



*Arkansas*  
**COMMON  
LANDSCAPE  
PROBLEMS**

**MP468**

**UofA** **DIVISION OF AGRICULTURE**  
**RESEARCH & EXTENSION**  
*University of Arkansas System*

# FOREWORD

Arkansans love their lawns and gardens and take great pride in ensuring the landscape surrounding their homes and businesses remains healthy and beautiful. As authors, editors and neighbors, our goal for this book was to provide a concise, easy-to-navigate guide to diagnosing and treating the most common disease, insects and weeds that can affect our green spaces in Arkansas.

We are here to help. With offices in every one of Arkansas' 75 counties, the people of the University of Arkansas System Division of Agriculture's Cooperative Extension Service are here to help you. We use the results of scientific research, much of it conducted at University of Arkansas System facilities to help you and your community thrive. That's our mission. That's our passion.

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On behalf of my colleagues,



Sherri Sanders  
White County Extension Agent - Agriculture

The information in this publication was current as of \_\_\_\_\_ and applies only to Arkansas. It may not be appropriate for other states or locations. The listing of any product in this publication does not imply endorsement of that product or discrimination against any other product by the University of Arkansas System Division Of Agriculture. Every effort was made to ensure accuracy, but the user of any crop protection product must read and follow the most current label for any product. For further assistance and information, contact the local Cooperative Extension Service office.

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# PLANT DISEASES



# Plant Diseases



Sherrie Smith

## Entomosporium leaf spot

**Cause:** *Entomosporium* sp. (fungus)

**Plants Attacked:** Red tip photinia, Indian hawthorn

**Damage:** Leaf spots, severe leaf drop

**Control:** Rake and destroy all leaves during the fall or winter to reduce disease on new leaves in the spring. Spray fungicides on plants with a history of problems, starting in the spring as leaves emerge. Difficult to control. Consider alternative plants in landscape. Homeowners may use products containing chloro-thalonil (Ferti-lome Broad Spectrum Lawn and Garden Fungicide®, Hi-Yield Vegetable, Flower, Fruit, and Ornamental Fungicide®, Ortho MAX Garden Disease Control®, Ortho Disease B Gon Garden Fungicide®, Garden Tech Daconil Fungicide® or Bonide Fung-onil Multi-Purpose Fungicide®); myclobutanil

and permethrin (Spectracide Immunox Plus®); tebuconazole (Bonide Rose Rx Systemic Drench® or Bayer Advanced Garden-Disease Control for Roses, Flowers, Shrubs®); tebuconazole and imidacloprid (Bayer Advanced Garden-All-in-One Fungicide/Insecticide/Fertilizer® or Ferti-lome 2-N-1 Systemic Fungicide®); thiophanate-methyl (Bonide Infuse Systemic for Turf and Ornamentals®); or triticonazole and acetamiprid (Ortho Rose and Flower Insect and Disease Control®). Complete fungicide options can be found at [www.uaex.edu/publications/mp-154.aspx](http://www.uaex.edu/publications/mp-154.aspx).

## Black spot

**Cause:** *Diplocarpon rosae* (fungus)

**Plants Attacked:** Rose

**Damage:** Leaf spots, severe leaf drop

**Control:** Rake and destroy all leaves during the fall or winter to reduce disease on the new leaves in the spring. Spray fungicides on plants with a history of problems, starting in the spring as leaves emerge. Minimize leaf wetness. Grow

resistant varieties. Homeowners may use products containing chlorothalonil

(Ferti-lome Broad Spectrum Lawn and Garden Fungicide®, Hi-Yield Vegetable, Flower, Fruit, and Ornamental Fungicide®, Ortho MAX Garden Disease Control®, Ortho Disease B Gon Garden Fungicide®, Garden Tech Daconil Fungicide® or Bonide Fung-onil Multi-Purpose Fungicide®); myclobutanil and permethrin (Spectracide Immunox Plus®); tebuconazole (Bonide Rose Rx Systemic Drench® or Bayer Advanced Garden-Disease Control for Roses, Flowers, Shrubs®); tebuconazole and imidacloprid (Bayer Advanced Garden-All-in-One Fungicide/Insecticide/Fertilizer® or Ferti-lome 2-N-1 Systemic Fungicide®); thiophanate-methyl (Bonide Infuse Systemic for Turf and Ornamentals®); or triticonazole and acetamiprid (Ortho Rose and Flower Insect and Disease Control®). Complete fungicide options can be found at [www.uaex.edu/publications/mp-154.aspx](http://www.uaex.edu/publications/mp-154.aspx).



Photos by Debra Schneider

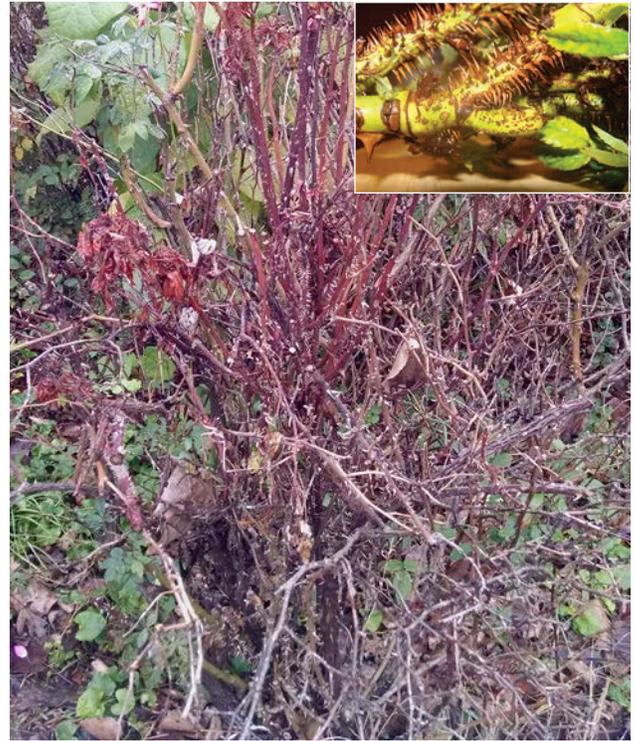
## Rose rosette virus (RRV)

**Cause:** *Emaravirus* (virus)

**Plants Attacked:** Rose

**Damage:** Elongated shoots, red or yellow leaf mottle, leaf distortion, excess prickles (thorns, inset), succulent thickened stems, witches' broom (rosette), flower distortion, discoloration or blight, branch dieback, reduced winter hardiness

**Control:** Viruses are not curable. Remove and destroy affected plants. For prevention, destroy any nearby multiflora roses. Prune ornamental roses by one-third in February to remove the vector, the wooly rose mite. Follow dormant pruning with a dormant oil to kill overwintering mites.



Photos by Sarah Whitaker



Sherrie Smith

## Powdery mildew

**Cause:** Various fungi

**Plants Attacked:** Various woody and perennial ornamentals

**Damage:** Leaf distortion, premature defoliation

**Control:** Rake and destroy fallen leaves in the fall. Spray fungicides on plants with a history of problems, starting in the spring as leaves emerge. Grow resistant varieties. Homeowners may use products containing chlorothalonil (Ferti-lome Broad Spectrum Lawn and Garden Fungicide®, Hi-Yield Vegetable, Flower, Fruit, and Ornamental Fungicide®, Ortho MAX Garden Disease Control®, Ortho Disease B Gon Garden Fungicide®, Garden

Tech Daconil Fungicide® or Bonide Fung-onil Multi-Purpose Fungicide®); myclobutanil and permethrin (Spectracide Immunox Plus®); tebuconazole (Bonide Rose Rx Systemic Drench® or Bayer Advanced Garden-Disease Control for Roses, Flowers, Shrubs®); tebuconazole and imidacloprid (Bayer Advanced Garden-All-in-One Fungicide/Insecticide/Fertilizer® or Ferti-lome 2-N-1 Systemic Fungicide®); thiophanate-methyl (Bonide Infuse Systemic for Turf and Ornamentals®); or triticonazole and acetamiprid (Ortho Rose and Flower Insect and Disease Control®). Complete fungicide options can be found at [www.uaex.edu/publications/mp-154.aspx](http://www.uaex.edu/publications/mp-154.aspx).

# Plant Diseases



Sherrie Smith

## Cercospora leaf spot

**Cause:** *Cercospora* sp. (fungus)

**Plants Attacked:** Hydrangea, crapemyrtle, various ornamentals

**Damage:** Leaf spots, premature defoliation

**Control:** Rake and destroy fallen leaves in the fall or winter. Avoid overhead irrigation. Spray fungicides on plants with a history of problems, starting in the spring as leaves emerge. Homeowners may use products containing chlorothalonil (Ferti-lome Broad Spectrum Lawn and Garden Fungicide®, Hi-Yield Vegetable, Flower, Fruit, and Ornamental Fungicide®, Ortho MAX® Garden Disease Control®, Ortho Disease B Gon Garden Fungicide®, Garden Tech Daconil Fungicide® or Bonide Fung-onil Multi-Purpose Fungicide®); myclobutanil and permethrin (Spectracide Immunox Plus®); tebuconazole

(Bonide Rose Rx Systemic Drench® or Bayer Advanced Garden-Disease Control for Roses, Flowers, Shrubs®); tebuconazole and imidacloprid (Bayer Advanced Garden-All-in-One Fungicide/Insecticide/Fertilizer® or Ferti-lome 2-N-1 Systemic Fungicide®); thiophanate-methyl (Bonide Infuse Systemic for Turf and Ornamentals®); or triticonazole and acetamiprid (Ortho Rose and Flower Insect and Disease Control®). Complete fungicide options can be found at [www.uaex.edu/publications/mp-154.aspx](http://www.uaex.edu/publications/mp-154.aspx).

## Phytophthora stem canker

**Cause:** *Phytophthora parasitica* (oomycete)

**Plants Attacked:** Annual vinca, petunia, snapdragon, salvia, verbena, pansy

**Damage:** Water-soaked lesions, stem dieback, wilting, death

**Control:** Pull out affected plants and remove from the planting. Space for good air circulation. Avoid overhead irrigation. Plant resistant varieties. French marigolds, zinnias, mums, dianthus, geraniums, coreopsis, portulaca and rudbeckia are resistant. No good fungicide options for homeowners.



Sherrie Smith

## Cypress canker

**Cause:** *Seiridium* sp., *Botryosphaeria* sp. (fungi)

**Plants Attacked:** Leyland Cypress, Italian Cypress, Arizona Cypress, Monterey Cypress

**Damage:** Lens-shaped cankers, branch dieback, death

**Control:** Prune out affected portions. Avoid drought stress. Fertilize per soil test. Consider alternative tree species. Holly, arborvitae, magnolia, tea olive and cryptomeria are some alternatives.



Photos by Sherrie Smith



Sherrie Smith

## Fire blight

**Cause:** *Erwinia amylovora* (bacterium)

**Plants Attacked:** Pear (ornamental and fruiting), apple, crabapple, pyracantha, cotoneaster, photinia, rose, blackberry, raspberry, spirea, among others

**Damage:** Leaf, bloom, twig and branch dieback

**Control:** Prune out affected portions. Sanitize pruners between cuts. Choose resistant cultivars. Apply bactericides at bloom. Ferti-lome Fire Blight Spray® (streptomycin sulfate) is labeled. See [www.uaex.edu/publications/mp-154.aspx](http://www.uaex.edu/publications/mp-154.aspx).

