grow green

earth-wise guide to

Diagnosis

of plant problems

changing sunlight

Correct diagnosis is essential in managing plant problems. Plants may be affected by how they are installed and maintained (cultural problems), insect pests, diseases, their environment, or a combination of the above.

An estimated 70% of all plant problems are caused by cultural practices or environmental problems rather than insects or diseases

Use pesticides as the last resort -- 97% of insects are either beneficial or harmless and can pollinate plants, destroy other insects and improve soil

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Prevent Plant Problems

- Use native and adapted plants
- Choose plants resistant to specific diseases and insects
- Keep plants healthy -- if they are weak and stressed, they are more likely to have other problems
- Monitor often for insect and disease damage to keep small problems from becoming large ones
- Tolerate some damage but if problem continues to worsen, seek out proper diagnosis
- When practical, physically remove insects or use a high pressure water spray to dislodge
- Clean up plant debris
- If feasible, physically remove infected leaves
- Keep plantings mulched to help prevent spread of diseases and to reduce weeds
- To avoid plant diseases, water early in the morning so foliage will dry quickly after sunrise
- Before using any pesticides make sure you have properly identified the problem

If you must use a pesticide…

- *Use the least toxic pesticide first*
- *Read and follow label directions*

How To Get Help

- Take a sample to your local nursery (seal the problem sample in a plastic bag)
- Contact the Master Gardener desk at the AgriLife Extension Office:
  - Call 854-9600
  - Drop off a sample at 1600-B Smith Road, Austin
  - Send a digital picture and detailed description of the problem to TravisMG@ag.tamu.edu
- Visit www.growgreen.org
- For severe tree problems, call a certified arborist

Submitting a Sample

- Early diagnosis will provide you with more options for solutions
- If insects are a problem, try to collect five or more insects
- Include some damaged leaves or roots
- Include photos showing the entire plant and some close-ups of the problem with a size reference (a hand or coin) in the image
- If you can't submit the sample immediately, keep refrigerated

For lawn problems see the Grow Green Lawn Problems fact sheet

Texas A&M AgriLife Extension
(512) 854-9600

City of Austin
Watershed Protection
(512) 974-2550

03/16

Name	Damage	Cause	Attacks	Preventions/Solutions
LEAVES: CURLING OR CUPPED				
Aphids	Usually on new foliage; excrete honeydew, often leading to sooty mold	Small, soft-bodied insects with cornicles or "tailpipes" coming off the tip of the abdomen	Crape Myrtle; many types of plants; usually host specific	• Use contact insecticides (less toxic ones include insecticidal soaps, horticultural oils, d-limonene, etc.) • Encourage natural controls such as ladybugs • Dislodge with high pressure sprays • Use natural or slow-release fertilizers to avoid excessive growth • See Grow Green Aphids fact sheet
Herbicide Damage	Distorted foliage; one time occurrence, problem will not spread to new foliage	Applicator error	Plants near area where herbicides recently used	• Don't use weed killer on windy days • Place cardboard barrier between plant and herbicide • Use wiper-type application instead of spraying
Oak Leaf Blister	Abnormal growth of leaf includes, bulges, depressions, cupping and twisting; favors cool, moist conditions that coincide with bud break	Fungal spores remain on the bud scales over winter and infect emerging leaves when conditions are favorable; severe infestations defoliate tree	Many species of oaks	• Tolerate problem -- it's unsightly but does not seriously affect overall health of tree • Avoid chemical controls; once infection has occurred, chemical treatments not effective
Thrips	Silvering of leaves from minute insects; tattered or deformed flowers	Small insects, winged or wingless, wings are feather-like	Roses, daylilies; vegetables and greenhouse crops	• Use row cover, oils, soaps, neem, d-limonene • Switch chemical treatments often to avoid resistance
LEAVES: HOLES, STRIPPED, AND/OR SKELETONIZED				
Caterpillars (many are beneficial)	Holes in leaves; sometimes skeletonized	Worm-like insect with six true legs toward the head; varying colors	Caterpillars can be generalists or plant-specific	• Monitor • Hand pick when feasible • Encourage beneficial insect predators • Use *Bt* on young insects, insect eggs or larva -- after that, it's best to use a contact insecticide • If using *Bt* or spinosad - both have to be CONSUMED by the insect for it to work; they are not contact insecticides • See Grow Green Caterpillars fact sheet
Grasshoppers (Katydids)	Holes with ragged edges; adults chew through entire leaf (Katydids, found more often in rural areas, feed at night–grasshoppers feed during the day)	Medium to large insects with well developed hind legs used for jumping; katydids often leaf-like in appearance	Not plant specific	• Use spinosad or contact insecticides • Use *Nosema locustae,* a bait that helps to gradually reduce populations; will not work next to an open area where grasshoppers can easily migrate into yard
Leafcutter Ants	Foliage stripped from plant; look for ant activity during day	Reddish-brown ants with a pair of spines on their head and three pairs of spines on their thorax; vary in size	Wide variety of plants	• Physically prevent from climbing trunk with spray adhesives around base • Use baits labeled for leafcutter ants • Use garlic spray as repellent only–might work for a short period of time, but would have to be reapplied


