawl up the plants to feed. Feeding occurs...
dark places on the plants or on the ground during the day. When disturbed, they quickly drop the ground. After one to two weeks of feeding, adults crawl or drop to the ground to lay eggs. Occasionally, a few adults can be found in houses during winter, apparently able to overwinter in this stage. Most die in the fall, and larvae survive the winter in the soil. There is only one generation per year.

**Controlling Lace Bugs on Ornamentals**

Patricia Cobb, Extension Entomologist
Alabama Cooperative Extension System
Circular ANR-193

Lace bugs are common insect pests of several kinds of shrubs and trees. Lace bugs suck plant juice from the underside of leaves. Adult lace bugs have wings that resemble fine lace when viewed with a magnifying glass. These small insects often go unnoticed until damaged leaves begin to have a splotched, yellow appearance. Small, tar-like spots of excrement on leaf undersides can be seen.

Female lace bugs lay groups of small dark eggs under leaves on leaf midribs or crossveins. The spiny, immature lace bugs (nymphs) that hatch from these eggs lack wings but feed just as voraciously as the adults. Most kinds overwinter as eggs, although some overwinter as adults. There are probably at least three generations of most lace bugs each year in Alabama.

**Description**

Lace bug adults are about 1/8 inch long, with mottled tan or gray and clear wings that cover the body. This motting gives them a lacy appearance when viewed with magnification. Nymphs (immatures) are less than 1/8 inch long, lack wings, and have dark, spiny bodies.

**Damage**

Lace bugs puncture plant tissues and suck out the juice. They feed on the underside of leaves without piercing all the way through the leaf. Infested leaves have a splotched, yellow appearance. If feeding continues, leaves become brown. Since lace bugs are often most numerous in mid- to late summer, broadleaf evergreens such as pyracantha keep their leaves a year or more, so the damaged leaves remain more than one season.

**Host Plants**

The azalea lace bug attacks azaleas. Hawthorn lace bugs attack pyracantha, hawthorn, and Japanese quince. Rhododendron lace bugs attack rhododendron, mountain laurel, and related plants. Sycamore lace bugs attack sycamore primarily, but they may also infest ash, hickory, and mulberry.

Check plants periodically for lace bugs. Be sure to direct spray to the underside of leaves since this is where lace bugs feed. Treat when nymphs and/or adults are present. According to the 2001 Alabama Pest Management Handbook, the following chemicals are available to homeowners for lace bug control.

<table>
<thead>
<tr>
<th>Chemical</th>
<th>Amt / gallon of water</th>
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<tbody>
<tr>
<td>acephate</td>
<td>Orthene TT&amp;O</td>
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<tr>
<td></td>
<td>see label</td>
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<tr>
<td>carbaryl</td>
<td>Sevin 50WP</td>
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<tr>
<td></td>
<td>2 tbls</td>
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<tr>
<td>chlorpyrifos</td>
<td>Dursban 2EC</td>
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<td></td>
<td>2 tsp</td>
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<tr>
<td>Diazinon formulations</td>
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</tr>
<tr>
<td>insecticidal soap</td>
<td></td>
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<tr>
<td>malathion 57% EC</td>
<td>2 tsp</td>
</tr>
</tbody>
</table>

Note: EC or E=emulsifiable concentrate TT&O=Turf, Tree & Ornamental Spray WP=Wettable Powder
White Pine Aphids
Frank Hale, Associate Professor
University of Tennessee

The white pine aphid, Cinara strobi (Fitch), occurs wherever Eastern white pines are grown. This pest uses its needle-like mouthparts to suck sap from twigs and branches. Severely infested parts of trees turn yellow and drop their needles.

White pine aphid adults are large (1/4 inch long), long-legged, and spider-like in appearance. The body is shiny dark brown with a white stripe down the middle of the back. White powdery spots on the sides are often present.

During the fall, winged females lay blackish eggs, end-to-end, in a row of eight or more on the needles. This aphid usually overwinters in the egg stage; however, if the weather is mild, some individuals from the last generation survive through the winter. Eggs hatch in the spring and resulting wingless females produce living young.

As the season progresses, several overlapping generations may occur. By late summer, large populations may be present.

Droughty weather at this time will increase needle drop. Each new generation moves to fresh sites on the tree to feed. Adults of the last generation of the summer produce overwintering eggs in the fall. Heavy infestations of aphids may kill young trees or may cause reduced growth. As the aphid feeds, it excretes honeydew. This sticky substance is the excrement from the aphid. A black sooty mold is commonly found growing on the honeydew. Sooty mold reduces the quality of trees and may reduce the amount of sunlight available to the leaves. Ants may also be found feeding on the honeydew.