# Plant Diseases



Sherrie Smith

## Leaf gall/flower gall

**Cause:** *Exobasidium vaccinii* (fungus)

**Plants Attacked:** Azalea, camellia

**Damage:** Leaf distortion, fleshy galls

**Control:** Remove galls while still green, if possible, to avoid spore production. In cases of widespread galling, fungicides may be appropriate. Homeowners may use products containing chlorothalonil (Ferti-lome Broad Spectrum Lawn and Garden Fungicide®, Hi-Yield Vegetable, Flower, Fruit and Ornamental Fungicide®, Ortho MAX Garden Disease Control®, Ortho Disease B Gon Garden Fungicide®, Garden Tech Daconil Fungicide® or Bonide Fung-onil Multi-Purpose Fungicide®); myclobutanil and permethrin (Spectracide Immunox Plus®); tebuconazole

(Bonide Rose Rx Systemic Drench® or Bayer Advanced Garden-Disease Control for Roses, Flowers, Shrubs®); tebuconazole and imidacloprid (Bayer Advanced Garden-All-in-One Fungicide/Insecticide/Fertilizer® or Ferti-lome 2-N-1 Systemic Fungicide®); thiophanate-methyl (Bonide Infuse Systemic for Turf and Ornamentals®); or triticonazole and acetamiprid (Ortho Rose and Flower Insect and Disease Control®). Complete fungicide options can be found at [www.uaex.edu/publications/mp-154.aspx](http://www.uaex.edu/publications/mp-154.aspx).

## Anthracnose

**Cause:** *Colletotrichum* sp., *Apiognomonia* sp., *Gloeosporium* sp., *Discula* (fungus)

**Plants Attacked:** Various trees, woody ornamentals

**Damage:** Leaf spots, leaf distortion, twig blight, twig and branch cankers, premature defoliation

**Control:** Rake and destroy leaves in the fall. At bud swell in the spring, copper fungicides or chlorothalonil may be applied if the tree is small enough to spray. Homeowners may use products containing chlorothalonil (Ferti-lome Broad Spectrum Lawn and Garden Fungicide®, Hi-Yield Vegetable, Flower, Fruit, and Ornamental Fungicide®, Ortho MAX Garden Disease Control®, Ortho Disease B Gon Garden Fungicide®, Garden Tech Daconil Fungicide® or Bonide Fung-onil Multi-Purpose Fungicide®); copper, expressed as metallic copper (Hi-Yield Bordeaux Mix Fungicide®); copper octanoate (Ortho Ecosense Garden Disease Control® or Concern Copper Soap Fungicide RTU®\*); copper salts-fatty acids (Concern Copper Soap Fungicide RTU®); or copper sulfate pentahydrate (Phyton 27®). See [www.uaex.edu/publications/mp-154.aspx](http://www.uaex.edu/publications/mp-154.aspx).



Photos by Sherrie Smith

\*RTU is a ready-to-use formulation.

## Ivy bacterial blight

**Cause:** *Xanthomonas campestris* pv. *hederae* (bacterium)

**Plants Attacked:** English ivy

**Damage:** Leaf spots, petiole and stem cankers, death

**Control:** Good sanitation is critical. Remove diseased leaves and stems. Avoid overhead irrigation, and water in the morning so foliage can dry. Copper fungicides may help prevent the spread of the disease when coupled with good cultural practices. Homeowners may use Hi-Yield Bordeaux Mix Fungicide® (copper, expressed as metallic copper); Ortho Ecosense Garden Disease Control® (copper octanoate); Concern Copper Soap Fungicide RTU®\* (copper octanoate); Concern Copper Soap Fungicide RTU® (copper salts-fatty acids); or Phyton 27® (copper sulfate pentahydrate). See [www.uaex.edu/publications/mp-154.aspx](http://www.uaex.edu/publications/mp-154.aspx).



Penn State Dept. of Plant Pathology and Environ. Microbiology Archives



Photos by Sherrie Smith

## Cedar apple rust

**Cause:** *Gymnosporangium juniperi-virginianae* (fungus)

**Plants Attacked:** Apple, crabapple, juniper

**Damage:** On apples and crabapples, leaf spots (inset), fruit spots and lesions on stems. On junipers, large galls form that become gelatinous and bright orange during wet weather.

**Control:** Prune out the galls on junipers. Remove nearby wild juniper species to protect ornamental malus species. Fungicide applications applied during the orange gall stage, until the galls become dry and brown, help protect apples and crabapples from infection. Homeowners may use Captan on fruit trees. On ornamentals, you may use Spectracide Immunox Plus® (myclobutanil and permethrin). See [www.uaex.edu/publications/mp-154.aspx](http://www.uaex.edu/publications/mp-154.aspx).

\*RTU is a ready-to-use formulation.

# Plant Diseases



Mitch Spanell

## Azalea/rhododendron cercospora leaf spot

**Cause:** *Cercospora handelii* (fungus)

**Plants Attacked:** Azalea, rhododendron

**Damage:** Angular leaf spots that may coalesce to blight large portions of the leaf, chlorosis and premature defoliation in severe outbreaks

**Control:** Practice good sanitation. Rake/destroy all fallen leaves. Apply fungicides on plants with a history of the disease, beginning in the spring as leaves emerge. Homeowners may use products containing chlorothalonil (Ferti-lome Broad Spectrum Lawn and Garden Fungicide®, Hi-Yield Vegetable, Flower, Fruit and Ornamental Fungicide®, Ortho MAX Garden Disease Control®, Ortho Disease B Gon Garden Fungicide®, Garden Tech Daconil

Fungicide® or Bonide Fung-onil Multi-Purpose Fungicide®); myclobutanil and permethrin (Spectracide Immunox Plus®); tebuconazole (Bonide Rose Rx Systemic Drench® or Bayer Advanced Garden-Disease Control for Roses, Flowers, Shrubs®); tebuconazole and imidacloprid (Bayer Advanced Garden-All-in-One Fungicide/Insecticide/ Fertilizer® or Ferti-lome 2-N-1 Systemic Fungicide®); thiophanate-methyl (Bonide Infuse Systemic for Turf and Ornamentals®); or triticonazole and acetamiprid (Ortho Rose and Flower Insect and Disease Control®). Complete fungicide options can be found at [www.uaex.edu/publications/mp-154.aspx](http://www.uaex.edu/publications/mp-154.aspx).

## Juniper needle/twig blight

**Cause:** *Kabatania juniperi*, *Phomopsis juniperovora* (fungus)

**Plants Attacked:** Juniper

**Damage:** Needle blight, twig blight, branch dieback

**Control:** Practice good sanitation. Prune out affected twigs and destroy. For *Kabatania*, apply mancozeb or thiophanate-methyl in the fall. For *Phomopsis*, apply Bonide Infuse Systemic for Turf and Ornamentals® (thiophanate-methyl) or Ferti-lome Liquid Systemic Fungicide II® (propiconazole) in the spring. See [www.uaex.edu/publications/mp-154.aspx](http://www.uaex.edu/publications/mp-154.aspx).



Sherrie Smith

## Leaf blister/leaf curl

**Cause:** *Taphrinia* sp. (fungus)

**Plants Attacked:** Oak, peach, plum

**Damage:** Blisters, leaf galls, leaf curl

**Control:** Rake or destroy leaves during the fall or winter. Mostly cosmetic on oak, but damaging on plum and peach. Apply fungicides after leaf fall in the fall but before bud swell in the spring. Copper fungicides and fungicides containing chlorothalonil are effective. Homeowners may use products containing chlorothalonil (Ferti-lome Broad Spectrum Lawn and Garden Fungicide®, Hi-Yield Vegetable, Flower, Fruit, and Ornamental Fungicide®, Ortho MAX Garden Disease Control®, Ortho Disease B Gon Garden Fungicide®, Garden Tech Daconil Fungicide® or Bonide Fung-onil Multi-Purpose Fungicide®); copper, expressed as metallic copper (Hi-Yield Bordeaux Mix Fungicide®); copper octanoate (Ortho Ecosense Garden Disease Control® or Concern Copper Soap Fungicide RTU®\*); copper salts-fatty acids (Concern Copper Soap Fungicide RTU®); or copper sulfate pentahydrate (Phyton 27®). Complete fungicide options can be found at [www.uaex.edu/publications/mp-154.aspx](http://www.uaex.edu/publications/mp-154.aspx).



Photos by K. Branch (top) and Carla Vaught (bottom)



Randy Forst

## Hypoxylon canker

**Cause:** *Hypoxylon* sp. (fungus)

**Plants Attacked:** Oak, maple, other hardwood trees

**Damage:** Bark shed, wilt, branch dieback, tree death

**Control:** Hypoxylon is not curable. This is a disease of stressed trees. To help prevent Hypoxylon canker, water during drought and fertilize per soil test to promote tree health.

\*RTU is a ready-to-use formulation.

# Plant Diseases



Jennifer Caraway

## Sooty mold (nonparasitic)

**Cause:** *Capnodium* sp. and others (fungi)

**Plants Attacked:** Many species of trees, shrubs, ornamentals

**Damage:** Cosmetic, but heavy colonies may inhibit photosynthesis

**Control:** Sooty mold results when sap-feeding insects excrete excess sugars onto the stems, leaves and branches of a plant they are feeding on. The sooty mold colonizes and feeds on this sugary substance. Control insect pests. Insecticide options can be found at [www.uaex.edu/publications/mp-144.aspx](http://www.uaex.edu/publications/mp-144.aspx).

## Iris leaf spot

**Cause:** *Mycosphaerella macrospora* (fungus)

**Plants Attacked:** Iris

**Damage:** Leaf lesions, premature death of the leaves

**Control:** Clean up all dead and damaged leaves. Improve air circulation if possible, and avoid overhead irrigation. Plant iris in full sun and space at least 8 inches apart. Apply fungicides in the spring where disease has previously been a problem. Homeowners may use products containing chlorothalonil (Ferti-lome Broad Spectrum Lawn and Garden Fungicide®, Hi-Yield Vegetable, Flower, Fruit, and Ornamental Fungicide®, Ortho MAX Garden Disease Control®, Ortho Disease B Gon Garden Fungicide®, Garden Tech Daconil Fungicide® or Bonide Fung-onil Multi-Purpose Fungicide®); myclobutanil and permethrin (Spectracide Immunox Plus®); tebuconazole (Bonide Rose Rx Systemic Drench® or Bayer Advanced Garden-Disease Control for Roses, Flowers, Shrubs®); tebuconazole and imidacloprid (Bayer Advanced Garden-All-in-One Fungicide/Insecticide/Fertilizer® or Ferti-lome 2-N-1 Systemic Fungicide®); thiophanate-methyl (Bonide Infuse Systemic for Turf and Ornamentals®); or triticonazole and acetamiprid (Ortho Rose and Flower Insect and Disease Control®). Complete fungicide options can be found at [www.uaex.edu/publications/mp-154.aspx](http://www.uaex.edu/publications/mp-154.aspx).



Photos by Michael Sullivan

## Bacterial leaf scorch

**Cause:** *Xylella fastidiosa* (bacterium)

**Plants Attacked:** Many species of trees, shrubs, ornamentals, fruit crops

**Damage:** Leaf scorch, twig and branch death, plant death

**Control:** Bacterial leaf scorch is not curable. Some trees live with it for a long time, while others die in a few years.



Sherrie Smith



Jerri Lephiew

## Hollyhock rust

**Cause:** *Puccinia malvacearum* (fungus)

**Plants Attacked:** Hollyhock, *Malva* spp.

**Damage:** Yellow leaf and stem spots; orange, spore-filled blisters; leaf death

**Control:** Remove old plant material and dispose by burying, burning or composting. Use protective fungicides before rust spots begin as a preventative. Homeowners may use products containing chlorothalonil (Ferti-lome Broad Spectrum Lawn and Garden Fungicide®, Hi-Yield Vegetable, Flower, Fruit, and Ornamental Fungicide®, Ortho MAX Garden Disease Control®, Ortho Disease B Gon Garden Fungicide®, Garden Tech Daconil Fungicide® or Bonide Fung-onil Multi-Purpose Fungicide®); myclobutanil and permethrin (Spectracide Immunox Plus®); tebuconazole

(Bonide Rose Rx Systemic Drench® or Bayer Advanced Garden-Disease Control for Roses, Flowers, Shrubs®); tebuconazole and imidacloprid (Bayer Advanced Garden-All-in-One Fungicide/Insecticide/Fertilizer® or Ferti-lome 2-N-1 Systemic Fungicide®); thiophanate-methyl (Bonide Infuse Systemic for Turf and Ornamentals®); or triticonazole and acetamiprid (Ortho Rose and Flower Insect and Disease Control®). Complete fungicide options can be found at [www.uaex.edu/publications/mp-154.aspx](http://www.uaex.edu/publications/mp-154.aspx).