Aphids


Herbicide Damage


Thrips


Caterpillars

Name	Damage	Cause	Attacks	Preventions/Solutions
LEAVES: HOLES, STRIPPED, AND/OR SKELETONIZED (CONTINUED)				
Leafcutter Bees	Neat, circular or half-moon pattern cut from edges of leaf	Bee-like but darker with light bands on abdomen	Roses	• Avoid insecticides -- they are not effective • Use row cover during susceptible period • Reduce breeding sites - look for rotting wood • Use thumb tacks or sealing wax on end of rose cuts to prevent entry
Leafminers	"Trails" in the leaves caused when pest chews between the surfaces of leaves	Includes: • Fly larvae • Moth larvae • Beetle larvae	• Columbine • Tomatoes • Peppers • Many Species	• Tolerate problem -- it's unsightly but rarely kills plant • Remove infected plant debris and leaves to prevent further spread
Leafrollers	Type of caterpillar eats circular holes in a row – from leaf rollers eating through the leaf before it unfurls	Greenish and somewhat transparent caterpillars with dark orange heads	Cannas	Use *Bt*, spinosad or contact insecticides
Snails and Slugs	Slime trails present; top layer of leaf tissue scraped off or holes present	Members of mollusk family; have fleshy, soft, slimy, legless bodies that range in color from whitish-yellow to black	Not plant specific	• Reduce excessive moisture • Using flashlight, hand pick snails at night • Attract to shallow container filled with beer overnight and then dispose of them in early morning • Eliminate hiding places • Use copper barriers • Cover seedlings with row cover or wire mesh • Use iron phosphate baits as last resort • See Grow Green Snails fact sheet
Tent Caterpillars and Webworms	Webbing in tree canopy with foliage consumed; holes in leaves, also skeletonized leaves **Tent caterpillars:** in tree crotches **Webworms:** at end of branches	**Tent caterpillars:** 1.5" long, often with bright markings and a few long hairs coming out of the body **Webworms:** yellowish-green with long tufts of hair protruding from the body	**Tent caterpillars:** Broadleaf trees and shrubs **Webworms:** Pecans, Oaks, Redbud, Mulberry, Others	• Break open webs or tents to allow predators in • Monitor regularly • Dislodge with high pressure spray or hand pick when feasible • Encourage beneficial insect predators • Use *Bt* on insect eggs, larva or young -- after that, it's best to use a contact insecticide • Can also use spinosad - both this and Bt have to be CONSUMED by the insect for it to work, they are not contact insecticides
LEAVES: PATCHES				
Downy Mildew	Gray to purplish powdery patches on lower leaf surface; yellow spots may appear on upper leaf surface; fungal strands and spores may be present	Fungus	• Snapdragons • Roses • Other ornamentals	• Choose resistant varieties • Remove infected leaves • Keep leaves dry • Apply fungicides
Powdery Mildew	White powdery patches on upper leaf surface; leaves may also pucker; fungal strands and spores may be present; new growth particularly susceptible	Particularly active in spring and fall during cool, humid conditions; spreads rapidly and can produce spores within 72 hours; does not require moist leaves to spread	• Crape Myrtles • Roses • Phlox • Rock Roses	• Avoid excess fertilizer • Plant disease resistant varieties • Increase air circulation • Remove severely infested plants • Least toxic fungicides contain potassium carbonate neem oil or *Bacillus subtilis* • See Grow Green Powdery Mildew fact sheet
Sooty Mold	Black patches with sticky leaves	From honeydew excreted from aphids or related insects	Not plant specific	Use horticultural oils to control insect population and to help clean sooty mold off of leaves; See Grow Green Aphids fact sheet


