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INSECTS

Orchid Pests and Their Management

Orchids are a troublefree source of beautiful flowers when they are grown indoors under the correct environmental conditions. These flowers are grown and displayed in greenhouses, conservatories, interiorscapes, and residential homes. The major orchids grown are *Cattleya*, *Phalaenopsis*, *Paphiopedilum*, *Dendrobium*, *Miltonia*, *Oncidium*, *Odontoglossum*, *Cymbidium*, and *Epidendrum*. Unfortunately, orchids are susceptible to a number of insect and mite pests, including aphids, mealybugs, scales, twospotted spider mites, and thrips.

Aphids, mealybugs, and soft scales use their mouthparts to suck the sap from plants. They can curl, yellow, or stunt leaves and can reduce flower production and stem growth. All three pests also excrete a clear, sticky liquid called honeydew. Black sooty mold fungus can grow on honeydew, covering leaves and making them unsightly. Aphids, such as the melon aphid, *Aphis gossypii*, are small (1 to 2 mm long), pear-shaped, soft-bodied insects with two tubelike projections called tail pipes sticking out from their abdomens. Aphids tend to cluster in groups. They feed on young growth, flower spikes, and developing flower buds. Aphids can cause flowers to become mottled and distorted. They are attracted to the fluid excreted by some orchids when they flower, and they are highly attracted to *Cymbidium*s.

The common mealybug species found attacking orchids are the citrus mealybug, *Planococcus citri*, and the longtailed mealybug, *Pseudococcus longispinus*. Mealybugs are small (2 to 5 mm long), soft-bodied insects that are covered with a white, waxy secretion. They prefer to feed in concealed spots such as at leaf junctures and leaf axils and under old leaf sheaths. Mealybugs also feed on orchid roots. *Dendrobium*s and *Phalaenopsis* are highly susceptible to mealybugs.

Scales can be divided into two groups, soft and hard scales. Hard scales include Boisduval scale,

Diaspis boisduvalii, and Florida red scale, *Chrysomphalus aonidum*. Soft scales include Brown soft scale, *Coccus hesperidum*. One difference between these two groups is that soft scales produce honeydew and hard scales do not. A dome-shaped shell often covers later stages of hard scale. Orchids are attacked by many other different species of scales as well. Scales are small, round insects from 1 to 5 mm long. They are most often found feeding on the underside of leaves along the midrib and underneath leaf sheaths. *Cattleya*s are highly susceptible to scales, especially Boisduval scale. Many orchids are attacked by a variety of scale species.

Twospotted spider mite, *Tetranychus urticae*, feeds on leaf undersides and sucks the chlorophyll out of plant cells. The feeding causes leaves to appear pin-poked, with yellow dots that give a characteristic silvery stippled appearance. Later, leaves turn yellow and sometimes fall off. Twospotted spider mites are greenish yellow, wingless, eight-legged creatures with a dark spot on each side of their body. They thrive when plants are stressed under warm, dry conditions, but they are less of a problem under conditions of high humidity. Twospotted spider mites are found on new growth and on thin-leaved orchids. For early detection, tap leaves over a white sheet of paper and look for crawling twospotted spider mites. *Cymbidium*s are highly susceptible.

Many thrips species feed on orchids, including western flower thrips, *Frankliniella occidentalis*; Cuban laurel thrips, *Gynaikothrips ficorum*; greenhouse thrips, *Heliothrips haemorrhoidalis*; and flower thrips, *Frankliniella bispinosa*. Thrips normally feed in flower buds and open flowers. As a result, flowers may be deformed or fail to open. Eventually, flowers turn brown, and petals become streaked or silvery in appearance and discolored. Thrips are only 0.5 to 4.0 mm long; they are difficult to see with the naked eye. A hand lens is helpful in identifying these pests on plants. Thrips feed by using their mouthparts like a straw to suck up plant juices. For early thrips detection, gently blow into an open flower and watch for thrips crawling inside the blossom.

To minimize orchid pest problems, implement such cultural management strategies as prevention, sanitation, and plant inspection. Prevention is the best strategy for managing orchid pests. Proper cultural conditions, such as the correct amount of water, temperature, light, fertility, and humidity, minimize potential pest problems. Many reference books and manuals on orchid culture are available. Be sure to know the cultural practices of specific orchids being grown.

Sanitation is another strategy to prevent orchid pest problems. Remove all plant debris and old orchid medium. Also, remove old leaf sheaths to eliminate hiding places for mealybugs and scales. Inspect plants on a regular basis by looking underneath leaves to detect the presence of aphids and spider mites. If pests are present, use a hard stream of water to dislodge insects and mites.