Control Measures
White pine aphid infestations may be prevented by treating trees with dormant oil before growth starts in the spring. Do not use oil until the temperature stays above 40F for 24 hours. Control summer infestations by applying sprays of chlorpyrifos (Dursban Pro (2 lb/gal EC), Dursban 50W [50% WSP], beta-cyfluthrin (Tempo SC Ultra [1 lb/gal SC]), cyfluthrin (Tempo 20WP [20% WP], Advanced Garden Lawn and Garden Multi-Insect Killer [0.75% emulsion, oil in water], Decathlon [20% WP], acephate (Orthene Turf, Tree & Ornamental Spray [75% SP], Address [75% SP], Orthene [9.4% EC]), insecticidal soap (M-Pede, Safer Insecticidal Soap Concentrate), horticultural oil (SunSpray Ultra-Fine Oil [98.8% paraffinic oil]), naled (Dibrom 8 Emulsive [8 lb/gal EC]), pymetrozine (Endeavor [50% water-dispersible granule]), malathion, diazinon or dimethoate (Cygon 2E [2 lb/gal EC], Dimethoate 2.67 EC [2.67 lb/gal EC]). Treat individually infested trees when more than 30 percent of the shoots have aphid colonies.

Control ant colonies with chlorpyrifos, cyfluthrin, beta-cyfluthrin or diazinon. These ants feed on honeydew and protect aphids by discouraging the natural enemies of the aphids. This protection aids in the buildup of aphid populations.

Needle Cast of Spruce
James Schuster,
Univ of Illinois Extension

The fungus Rhizosphaera kalkhoffii causes needle cast of spruce. It mostly occurs on spruces that are not being grown in their native habitat. The Colorado blue spruce is the most susceptible spruce to this disease. White spruce is moderately resistant and Norway mostly resistant. The other spruces fall somewhere in between susceptible and resistant. Other conifers may also be hosts including some pines such as Austrian pine.

Symptoms
Infection occurs in the spring usually on lower branches and works upward around the tree. Some times the disease may start higher and then work downward. Any size tree may be attacked but small trees are more susceptible and are more likely to be killed by serious yearly infection. Infected foliage usually turns a mottled yellow in late summer on current year needles. During the late winter and early spring, the needles turn brown (purplish brown on Colorado spruces). These discolored needles then fall off during the summer and fall leaving current year needles.

Basically the brown to purplish color takes 12 or more months from the time of infection. Under the right conditions, fruiting bodies (pycnidia) can be seen on all sides of the needles. The pycnidia are in rows since they emerge from the stomata that are in rows on the needles. The pycnidia can usually be found on the dead needles but sometimes the pycnidia can be found on infected green needles.

Control
Plant spruces that are most resistant. Provide good air circulation. Avoid overhead watering and watering at night. Get positive identification of the disease. There are other non-infectious diseases that may mimic needle cast symptoms. Use a fungicide when necessary. Fungicide treatments need to be done for two years in a row. Remove all infected needles and destroy.
Using Fungicide Sprays Effectively
Stephen Nameth & Jim Chatfield
Ohio State University

Fungicides can be an important component of the disease management program. However, it is important to remember that their use should be integrated with the use of sound cultural practices, a knowledge of pathogen and disease biology, and disease resistance whenever possible.

Fungicides are only effective when infectious plant diseases that are caused by fungi are truly the cause of the problem. In many cases, pests and diseases follow other environmental imbalances and may not be the major problem. In cases such as these, a fungicide may help but is often not the total answer. Also, it is important to remember that fungicides are only effective if several rules are followed. First, the correct material must be selected. This depends on correct diagnosis and identification of the pathogen. Second, the chemical must be applied at the right time of year and frequently enough to protect plant material adequately. Third, fungicides must be applied properly over plant surfaces. These three rules depend on making correct decisions based on correct knowledge. Too many people simply "spray and pray," and are often disappointed with the results.

Correct Diagnosis

You must be sure of what the problem is before proceeding. The most effective fungicides in use today have been developed for specific situations and specific diseases. To use these chemicals, you must spend time making a correct diagnosis.

Your state Extension specialists, plant disease diagnostic clinic, and county Extension agents can assist you with the proper diagnosis.

