

COMMON INSECTS & DISEASES OF COLORADO TREE AND SHRUBS

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CASTLE PINES NORTH

METROPOLITAN DISTRICT™

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Alternative Pest Management for the Landscape

- Maintaining the perfect landscape may result in a dependence on pesticides that can lead to environmental and human health problems.
- Many homeowners would prefer different ways to control pests in gardens and landscapes.
- An Integrated Pest Management (IPM) program offers a variety of pest control alternatives, which include:
 - Cultural Control
 - Mechanical Control
 - Biological Control
 - Chemical Control
- *Learn to identify specific insects before determining control needs. (Insect populations can include beneficial insects that you may not want to kill.)*

Cultural Pest Control Methods

Cultural methods of pest management attempt to create the optimum growing conditions for plants and natural predators, and unfavorable conditions for pests.

- Select well-adapted, disease-resistant plant varieties, and choose the right plants for the location and soil conditions. Buy healthy and pest-free plants.
- Avoid under or over watering - both make plants vulnerable to insects and disease.
- Improve the soil by adding organic amendments. A soil analysis helps to evaluate soil type and fertility. Soil testing kits can be ordered by visiting www.soiltestinglab.colostate.edu.
- Change the location of annual plants from year to year to disrupt the life cycle of pests.
- Remove infested plant residue from your garden in the fall, so that pests do not over-winter there.
- Incorporate a wide variety of plants to disperse potential pest problems and to provide diverse habitat for beneficial insects.
- Keep your vegetable garden clean of rocks, wood, and debris that provide hiding places for slugs or damaging insects.

Mechanical Pest Control Methods

Mechanical pest management options rely on physical methods of destroying pests and include:

- Hand weeding/mowing
- Using a hoe or tiller rather than a herbicide
- Hand-picking insects off plants
- Hosing down plants to dislodge insects
- Pruning diseased or insect-infested woody plants

- Using mulches to reduce erosion and weeds and to conserve moisture

Biological Pest Control Methods

Beneficial organisms such as certain insects or fungi can help control pests naturally, or they may be purposely introduced.

The main categories of these “beneficials” include:

- Predators – including lady beetles, spiders, green lacewings, syrphid flies, damsel bugs, minute pirate bugs, ground beetles, and predatory mites. Larger animals such as birds, frogs, and garden snakes also prey on pest insects.
- Parasites – include the tachinid fly and braconid wasp that lay eggs on or inside insect pests.
- Pathogens – fungi, bacteria, and viruses that infect pests much in the same way they infect people or other animals.

Some garden stores and catalogs carry beneficials, such as lady beetles. Conserving beneficials already in your garden is likely more cost-effective, and frequently is more successful. Pesticides often kill these beneficial organisms.

To encourage beneficials in your yard:

- Plant a diverse landscape that provides a variety of habitats and food sources.
- Learn to distinguish beneficial insects from pests.
- Minimize pesticide applications.

These natural controls often work more slowly than pesticides, and they require a food supply that could be the very pest you’d prefer to be gone. However, they are nature’s way of handling high populations of pests, they don’t contaminate our water supplies, and they can lend beauty to a garden.

Chemical Pest Control Methods

Chemical pesticides are often used to control diseases, pests or weeds. Chemical control is based on substances that are toxic (poisonous) to the pests involved. A major advantage of chemical pest control is its efficiency.

- There are some naturally occurring chemicals that are classified as pesticides but can be used in the context of organic gardening. These compounds tend to be less harmful to beneficial insects, and they often break down more rapidly than synthetic pesticides.
- Reduced risk pesticides include microbial insecticides, botanical pesticides, mineral-based pesticides, and synthetic organic compounds (oils, soaps, and detergents) produced from petroleum distillates. These chemicals are available in some garden stores, but may have to be requested specifically.
- Please note that these products are still classified as pesticides and should not be used indiscriminately. They are best incorporated into a management program that uses all available cultural, mechanical, and biological control methods.
- Do not assume that naturally occurring chemicals are non-toxic. Some of these are more toxic to humans than synthetic pesticides. As with all chemicals, always read the label instructions prior to using these alternatives. Under certain conditions, some of these chemicals can cause injury to plants and animals.

