

Plant Diseases & Problems

Managing Diseases in Turf and Ornamentals

A healthy start - Getting a lawn or landscape off to the right start will really pay off in reduced disease and maintenance problems. The key to the success is the soil. The challenge is to improve the soil and correct problems such as compaction, poor drainage, low organic matter, nutrient imbalance, buried debris, and improper grading.

Healthy plants need improved levels of organic matter and soil nutrients. Incorporating compost can have a tremendous effect on improving the soil. A good quality topsoil can be incorporated to the existing soil. Be aware of weeds and other undesirable elements that can be brought in with the soil.

Plant selection is the next step. Match the plant to the site. Select plants with disease resistance to the major problems in the landscape. Select healthy plants and sod. Look for obvious signs of insects or disease. Avoid trees and shrubs with wounded trunks, cankers, small root balls, or plants that have not been properly cared for by the grower.

Use care when planting the lawn, trees, shrubs, and flowers. Finally, water and maintain the plants until they become well established at the site. This may take anywhere from six months to several years.

Inherited Problems – Existing landscapes are where many landscape contractors inherit plant and site problems that can affect plant health. The genetics of the plant cannot be changed and often, only minor changes can be made to the soil and the site, so very real expectations should be established with the customer as to what can be done to “control” disease problems. A weak or stressed plant may not be diseased today, but will be prone to problems tomorrow.

The following are some approaches to maintain existing landscapes for greater plant health:

Pruned trees and shrubs to prevent crowding and provide better air circulation. By improving air flow, leaves will dry faster which reduces disease problems on foliage. Remove crowded plants to allow adequate space for root growth and development. Crowded plants compete for nutrients, water & light, and are less healthy.

Mowing is the most frequent maintenance practice of turfgrass care, so follow the rules of mowing to have the greatest impact on turf health. Mow with sharp blades at the recommended height and frequency. Improper mowing stresses turf and can result in brown grass and disease problems. Some of the most common problems are scalping, mowing turn that is wilted or under moisture stress, mowing in the same pattern and allowing the grass to grow too tall. These practices can contribute to serious problems with leaf spot and patch disease problems.

Plant Diseases & Problems

Fertilization is a tremendous tool to maintain healthy plants situated in a low quality of soil. Many of the new turfgrass cultivars have vigorous growth habits and need adequate fertilization to achieve their optimal growth potential. Trees, shrubs, and flowers will also require fertilization to be healthy. The type of soil required by these plants and the nutrients available at the site will influence the amount and frequency of the fertilization needed.

Watering is essential for all plant growth. The trick is to have the right amount. Too much or too little will cause plants to be stressed and may lead to disease problems. One of the most common problems is root rot from over watering and/or poor drainage. The most important concept to remember about watering is to maintain uniform soil moisture in the root zone of the plant. Many diseases can be dramatically increased if plants are subjected to widely changing soil moisture levels.

Soil compaction is the common term, but the real problem is the lack of adequate oxygen in the root zone. Plant roots require air to breathe. In many cases, if soil oxygen levels are increased, plant health generally improves.

ROAD SALT AND TREES

What is the problem?

- **Many trees--and shrubs--can be disfigured and killed by road salt (sodium chloride), significantly raising tree costs for private and public tree managers.**
- The worst damage occurs to sensitive species planted near heavily salted roads with high traffic, especially when they lie downhill, downwind, or have poor drainage.

How can salt damage be recognized?

- **Winter:** look for “witch’s brooms” (cluster of twigs growing out of branch ends) on deciduous trees, yellow tips on evergreen needles.
- **Early Summer:** look for marginal leaf scorch on deciduous trees, yellow, brown, or fallen needles on evergreens--especially on the side toward the road.
- Other problems can produce the same symptoms, so examine the whole plant and site.

How does the damage occur?

