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Important Pests of Ornamental Aspen

F. A. Baker, Forest Pathologist
Karen Shotwell, Extension Diagnostician
Diane Alston, Extension Entomologist
Sherman Thomson, Extension Plant Pathologist

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Aspens are one of the more popular forest trees in the Intermountain West. They add a brilliant yellow glow to the collage of fall colors. In an attempt to enjoy these beautiful trees around the home environment, many well-intentioned homeowners purchase or otherwise acquire aspens and transplant them in their yards. Unfortunately, aspens are not adapted to the environmental conditions of the valleys, and many problems develop.

Aspens are members of the willow family and in the genus *Populus*. The aspen in the Intermountain West is the quaking aspen, given its name because its leaves quake or tremble in the slightest breeze. This tree grows best in the Rockies above 7,000 feet elevation, where temperature and moisture are favorable. Aspens are usually found in groups of genetically identical individuals, called clones. Clones form because aspens reproduce by suckering (sprouting) from roots. As the stems age, they decline and eventually die, and they are replaced by suckers from their root systems. Aspens are short lived; even under optimal conditions, aspen trees rarely live longer than 100 years.

When aspens are planted outside their preferred range, and especially so in a landscape situation, they are subjected to many stresses to which they are not adapted. In valleys of the Great Basin, soils are usually more alkaline, temperatures are warmer, and there is often much less soil moisture than in the native habitats. These stresses reduce tree size and increase tree susceptibility to many insects and diseases. The ultimate effect of these stresses is to reduce the normal lifespan of aspens in most ornamental situations to 25 years or less! Homeowners must be prepared to replace aspens when their useful life is ended. While some measures can extend tree life, the time gained is often not worth the cost involved.

Many of the pest and nutrient problems that are discussed below occur soon after an aspen is planted. When selecting trees or clumps of aspens to plant, choose from healthy clones. The most important consideration is the size of the root mass and the amount of small roots present. The size of the trunks or tops is unimportant; in fact, the smaller the tops the more likely the tree will survive. A large, relatively intact root system will soon produce many vigorous, desirable shoots which may outgrow those present when the tree was transplanted. It is best to anticipate transplanting one year before, and root-prune or cut the roots around the selected trees. This practice greatly increases the success of transplanting.

The most common pests and problems of aspens in ornamental situations in the Intermountain West are discussed below, along with suitable measures for their control. These

problems may also occur in natural stands of aspen. Where the trees are of special value, such as in campgrounds, control measures may be applied.

Nutrient Problems

Iron chlorosis or iron deficiency is perhaps the most common problem affecting ornamental aspens. Leaves turn pale yellow between the veins, and become more pale during the summer. These symptoms appear about mid-June, or when the weather becomes hot. In some cases, small dead spots may form on the leaves between the veins, but seldom across the veins. Eventually, leaves on the ends of the branches, and sometimes the branches themselves die. Dead branches should be pruned from the tree.

Iron chlorosis or deficiency may be caused by having too little iron in the soil, or iron which is not available to the plant because of alkaline soil or because of excessive or insufficient watering. A quick fix is to apply iron to the leaves. This must be done repeatedly during the season to obtain a green appearance, and treatments must be applied each year because iron is shed with the leaves in the autumn. An alternative approach, more beneficial to the tree over the long term, is to apply a chelated form of iron to the soil around the roots of the tree. Iron chelates are not bound in the soil and slowly release iron to the plant. Applications should be made early in the spring for best results. Not all chelated iron compounds are effective in high pH soils. Products chelated with EDDHA (e.g. Sequestrine 138 or Miller's Ferriplus) are more effective and work more consistently than other chelates. Soil applications may not correct current year symptoms, but will provide long term benefit to the tree. Iron can also be injected into the tree, but injection is not recommended because this process creates wounds which may be invaded by other organisms.

A recently recognized cause of iron chlorosis is insufficient watering. Most aspens are planted in lawns and are watered with the lawn. Tree roots compete poorly with grass roots, and are usually deeper in the soil. Most homeowners provide only enough water to saturate the root zone of the turf, causing moisture stress in their trees. This situation will usually become apparent following the first extended hot, dry spell of the year. To minimize stress to the tree, water the trees several times per week, applying at least 1 inch of water to the tree's root zone each time. The root zone of the tree extends from the trunk to a distance roughly equal to the tree's height in all directions. During extremely hot periods, or on particularly sandy soils, 2 to 3 inches of water should be applied. Normal lawn sprinklers can be used. To determine how much water is being applied set out several straight-walled cans before sprinkling to measure the amount of water collected.