# Plant Diseases



Dustin Blakey and Sherrie Smith (inset photo)

## Crown gall

**Cause:** *Agrobacterium tumefaciens* (bacterium)

**Plants Attacked:** Rose, willow, poplar, Euonymus, and fruit trees like apple (*Malus* spp.), cherry, plum, or apricot (*Prunus* spp.) and many others

**Damage:** Woody, knobby galls on stems at soil line and on roots, may sometimes be found on aerial portions of the plant. Chlorosis, stunting and death may occur on plants with numerous galls.

**Control:** Plant disease-free nursery stock. Avoid injury to roots and crown at planting, as wounding allows entry for the bacterium. Clean pruning and other tools between cuts with 10% liquid household bleach (one cup bleach to nine cups

water) or 70% alcohol. Remove and get rid of (burn or place in trash) all severely infected plants. Avoid propagating from infected plants. Do not replant the same type of plant or other susceptible plant species in the infested spot for at least five years.

## Black knot

**Cause:** *Apiosporina morbosa* (sym. *Dibotryon morbosum*) (fungus)

**Plants Attacked:** Ornamental and fruiting cherry, plum, rarely peach

**Damage:** Small, light brown swellings usually located at the base of the leaf petiole or on the fruit spur become hard, brittle and black in color with age. The knots often protrude more on one side of the affected branch. Branch dieback.

**Control:** Prune out any knots. Apply fungicides beginning at green tip in the spring and continuing at two-week intervals until terminal growth stops. Homeowners may use products containing chlorothalonil (Ferti-lome Broad Spectrum Lawn and Garden Fungicide®, Hi-Yield Vegetable, Flower, Fruit and Ornamental Fungicide®, Ortho MAX Garden Disease Control®, Ortho Disease B Gon Garden Fungicide®, Garden Tech Daconil Fungicide® or Bonide Fung-onil Multi-Purpose Fungicide®) or thiophanate-methyl (Bonide Infuse Systemic for Turf and Ornamentals®). See [www.uaex.edu/publications/mp-154.aspx](http://www.uaex.edu/publications/mp-154.aspx).



Photos by Sherry Beaty

## Spring dead spot

**Cause:** *Ophiosphaerella*, *Leptosphaeria* spp. (fungus)

**Plants Attacked:** Bermuda (primarily)

**Damage** Round, sunken gray patches of dead grass. Patches may run together to blight large areas of turf.

**Control:** Bermuda needs balanced soil fertility to minimize disease and winter injury. Soil test regularly to monitor P (phosphorus) and K (potassium). Apply fertilizer as needed according to soil test. Higher soil pH (7.0 and above) may greatly enhance damage by spring dead spot. Apply fungicides about 30 days prior to dormancy in the fall. Homeowners may use Ferti-lome F-Stop Liquid<sup>®</sup> (myclobutanol), Bonide Infuse Systemic Disease Control Lawn and Landscape<sup>®</sup> (thiophanate-methyl) or Scotts Lawn Disease Control Ready-Spray RTU<sup>®\*</sup> (triticonazole). See individual labels for full directions. See [www.uaex.edu/publications/mp-154.aspx](http://www.uaex.edu/publications/mp-154.aspx).



Photos by John Glover (left) and Jeff Welch (right)



Photos by John Glover (left) and Michelle Moberly (right)

## Large patch/zoysia patch

**Cause:** *Rhizoctonia solani* (fungus)

**Plants Attacked:** Bermuda, zoysia, centipede, St. Augustine

**Damage:** The turf in affected areas becomes thin and grass leaves may appear bleached or yellow. Large circular, semicircular or arc-shaped areas of damaged turf develop. When the disease is active, the interface between healthy and diseased turf may appear orange or bronze in color, especially on zoysia.

**Control:** Avoid high nitrogen fertilizers early in the season. Avoid night watering and too frequent watering. Dethatch during the growing season if thatch is greater than 1/2 inch. Apply fungicides in the spring and again in the fall. Homeowners may use Spectracide Immunox Fungus Plus Insect Control for Lawns<sup>®</sup> (propiconazole + lambda-

cyhalothrin), Scotts Lawn Fungus Control<sup>®</sup> (thiophanate-methyl) or Bonide Infuse Systemic Disease Control Lawn and Landscape<sup>®</sup> (thiophanate-methyl). See [www.uaex.edu/publications/mp-154.aspx](http://www.uaex.edu/publications/mp-154.aspx).

\*RTU is a ready-to-use formulation.

# Plant Diseases



Mark Brown

## Take-all patch

**Cause:** *Gaeumannomyces graminis* (fungus)

**Plants Attacked:** Bermuda, zoysia, centipede, bent, blue, St. Augustine, fescue

**Damage:** Small sunken, water-soaked patches appear in turf. The affected grass may initially appear red-brown before dying and turning a dull brown color. The roots and crown of infected plants become dark brown to black.

**Control:** Avoid high nitrogen fertilizers early in the season. Use a balanced fertilizer. Avoid night watering and too frequent watering. Dethatch during the growing season if thatch is greater than 1/2 inch. Keep pH below 5.5 to help minimize disease. Apply fungicides twice in the spring 30 days apart and twice again in the fall 30 days apart. Homeowners may use Spectracide Immunox Fungus Plus Insect Control for Lawns® (propiconazole + lambda-cyhalothrin); Bayer Advanced Fungus Control of Lawns® (propiconazole); Ferti-lome Liquid Systemic Fungicide II® (propiconazole) or Ferti-lome Liquid

Systemic Fungicide II RTU®\* (propiconazole); Scotts Lawn Fungus Control® (thiophanate-methyl); Bonide Infuse Systemic Disease Control Lawn and Landscape® (thiophanate-methyl); or Scotts Lawn Disease Control Ready-Spray RTU® (triticonazole). See [www.uaex.edu/publications/mp-154.aspx](http://www.uaex.edu/publications/mp-154.aspx).

## Dollar spot

**Cause:** *Sclerotinia homeocarpa* (fungus)

**Plants Attacked:** Zoysia, bermuda, centipede

**Damage:** Small (3 to 5 inches), circular dead spots of grass

**Control:** Proper fertilization, irrigation and cutting height are preventatives. Avoid excessive thatch. Ferti-lome F-Stop Liquid® (myclobutanil); H&I Agritech GreenCure® (potassium bicarbonate); Ferti-lome Liquid Systemic Fungicide II® (propiconazole); Spectracide Immunox Fungus Plus Insect Control for Lawns® (propiconazole + lambda-cyhalothrin); Bayer Advanced Fungus Control of Lawns® (propiconazole); Scotts Lawn Fungus Control® (thiophanate-methyl); Bonide Infuse Systemic Disease Control Lawns and Landscape® (thiophanate-methyl); or Scotts Lawn Disease Control Ready-Spray RTU® (triticonazole) may be used. For chemical controls, see [www.uaex.edu/publications/mp-154.aspx](http://www.uaex.edu/publications/mp-154.aspx).



Photos by Brannon Thiesse

\*RTU is a ready-to-use formulation.

# INSECT PESTS



# Insect Pests



Photos by Donn Johnson

## Aphids

There are many aphid species.

**Description:** Small, soft-bodied sucking insects

**Plants Attacked:** Houseplants, fruits, vegetables, annuals, perennials, shrubs and trees

**Damage:** Aphids feed on plant juices and produce honeydew, which supports growth of sooty mold. Feeding causes deformed leaf and stem growth (pictured: aphids on blackberry terminal).

**Control:** Recommended insecticides include acephate (Orthene Turf, Tree and Ornamental WSP®), acetamiprid (Ortho Flower, Fruit and Vegetable Insect Killer®), azadirachtin (Certis Neemix 4.5®), bifenthrin (Hi-Yield Bug Blaster Bifenthrin 2.4®, Ortho Home Defense MAX®, Ortho Bug-B-Gone MAX Insect Killer®, etc.), cyfluthrin (Bayer Advanced Power Force®), dinotefuran (Green Light Tree and Shrub Insect Control with Safari 2G®), horticultural oil, imidacloprid (Bayer Advanced Fruit, Citrus and Vegetable Insect Control®, Bonide Annual Tree and Shrub Insect Control with SYSTEMAXX®, Ferti-lome Azalea/Evergreen Food Plus with Systemic®, etc.), insecticidal soap, malathion (Malathion®), pyrethrins (Ferti-lome Triple Action Plus®, Bayer Advanced Natria®, McLaughlin PyGanic EC or Dust®, etc.) and resmethrin (Prentiss Resmethrin®, Ferti-lome Whitefly and Mealybug Killer®). Additional information may be found at [www.uaex.edu/publications/mp-144.aspx](http://www.uaex.edu/publications/mp-144.aspx).

## Armyworms

**Description:** The armyworm (*Pseudaletia unipuncta*) varies in length from 1/16 inch to 2 inches as mature larva. It has stripes running the length of its body – one stripe present on each side and a stripe down the middle of the back. The armyworm is hairless, having a base color ranging from yellow-green to a dark brown to gray. The fall armyworm (*Spodoptera frugiperda*) larva also has stripes but differs in having a yellow-white inverted Y-marking on the head and four dark circular spots on the upper side of each abdominal segment. It reaches a length of 2 inches when mature.

**Plants Attacked:** Armyworm hosts include grasses such as small grains, pasture grasses, turfgrasses and corn. Fall armyworm hosts include grasses (including lawn grasses), corn, cotton, alfalfa, clover, peanuts, tobacco and many garden plants. They also inhabit the thatch layer in turf.

**Damage:** Armyworm and fall armyworm larvae cause defoliation damage that results in turfgrass thinning. These caterpillars are known to move en masse to new food sources causing defoliation damage along the way. Both species prefer to feed at night.

**Control:** Recommended insecticides for control include azadirachtin (Bonide Grub Beater Insect Control®, Certis Neemix 4.5®), *B.t.*, bifenthrin (Hi-Yield Bug Blaster Bifenthrin 2.4®, Garden Tech Over 'n Out Granules®, etc.), carbaryl (Ferti-lome Liquid Sevin®, Ortho Bug-Geta Plus Snail®, Sevin®), chlorantraniliprole (Scotts GrubEx1®), cyfluthrin (Bayer Advanced Power Force®, etc.), gamma-cyhalothrin (Triazide Insect Killer Once and Done®), halofenozide (Hi-Yield Kill-A-Grub®), indoxacarb, lambda-cyhalothrin (Spectracide Ant Shield Home Barrier®, Bonide Caterpillar Killer®, etc.), permethrin (Ortho Bug-B-Gone®, Hi-Yield Kill-A-Bug II®, etc.), spinosad (Ferti-lome Borer, Bagworm, Tent Caterpillar and Leafminer Spray®, Dow Blackhawk Naturalyte Insect Control®, Bonide Captain Jack's Deadbug Brew Concentrate®), thiamethoxam (Gulfstream Maxide Professional Grade Dual Action Grub Killer®), trichlorfon (Bayer 24 Hour Grub Killer Plus Granules®) and various entomogenous nematode products. Additional information may be found at [www.uaex.edu/publications/mp-144.aspx](http://www.uaex.edu/publications/mp-144.aspx).