- **Lower salt levels in the soil slow tree growth and vigor by interfering with nutrient availability and uptake. Higher levels in trees cause young plant tissues to dry out and die. In both cases, the chloride ion is the active agent.**
- Severe damage on evergreens comes primarily from spray taken up by the needles.
- For deciduous trees, research suggests significant damage also comes from salt being taken up by the roots and by soil structural collapse.



Salt damage on sugar maple

Plant Diseases & Problems

Which common urban species are sensitive?

- **The following common trees are usually severely damaged by road salt:**
- red maple (*Acer rubrum*)
- sugar maple (*A. saccharum*)
- hackberry (*Celtis occidentalis*)
- black walnut (*Juglans nigra*)
- Norway spruce (*Picea abies*)
- white spruce (*P. glauca*)
- white pine (*Pinus strobus*)
- Douglas fir (*Pseudotsuga menziesii*)
- pin oak (*Quercus palustris*)
- littleleaf linden (*Tilia cordata*)

What can I do about it?

- **Plant salt-tolerant species** such as ashes, callery pears, ginkgo, hawthorns, honeylocust, London plane, tolerant maples (Norway, hedge, or sycamore), English and red oak, tolerant pines (Austrian, pitch, or Japanese black), Sargent cherry, or Scholar Tree.
- Reduce salt application rates, lower the throwing distance, and apply *before* roads freeze.
- Use a less harmful product such as CMA or IcebanTM, and mix in inert materials like sand.
- Raise the planting site, or block off the trees from the road with a barrier.
- Improve drainage or adjust grade, so salt is easily leached away from trees.
- Flushing well-drained soils at the end of the winter, or incorporating gypsum or a similar commercial product into the soil before winter begins, has been found to reduce salt damage in some cases.

COMMON MAPLE PROBLEMS

Why is this topic important?

- **Maples dominate urban forests (50-90%),** so their problems attract a lot of attention.
- It is important to learn to recognize serious problems, and ignore inconsequential ones.

Is there a optimal time to look for serious problems?

- **Yes.** Late summer is a good time to view stress in trees because its effects are so visible in the canopy, and winter is a good time to see structural defects.

What do I look for?

- branch dieback
- early fall coloration
- leaf scorch
- reduced terminal growth
- large seed production
- signs of specific insects or diseases

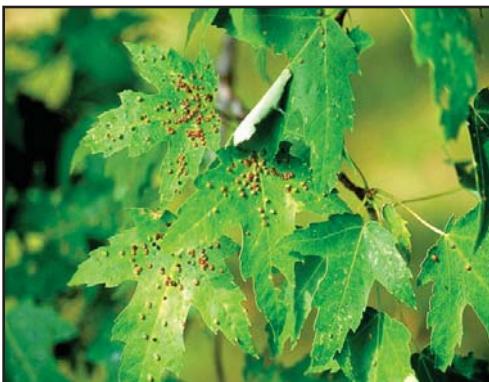
Plant Diseases & Problems

What serious problems can be seen?

- **Drought** - Reduced water supply during summer months means more water is being given off than is being taken up. Maples will often exhibit *leaf scorch* (browning of leaf edges). Repeated leaf scorch often indicates restriction, smothering, or death of the roots.
- **Girdling roots** - These roots circle trunks, often below grade, constricting sugar transport to the roots and slowly killing them. Norway maples seem particularly prone. Symptoms: center crown death or early fall coloration. Inspect roots of new stock carefully.
- **Included bark** - Branch attachments on maples often have included (embedded) bark between branch and trunk, or co-dominant stems. This weak union is a common point of failure on older maples. Inspect suspicious unions showing swelling, plants, or leakage.
- **Maple decline** - Decline or dieback of sugar maples is becoming more common. Probable cause is a combination of internal factors aggravated by environmental conditions. Symptoms: premature fall color, smaller leaves, and branch dieback. There is no permanent solution.
- **Verticillium wilt** - This destructive disease attacks through the roots, causing the xylem to plug up. Symptoms: wilting of leaves on one limb, reduced growth, gray-green streaks in sapwood. Prune out affected limbs. Avoid wounding roots, and water new trees. If replacing with another tree on the same site, select a resistant species.