Insecticides and miticides are another option when dealing with orchid pests, especially when populations are high. Insecticides such as insecticidal soap, malathion, acephate (Orthene), diazinon (Knox Out), chlorpyrifos (Dursban), and bendiocarb (Turcam/Dycarb) control aphids, mealybugs, scales, and thrips. Thrips are also controlled with spinosad (Conserve) and methiocarb (Mesuro). Twospotted spider mite is controlled with the miticides dicofol (Kelthane), hexakis (Orthonex III), and abamectin (Avid). Be sure to read the label carefully and wear protective clothing. Apply insecticides to control mealybugs and scales when crawlers are present, as this is the most susceptible stage. Be aware that some insecticides and miticides cannot be used on orchids. Many materials have not been tested on orchids, so try any material on a small group of orchids—especially when they are in flower—before exposing the entire crop to an application.

You can also use biological control to deal with insect and mite pests. Biological control involves the use of a pest's natural enemies, such as parasitoids, predators, and entomopathogenic fungi. Be sure to control ants, which are attracted to the fluid extracted by orchids, because ants protect aphids, soft scales, and mealybugs from attack by natural enemies. Consult biological control supplier catalogs for natural enemies available for each insect and mite pest. (*Raymond Cloyd*)

Zimmerman Pine Moth

Treatments can still be applied for Zimmerman pine moth. In the late summer and early fall, newly

hatched larvae feed on the bark and the base of buds before forming a hibernacula in bark or bud crevices to spend the winter. Chlorpyrifos (Dursban) or dimethoate (Cygon) should be effective in reducing insect attack next year. Applications can also be made in April when larvae leave the hibernacula and migrate across the bark before boring into the trunk or shoot. (*Phil Nixon*)

Yellow-bellied Sapsucker

Yellow-bellied sapsuckers attack Illinois trees during both spring and fall migrations through the state. These woodpeckers typically fly south through Illinois from about mid-September through October, and they fly back north in the spring from early April through mid-May. These starling-sized black-and-white birds typically drill holes that are 1/4 inch in diameter in vertical or horizontal rows in the predawn hours. They then feed on the sap as it runs out of the holes. They also feed on insects that are attracted to the sap, but much of their diet consists of tree sap.

In Illinois, these holes are unlikely to damage the health of the tree because the birds are in the state for only a short time. In the far southern United States as well as the far northern United States and southern Canada, where the birds spend the winter and summer, individual trees may be killed from continual drilling and feeding. Trees most often attacked in Illinois are Scotch pine, Austrian pine, and white-barked birches, although many other species are attacked occasionally.

To protect individual trees while the birds are flying through, wrap tree wrap around attacked trunks. Remove the wrap when the migration time has passed; otherwise, moisture underneath the wrap may promote disease. Inflatable owls or snakes may also be effective, as will lengths of garden hose that resemble snakes. For the owls and snakes to be effective, they must be moved almost daily. It is thought that the same bird attacks the same tree each year as it migrates through the area. Thus, a bird watching a tree notices that the owls or snakes haven't moved for several days and concludes they must be dead. The association of individual birds and specific trees also explains why only certain trees are attacked while nearby trees of the same species are unharmed. Remember that yellow-bellied sapsuckers are protected by state and federal laws as well as international treaty, making it illegal to harm or kill the birds. (*Phil Nixon*)

PLANT DISEASES

Is Verticillium Wilt Overdiagnosed?

Verticillium wilt continues to be a relatively common problem among shade trees such as maple, ash, and many others. It is important to remember, though, that the basic “vert” symptoms such as wilted, yellowed, scorched, or dead leaves, early fall color, dieback, and even discolored vascular tissue can indicate a number of different plant problems. These problems include root rot, cankers, deep planting, girdling roots, damaged branches or roots, poor soil-water drainage, and drought stress. The only way to prove the symptoms are caused by Verticillium wilt is to culture for the fungus (see issue No. 11 of this newsletter). To further confuse the issue, laboratory culturing is not 100% effective at identifying the presence of the Verticillium wilt fungus, and a primary field diagnostic symptom, vascular streaking, may not always be present even when the fungus is killing the tree. The bottom line is that this disease is not always easy to diagnose.

You are probably thinking, “Who cares why the tree is dying or dead? The outcome is the same.” Yes, but can we learn something from the tree or perhaps save it? Recently, I attended the Shade Tree Wilt Conference held in St. Paul, Minnesota. A highlight of the meeting was the root collar excavation work by Gary Johnson of the University of Minnesota. Using a nondestructive method, Johnson has examined over 40 species of “sick” trees, many diagnosed in the field as having Verticillium wilt. He found that Verticillium wilt is overdiagnosed in the field. Many times, these so-called “vert” trees are declining or dying from a problem that is preventable and possibly curable—namely, deep planting or girdling roots. Even if Verticillium wilt is positively identified in the tree, you should investigate the site for stress factors that may have allowed the fungus to enter the roots and cause disease.