University of Georgia



Oklahoma State University

## Bagworm

**Description:** This caterpillar forms a distinctive bag out of silk and bits of plant material.

**Plants Attacked:** Favored host plants include arborvitae, cedar, cypress, juniper, pines and other conifers.

**Damage:** Bagworms feed on plant foliage and are typically only an aesthetic problem.

**Control:** Recommended insecticides include acephate (Orthene Turf, Tree and Ornamental WSP<sup>®</sup>, Bonide Systemic Insect Control<sup>®</sup>), acetamiprid (Ortho Rose Pride Insect Killer<sup>®</sup>, etc.), azadirachtin (Bonide Grub Beater Insect Control<sup>®</sup>, Certis Neemix 4.5<sup>®</sup>), *B.t.* (Garden Safe BT<sup>®</sup>, Safer Caterpillar Killer<sup>®</sup>, Dipel Dust<sup>®</sup>, etc.), bifenthrin (High Yield Bug Blaster Bifenthrin 2.4<sup>®</sup>, Ortho Bug-B-Gone MAX Insect Killer<sup>®</sup>, Ortho Home Defense MAX<sup>®</sup>, etc.), carbaryl (Ortho Bug-Geta<sup>®</sup>, Ferti-lome Liquid Sevin<sup>®</sup>, Garden Tech Sevin<sup>®</sup>, etc.), dinotefuran (Green Light Tree and Shrub with Safari 2G<sup>®</sup>), chlorantraniliprole, cyfluthrin (Bayer Advanced Power Force<sup>®</sup>), malathion (Malathion<sup>®</sup>), permethrin (Hi-Yield Kill-A-Bug II<sup>®</sup>, Ortho Bug-B-Gone<sup>®</sup>, Bonide Eight Insect Control Flower and Vegetable Granules<sup>®</sup>) and spinosad (Dow Naturalyte Insect Control<sup>®</sup>, Green Light Lawn and Garden Spray with Spinosad<sup>®</sup>, Bonide Borer, Bagworm, Tent Caterpillar and Leafminer Spray<sup>®</sup>, etc.). Additional information may be found at [www.uaex.edu/publications/mp-144.aspx](http://www.uaex.edu/publications/mp-144.aspx).



Donn Johnson



University of Georgia



Mississippi State University

## Pine bark beetles

Multiple species: six-spined engraver (*Ips calligraphus*), southern pine engraver (*Ips grandicollis*), small southern pine engraver (*Ips avulsus*), southern pine beetle, SPB (*Dendroctonus frontalis*), black turpentine beetle, BTB, *Dendroctonus terebrans*

**Description:** Bark beetles are small, reddish-brown to black, cylindrical beetles. Their head is concealed when viewed from above.

**Plants Attacked:** Pine species and occasionally other conifers, such as spruce, hemlock and fir, are attacked.

**Damage:** Foliage on affected trees fades from green to yellow to reddish brown. Small, whitish or reddish-brown, popcorn-like globs of resin and boring dust (pitch tubes) appear on the bark at entrance sites. Exit

holes have a shothole appearance. After emergence, characteristic galleries can be seen under the bark (*Ips* spp./Y-, I- or H-shaped galleries; SPB/S-shaped galleries and BTB/D- or fan shaped-galleries).

**Control:** Maintain proper fertilization and watering to prevent stress. *There are no effective preventive chemical control measures.* Trunk sprays with bifenthrin (Ortho Bug-B-Gone MAX Insect Killer<sup>®</sup>, Hi-Yield Bug Blaster Bifenthrin 2.4<sup>®</sup>, etc.) or permethrin (Hi-Yield 38 Plus Turf, Termite and Ornamental Insect Control<sup>®</sup>, Bonide Eight Insect Control Flower and Vegetable Granules<sup>®</sup>, etc.) on nearby healthy trees may prevent infestation spread. Some materials are available to commercial applicators only. Additional information may be found at [www.uaex.edu/publications/mp-144.aspx](http://www.uaex.edu/publications/mp-144.aspx).

# Insect Pests



Donn Johnson



Michigan State University

## Fall webworm

**Description:** Larvae are usually pale yellowish-greenish with a broad, dusky stripe down the back and a yellowish stripe down each side. Larvae are covered with long, silky, gray hairs, and head color varies from red to black. Full-grown larvae are about 1 inch long. Webs occur in the ends of branches.

**Plants Attacked:** Fall webworms feed on more than 100 species of forest and shade trees. Pecan, walnut, American elm, hickory, fruit trees and some maples are preferred hosts; persimmon and sweetgum are also attacked.

**Damage:** Fall webworms enclose leaves and small branches in light gray silken webs. In shade trees and ornamentals, fall webworms cause heavy defoliation, the presence of the large, unsightly webs and branch dieback.

**Control:** Small nests can be pruned out of small to medium trees.

Recommended insecticides include acephate (Orthene Turf, Tree and Ornamental WSP<sup>®</sup>, Bonide Systemic Insect Control<sup>®</sup>), acetamiprid (Ortho Rose Pride Insect Killer<sup>®</sup>, Ortho Flower, Fruit and Vegetable Insect Killer<sup>®</sup>, etc.), azadirachtin (Bonide Grub Beater Insect Control<sup>®</sup>, Certis Neemix 4.5<sup>®</sup>), *B.t.* (Garden Safe BT<sup>®</sup>, Safer Caterpillar Killer<sup>®</sup>, Dipel Dust<sup>®</sup>, etc.), bifenthrin

(Hi-Yield Bug Blaster Bifenthrin 2.4<sup>®</sup>, Bug-B-Gone<sup>®</sup>, Ortho Home Defense MAX<sup>®</sup>, etc.), carbaryl (Ortho Bug-Geta<sup>®</sup>, Ferti-lome Liquid Sevin<sup>®</sup>, Garden Tech Sevin<sup>®</sup>, etc.), dinotefuran (Green Light Tree and Shrub with Safari 2G<sup>®</sup>), cyfluthrin (Bayer Advanced Power Force<sup>®</sup>), insecticidal soap, permethrin (Hi-Yield Kill-A-Bug II<sup>®</sup>, Ortho Bug-B-Gone<sup>®</sup>, Bonide Eight Insect Control Flower and Vegetable Granules<sup>®</sup>) and spinosad (Dow Naturalyte Insect Control<sup>®</sup>, Green Light Lawn and Garden Spray with Spinosad<sup>®</sup>, Bonide Borer, Bagworm, Tent Caterpillar and Leafminer Spray<sup>®</sup>, etc.). Additional information may be found at [www.uaex.edu/publications/mp-144.aspx](http://www.uaex.edu/publications/mp-144.aspx).

## Fire ant, red imported fire ant

**Description:** Red imported fire ant workers are reddish-brown, aggressive ants that range from 1/8 to 1/4 inch long. They build conspicuous nests that often appear as dome-shaped mounds of soil. However, in sandy soils, mounds are flatter and less visible. When nests are disturbed, numerous fire ants will aggressively emerge and attack any intruder.

**Plants Attacked:** Fire ants are opportunistic feeders and will feed on fruit, shoots and seedlings of numerous plants and can also interfere with the root system. Fire ants will also tend scale insects, mealybugs and aphids and use the honeydew produced as a food source. Fire ants can also interfere with the activity of natural pollinators and beneficial predatory insects.

**Damage:** Fire ants inflict a painful, burning sting that results in a pustule and intense itching that may persist for days. If pustules are broken, infection may occur. Allergic reactions to fire ant stings may range from rashes and swelling to paralysis or anaphylactic shock. Severe allergic reactions, though rare, may be fatal.

**Control:** Control methods include broadcast bait applications, individual mound treatments, a combination of the previous two methods and barrier and spot treatments. Recommended insecticides for control include acephate (Ortho Fire Ant Killer<sup>®</sup>), carbaryl (Sevin Lawn Insect Granules<sup>®</sup>, Lilly Miller Grasshopper, Earwig, Cutworm and Sowbug Bait<sup>®</sup>, etc.), fipronil (Combat Quick Kill Formula<sup>®</sup>), hydramethylnon bait (Amdro Fire Ant Bait<sup>®</sup>), indoxacarb bait (Hot Shot MaxAttack Bait<sup>®</sup>, Over 'n Out Fire Ant Killer Mound Treatment<sup>®</sup>, Real Kill Ant Bait Station<sup>®</sup>, Spectracide Ant Shield Bait Station<sup>®</sup>) bifenthrin (Ortho MAX Fire Ant Granules<sup>®</sup>, Stinger Fire Ant Killer<sup>®</sup>, etc.), cyfluthrin, deltamethrin (Hi-Yield Kill-A-Bug II<sup>®</sup>, Turf Ranger Insect Control Granules<sup>®</sup>), lambda-cyhalothrin (Spectracide Ant Shield Bait Station<sup>®</sup>, Ant Shield Home Barrier Granules<sup>®</sup>), pyriproxyfen bait (Distance Fire Ant Bait<sup>®</sup>, Esteem Fire Ant Bait<sup>®</sup>), S-methoprene bait (Extinguish Professional Fire Ant Bait<sup>®</sup>) and spinosad bait (Dow Conserve Fire Ant Bait<sup>®</sup>, Dow Justice Fire Ant Bait<sup>®</sup>). Additional information may be found at [www.uaex.edu/publications/mp-144.aspx](http://www.uaex.edu/publications/mp-144.aspx).



USDA-APHIS PPQ Archives



Mississippi State University

## Flatheaded appletree borer (FAB)

**Description:** In larvae, the first body segment behind the head is flattened laterally. Full-grown larvae are about 1 inch long, legless and yellow-white. Adult beetles are elongate-oval, flattened and shiny dark bronze above and brassy beneath. The emergence hole formed by the adult is a large, 3/16-inch, D-shaped hole.

**Plants Attacked:** FAB is a severe pest of landscape trees, especially maple, hickory, linden, oak, sycamore, tuliptree, dogwood and apple. Almost any hardwood tree that has been stressed by defoliation, sunscald, drought, soil compaction or mechanical injury may be attacked. Young trees are especially vulnerable for two years following transplanting.

**Damage:** Larvae excavate long, shallow, broad, oval galleries on the main trunk or large branches just under the bark or into the sapwood. Wet, greasy-appearing dead areas of bark often occur above these burrows and often have sap exuding from them. Galleries are packed tightly with fine sawdust-like frass. Damage usually occurs on the sunny side of trees but may completely encompass the tree. Injuries usually result in killing large areas of bark and sometimes in girdling and killing the tree or infested branches.

**Control:** Prevent plant stress with proper fertilization and watering. Recommended insecticides include azadirachtin (Bonide Grub Beater Insect Control®, Certis Neemix 4.5®), bifenthrin (Hi-Yield Bug Blaster Bifentrin 2.4®, Ortho Bug-B-Gone MAX Insect Killer®, Ortho Home Defense MAX®, etc.), imidacloprid (Bayer Advanced Fruit, Citrus and Vegetable Insect Control®, Bonide Annual Tree and Shrub Insect Control with SYSTEMAXX®, Ferti-lome Azalea/Evergreen Food Plus with Systemic®, etc.) and permethrin (Hi Yield Kill-A-Bug II®, Ortho Bug-B-Gone®, Bonide Eight Insect Control Flower and Vegetable Granules®). Some materials are available to commercial applicators only. Additional information may be found at [www.uaex.edu/publications/mp-144.aspx](http://www.uaex.edu/publications/mp-144.aspx).



University of Minnesota



University of Missouri



Photos by Donn Johnson

## Flea beetles

(There are many flea beetle species. The strawberry rootworm flea beetle is pictured.)

**Description:** Flea beetle is a generic name for many species of small jumping beetles commonly seen early in the gardening season. Flea beetles may be somewhat elongate to oval in shape and vary in color, pattern and size. All have thickened hind legs that enable them to jump, hence their common name.

**Plants Attacked:** Some species are general feeders, while others have a more restricted host range. Flea beetles are common pests of many vegetable crops, and they occasionally damage flowers, shrubs and some trees.

**Damage:** Flea beetles cause a characteristic injury known as shotholing. Adults chew many small holes or pits in leaves, which makes them look as if they have been damaged by fine shot.