What inconsequential problems affect maples?

- **Tar spot** - This is a fungal leaf disease occurring on Norway, red and silver maples. Early light yellow-green areas later turn into black, raised, tar-like spots on upper leaf surfaces. Damage is ugly, but usually only cosmetic. Raking up and removing infested leaves reduces infection.
- **Powdery mildew** - Here is another fungal leaf disease. It shows up as a thin layer or patches of grayish white powdery material. Infected leaves may turn yellow and drop early. A cosmetic problem only.
- **Maple gall mites** - These tiny mites produce very visible warty or spindle shaped galls on the leaves of maples. Usually noticed in April and May, they can be very unsightly. This is a cosmetic problem that does not affect the overall health of the tree.



Bladder gall on maple, a disfiguring but minor disease

Plant Diseases & Problems

BORERS

What are they?

- The word “borers” applies to all wood-boring insects, including moths, beetles, sawflies, horntails and flies. Most of the damage is done when they are in the larval stage.
- Borers attack urban and rural forest trees, causing wood defects that weaken or kill the tree.
- Most borers are attracted to weakened trees, but a few exotic borers (such as the **Asian long horn beetle** or the **emerald ash borer**) appear to attack healthy trees as well.

What are the exterior signs of the presence of borers?

- Dead tree, dead top of tree, dead limbs or branches, or branches that lack vigor.
- Exit holes, where the insect has left the tree, that range in size from a pinhead to 3/4”.
- Sawdust at the entrance of exit holes, or on the ground beneath.

What kind of interior damage do they cause?

- Adult boring insects deposit their eggs beneath the bark by piercing or chewing through it.
- Once hatched, the larvae feed by tunneling into young shoots, branches, trunks, roots, or underneath the bark.

Why are borers a serious threat?

- **They kill trees**, both old and young.
- Loss of terminals, branches and trunks weakens and deforms the entire tree.
- In municipal settings, trees with borers become hazardous when their wood is weakened.

What trees are susceptible?

- **Trees suffering from environmental stress** such as prolonged drought or site that is not suited to the species.
- **Storm-damaged trees**: their weak condition and open wounds are inviting to insect borers.
- **Transplanted trees**, especially when not watered the first year or two.
- **Young nursery plantings** growing near infested areas.
- **Urban species that commonly have borers** include white birch, European mountain ash, crabapple, and black locust.

How should this problem be handled?

- **Plant the right tree in the right location** in the first place.
- **Minimize environmental stress**, especially on young trees (e.g., with summer watering).
- **Get a positive identification on host and insect**. There are many different species of insect borers, and each one has a different life cycle, therefore requiring different timing on treatments.
- **Remove dead or damaged wood**, and be sure pruning cuts are made properly.
- For details on treatments, consult the current recommendations of your University Extension service.

Plant Diseases & Problems

SHADE TREE ANTHRACNOSE

What is that?

- Anthracnose is a leaf disease caused by fungi that are active in the early spring.
- It can highly disfigure leaves on susceptible trees, and this very noticeable damage often concerns homeowners greatly, especially in the spring.
- Shade tree anthracnose is separate from **dogwood anthracnose**, which is a different disease caused by a much more virulent fungus that requires early and aggressive management.

What causes shade tree anthracnose?

- **Fungi of the genus Discula (and related forms) are responsible for this disease.**
- The fungi pass the winter on dead leaves on the ground, or occasionally in cankers on affected twigs in the trees. In the early spring, their spores are dispersed for reinfection.
- Anthracnose fungi can only affect leaves under cool and moist conditions typical of early spring. When the weather warms up and dries out, infection can not occur.

What does it look like?