INSECTS

Aphids

- Aphids are the most common insects found on trees, shrubs, and garden ornamental plants.
- Colorado has over 350 different kinds of aphids, but most feed on only a few species of plants.
- These small, pear-shaped insects vary in color from green to orange, red, brown or gray.
- Most plants in Colorado support at least one species of aphid. Most aphids rarely injure plants or even attract attention, but a few aphid species do cause problems.
- Aphids feed by sucking sap from plants. When the number of aphids on a plant are very high for an extended period, their feeding can cause wilting and dieback of shoots and buds.
- Leaf curling, the presence of ants or the excretion of a sweet, honeydew-like substance may all be an indication of an aphid problem.
- Ladybugs, green lacewings, and parasitic wasps are some of aphids' natural enemies and will help control them. Aphids can also be controlled with insecticidal soaps. High water pressure may also wash away aphids and remove sticky honeydew.
- When aphids can't be controlled by these natural methods, insecticides containing the active ingredients acephate, bifenthrin, and imidacloprid are effective. Be sure to follow all label directions when using insecticides.

Brown Headed Ash Sawfly

- Adults appear in early spring and lay eggs in slits cut along the outer margin of young leaflets. The green, worm-like larvae chew the leaves in spring.
- During early stages of an infestation, larvae make small "pinhole" wounds in the interior of leaves. Older larvae consume the leaf material between the leaf veins and can cause defoliation.
- This insect is easily controlled by almost any garden insecticide, including soaps. Many can also be dislodged by a strong jet of water from a hose. Weather is the most important natural control. Late spring frosts and strong winds may also kill large numbers.
- Infested trees usually recover from defoliation as lost foliage is replaced by new foliage on healthy, vigorous trees. Control is seldom warranted.

Cooley Spruce Gall Adelgid

- Cooley spruce galls are common and conspicuous on blue spruce. They do little or no harm to the tree.
- The galls are produced by aphid-like insects, Cooley spruce gall adelgids. Galls appear early in the season as 2- to 4-inch cucumber-shaped growths. They are often mistaken as seed cones.
- Cooley spruce gall adelgids require two hosts to complete their normal life cycle: Spruce and Douglas-fir.
- Once the galls begin to form, insecticides are ineffective because the insects are protected within the galls. Old galls are covered by new growth the following season and become almost unnoticeable after a few seasons.
- The best times to spray are in the spring before new growth starts or in the fall when overwintering stages of the insect have returned to the tree.

Douglas-Fir Tussock Moth

- Douglas-fir tussock moth caterpillars feed on needles of spruce, Douglas-fir and true firs.
- The potential for problems can be predicted by surveying for egg masses before eggs hatch in late spring.
- The caterpillars can extensively defoliate plants, feeding first on the new growth then later moving to older needles. Injury typically is first concentrated at the top of the tree. Tops of heavily damaged trees may be killed, sometimes after only a single season of severe injury.
- Several insecticides can be used to control Douglas-fir tussock moth during outbreaks. Numerous natural enemies attack these insects and these will often control outbreaks after a season or two.

Emerald Ash Borer

- Emerald ash borer (EAB) is an exotic beetle that was discovered in southeastern Michigan near Detroit in the summer of 2002.
- Adult beetles feed on ash foliage but cause little damage. The larvae feed on the inner bark of ash trees, disrupting the tree's ability to transport water and nutrients.
- Emerald ash borer probably arrived in the United States on solid wood packing material carried in cargo ships or airplanes originating in its native Asia.
- 35 states and the Canadian provinces of Ontario, Quebec, New Brunswick, Nova Scotia and Manitoba are now infested.
- Discovered in Boulder, CO on 9/23/2013, it has been confirmed in Gunbarrel, Longmont, Lafayette, Lyons, Superior, Broomfield, Westminster and Larimer County.
- The Denver Metro area has over 1.5 million Ash trees (1 in 6 trees) – close to 20% of our urban tree canopy!