Insect Problems

Aspen Borers. Many species of boring beetles frequently attack aspen. The most important is *Saperda calcarata*, a round headed, long-horned beetle (Figure 1).


Figure 1. Adult Saperda.

However, the damage is similar regardless of the boring insect involved. These insects attack stressed trees of varying size and age in an effort to lay their eggs. The damage is caused by

developing larvae which feed in the trunk of the aspen for perhaps several years. Their tunneling often weakens the wood of the trunk and allows invasion of canker and decay fungi. The tree may ultimately break in a wind or snow storm. Larval

activity is evident by accumulations of fibrous, coarse wood fragments called frass. Affected trees often "bleed" from borer wounds (Figure 2).

Figure 2. Bleeding wound with frass (Saperda).

The most effective deterrent to borers is to maintain trees in a vigorous condition. Healthy trees can resist boring activity, preventing the insects from laying their eggs. Maintaining vigor may be difficult to do because ornamental aspens are subject to frequent stresses. Insecticides are of little benefit in controlling borers. Adult beetles do not feed on aspens, and thus do not ingest the insecticides. Insecticides, including systemics (those that move within the plant), are also ineffective because they do not reach the inner wood where the larvae are feeding. A good approach to dealing with borers in aspens is to cut the infested stem before it is killed and select one or several suckers as replacements.

Tent Caterpillars commonly defoliate aspens, forming a web "tent" around several leaves to protect themselves from predators (Figure 3). Tent caterpillars rarely cause tree death; they simply are unsightly. These spinning insects are easily controlled by pruning the tents from the tree. Penetration of insecticide sprays into the insect's webbing is usually poor, thereby making control with insecticides difficult.

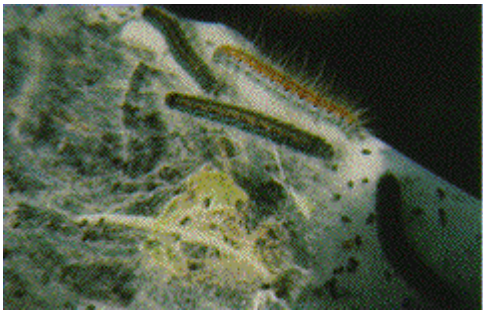

Figure 3. Tent caterpillars.

Oyster shell scales often aggregate and form solid crusts on twigs and limbs (Figure 4). These insects suck sap from tree bark and often kill branches and in some cases, whole trees. Aspens with scale infestations are often unsightly and weakened. Control of the insect depends upon the stage of the insect when it is noticed. If the problem is noticed before the insects become active in mid- to late spring, the entire tree should be sprayed with Superior-type oil available from garden shops. During mid-spring, after the insects have become active but before the young insect has formed its armored scale, the insects can be seen moving on the twigs; this is called the "crawler" stage. Several insecticides control crawlers, including Sevin, Malathion or Orthene. Consult the labels of these chemicals for rates and application information. After the scale is formed, insecticides are useless; wait until late winter or early spring while the tree is still dormant and apply the Superior oil.

Figure 4. Oyster shell scale adults encrusting twig.

Aspen leafminer larvae feed on leaves and form blotches or serpentine patterns which are unsightly (Figure 5). Feeding damage may cause the leaves to fall early, but in most cases leafminer infestations are not severe enough to significantly affect tree health. Control of leafminers is not always warranted. If treatment is deemed necessary, treat foliage when leaves are half-sized, or in May or June when mines are first observed. Homeowners may consider approved formulations of Orthene, Sevin, Cygon, or Lindane. However, check labels for names of trees which can be treated.

Figure 5. Aspen leafminer serpentine mines.

Aspen galls. Several insects cause swellings in stems, shoots, leaves and petioles of aspens, called galls (Figure 6). Most galls cause local injury that does not affect tree growth or survival. Some premature leaf drop can occur. Management is rarely justified, and may not be practical, because insects in galls are not vulnerable to insecticides. Adults emerging from the galls to lay eggs may be effectively controlled with Dursban. Orthene or acephate has been used with varying success.

Figure 6. Aspen galls.

Disease Problems

Leaf diseases on aspens are caused by several different fungi. In ornamental situations, they rarely cause tree mortality. More often, however, they cause unsightly leaves, and affected trees shed their leaves earlier in the growing season, often without producing the desirable fall coloration. Foliar diseases affect the tree's appearance more than they affect its well-being, although the tree may grow more slowly with repeated annual attacks. Infected leaves drop to the ground and therefore the fungus must reinfect healthy leaves the following spring.