**Control:** Recommended insecticides include acetamiprid (Ortho Flower Fruit and Vegetable Insect Killer®), carbaryl (Ortho Bug-Geta®, Ferti-lome Liquid Sevin®, Garden Tech Sevin®, etc.), cyfluthrin (Bayer Advanced Power Force®), gamma-cyhalothrin (Spectracide Triazide Once and Done®), imidacloprid, insecticidal soap, lambda-cyhalothrin, malathion (Malathion®), permethrin (Hi-Yield Kill-A-Bug II®, Ortho Bug-B-Gone®, Bonide Eight Insect Control Flower and Vegetable Granules®) and spinosad (Dow Naturalyte Insect Control®, Green Light Lawn and Garden Spray with Spinosad®, Bonide Borer, Bagworm, Tent Caterpillar and Leafminer Spray®, etc.). Additional information may be found at [www.uaex.edu/publications/mp-144.aspx](http://www.uaex.edu/publications/mp-144.aspx).

# Insect Pests



Sherrie Smith



Texas A & M University

## Gall-forming insects

Gall-forming insects include aphids, phylloxerans, psyllids, midges (gall gnats) and cynipid wasps (gall wasps).

**Description:** Galls are irregular plant growths resulting from the interaction between plant hormones and powerful growth-regulating chemicals produced by some insects or mites. Galls may occur on leaves, bark, flowers, buds, acorns or roots. Leaf and twig galls are most noticeable.

**Plants Attacked:** Galls are primarily a pest of trees. A few occur on woody ornamental shrubs and flowers.

**Damage:** Galls cannot be cured after they have formed, and they do not significantly affect the vigor of established, healthy plants.

**Control:** Because galls on any particular plant cannot be predicted, **chemical control measures are not usually recommended.** However, many gall-makers are present near bud break, and treatment when gall-forming insects are laying eggs or in early gall development may provide some control. Recommended insecticides include abamectin, azadirachtin (Bonide Grub Beater Insect Control<sup>®</sup>, Certis Neemix 4.5<sup>®</sup>),

bifenthrin (Hi-Yield Bug Blaster Bifenthrin 2.4<sup>®</sup>, Ortho Bug-B-Gone MAX Insect Killer<sup>®</sup>, Ortho Home Defense MAX<sup>®</sup>, etc.), carbaryl (Ortho Bug-Geta<sup>®</sup>, Ferti-lome Liquid Sevin<sup>®</sup>, Garden Tech Sevin<sup>®</sup>, etc.), cyfluthrin (Bayer Advanced Power Force<sup>®</sup>), horticultural oil (dormant), imidacloprid (Bayer Advanced Fruit, Citrus and Vegetable Insect Control<sup>®</sup>, Bonide Annual Tree and Shrub Insect Control with SYSTEMAXX<sup>®</sup>, Ferti-lome Azalea/Evergreen Food Plus with Systemic<sup>®</sup>, etc.), insecticidal soap, malathion, permethrin (Hi-Yield Kill-A-Bug II<sup>®</sup>, Ortho Bug-B-Gone<sup>®</sup>, Bonide Eight Insect Control Flower and Vegetable Granules<sup>®</sup>) and spinosad (Dow Naturalyte Insect Control<sup>®</sup>, Green Light Lawn and Garden Spray with Spinosad<sup>®</sup>, Bonide Borer, Bagworm, Tent Caterpillar and Leafminer Spray<sup>®</sup>, etc.).

## Japanese beetle

**Description:** Adult beetles are shiny metallic-green with coppery-brown wing cases. The beetles also have six small tufts of white hairs along each side and the back of the abdomen.

**Plants Attacked:** Hosts include small fruits, tree fruits, garden crops, ornamental shrubs, vines and trees. Feeding studies show a host range in excess of 300 plants in 79 plant families.

**Damage:** Adults are gregarious general feeders on leaves, flowers and fruits. Adult beetles usually feed in groups, starting at the top of a plant and working downward. While a single beetle does not eat much, group feeding by many causes severe damage. Adults feed on the upper surface of foliage, chewing out tissue between veins. This gives the leaf a characteristic skeletonized appearance.

**Control:** Recommended insecticides include acephate (Orthene Turf, Tree and Ornamental WSP<sup>®</sup>, Bonide Systemic Insect Control<sup>®</sup>), acetamiprid (Ortho Rose Pride Insect Killer<sup>®</sup>, Ortho Flower, Fruit and Vegetable Insect Killer<sup>®</sup>, etc.), azadirachtin (Bonide Grub Beater Insect Control<sup>®</sup>, Certis Neemix 4.5<sup>®</sup>), bifenthrin (Hi-Yield Bug Blaster Bifenthrin 2.4<sup>®</sup>, Garden Tech Over 'n Out Granules<sup>®</sup>, etc.), carbaryl (Ortho Bug-Geta<sup>®</sup>, Ferti-lome Liquid Sevin<sup>®</sup>, Garden Tech Sevin<sup>®</sup>, etc.), chlorantraniliprole (Scotts GrubEx1<sup>®</sup>), cyfluthrin (Bayer Advanced Power Force<sup>®</sup>), dinotefuran (Green Light Tree and Shrub Insect Control with Safari 2G<sup>®</sup>), imidacloprid (Bayer Advanced Fruit, Citrus and Vegetable Insect Control<sup>®</sup>, Bonide Annual Tree and Shrub Insect Control with SYSTEMAXX<sup>®</sup>, Ferti-lome Azalea/Evergreen Food Plus with Systemic<sup>®</sup>, etc.), permethrin (Hi-Yield Kill-A-Bug II<sup>®</sup>, Ortho Bug-B-Gone<sup>®</sup>, Bonide Eight Insect Control Flower and Vegetable Granules<sup>®</sup>) and thiamethoxam. Additional information may be found at [www.uaex.edu/publications/mp-144.aspx](http://www.uaex.edu/publications/mp-144.aspx).



Donn Johnson

## Lace bugs

There are at least 17 species of lace bugs that are pests of trees and shrubs in the eastern United States.

**Description:** Adult lace bugs are small (approximately 0.1 to 0.25 inch in length), delicate insects with sculptured, lacelike wings. Nymphs (immature lace bugs) do not have lacy wings but are usually spiny.

**Plants Attacked:** Most lace bug species have a limited host range and may attack only a handful of plant species. Plants that are commonly attacked include azalea, hawthorn, lantana, oak, pyracantha and sycamore.

**Damage:** Lace bugs injure leaves by sucking out plant juices from the underside. Leaves will develop a tiny, yellow-speckled or mottled appearance on the top side of the leaf. As a result of lace bug feeding, infested leaves will become discolored by black tar-like specks on the leaf underside.

**Control:** Recommended insecticides include acephate, (Orthene Turf, Tree and Ornamental WSP<sup>®</sup>, Bonide Systemic Insect Control<sup>®</sup>), bifenthrin (Hi-Yield Bug Blaster Bifenthrin 2.4<sup>®</sup>, Ortho Bug-B-Gone MAX Insect Killer<sup>®</sup>, Ortho Home Defense MAX<sup>®</sup>, etc.), carbaryl (Ortho Bug-Geta<sup>®</sup>, Ferti-lome Liquid Sevin<sup>®</sup>, Garden Tech Sevin<sup>®</sup>, etc.), chlorantraniliprole (Scotts GrubEx1<sup>®</sup>), dinotefuran (Green Light Tree and Shrub Insect Control with Safari 2G<sup>®</sup>), imidacloprid (Bayer Advanced Fruit, Citrus and Vegetable Insect Control<sup>®</sup>, Bonide Annual Tree and Shrub Insect Control with SYSTEMAXX<sup>®</sup>, Ferti-lome Azalea/Evergreen Food Plus with Systemic<sup>®</sup>, etc.), insecticidal soap, malathion, permethrin (Hi-Yield Kill-A-Bug II<sup>®</sup>, Ortho Bug-B-Gone<sup>®</sup>, Bonide Eight Insect Control Flower and Vegetable Granules<sup>®</sup>) and thiamethoxam (Gulfstream Maxide Professional Grade Dual Action Grub Killer<sup>®</sup>). Additional information may be found at [www.uaex.edu/publications/mp-144.aspx](http://www.uaex.edu/publications/mp-144.aspx).



J. K. Barnes



University of Florida



North Carolina State University

## Leafminers

Many different insects are leafminers, including certain flies, wasps, moths and beetles. The immature (larval) stage of these insects produces the distinctive mines.

**Description:** Leafminers are insects that develop and live within the leaves of plants. Typically, the leaves are injured by the insect feeding on the soft interior tissues so that only the paper-thin covering of the exterior leaf surfaces remain.

**Plants Attacked:** Many ornamental plants are attacked, but azalea, bougainvillea, hollies, chrysanthemum, lantana, oak and boxwood are some of the preferred hosts.

**Damage:** Leafminer damage is conspicuous, but healthy plants should be able to tolerate considerable injury before losing vigor or yield. During heavy infestations, plants may appear bleached or faded and their aesthetic value can be reduced. Occasionally, leaves turn yellow and drop, due in part to the entry of pathogenic fungi and bacteria into old mines.

**Control:** Recommended insecticides include acephate (Orthene Turf, Tree and Ornamental WSP<sup>®</sup>), acetamiprid (Ortho Flower, Fruit and Vegetable Insect Killer<sup>®</sup>), azadirachtin (Certis Neemix 4.5<sup>®</sup>), bifenthrin (Hi-Yield Bug Blaster Bifenthrin 2.4<sup>®</sup>, Ortho Home Defense MAX<sup>®</sup>, Ortho Bug-B-Gone MAX Insect Killer<sup>®</sup>, etc.), chlorantraniliprole (Scotts Grub Ex1<sup>®</sup>), dinotefuran (Green Light Tree and Shrub Insect Control with Safari 2G<sup>®</sup>), imidacloprid (Bayer Advanced Fruit, Citrus and Vegetable Insect Control<sup>®</sup>, Bonide Annual Tree and Shrub Insect Control with SYSTEMAXX<sup>®</sup>, Ferti-lome Azalea/Evergreen Food Plus with Systemic<sup>®</sup>, etc.), lambda-cyhalothrin, permethrin (Hi-Yield Kill-A-Bug II<sup>®</sup>, Ortho Bug-B-Gone<sup>®</sup>, Bonide Eight Insect Control Flower and Vegetable Granules<sup>®</sup>), spinosad (Dow Naturalyte Insect Control<sup>®</sup>, Green Light Lawn and Garden Spray with Spinosad<sup>®</sup>, Bonide Borer, Bagworm, Tent Caterpillar and Leafminer Spray<sup>®</sup>, etc.) and thiamethoxam. Additional information may be found at [www.uaex.edu/publications/mp-144.aspx](http://www.uaex.edu/publications/mp-144.aspx).

# Insect Pests



Sherrie Smith

## Mealybugs

Mealybugs are a type of scale insect with about 275 species known to occur in the continental United States.

**Description:** Mealybugs are small, soft, usually oval insects (1 to 4 mm long), and the body is usually covered with a white, cottony or mealy wax secretion. Many mealybugs produce marginal filaments of wax that may be wedge-shaped or spine-like, but others lack marginal filaments entirely.

**Plants Attacked:** Mealybugs feed on a wide variety of plants and are common pests of both indoor and outdoor ornamental plants. In greenhouses, they are well-known pests of coleus, fern, begonia and geraniums.

**Damage:** Mealybugs suck plant sap by inserting long piercing-sucking mouthparts deep into plant tissue. They do not cause plants serious injury in low numbers. However, in large numbers, mealybugs cause leaf yellowing, leaf curling and/or leaf drop. Mealybugs also produce honeydew, which supports the growth of sooty mold.