Hackberry Nipplegall Psyllid

- Resembling tiny cicadas, these insects known as psyllids are about 1/8 inch long.
- They produce prominent warty leaf galls, sometimes nearly covering the leaf. Damage is primarily an aesthetic issue, control is rarely needed.
- Adults deposit eggs on the undersurfaces of the leaves. When eggs hatch, young nymphs feed on the leaf.
- An overgrowth that appears as a raised swelling on the lower leaf surface is induced by this feeding, ultimately producing the gall that covers the insect.
- The psyllid is commonly attacked by parasitic wasps that help reduce populations. They remain in the old galls through the winter, emerging the following spring.
- Hackberry psyllids are also a common and important prey of many resident and migratory birds.

Ips Beetle

- Ips is a common group of bark beetles that infests pine and spruce trees. Several generations occur each season.
- Normally ips beetles limit their attacks to trees that are in decline due to root injuries, wounding, or other stresses.
- As adult ips beetles enter trees and tunnel, a yellowish- or reddish-brown boring dust is produced and accumulates in bark crevices or around the base of the tree.

- When the larvae tunnel, affected parts of the tree discolor (“fade”) and die. These symptoms may be limited to parts of the tree, such as a single branch or the top.
- To prevent ips beetle attacks, keep trees healthy and remove dead trees and any “slash” or coniferous firewood from the vicinity of valuable trees.
- Insecticides can be applied preventatively prior to adult beetle infestation, typically early spring and summer.

Japanese Beetle

- For close to a century, the Japanese beetle has been one of the most damaging insect pests of both turfgrass and landscape plants over a broad area of the eastern US.
- Recently, there have become a few permanent, reproducing populations of this insect in communities along the Front Range. Japanese beetle larvae are a type of white grub that feeds on the roots of grasses.
- Plants damaged by the adults include Virginia creeper, grape, rose, crabapple/apple, linden and raspberry.
- Adults are best controlled by handpicking or by use of certain insecticide sprays. Japanese beetle traps can capture many adults, but have never been shown to reduce damage to nearby plants.
- Japanese beetle larvae can be controlled with certain insecticides or by insect parasitic nematodes.

Leafcutter Bees

- Leafcutter bees are native bees, important as pollinators.
- They are not aggressive and have a mild sting that is used only when they are handled.
- Individual females do all the work of rearing. This includes digging out nesting areas, creating nest cells and providing their young with food. Adult females may live up to two months and lay some 35 to 40 eggs during this time.
- Leafcutter bees cut the leaves of plants (Roses, Ash, Redbud, Azalea and Lilac are most often targeted). The cut leaf fragments are used to form nest cells.
- Leafcutter bees nest in soft, rotted wood or in the stems of large, pithy plants, such as Roses.
- Insecticides are ineffective – the only known control is to cover susceptible plants with cheesecloth or other loose netting during periods of leafcutter bee activity.

Lilac/Ash Borer

- Lilac/ash borer is an insect native to North America that is common in ash trees, particularly if trees are stressed.
- Damage is done by the larva, a type of caterpillar that tunnels into the trunk and lower branches of ash trees.
- If necessary, lilac/ash borer can be easily controlled by spraying the trunk and lower branches in spring during the time when adult females lay eggs on the trunk and the newly hatched caterpillars begin to tunnel into the wood. Soil injectables (Merit) do not work on the larvae.
- On lilac and privet, damage is confined to the base of the plant.
- Lilac/ash borer should not be mistaken for the Emerald Ash Borer, an introduced insect of Asian origin that was recently found in Boulder and a few surrounding counties, and is far more seriously damaging to ash trees.