Aspen Leaf Spot. The most common foliar problem on aspen is aspen leaf spot caused by the fungus *Marssonina populi*. This fungus causes dry, brownish lesions with yellowish borders (Figure 7). Margins are often irregular and indistinct, and not restricted by veins as are those caused by iron chlorosis. Infection is favored by wet weather, especially when the aspen leaves are emerging from the buds. During particularly wet springs, extensive infection can occur throughout aspen forests, resulting in massive defoliation and a loss of the delightful fall color. After several years of defoliation the disease may even kill aspens.

Figure 7. Marssonina leaf spot.

In the home landscape, the impact of this leafspot can be minimized by increasing the vigor of trees by proper watering and fertilization. Vigorous trees can produce new leaves, free of disease, that can make the sugars that the tree needs to continue growing. In most cases, increasing vigor is all that is needed to ensure tree survival.

When trees have been defoliated two or more consecutive years, or the trees are "key" landscape trees, fungicide use may be warranted. Labeled fungicides include chlorothalonil (Daconil 2787, Daconil Lawn and Garden Fungicide, Broad Spectrum Funagicide) or fixed copper fungicides (Microcop, Copro, Kop-R-Spray, Kocide 101, Champ). One of these fungicides must be applied at label rates beginning at budbreak and applications should be made at 10–14 day intervals as long as wet weather continues or until leaves reach their full size. Sprinkler irrigation on foliage should be avoided because it creates conditions favorable for infection and can spread spores.

Destroying fallen leaves is often recommended for controlling this and other leaf diseases. However, this practice may be of limited value because spores of leaf disease fungi can often travel great distances from untreated aspens and thousands of spores can be produced on leaves that remain. In dry years, removing the nearby source of spores is of little benefit because conditions do not favor infection; in wet years, a single spore source can provide enough spores to infect many trees. Therefore, nothing more intensive than the normal fall leaf raking is necessary.

Ink spot is a leafspot restricted to high elevation aspen stands. This leafspot is easily distinguished from other foliar problems by the presence of large, flat, black fungal structures on the leaves. These spots resemble drops of ink or tar (Figure 8). Later in the summer, the black structures may fall from the leaves, leaving roundish holes in the leaf. This disease is not a problem of ornamental aspens in lower valleys, but is often mis-named by homeowners when they see aspen leaf spot. Control is not warranted for ink spot.

Figure 8. Ink Spot.

Powdery mildew produces a greyish coating over the leaf. This powdery mass consists of the thread-like mycelia and spores of the fungus (Figure 9). Powdery mildews are unusual in that unlike most fungi they grow well under dry conditions. Although it detracts from the appearance of leaves, powdery mildew causes little damage to aspens, and control is usually not justified.

Figure 9. Powdery mildew.

Leaf scorch is a foliar problem caused by insufficient soil moisture. In aspens leaf scorch is usually limited to ornamental situations. Leaf margins are killed (Figure 10) when the tree cannot supply enough moisture to the leaves during hot, dry weather, especially when it is windy. Leaf scorch is aggravated by iron deficiency. Proper watering—enough to saturate the tree's root zone—can prevent further damage.

Figure 10. Leaf scorch.

Cytospora canker is one of the most common diseases affecting aspen twigs and stems in ornamental situations. This fungus invades wounds—those caused by humans as well as those made by insects, branch rubbing, and other "natural" causes. This fungus is a parasite of weak and dying trees in natural stands, and often attacks stressed trees in the landscape. Once *Cytospora* invades a wound, it often girdles a branch by killing the cambium (Figure 11). Vigorous trees, however, can limit the invasion and are rarely killed. Therefore the most effective control is to encourage tree vigor by providing adequate water and fertilizer. Pruning of the affected branch is recommended to prevent the infection from progressing into major branches, but its value is mainly to remove dead branches and improve the tree's appearance. Fungicides are not effective.

Figure 11. Cytospora canker.

Trunk and Root Rots. Several fungi may decay the roots and trunks of aspens, especially those of larger or older trees, causing the trees to break. These fungi are usually not a problem in ornamental aspens because the trees rarely reach a size where they do serious damage when they fall. If these fungi are present and the trees could damage some property if they fall, the trees should be removed.

Mention of a trademark or proprietary product does not constitute endorsement by the authors or Utah State University. Be sure to read and understand label instructions before using any pesticide.

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