**Control:** Recommended insecticides include acephate (Orthene Turf, Tree and Ornamental WSP<sup>®</sup>), acetamiprid (Ortho Flower, Fruit and Vegetable Insect Killer<sup>®</sup>), *Beauveria bassiana*, bifenthrin (Hi-Yield Bug Blaster Bifenthrin 2.4<sup>®</sup>, Ortho Home Defense MAX<sup>®</sup>, Ortho Bug-B-Gone MAX Insect Killer<sup>®</sup>, etc.), carbaryl (Ortho Bug-Geta<sup>®</sup>, Ferti-lome Liquid Sevin<sup>®</sup>, Garden Tech Sevin<sup>®</sup>, etc.), cyfluthrin (Bayer Advanced Power Force<sup>®</sup>), dinotefuran (Green Light Tree and Shrub Insect Control with Safari 2G<sup>®</sup>), horticultural oil, imidacloprid (Bayer Advanced Fruit, Citrus and Vegetable Insect Control<sup>®</sup>, Bonide Annual Tree and Shrub Insect Control with SYSTEMAXX<sup>®</sup>, Ferti-lome Azalea/Evergreen Food Plus with Systemic<sup>®</sup>, etc.), insecticidal soap, neem oil, permethrin (Hi-Yield Kill-A-Bug II<sup>®</sup>, Ortho Bug-B-Gone<sup>®</sup>, Bonide Eight Insect Control Flower and Vegetable Granules<sup>®</sup>) and thiamethoxam. Additional information may be found at [www.uaex.edu/publications/mp-144.aspx](http://www.uaex.edu/publications/mp-144.aspx).

## Sawflies

There are many sawfly species. Redheaded pine sawfly larvae are pictured.

**Description:** Sawflies are related to wasps and bees, and females have a saw-like ovipositor used to lay eggs, thus the name. Adult sawflies are wasp-like insects that do not sting. Larval sawflies are plant feeders and look like hairless caterpillars (the immature stage of butterflies and moths). Caterpillars have two-five prolegs on the abdomen, while sawflies have six or more.

**Plants Attacked:** There are many different species of sawflies, and each prefers specific plants or groups of related plants. Hosts include both evergreen plants and deciduous plants.

**Damage:** Sawflies are foliage feeders, and when feeding in groups, they can quickly defoliate portions of their host plant.

**Control:** Recommended insecticides include acephate (Orthene Turf, Tree and Ornamental WSP<sup>®</sup>), acetamiprid (Ortho Flower, Fruit and Vegetable Insect Killer<sup>®</sup>), carbaryl (Ferti-lome Liquid Carbaryl Garden Spray<sup>®</sup>, Garden Tech Sevin Concentrate<sup>®</sup>, Ortho Bug-Geta Plus<sup>®</sup>, Bayer Advanced Complete Insect Killer for Gardens<sup>®</sup>), chlorantraniliprole, cyfluthrin, imidacloprid (Bayer Advanced Fruit, Citrus and Vegetable Insect Control<sup>®</sup>, Bonide Annual Tree and Shrub Insect Control with SYSTEMAXX<sup>®</sup>, Ferti-lome Azalea/Evergreen Food Plus with Systemic<sup>®</sup>, etc.), insecticidal soap and spinosad. Additional information may be found at [www.uaex.edu/publications/mp-144.aspx](http://www.uaex.edu/publications/mp-144.aspx).



Ronald F. Billings, Texas Forest Service

## Scales

There are about 350 species of armored scales and 85 species of soft scales occurring in the United States.

**Description:** *Armored scales* secrete a waxy covering over their bodies, but this covering is not an integral part of the body. Scales live and feed under this armored covering. Size varies from 1/16 to 1/8 inch in diameter and color is species dependent. Armored scales may be circular, oval, oblong, thread-like, or pear-shaped. *Soft scales* have a waxy covering that is an integral part of their body. Soft scales vary in color, size and shape; they range from 1/8 to 1/2 inch in diameter and may be nearly flat to almost spherical in shape.

**Plants Attacked:** Almost all woody plants are subject to attack by one or more species of scale.

**Damage:** Scales cause damage by sucking plant juices from leaves, stems and trunks. Heavily infested plants appear unhealthy and produce little new growth. Scales feeding on the underside of leaves may cause yellow spots on the top side. These spots enlarge with continued feeding. If uncontrolled, scales may cause premature leaf drop and twig or branch death. Soft scales excrete honeydew, which supports the growth of sooty mold. Armored scales do not excrete honeydew.

**Control:** Some control materials are effective against crawlers only or provide suppression only, so read the label carefully before using. Recommended insecticides may be found at [www.uaex.edu/publications/mp-144.aspx](http://www.uaex.edu/publications/mp-144.aspx).



North Carolina State University



John D. Hopkins



R. S. Davis et al., 2010



Lizabeth Herrera

## Spotted wing drosophila (SWD)

**Description:** Adult SWD are small (2 to 3 mm) with clearly visible red eyes, small featherlike antennae and pale brown bodies with darker stripes on the abdomen. Adult SWD males (pictured) have one black spot toward the tip of both wings and two bands of sex combs on each foreleg that distinguish them from most other *Drosophila* species. Females have no wing spot.

**Plants Attacked:** This fly, related to vinegar flies, attacks ripening and ripe, soft fruit: small fruit – blackberry, blueberry, boysenberry, grapes, raspberry, strawberry; tree fruits – apricot, cherry, mulberry, nectarine, peach, persimmons, plum; and to a lesser extent, vegetable fruits – melons and tomatoes.

**Damage:** Adults and larvae cause the most damage to fruit. Females can saw into fruits during egg laying and cause a depression that can lead to secondary fungal and pest infestations. Larvae tunnel in the fruit rendering fruit unmarketable.

**Control:** *Exclusion:* Fine mesh floating row covers can help protect crops with lower growing heights. *Sanitation:* Avoid spotted wing drosophila damage by frequent, complete harvest of fruit. Any unmarketable fruit should be removed from the field and either frozen for four days and disposed of in the trash or solarized for several days to kill any eggs and larvae. Recommended sprays (need to rotate weekly) include malathion (Malathion®), spinosad (Dow Blackhawk Naturalyte Insect Control®, Bonide Captain Jack's Deadbug Brew Concentrate®, Dow Naturalyte Insect Control®, etc.), bifenthrin (Hi-Yield Bug Blaster Bifenthrin 2.4®, Ortho Bug-B-Gone MAX Insect Killer®, etc.), zeta-cypermethrin or pyrethrins (McLaughlin PyGanic EC or Dust®, Ferti-lome Triple Action Plus®, Safer Concern Multi-Purpose Insect Killer Concentrate®, Ferti-lome Fruit Tree Spray®, etc.). Additional information and complete insecticide options can be found at [www.uaex.edu/publications/pdf/MP467.pdf](http://www.uaex.edu/publications/pdf/MP467.pdf).

# Insect Pests



Donn Johnson



Sherrie Smith

## Spider mites

Spider mites are not insects. They are closely related to spiders and ticks.

**Description:** Spider mites have eight legs and a one-part body. They lack wings, antennae and compound eyes. Individual spider mites are almost microscopic but can cause serious damage when occurring in large numbers.

**Plants Attacked:** Dozens of species attack shade trees, shrubs and herbaceous plants.

**Damage:** Spider mite damage to foliage is similar on all host plants. Spider mite mouthparts (stylets) are used to rupture leaf cells and draw up cell sap. Small patches of cells are killed, resulting in a stippling or fine flecking on the upper surface of leaves, giving the leaves a sand-blasted appearance. The foliage of heavily infested plants becomes bronzed, bleached, yellow or gray. If untreated, plants lose vigor; become progressively thinner and may eventually die.

**Control:** Recommended insecticides include bifenthrin (Ortho Bug-B-Gone MAX Insect Killer<sup>®</sup>, Hi-Yield Bug Blaster Bifenthrin 2.4<sup>®</sup>, Bonide Eight Insect Control Flower and Vegetable Granules<sup>®</sup>), horticultural oil, insecticidal soap, lambda-cyhalothrin (Bonide Beetle Killer<sup>®</sup>, Spectracide Bug Stop Indoor Plus Outdoor Insect Killer<sup>®</sup>), malathion (Malathion<sup>®</sup>), spinosad (Green Light Lawn and Garden Spray with Spinosad<sup>®</sup>, Monterey Garden Insect Spray OMRI<sup>®</sup>, Bonide Captain Jack's Deadbug Brew Concentrate<sup>®</sup>) and sulfur (Ferti-lome Dusting Sulfur<sup>®</sup>, Hi-Yield Dusting Wettable Sulfur<sup>®</sup>, Ortho Elementals 3-in-1 Rose and Flower Care<sup>®</sup>). Additional information may be found at [www.uaex.edu/publications/mp-144.aspx](http://www.uaex.edu/publications/mp-144.aspx).

## Spittlebug

Two-lined spittlebug and nymphs surrounded by white, frothy spittle mass are pictured.

**Description:** Adults appear as black, robust leafhoppers with two red stripes across the back with wings held roof-like over the back. Adults are about 1/3 inch long with bright red eyes and a bright red abdomen. Nymphs resemble wingless adults but smaller. They are yellow, white or orange with red eyes and brown heads. Nymphs surround themselves with a white, frothy spittle mass that provides protection from desiccation and predators.

**Plants Attacked:** Spittlebug nymphs damage centipedegrass, St. Augustinegrass, zoysiagrass, bermudagrass and a variety of ornamental plants. Adult spittlebugs commonly infest hollies, wild grasses, aster, blackberry, pea and morning glory.

**Damage:** Spittlebug nymphs suck plant juices from turfgrass, which weakens and stresses plants causing them to turn yellow and then brown. Severe infestations can kill turfgrass. Spittlebug masses may also become an aesthetic nuisance. Adult two-lined spittlebugs fly to shrubs in late summer and early fall. Their feeding can result in splotchy and yellow leaves and premature leaf drop.

**Control:** Recommended insecticides include acephate (Orthene Turf, Tree and Ornamental WSP<sup>®</sup>), bifenthrin (Ortho Bug-B-Gone MAX Insect Killer<sup>®</sup>, Hi-Yield Bug Blaster Bifenthrin 2.4<sup>®</sup>, Bonide Eight Insect Control<sup>®</sup>), carbaryl (Ferti-lome Liquid Carbaryl Garden Spray<sup>®</sup>, Garden Tech Sevin Concentrate<sup>®</sup>, Ortho Bug-Geta Plus<sup>®</sup>, Bayer Advanced Complete Insect Killer for Gardens<sup>®</sup>), cyfluthrin (Bayer Advanced Power Force/Vegetable and Garden Insect Spray<sup>®</sup>), horticultural oil, insecticidal soaps, lambda-cyhalothrin and permethrin (Hi-Yield Kill-A-Bug II<sup>®</sup>, Ortho Bug-B-Gone<sup>®</sup>, Bonide Eight Insect Control Flower and Vegetable Granules<sup>®</sup>). Additional information may be found at [www.uaex.edu/publications/mp-144.aspx](http://www.uaex.edu/publications/mp-144.aspx).



Clemson University



University of Arkansas

## Tent caterpillar, Eastern tent caterpillar

**Description:** The eastern tent caterpillar is black with a white stripe along the middle of the back and a row of pale blue oval spots on each side. It is sparsely covered with fine light brown hairs. Full-grown larvae are about 2 inches in length. They spin their silken tents in branch forks.

**Plants Attacked:** Larvae feed most often on apple and wild or ornamental cherry and occasionally on pecan, hawthorn, beech and willow.

**Damage:** Damage can range from light to heavy defoliation, depending on the size of the tree attacked and the number of webs per tree. The presence of large, unsightly webs can make trees aesthetically unpleasing.