Mountain Pine Beetle

- Mountain pine beetles (MPB) are the most important insect pest of Colorado's pine forests. MPB often kill large numbers of trees annually during outbreaks.
- Trees that are not growing vigorously due to old age, crowding, poor growing conditions, drought, fire or mechanical damage, root disease and other causes are most likely to be attacked.
- Once MPB infests a tree, nothing practical can be done to save that tree. This insect carries bluestain fungus into the tree, which clogs the trees' circulatory system.
- For a long-term remedy, thin susceptible stands. Leave well-spaced, healthy trees.
- For short-term controls, spray, cover, burn or peel attacked trees to kill the beetles. Preventive sprays can protect green, unattacked trees.

Oystershell Scale

- Oystershell scale develops on the bark of many common plants (Aspen, Ash, Cotoneaster, Lilac) and can cause serious injury during outbreaks. They feed on the plant by sucking plant sap.
- Oystershell eggs typically hatch in late May/early June and the active 'crawlers' that emerge move about to find new sites to feed.
- Pesticides or horticultural oils applied when the crawlers are present can be very effective in controlling oystershell scale.
- On smaller trees, old scale coverings and eggs can be destroyed by scrubbing the bark with a soft plastic brush.
- Old scales remain in place for several years after the scales have died.

Peachtree Borer

- The peachtree borer is the most destructive insect pest of Peach, Cherry, Plum, and other stone fruits in Colorado.
- Damage is done by the immature larvae in spring after egg hatch, which chew beneath the bark of the lower trunk and larger roots.
- Insecticide sprays applied to the lower trunk when eggs are laid (July/August) can prevent new infestations.
- Peachtree borer is most easily controlled by sprays of insecticides applied to the lower trunk and base of the tree.
- These are preventive sprays that target the eggs and early larval stages exposed on the bark of the tree. Once larvae have migrated into the tree, insecticides are not effective.

Pine Needle Scale

- Pine needle scale feeds on the needles of most species of pines, spruce and fir. During outbreaks, needles may be so covered with the bodies of the scales, the plant has the appearance of being spattered with white paint.
- The insect hatches in the spring and quickly attaches itself to the tree's needles. Heavily infested needles drop prematurely. Sustained outbreaks cause needle loss and sometimes twig dieback.
- The most effective controls of pine needle scale are "crawler sprays," insecticides applied to coincide with the vulnerable crawler stage of the insect. Many yard and garden insecticides are labeled for this purpose.

- Proper timing is important if insecticide applications are to be successful. On many plants, infestations are localized and can be controlled with spot sprays.

Pine Tip Moth

- Pine tip moths feed on and destroy new growth (terminals) of pines grown throughout most of Colorado.
- Injury often is quite conspicuous, and infested plants may appear unattractive. Although little real injury to the health of the infested tree results from pine tip moth attacks, tree growth can be delayed and the form altered to a bushier appearance.
- Tip moth injury can be diagnosed during early to mid-summer by examining suspect shoots that have dried and shriveled. Moth larvae bore into the new young shoots and feed on shoot tissue May – July.
- The southwestern pine tip moth that commonly infests Scotch, Ponderosa and Mugho pines is best controlled with insecticides applied as new needles are elongating.

Poplar Twiggall Fly

- Poplar Twiggall fly produces a smooth knot-like gall on the twigs of Cottonwoods, Poplars and, particularly, Aspen. These galls continue to expand for years after they are produced.
- The fly overwinters in the gall as a fully developed maggot. In late winter/early spring, the maggot drops to the ground and pupates.
- Adult flies emerge in spring with the onset of new growth on the host plant. After mating, females lay eggs by inserting them into plant tissue.
- The combination of egg laying and larval feeding causes the gall to form. The damage caused by the Twiggall fly is mainly aesthetic.
- Natural controls (parasitic wasps and birds) help keep populations in check. Control with insecticides has proven unsuccessful.