Selecting the Proper Material

Diagnosis leads to selection of the right material to do the job. Usually, several materials are effective against the type of disease you are dealing with. For instance, triforine, sulfur or triadimefon all control powdery mildews. Before selecting any chemical, read the label. Can you carry out the instructions? Is the plant type listed on the label? If so, the chemical is registered for use on the plant, and should be effective in providing disease control if used properly. If not, it is illegal to use that particular pesticide.

Use the Correct Method of Application

Foliar application fungicide sprays usually work in controlling infectious diseases because they act as a chemical barrier on leaf, stem or flower surfaces. When the pathogen arrives on the plant surface, it encounters this barrier and is unable to infect the plant. Effective fungicide use requires that this barrier be as complete as possible. A spray method must provide the best combination of practical usefulness and good coverage. For many diseases, special attention must be given to undersurfaces of leaves, especially on the lower leaves of the plant.

The completeness of the barrier depends on how well the spray spreads and sticks to the plant surfaces. For this reason, spreader-stickers or spray adjuvants can be added to many sprays. Sometimes the product label alerts the user to these problems. However, observing the spray deposit after you have finished some of the job may be the best way to decide if an adjuvant should be used. Hairy or waxy foliage is especially difficult to cover properly without a spreader-sticker.

Proper Timing of Fungicide Applications

Timing refers to when and how often the spray must be applied to effectively control a disease. The first application usually is made at a time close to but before the pathogen arrives on the plant surface. This information is often provided on the pesticide label or is available in Extension literature from your local county Extension agent. In most situations, fungicides are not effective in controlling the disease if the pathogen has already entered (infected) the plant tissues. In many cases, specific information about the disease cycle may be needed to time the first application correctly.

After the first application is made, the pesticide barrier is established on the plant surfaces. Effective use involves keeping this barrier active and complete throughout the time that the pathogen can arrive on and infect the plant. Modern fungicides are developed so that they do not persist in the environment for long periods of time. Rainwater, sunlight, microbial action and oxidation decrease effectiveness of the fungicide. Reapplication of the spray is needed in many cases to keep the fungicide barrier active.

Plant growth also affects the completeness of the barrier. As new leaves and shoots appear, they are unprotected and may be subject to infection. If so, they must be recovered with the barrier.

The fungicide label gives reapplication guidelines, usually in ranges of 7-14 day intervals. If excessive rainfall or rapid growth of the plant occurs, the shorter interval between sprays should be used. If not, use the longer interval.

Kentucky Snake Identification

Ever wondered what kind of snake just slithered by your foot? There is a new web site devoted to the 33 known snake species in Kentucky and the surrounding regions. The site has complete descriptions and pictures.

www.kentuckysnakes.org
The past several years, we have included a section on listing the degree day totals for various parts of Kentucky. This information is intended to give you more precision in your spray programs. For instance, on March 15 of 2002, the degree day totals for Lexington were 86 which would have indicated that we were roughly mid-way through the susceptible period for controlling Maple bladdergall mite (range 58-148 degree days). In 2003, the degree day totals on March 15 was only 14. Thus any sprays aimed at maple bladder gall mite would have been too early to hit the target pest.

Using Degree Days as a predictor takes into account cool vs. warm weather. Plants and animals that do not regulate internals temperatures (often called “cold blooded”) vary in their physiological development, or metabolism according to what temperature they are subjected to. In short, these organisms develop rapidly at warm temperatures and slowly at cool temperatures.

Degree-days can easily be calculated by taking the daily high temperature + daily low temperature and dividing this by two. The resulting number is subtracted from 50. A negative number is listed as zero.

Example: High temp=75; Low temp=52

\[
\frac{75+52}{2} = 63.5
\]

64 - 50 = 14 degree days for that day.

14 would be then be added to the previous days total. Degree days are calculated from January 1 of each year. The College of Agriculture has developed an online degree day calculator where you can enter in the city that is nearest you and get the degree day dates. The address for that site is http://wwwagwx.ca.uky.edu/cgi-bin/generic_dd_www.pl

One very important fact to remember is that degree days can vary widely across the state. Calculating degree days for your local area is the best way to prepare for spray programs.

Degree Day Totals through March 26, 2003

- Bardstown - 102
- Bowling Green - 142
- Covington - 58
- Henderson - 104
- Huntington WV - 141
- Lexington - 90
- London - 118
- Louisville - 90
- Mayfield - 108
- Paducah - 102
- Princeton - 161
- Quicksand - 154
- Somerset - 138