**Control:** Small nests can be mechanically removed from small to medium trees. Recommended insecticides include acephate (Orthene Turf, Tree and Ornamental WSP®), acetamiprid (Ortho Flower, Fruit and Vegetable Insect Killer®), azadirachtin, *B.t.*, bifenthrin, carbaryl (Ferti-lome Liquid Carbaryl Garden Spray®, Garden Tech Sevin Concentrate®, Ortho Bug-Geta Plus®, Bayer Advanced Complete Insect Killer for Gardens®), chlorantraniliprole, indoxacarb, insecticidal soap, novaluron, permethrin (Hi-Yield Kill-A-Bug II®, Ortho Bug-B-Gone®, Bonide Eight Insect Control Flower and Vegetable Granules®), pyrethrins, spinosad (Green Light Lawn and Garden Spray with Spinosad®, Monterey Garden Insect Spray OMRI®, Bonide Captain Jack's Deadbug Brew Concentrate®) and tebufenozide. Additional information may be found at [www.uaex.edu/publications/mp-144.aspx](http://www.uaex.edu/publications/mp-144.aspx).



W. Hoffard, USDA Forest Service



University of Missouri



University of Florida



Sherrie Smith

## Thrips

There are 6,000 thrips species in the United States. Most important are the onion, citrus, greenhouse and gladiolus.

**Description:** Females are small, slender, winged insects amber or yellowish-brown to dark brown in color. Females are about 1/16 inch long. Males are similar to females but smaller and always light yellow.

**Plants Attacked:** Plants most attractive to thrips include chrysanthemum, gloxinia, impatiens, tomato, vegetables and grasses.

**Damage:** Thrips feeding causes physical damage to tissues of developing and mature flowers and leaves. Thrips also feed on pollen. Some species of thrips can also vector tomato spotted wilt virus.

**Control:** Before using any control material, read the label and note whether the material is labeled for the intended site (landscape, nursery or greenhouse). Recommended insecticides include acephate (Orthene Turf, Tree and Ornamental WSP®), acetamiprid (Ortho Flower, Fruit and Vegetable Insect Killer®), bifenthrin, carbaryl, cyfluthrin, dinotefuran, horticultural oil, imidacloprid (Bayer Advanced Fruit, Citrus and Vegetable Insect Control®,

Bonide Annual Tree and Shrub Insect Control with SYSTEMAXX®, Ferti-lome Azalea/Evergreen Food Plus with Systemic®, etc.), insecticidal soap, lambda-cyhalothrin, malathion (Malathion®) and spinosad (Green Light Lawn and Garden Spray with Spinosad®, Monterey Garden Insect Spray OMRI®, Bonide Captain Jack's Deadbug Brew Concentrate®). Additional information may be found at [www.uaex.edu/publications/mp-144.aspx](http://www.uaex.edu/publications/mp-144.aspx).

# Insect Pests



Clemson University-USDA



Joe Boggs, Ohio State University Extension

## Twig girdler

**Description:** The adult twig girdler is a beetle about 3/4 inch long, stout and grayish-brown with a lighter-colored band across its elytra (wing covers). The adult has antennae as long as its body.

**Plants Attacked:** Common hosts of the twig girdler include pecan, persimmon, elm, hickory, oak, honeylocust, hackberry, poplar, linden, redbud, basswood, dogwood and various fruit trees.

**Damage:** Adult females chew a V-shaped groove around a small twig, girdling it. An egg is deposited beneath the bark in the twig section beyond the cut. The cut/girdled twig dies quickly and usually falls to the ground. After hatching, the young larva bores into the dead twig to feed. The larva will overwinter in the fallen twig. Twig girdlers produce one generation a year. Heavily damaged trees appear ragged and unattractive, and young trees can become deformed by repeated attacks.

**Control:** Homeowners should collect and destroy infested twigs and branches found on the ground beginning in September or no later than May. If practical, prune infested twigs still in the tree. Chemical control is not practical.

## White grubs

The larvae of Scarab beetles are referred to as white grubs, and there are many species capable of damaging turfgrass. Pictured (left to right) are adults and larvae of green June beetle, May beetle (*Phyllophaga*), masked chafer, Japanese beetle and black turfgrass (*Ataenius*).

**Description:** White grubs as a group are C-shaped, white to dirty white in color with brownish head and legs and usually have a darker gray area at the tip of the abdomen. Adults are medium-sized beetles that feed in a variety of trees and shrubs.

**Plants Attacked:** White grubs primarily feed on grass roots, but some species also feed on the roots of ornamental plants.

**Damage:** White grubs damage turfgrasses by feeding on grass roots, resulting in plants being cut off from water and nutrients. Damage appears as yellowing or browning of the leaves and as drought stress even when moisture conditions are good. Infested turfgrass may be loose enough to pull easily from the soil, and the ground may become spongy to the step. Turf damage may also occur as a result of animals rooting up the turf hunting for grubs.

**Control:** Recommended control materials include *Beauveria bassiana*, carbaryl (Sevin Lawn Insect Granules<sup>®</sup>, Ferti-lome Liquid Carbaryl Garden Spray<sup>®</sup>, Ortho Bug-Geta Plus Snail, Slug and Insect Killer<sup>®</sup>, Bayer Advanced Grasshopper, Earwig, Cutworm and Sowbug Bait<sup>®</sup>, etc.), chlorantraniliprole (Scotts GrubEx1<sup>®</sup>), dinotefuran (Green Light Tree and Shrub Insect Control with Safari 2G<sup>®</sup>), halofenozide (Hi-Yield Kill-A-Grub<sup>®</sup>), imidacloprid (Bayer Advanced Fruit, Citrus and Vegetable Insect Control<sup>®</sup>, Bonide Annual Tree and Shrub Insect Control with SYSTEMAXX<sup>®</sup>, Ferti-lome Azalea/Evergreen Food Plus with Systemic<sup>®</sup>, etc.), thiamethoxam (Gulfstream Maxide Professional Grade Dual Action Grub Killer<sup>®</sup>) and trichlorfon (Bayer Advanced 24 Hour Grub Killer Plus Granules<sup>®</sup>). Additional information may be found at [www.uaex.edu/publications/mp-144.aspx](http://www.uaex.edu/publications/mp-144.aspx).



Donn Johnson

## Emerald ash borer (EAB)

**Description:** Emerald ash borer adults are small, metallic green beetles (3/8 to 1/2 inch long and 1/16 inch wide). EAB larvae are white and slightly flattened with a pair of brown pincher-like appendages on the last segment. Size varies as larvae feed and grow under the ash tree's bark. Full-grown larvae average 1 1/2 inches in length. They wind back and forth as they feed and create S-shaped galleries under the bark. Larvae feed under the bark for one to two years and can survive in green wood, like firewood, as long as bark is attached.



University of Kentucky

**Plants Attacked:** All eastern North American ash species are susceptible, including green, white, black, blue and pumpkin ash (*Fraxinus* spp.). EAB can also attack white fringetree (*Chionanthus virginicus*), a species native to the southeast United States that is planted ornamentally.

**Damage:** Adults feed on ash foliage causing little damage. Larvae feed on the inner bark disrupting the tree's ability to transport water and nutrients and ultimately cause the tree's death. After the first year of infestation, small, D-shaped exit holes can be found on the trunk and branches. Bark may split vertically above larval feeding galleries. Stress likely contributes to the vulnerability and rapid decline of infested ash trees. Emerald ash borers, however, have killed apparently vigorous trees under regular irrigation and fertilization.

**Control:** Stopping the spread of EAB involves cutting infested trees and chipping or incinerating all tree remains. Systemic insecticides, like imidacloprid (Bayer Advanced Fruit, Citrus and Vegetable Insect Control®, Bonide Annual Tree and Shrub Insect Control with SYSTEMAXX®, Ferti-lome Azalea/Evergreen Food Plus with Systemic®, etc.), applied as a protectant prior to infestation have helped save some high-value trees. Additional information may be found at [www.uaex.edu/publications/mp-144.aspx](http://www.uaex.edu/publications/mp-144.aspx).



Donn Johnson



Sherrie Smith

## Brown stink bug on pecan

**Description:** Brown stink bugs are green and brown, shield-shaped bugs 0.5 to 1.5 inches in length. They have piercing-sucking mouthparts and a triangular shape between the base of the wings. Adults (pictured) feed on immature nuts causing the interior to darken and prematurely drop from the tree. Feeding after shell hardening causes brown to black, pithy, bitter spots on the kernels, reducing nut quality.

**Plants Attacked:** Pecans, most fruiting plants

**Damage:** Brown stink bugs may be present in orchards all year but normally cause the most serious injury from late August through September. Prior to shell hardening, feeding injury causes nut drop.

**Control:** Recommended products include lambda-cyhalothrin (Spectracide Bug Stop Indoor Plus Outdoor Insect Killer®, Bonide Beetle Killer®, etc.).



Donn Johnson

## Granulate ambrosia beetle

**Description:** Adult females are stout-bodied. The mature color is dark reddish brown. Males are much smaller and differently shaped than females, with a “hunch-backed” appearance. Males are flightless.

**Plants Attacked:** This beetle has many reported hosts, but some of the most common include red maple, redbud, styrax, ornamental cherry, pecan, peach, plum, cherry, persimmon, Japanese maple, golden rain tree, dogwood, sweet gum, Shumard oak, Chinese elm, magnolia, fig and azalea.

**Damage:** Female beetles bore into the sapwood of stems and young trees. Though attracted to damaged, stressed or transplanted trees, the granulate ambrosia beetle also attacks seemingly healthy, thin-barked hardwoods or branches from 1.0 to 2.5 inches in diameter. Visible symptoms include wilted foliage and strands of boring dust protruding from small holes. These insects make galleries directly into the heartwood of the tree, which they inoculate with an ambrosia fungus that is used as their food source. In addition, they can introduce or create entry points for pathogenic fungi such as *Fusarium* spp. Death is more likely related to these pathogenic fungi that block xylem vessels. Young, infested trees often die, while more established landscape trees may sometimes survive. Serious attacks that result in tree death usually occur during the leafing-out stage.

**Control:** Adult beetle activity begins in March and peaks in mid to late April. Heavily infested plants or plant parts should be removed and destroyed. It may be best for large growers to wait three to four weeks after trees are attacked before removal so as to concentrate and destroy the greatest number of beetles, possibly sparing some healthy trees. Once trees are infested, the beetle cannot be killed within the plant and fungicides are ineffective against the fungus. Protective trunk sprays with pyrethroid insecticides have been helpful in preventing attack. Additional information may be found at [www.uaex.edu/publications/mp-144.aspx](http://www.uaex.edu/publications/mp-144.aspx).

## Crapemyrtle bark scale (CBMS)

**Description:** Adult females appear as white or gray felt-like encrustations on small twigs to large trunks, often appearing near pruning wounds or in branch crotches on older wood. CMBS is white to gray in color and approximately 2 mm in length. Careful examination may reveal dozens of pink eggs or crawlers under some of the larger white scale covers. This felt scale is different from either an armored or soft scale.

**Plants Attacked:** Currently, crapemyrtles are the only host plant that comes under significant attack. American beauty berry has been identified as an alternate host.

**Damage:** Crapemyrtle bark scale insert piercing-sucking mouthparts into the plant and feed on plant fluids. As these insects feed, they excrete a sticky fluid (honeydew) that coats the plant. This honeydew supports the growth of sooty mold. This mold is not pathogenic but does inhibit photosynthetic capacity of coated leaves. Under a severe CMBS infestation, the plant can suffer from twig and branch dieback. Even under light to moderate infestations, the honeydew and resultant sooty mold adversely impact the aesthetic beauty of the plant in the landscape.

**Control:** Effective control measures are still being evaluated. However, a late fall/winter application of dormant oil may be helpful. The treatment with the greatest promise is a soil drench to the root zone with a labeled neonicotinoid systemic insecticide applied in the spring. This insect is easily spread via pruning debris, so care must be taken to prevent infesting nearby crapemyrtles. Additional information may be found online at [www.uaex.edu/publications/mp-144.aspx](http://www.uaex.edu/publications/mp-144.aspx).



Mississippi State University



Joseph Berger, Bugwood.org

## Grasshopper

**Description:** Most grasshoppers are winged and are good fliers. The redlegged grasshopper (pictured) has a reddish-brown back, a yellow belly and bright red hind legs. Newly hatched nymphs are white. However, after several hours of exposure to sunlight, they assume the distinctive colors and markings of adults.