Spider Mites

- Spider mites are common plant pests. Symptoms of injury include flecking, discoloration (bronzing) and scorching of leaves. Injury can lead to leaf loss and even plant death.
- Injury is caused as they feed, bruising the cells with their small, whip like mouthparts and ingesting the sap.
- Natural enemies include small ladybugs, predatory mites and thrips and minute pirate bugs.
- Adequate watering of plants during dry conditions can limit the importance of drought stress on spider mite outbreaks. Periodic hosing of plants with a forceful jet of water can physically remove and kill many mites, as well as remove the dust that collects on foliage and interferes with mite predators.
- One reason that spider mites become a problem is the use of insecticides that kill their natural predators.

Tent Caterpillar

- Tent caterpillars are so named because they construct a communal tent of densely spun silken threads, most often in branch crotches. The tents are used for caterpillar protection, resting and molting.
- Tent caterpillars feed on various trees depending on the type of insect. Cottonwood, plum, chokecherry, willow, aspen and some fruit trees are most often affected.

- These insects attract attention due to the conspicuous tents. However, they rarely cause any significant injury. Greatest injury occurs from early season defoliation, particularly on stressed plants. Control is seldom needed.
- Many biological controls naturally regulate populations of these insects. You can also physically remove the tents.

Zimmerman Pine Moth

- Caterpillars of the Zimmerman pine moth damage pine trees by tunneling into the trunks and branches, often causing branches to break.
- This insect is a wood boring insect that was accidentally introduced into and later established in several areas of Colorado. Scotch and Austrian pines are particularly susceptible to injury.
- Evidence of injury are pale yellow, popcorn-like masses of sap that develop in response to feeding wounds. Damage usually occurs in the upper part of the tree and feeding is often concentrated at the area where branches meet the trunk. This produces weakening that may result in limbs dying or breaking from the tree.
- Preventive insecticide sprays are effective when applied during periods when the caterpillars are exposed on the surface of the tree (often mid to late April).

DISEASES

Bacterial Wetwood

- Bacterial wetwood (also known as bacterial slime or slime flux) is a common disease that affects the central core or bark of many shade and forest trees.
- In Colorado, the disease is most prevalent in aspen, cottonwood, elm and willow. Affected trees may die.
- The slime is the exudate generated from fermentation pressure in wetwood affected trees and is toxic to growing areas of the tree. The ooze is foul-smelling, slimy, and colonized by yeast organisms when exposed to air. Several insects commonly feed on this slime.
- Very little is known about the bacteria and other microorganisms associated with wetwood and their transmission to healthy trees.
- Prevention of tree stress is the best management approach. Effective control measures do not exist.

Cytospora Canker

- Cytospora canker is caused by fungi. *Cytospora* affects many species of shrubs and trees in Colorado, including aspen, cottonwood, Lombardy and other poplars, apple, cherry, peach, plum, birch, willow, honeylocust, mountain ash, silver maple, spruce, and Siberian elm.
- The fungus attacks trees or parts of trees that are injured or in a weak or stressed condition. It can cause their death.
- The disease especially affects trees with root damage, which are often found in areas under construction, or trees that have been recently transplanted.
- To manage the disease, reduce stress on trees, use resistant plants, remove infected limbs, clean wounds and prune properly. Once infection occurs, the best treatment is to increase plant vigor and sanitation.

Dutch Elm Disease

- Dutch elm disease is an aggressive fungal disease of American elms. The fungus is spread from tree to tree via the European elm bark beetle.
- As the beetles tunnel in to lay eggs, the fungus enters the plants' vascular system, plugging it up. As a result, leaves wilt and the affected tree dies within months to a year later.
- An elm infected with Dutch elm disease must be removed and the wood disposed of. This helps slow the spread of the fungus to healthy trees. Where elms are growing next to each other, it is important to trench roots to prevent disease spread from one tree to another through root grafts.
- Valuable trees without symptoms can be injected with fungicides as a preventive action.
- There once may have been as many as 200,000 American elms in Denver. Today, there are just about 3,000 left.