- **The symptoms include irregular, brown-black blotches, sometimes paralleling the leaf veins.**
- When the weather is particularly favorable (lengthy cool and moist period), entire leaves can become blighted and significant tree defoliation can occur.
- Some important landscape and street trees are particularly susceptible. They include maples, ashes, sycamores, beech, birch, elm, walnut, and horsechestnut.

What should be done about this disease?

- **This is a minor blemish that rarely affects the overall health of the tree.** Since this disease will stop as the weather becomes warmer and drier, there is no need for control measures in most cases.
- Even if defoliation occurs, the tree will put out its second flush of growth under warmer and drier conditions that prevent reinfection by the fungus.
- To help reduce the infection level the following spring, remove and discard the leaves from a diseased tree in the fall-- or compost them properly.
- If anthracnose is serious near a new planting site, select trees that are resistant to it.
- **Fungicides are rarely recommended.**

If anthracnose is a recurring problem and/or the tree is on a prominent site, where the damage is esthetically unacceptable, a fungicide program may be warranted.

Initiate any fungicide treatment before budbreak; by the time symptoms can be seen, it is too late to treat the fungus. Check your local University Extension office for recommendations on products, dosage, and timing.



Ash Anthracnose

Plant Diseases & Problems

Wood Decay Fungi on Living Trees

What does that mean?

- **Some fungi can attack and weaken the wood in living trees under certain conditions.**
- Vigorously growing trees are usually able to resist decay fungi by outgrowing them or by stopping them with barriers, but wounded or weakened trees are susceptible to invasion.

Why is this topic important?

- **Decay fungi can create hazard trees with a great potential for harm.**
- Many older trees that fail during storms have had their strength sharply reduced or even eliminated by decay fungi. Mushrooms or bracket fungi on trunk or butt are warnings!
- Strength loss is difficult for amateurs to detect, and even for professionals to evaluate.

Which decay fungi are common and dangerous in an urban setting?

- ***Climacodon septentrionalis*.** This fleshy fungus is made up of multiple cream-colored shelves, each shelf underlain with many spore-bearing “teeth”, and it fruits in August and September. Especially common on sugar maple.
- ***Fomes fomentarius*.** The top portion of the fruiting structure is hard, gray in color, and takes on a hoof-shaped appearance, up to 6-8” across. Maple, beech, and birch are most often infected, commonly at older pruning wounds.
- **Artist conk (*Ganoderma applanatum*)**. Woody shelf-type fruiting body up to 2’ wide is found on the lower part of trunk or tree butt. Top brown to reddish-brown with a creamy white margin, may be shiny. Wide host range includes oaks, maples, and beech.
- ***Daedalea quercina***. Fungus with woody, perennial, shelf-like fruiting body growing from old pruning wounds. Underside is maze-like. Common on red oak and other oaks.
- **Chicken-of-the-woods (*Laetiporus sulfureus*)**. Lemon-yellow/orange shelf-type fruiting body. Found singly or in overlapping fans on trunks and butts of many deciduous trees. This is a “brown rot” that takes the cellulose our first, and it leads to rapid strength loss.
- ***Cerrena unicolor***. This fungus fruits as multiple, thin, leathery shelves, with green moss on top of younger shelves. It is especially threatening to stressed trees because it easily outraces efforts at containment. Produces an ever-expanding elongate canker on many deciduous trees.

What can I do about it?

- **Prevention is the best defense, because you can't “save” a tree that has decay.**
- **Promote reasonable growth of young trees:** water well during dry spells, aerate the soil, maintain 2-6” organic mulch, and apply slow-release fertilizer in early fall or spring.
- **Avoid injuring or smothering the roots** during construction or other activity.
- **Minimize entry of decay fungi:** protect the young trunk from injury, and use proper pruning technique, timing, and management.
- **Provide supplemental water to trees with decay when needed** so the tree can outgrow or contain the spread of decay.
- **Call a tree professional** trained in the area of decay detection and evaluation.