Leafcutter Ants


Leafminers


Leafrollers


Snails & Slugs

Name	Damage	Cause	Attacks	Preventions/Solutions
LEAVES: SCORCHED EDGE				
Cold Injury	Scorched leaves, especially around new growth	Severe, sudden or lengthy cold temperature	Inappropriate plant for local climate or unusually harsh temperatures	• Select winter hardy plants • Don't fertilize too late in fall to avoid new tender growth • Avoid poorly drained soils • Water one time/month in winter if no rain
Dog Urine	Leaf edges scorched around entire margin	Dog urine	Not plant specific	• Tolerate problem • Create physical barrier for pets
Fertilizer -- Excessive	Leaf edges scorched around entire margin	Excessive use of salt-based, synthetic fertilizer	Not plant specific	• Evaluate and amend fertilizer practices • Choose organic, slow release fertilizers
Oleander Leaf Scorch	Begins with scorched leaf edges, progresses to leaf drop and eventually kills entire plant	Bacteria transmitted by leafhoppers that plug up vascular system	Oleanders	• Avoid chemical treatments -- no treatment known to be effective • Remove infected plants to prevent further spread
Root Damage – Vascular System Blockage	Scorched or wilted leaves	Roots or vascular system are damaged and leaves do not receive needed moisture; can be caused by fungi, bacteria or nematodes	Not plant specific	• Evaluate and amend cultural practices • Severe damage may require plant removal
Too Much Sunlight	Leaf edges scorched around entire leaf margin; burning on areas of leaf exposed to direct sun	Occurs when shade-providing tree is removed or planted in a bad area	Not plant specific	Transplant to a location with less sunlight
Inadequate Water	Dying around margins of leaves with dead leaf tissue between veins toward the midrib	Caused by natural drought conditions or not enough water	Not plant specific	• Tolerate in non-irrigated area • Evaluate and amend watering practices
LEAVES: SPOTS				
Air Pollution	Little spots or stipules	Ozone, sulfur dioxide	**Ozone:** • Petunia • Pines • Vegetables	• Tolerate damage • Plant less susceptible species
Bacterial Diseases	Random, angular-shaped black or brown spots; look water soaked; may have a yellowish halo; can spread rapidly	Bacteria	• Chrysanthemums • Geraniums • Impatiens • Many others	• Avoid wetting foliage during irrigation • Remove infected leaves and debris or entire plant if severe infestation • Disinfect tools
Fungal Leaf Spot	Circular to irregular lesion with a dry, brown or black raised center; randomly scattered damage	Fungus	Many species of landscape and garden plants	• Choose resistant varieties • Remove infected leaves • Keep leaves dry • Apply fungicides
Viruses	Mosaic pattern - alternate light and dark green areas in leaves; mottled appearance, distinct lines between colors; may have a purple border	Viral problems often spread from plant to plant by insects	Virus associated by plant species	• Remove and destroy infected plants as there are no treatments • Manage weed problems where disease-carrying insects can hide