Fire Blight

- Fire blight is a bacterial disease that affects certain species in the rose family. It is especially destructive to apples, crabapples and pears.
- The disease also can occur on serviceberry, cotoneaster, hawthorn, quince, pyracantha, blackberry and raspberry.
- Symptoms include dead branches, water-soaked blossoms, light brown to blackened leaves, discolored bark, black "shepherd's crook" twigs, and dried fruits.
- Disease incidence varies from year to year and severity is influenced by cultivar susceptibility, tree age, succulence of tissues and spring weather conditions. The disease is most serious when spring temperatures pre-bloom and bloom are warmer than average.
- Management includes choosing resistant varieties, proper cultural practices, pruning and preventive chemical sprays.

Juniper Hawthorn Rust

- Juniper-hawthorn rust is a fungal disease that requires a juniper and an alternate host to complete its lifecycle. Alternate hosts are apple, crabapple, hawthorn and mountain ash.
- On a juniper, one to two-inch ball-shaped galls develop on stems from spores blown in from the alternate host.
- In the springtime, gelatinous spore horns called teliohorns erupt from these galls. Spores from teliohorns are blown to an alternate host where they cause leaf spot.
- These spots are small, bright orange-yellow, and surrounded by a red halo. Spores are produced on the underside of each leaf spot in hair-like projections. Wind carries the disease back to junipers.
- Spores produced on juniper only infect alternate hosts; spores produced on an alternate host only infect juniper.
- Although the galls are innocuous to the juniper, repeated infection on the alternate host can cause early defoliation, and smaller fruit.
- Defoliated trees may suffer winter injury and often fail to grow fruit the following season.
- Cultural controls include removing juniper galls before they produce spores and separating junipers from potential alternate hosts.

- A few hundred yards separation is generally sufficient for practical garden purposes. The danger markedly decreases with distance, especially when separated by a windbreak.
- Certain fungicides applied to alternate hosts at seven-to-ten day intervals, beginning at bloom, are effective. Chemical control is not necessary on a juniper.

Marssonina Leaf Spot

- The fungus *Marssonina* causes the most common foliage disease on aspen, poplar and cottonwood in urban and forested areas of Colorado.
- Infection begins in the spring at bud break when spores are blown or splashed to the tender, newly-developing leaves. The disease does not kill trees, but stresses them and may weaken them over time.
- Brown spots with yellow halos begin to appear on leaves in mid to late July. Many of these spots eventually merge together, creating large brown blotches. Leaves may drop prematurely.
- To manage the disease, rake up fallen leaves in the fall and dispose or compost. If there is a history of infestation, a fungicide may be used in the spring beginning at bud break. Fungicides are of no value by the time symptoms appear.

Powdery Mildew

- Powdery mildews are characterized by spots or patches of white to grayish, talcum-powder-like growth on leaves. It's more likely to appear in mid-to-late summer when cool evenings follow warm, humid days.
- They affect virtually all kinds of plants: grasses, vegetables, ornamentals, weeds, shrubs, fruit trees, and broad-leaved shade and forest trees.
- In Colorado, powdery mildews are common on ash, lilac, grape, roses, turfgrass, vegetables, euonymus, cherry, apple, crabapple, pear and Virginia creeper.
- The best control is to provide adequate air circulation with proper thinning and spacing of plants, plant in full sun, and avoid overhead watering, especially late in the day. Remove and destroy infected leaves, and avoid fertilizers high in nitrogen that promote new growth.

Rose Diseases

- Few rose diseases are found under Colorado conditions. The state's dry climate and high altitude are not conducive to the development of most fungal diseases.
- If you like to work at growing things, you might prefer the challenge of hybrid tea roses, which are more susceptible to problems.
- Hardy roses, such as shrub and species roses are generally disease-free. If you're a no-mess type of gardener, the hardy roses are for you.
- You can control or prevent most rose diseases with simple maintenance practices. Choose disease resistant rose varieties and avoid planting wounded plants. Always plant roses in well-drained soil with lots of sun and good air circulation. Avoid overhead irrigation, and remove and destroy diseased leaves during the growing season.