Trees that have been planted too deep or that have girdling roots may exhibit canopy symptoms such as early fall color, thin canopy, or reduced annual twig growth. In addition, the trunk may be leaning, have no noticeable flare roots (well below the soil grade), or have one or more flat sides at the base. Johnson has observed Littleleaf linden ‘Greenspire’ to be one of the more problematic trees, although Norway maple and members of the *Prunus* genus commonly have problems as well.

His diagnostic tools? A steel rod, three-pronged hand rake, small shop vacuum, and portable generator! Johnson demonstrated his work on two linden trees located at “Plant Pathology Headquarters” in St. Paul. The trees were 10 to 15 years old, about the same size, and planted on either side of a sidewalk in a protected area. However, one tree was leaning somewhat and the crown was much thinner than its “twin.” In this case, the girdling roots should have been obvious to the casual observer, unless they were covered by mulch. But the extent of the girdling could not be determined until some of the soil was removed.

Before our arrival, Johnson spent about 50 minutes examining the root system nondestructively. After probing the soil to find the depth and direction of the first roots, he carefully removed the soil from around the base of the trunk using a hand rake and vacuum. In this case, he found that 90% of the trunk was compressed (under pressure) by girdling roots. He estimated that this tree would die or blow down within two years. His recommendation? The tree will die, and it is a hazard, so cut it down now.

Does this sound like a waste of valuable time to you? Johnson believes that trees with girdling roots can be saved if the compressing roots are identified early and removed. As a rule, he says that if 50% or more of the circumference of the trunk is girdled and compressed, the tree, in an urban setting, will die well before its time. When that happens, how will the problem be diagnosed—Verticillium wilt, root rot, insects, or high winds? (*Bruce Paulsrud*)

Apple Note

Many of our clients at the Plant Clinic have apple trees in their landscapes and questions on disease problems. The major diseases encountered on apples this year were cankers, scab, fly speck, sooty blotch, powdery mildew, rust, fire blight, and black rot. Pruning is one of the most important cultural methods to help prevent many of these diseases. Although it is probably slightly better for tree health to prune apple trees in March, it is easier to do a good job as soon as the fruit crop is removed. Healthy plant material is more easily distinguished from dead or cankered wood in the fall. Pruning and removing dead and cankered wood and opening the tree to better air circulation limit the development of fire blight, black rot, sooty blotch, fly speck, and scab. If you suspect that fire blight was present in your tree, disinfect the pruners after every cut to prevent further spread of the

pathogen. We recommend rubbing alcohol or a 10 percent solution of chlorine bleach as disinfectants, but other products may work as well. (*Nancy Pataky*)

Pruning Oaks

Many fungal diseases affect oaks, but oak wilt is the one that strikes fear in the heart of most landscapers and homeowners. It has the ability to kill a mighty oak in as little as a few weeks. This disease was discussed in issue No. 7 of this newsletter. Here is some important information about oak pruning that will help discourage oak wilt.

Because of the many cankers, wood rots, and injuries that occur on oak, periodic removal of dead wood is necessary. With many trees, we can do this as the dead wood appears, but oaks should be pruned only in the dormant season. Most references say to prune oaks in Illinois from September through March, while others suggest any time after July. Still others just say to prune in the dormant season.

Oak wilt is spread in two ways. One method is by root graft from oak to oak. This happens underground and is not influenced by pruning. The other method is by insects that have acquired the oak wilt fungus. The fungus must enter the tree through a wound, and the insect provides transportation to that wound site. These insects are attracted to sap, and they are attracted to your tree when sap is exposed to the air. When trees are pruned in the growing season, they exude sap from the wound, which could attract the insects carrying the oak wilt fungus. For this reason, oak pruning is not recommended during the growing

season. City arborists do not have the luxury of waiting for a specific time period. They often have their work force during the growing season, so they may push the limit and prune in late summer, especially in areas that do not have a known oak wilt problem. Homeowners can and should be more conservative. For more information on oak wilt, consult *Report on Plant Disease* No. 618. (*Nancy Pataky*)

Home, Yard & Garden Pest Newsletter is prepared by Extension specialists from the University of Illinois at Urbana-Champaign and the Illinois Natural History Survey. Information for this newsletter is gathered with the help of staff members, Extension field staff, and others. Karel Jacobs and Donna Danielson of The Morton Arboretum also provide information and articles.

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