Powdery Mildew


Oleander Leaf Scorch


Changing Sunlight

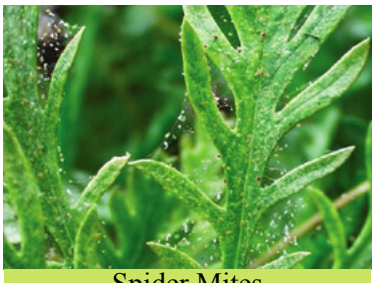

Fungal Leaf Spot

Name	Damage	Cause	Attacks	Preventions/Solutions
LEAVES: SPOTS (CONTINUED)				
Black Spot	Small, roundish black spots, often bordered by yellowing areas; severe infestations may cause premature leaf drop	Fungus that needs seven hours of moisture with an optimum temperature of 65˚F	Roses	• Choose resistant varieties • Remove infected leaves • Keep leaves dry • Apply fungicides • See Grow Green Fungal Leaf Spot fact sheet
Fire Blight	Growing tips look scorched and turn brown; leaves remain on shoots; attacks flowers and/or new shoots	Bacteria more likely to infect damaged plant tissue; prefers rainy or humid weather with daytime temperatures in the 75˚ - 85˚F range, with night temperatures above 55˚F	• Photinias • Pyracantha • Apples • Pears • Loquat • Other *(Prunus* sp.*)*	• Monitor susceptible plants during ideal conditions • Avoid excessive pruning and nitrogen applications to limit tender new growth • Prune out diseased plant parts at least 8-12 inches beyond visible damage • Disinfect tools between cuts • Replace pyracantha with non-invasive species
Galls	Plant is "stung" by pest, causing localized swelling; galls come in a variety of shapes, sizes and locations on the plant	Abnormal growth response to insects, mites, nematodes, bacteria or fungus	• Oaks • Pecans • Cypress • Cottonwood • Yaupon Holly • Others	• Tolerate problem -- rarely harmful to plants • Avoid insecticides -- they are ineffective • Hand-pick or prune and discard infested plant parts, if practical
Scale Insects	Small hard bumps or cottony-looking growths on leaves or stems, often mistaken for part of the plant; excrete honeydew, sometimes leading to sooty mold	Looks like a spot, but insect found under a secreted protective covering that can be hard or soft	Many types of plants-usually host specific	• Monitor plants regularly • Prune infested areas, double bag and dispose • Use contact insecticides (soaps, oils, neem) • See Grow Green Scales fact sheet
Spider Mites	Tiny white, stippled spots; tiny mites and webbing on underside of leaf	Very small arachnids (related to spiders), with eight legs; most common under hot, dry conditions	• Marigolds • Rosemary • Buddleia • Junipers • Roses	• Dislodge with high pressure spray • Encourage predatory mites, ladybugs and lacewings • Use contact insecticides (soaps and oils) • See Grow Green Spider Mite fact sheet
LEAVES: YELLOWING				
Iron Chlorosis	Veins in leaves stay green; rest of leaf turns yellow; usually on new growth	Environmental stress such as excessive water; high soil pH	Not plant specific	• Replace with adapted species • Promote healthy soil • Be aware that iron products provide only temporary benefits
Nitrogen Deficiency	General yellowing on older leaves	Lack of fertilizer/nutrients	Not plant specific	Fertilize with slow-release organic nitrogen source
Soil Moisture Extremes	General yellowing on older leaves	Too little or too much water	Not plant specific	• Check that plant is getting appropriate amount of sun and water • Dig down 4" deep and feel soil for moisture content; water if needed
Lack of Sunlight	Long, weak or lanky growth; failure to bloom	Lack of sun	Sun-loving plants in shade	Transplant to sunnier location


Black Spot


Scales


Galls


Spider Mites

Name	Damage	Cause	Attacks	Preventions/Solutions
LEAVES: WILTING				
Root Problems	Roots may be diseased, confined or damaged	Improper care, planting or construction damage	Not plant specific	• Inspect roots for signs of disease • Evaluate planting and cultural practices
Over-watering	All leaves on plant are wilted	Roots begin to rot	Not plant specific	Evaluate and amend watering practices
Insufficient Water or Drought (see causes)	All leaves on plant are wilted	Caused by natural drought conditions or not enough water	Not plant specific	Evaluate and amend watering practices
TREE PROBLEMS				
Borers	Wilting leaves and holes or tunnels on the trunk and branches	Insect damage disrupts flow of water in plant	Species specific	• Avoid chemicals -- there is no solution • Try to avoid problem by choosing right trees for the right location • Water properly and fertilize • Don't damage base of trunk with lawn equipment
Fungal Decay	Trunk is split or cracked -- with decay	After trunk is wounded, fungal decay occurs	Not plant specific	Call a certified arborist for proper diagnosis
Oak Wilt	Area around leaf vein turns brown; rest of leaf is still green, found on the tree or on the ground; veinal necrosis is the best diagnosis	Pruning at the wrong time of year, i.e., when Nitidulid beetle is active and able to transport spores to non-infected trees (also spread by root grafts)	• Live Oaks • Spanish Oak • Shumard Oak • Blackjack Oak	• Don't prune susceptible oaks from the beginning of February to mid June • Paint all pruning wounds immediately after pruning • Unique treatment required • Call certified arborist for fungicidal trunk injections and trenching
Trunk Damage	Trunk is split or cracked -- without decay	Mechanical injury, extreme temperature or plant may be inappropriate for Central Texas	Not plant specific	No treatment once damage has occurred
MISCELLANEOUS				
Canopy Thinning	Trees and shrubs have buds, but when they leaf out, leaves are small and the plant looks "thin"	Herbicide broadcast in weed and feed products can cause damage; compacted soil due to construction	Not plant specific	• Consult a certified arborist • Aerate soil • Avoid weed and feed products
Flowerless Plants – Maturity	No flowers	Some plants must be old enough to produce flowers; may not bloom as much as others; may need more sunlight	Some woody plants	• Have patience with young plants! • Move plants to sunnier location
Early Leaf Drop	Leaves found at base of plant	Natural drought conditions or not enough water	Not plant specific	Evaluate and amend watering practices
Leggy Plant	"Stretched"-looking plant	Changed light conditions or not enough light	Any sun-loving plants in shade	Move plants to sunnier location


Iron Chlorosis


Insufficient Water


Oak Wilt


Leggy Plant