Rose Mosaic

- Rose mosaic, caused by a virus, is found worldwide. Symptoms vary but usually show up as mosaic patterns or splotches of yellow and green on leaves. Flowers may be mottled in color, a condition called flower breaking.

- Leaf and flower symptoms may detract from the overall quality of the plant. Infected plants may be more sensitive to winter injury.
- Plant health, weather, varieties and other factors all can contribute to virus symptoms. No evidence exists that insects transmit this virus.
- The only way to control rose mosaic is to remove infected plants. Because of limited effect on flowering, most people leave the plant alone and ignore the virus.

Powdery Mildew

- Powdery mildew is one of the state's most common rose diseases because it occurs in dry as well as humid weather.
- The powdery mildew fungus produces a white, talcum-powder-like growth on the top and bottom of the leaves and stems.
- When the disease is severe, plants become stunted and leaves curl and drop.
- Generally, the most favorable conditions for powdery mildew are daytime temperatures near 80 degrees F with a relative humidity of 40 to 70 percent, and nighttime temperatures near 60 degrees.
- To manage powdery mildew, plant resistant varieties and follow guidelines previously discussed. Fungicides, sulfur dusts and neem oil also provide control.

Rust

- Rust first appears on the undersides of leaves and other plant parts as orange, powdery pustules. As these pustules develop, they become visible on the upper leaf surfaces as orange-brown spots.
- Rust can develop when temperatures are 65 to 70 degrees and moisture is continuous for two to three hours.
- Considerable variation exists in plant resistance. It is not uncommon for only one or two rose varieties in a planting to get rust while others remain rust free. It might be that a species of the fungus is present that can develop only on particular varieties.
- Management of rose rust includes using resistant varieties, removal of infected stems and leaves at first appearance and the use of preventive fungicides.

Thousand Cankers Disease (TCD)

- Thousand cankers disease (TCD) is a new and lethal disease of walnuts in Colorado. It is caused by a fungus that is carried from tree to tree by the very small walnut twig beetle (WTB). At present there are no known chemical or other treatments available.
- Once the fungus is introduced into the tree, it colonizes tissue surrounding beetle galleries and causes small dead areas in the bark (cankers). Trees are killed by the attacks of the WTB and subsequent cankers that girdle branches.
- The first symptom is leaf yellowing and flagging, particularly in the upper crown. Leaves eventually dry and remain on trees for an extended period.
- This disease is primarily an urban forestry issue in Colorado because there are no native stands of black walnuts. The stakes are higher in states to the east.

Thyronectria Canker

- Thyronectria cankers mainly affect locusts, and have bumpy, cushion-like fruiting bodies that are light yellow-brown to reddish-brown when fresh but blacken with age. Fruiting bodies usually are found in bark openings, such as lenticels.
- Disease symptoms include dieback of affected branches, reduced foliage, premature fall coloration and early leaf drop. Cankers can girdle the stem and kill the tree.
- Cankers (areas of dead tissue) are found at the base of trees, at branch crotches, around wounds or on branch stubs. Cankers can range from slightly flattened surfaces to distinctly sunken areas with large callus ridges at the canker margin. Areas of stems and branches with thin bark may have a red-yellow discoloration.
- No treatment is available. Prevent wounds and stress on trees, remove dead branches and promote tree vigor.

Verticillium Wilt

- Verticillium Wilt primarily affects Ash, Catalpa, Redbud, Sumac and Maple. It can occasionally be found on Elm, Linden and Fruit Trees.
- Foliar symptoms typically include wilting and yellowing of leaves, death of limbs (often on one side or a portion of the plant) or death of the tree.
- These symptoms may look like water stress. Wood under the bark may exhibit discolored streaks or bands.
- The disease is found throughout the Rocky Mountain region at a low incidence and is usually seen in trees under stress from poor growing conditions.
- No cure is available other than increasing the tree's vigor and pruning out infected branches.