**Plants Attacked:** Most grasshoppers are general feeders, but they do prefer young green plants. They will feed on many garden vegetables and flowers;

however, squash and tomatoes are among the least favored garden hosts.

**Damage:** Grasshoppers have chewing mouthparts that remove large sections of leaves and flowers, sometimes devouring entire plants. During years when grasshoppers are extremely abundant and food is scarce, they feed on almost all plants. Grasshoppers generally don't feed on most trees and shrubs, but they may be used as convenient resting sites. Grasshoppers may nibble on foliage and tender bark, causing considerable injury over the course of a season. Established plants tolerate this leaf loss and usually recover. Grasshoppers breed and develop in undisturbed sites such as pastures, empty lots and roadsides. When plants in these areas dry out or are eaten, grasshoppers may move to more lush growth found in yards and gardens.

**Control:** Options for grasshopper control include insecticides formulated as either sprays or baits. These include acephate (Orthene Turf, Tree and Ornamental WSP<sup>®</sup>, Bonide Systemic Insect Control<sup>®</sup>), carbaryl (Ortho Bug-Geta<sup>®</sup>, Ferti-lome Liquid Sevin<sup>®</sup>, Garden Tech Sevin<sup>®</sup>, etc.), cyfluthrin (Bayer Advanced Power Force<sup>®</sup>), malathion, bifenthrin (Hi-Yield Bug Blaster Bifenthrin 2.4<sup>®</sup>, Bug-B-Gone MAX Insect Killer<sup>®</sup>, Ortho Home Defense MAX<sup>®</sup>, etc.), gamma and lambda-cyhalothrin (Spectracide Triazide Insect Killer<sup>®</sup>, Bonide Beetle Killer<sup>®</sup>, Spectracide Bug Stop Indoor Plus Outdoor Insect Killer<sup>®</sup>) and permethrin (Hi-Yield Kill-A-Bug II<sup>®</sup>, Ortho Bug-B-Gone<sup>®</sup>, Bonide Eight Insect Control Flower and Vegetable Granules<sup>®</sup>). Biological control of grasshoppers with a disease organism, the protozoan *Nosema locustae*, is also an option when rapid control in an outbreak situation is not needed. Additional information may be found at [www.uaex.edu/publications/mp-144.aspx](http://www.uaex.edu/publications/mp-144.aspx).



# LANDSCAPE WEEDS



# Landscape Weeds



John Boyd

## Woody sprouts

**Description:** Sprouts of oak, hickory, crepe myrtle, sugarberry, mimosa and other woody species are one of the most common problems in landscape beds and lawns. They are often well-rooted and, therefore, difficult to pull, or the stems break during pulling leaving the roots intact.

**Control:** Cutting the stems with pruning shears and treating the cut end with undiluted glyphosate containing at least 41% active ingredient will stop resprouting. Another method is inserting a florist's water tube filled with undiluted glyphosate over the cut end of the stem and leaving it for several days. The cut should be fresh. This technique avoids the risk of getting glyphosate on nearby plants. Preemergence herbicides are usually ineffective on these large-seeded species.

## Silver thread moss

**Species:** *Bryum argenteum*

**Description:** Silver thread moss is the most common moss in Arkansas. It may be found in turfgrass and on many surfaces in shaded areas. It is associated with excess surface moisture as a result of frequent irrigation, heavy shade or poor drainage. Mosses spread rapidly via asexual reproduction. Anything that spreads fragments of moss plants can lead to new infestations. Because of their asexual method of reproduction, small moss colonies can rapidly spread.

**Control:** QuickSilver T&O® (carfentrazone) at 6.7 ounces per acre in 100 gallons of water per acre when temperatures are less than 85°F provides excellent moss control. Grasses are generally tolerant of QuickSilver. QuickSilver does not control algae. Reducing shade and improving drainage improves moss control. Clorox® can be used to control moss on a roof. Protect desirable plants from Clorox runoff.



John Boyd

## Yellow nutsedge

**Species:** *Cyperus esculentus*

**Description:** Yellow nutsedge is a warm-season perennial that may be 1 to 2 feet tall. The leaf tips are sharp and pointed compared to the blunt leaf tips of purple nutsedge. The leaves are arranged in threes. Stems are pithy and triangular (inset). Yellow nutsedge produces seeds, rhizomes and tubers. The tubers have a sweet taste compared to the bitter flavor of purple nutsedge tubers. The seedheads are yellow when mature. Yellow nutsedge is not usually a problem in lawns. It is more common in ornamental beds and vegetable gardens. Nutsedge will grow through plastic mulch, aboveground pool bottoms and asphalt.



John Boyd

**Control:** SedgeHammer®+ (halosulfuron), Image®, Certainty® (sulfosulfuron), Monument® (trifloxysulfuron), Dismiss® (sulfentrazone) and Dismiss South® (sulfentrazone + imazethapyr) are all effective for yellow nutsedge. Certainty is safe on all warm-season grasses. SedgeHammer+ is less effective but may be used on all lawn grasses. Follow-up applications are needed when regrowth appears. SedgeHammer+, Certainty and Image may be sprayed around some ornamentals in landscape beds. See the label for species tolerance and use details. Herbicides kill only the tubers attached to plants. Spray when yellow nutsedge is in the 3- to 8-leaf stage of growth.



John Boyd

## Green kyllinga

**Species:** *Kyllinga brevifolia*

**Description:** Green kyllinga is a warm-season perennial with triangular stems and leaves arranged in threes. It reaches 6 inches in height. The seedhead is a rounded, congested clump with the leaves just below. Kyllinga forms dense mats and survives low mowing. It prefers wet, poorly drained soils. There are several species of kyllinga in Arkansas. It is common in turfgrass but not landscape beds.

**Control:** Monument® (trifloxysulfuron), Certainty® (sulfosulfuron) and Dismiss South® (sulfentrazone + imazethapyr) provide excellent kyllinga control. SedgeHammer®+ (halosulfuron), while slightly less effective on kyllinga, is safe to use on all turfgrasses.

Certainty also provides control and is safe on all warm-season grasses. SedgeHammer+, Certainty and Image® may be sprayed around some ornamentals in landscape beds. See the label for species tolerance and use details.

# Landscape Weeds



John Boyd

## Purple nutsedge

**Species:** *Cyperus rotundus*

**Description:** Purple nutsedge is a warm-season perennial with leaves arranged in threes and with triangular stems. The leaf tips are blunter than those of yellow nutsedge. The plants are smaller than yellow nutsedge and have darker green leaves. Flowers are a dull reddish-purple. Dark-colored, bitter-tasting tubers are produced in chains connected by rhizomes. This is the most difficult sedge to control and is considered to be one of the world's worst weeds. Purple nutsedge spreads by seed, tubers and rhizomes. Prevention and sanitation are very important in controlling this pest.

**Control:** Monument® (trifloxysulfuron), Certainty® (sulfosulfuron) and Dismiss South® (sulfentrazone +

imazethapyr) provide temporary suppression of purple nutsedge. Certainty is safe on all warm-season grasses. SedgeHammer®+ (halosulfuron), while slightly less effective, is safe to use on all turfgrasses. Image 70 DG® (imazaquin) is an effective herbicide for suppressing sedges in warm-season turfgrasses. Image may cause stunting of turfgrasses. Repeat applications will be needed with any of these herbicides. SedgeHammer+, Certainty and Image may be sprayed around some ornamentals in landscape beds. See the label for a list of tolerant species and usage details.

## Sedge control for homeowners

SedgeHammer®+ (halosulfuron + surfactant) is a good sedge control choice for homeowners because it is effective on the common sedges, comes in a small package with surfactant added and is safe on all turfgrasses. SedgeHammer+ may be sprayed around some ornamentals in landscape beds. See the label for a list of tolerant species and usage details. **Do not spray SedgeHammer+ over the top of landscape plants.**

**Hi-Yield Nutsedge Control® also contains halosulfuron.** Ortho Nutsedge Killer for Lawns® (0.05% sulfentrazone) is a quick-acting herbicide that is fairly effective on most sedges and safe on most lawn grasses. Sulfentrazone is fast-acting and will cause leaf burn on sedges within two to three days of application. It is less effective on purple nutsedge than halosulfuron.

## Bamboo

**Species:** *Phyllostachos* spp., others (*Arundinaria gigantea* is the only Arkansas native cane.) Most of the problem plants are introduced species.

**Description:** Bamboo is a woody member of the grass family. The joints of the main stem are hard and solid; the area between the joints is hollow.

**Control:** In home landscapes, glyphosate is the most practical treatment for bamboo. Like greenbrier (page 45), new, tender growth must be present to permit absorption of the herbicide. Cut the bamboo to the ground and spray when new shoots reach a height of 18 to 24 inches. Use a 5% solution of a glyphosate product containing at least 41% active ingredient. Repeat each time the bamboo shoots appear. In areas where root uptake by nearby plants is not a concern, Arsenal® (imazapyr) is more effective than glyphosate for bamboo control. Drilling a small hole just below a joint and filling the hollow section below with undiluted glyphosate is somewhat effective for small stands.



John Boyd



John Boyd

## Bermudagrass

**Species:** *Cynodon dactylon*

**Description:** Bermudagrass is a warm-season perennial with long, prostrate stems that root at the nodes. It may be from 4 to 16 inches tall. The seedheads are fingerlike (inset) with four to seven fingers. It is the most common lawn grass in the state. Bermudagrass spreads by above and below ground lateral stems.

**Control:** Use sethoxydim (Segment®), fluazifop (Ortho Grass B Gon®) or clethodim (Envoy®) for control in landscape beds. These herbicides affect only grasses and, therefore, should not be applied to ornamental grasses. Use only on nongrass ornamental species. They are safe over the top of nongrass ornamentals such as mondo grass, liriopie and iris. Sethoxydim

may be used in centipedegrass lawns. Use fluazifop plus triclopyr ester for bermudagrass control in tall fescue or zoysiagrass turf.

**Preplant Control:** Make three or four applications of a glyphosate product containing at least 41% active ingredient at 2 to 3 quarts per acre over the growing season (May, July and September). Wait for regrowth before making the next application. Using this method does not guarantee complete control. Tank mixing with 24 fluid ounces per acre of Fusilade II® (fluazifop) may improve control. Do not seed for 30 days after applying Fusilade II.

# Landscape Weeds



John Boyd

## Large crabgrass

**Species:** *Digitaria sanguinalis*

**Description:** Summer annual, pale green, often hairy, with stems rooting at the nodes. The seedhead has two to nine finger-like spikelets. Flowers midsummer until frost and may grow 6 to 30 inches tall. Crabgrass may be the most common lawn, turf and garden weed.

**Control:** Preemergence products for crabgrass control include Barricade® (prodiamine), Pendulum® (pendimethalin), Specticle (indaziflam) and Dimension® (dithiopyr). Preemergence is the best approach to crabgrass control because the postemergence herbicides are not very effective. Preemergence herbicides should be applied around March 1 or before crabgrass begins to germinate. Water in with 0.25 to

0.5 inch of irrigation for best results. Scotts Halts® (pendimethalin) is a good preemergence choice for homeowners. For postemergence control, apply quinclorac (Quinclorac 75 DF®, Drive®, Drive XLR8®) to tolerant turfgrasses when crabgrass is less than two tillers or mature. Repeat application in seven days. Use methylated seed oil as a surfactant. Other postemergence possibilities include Tenacity® (mesotrione) or Segment® (sethoxydim) in centipede grass. Some homeowner products that contain quinclorac include Ortho Weed-B-Gon Weed Killer for Lawns Plus Crabgrass Control Concentrate®, Bayer Advanced All-in-One Lawn Weed and Crabgrass Killer® and Ferti-lome Weed-Out with Q®.

## Dallisgrass

**Species:** *Paspalum dilatatum*

**Description:** Wide-bladed, warm-season, perennial, clump-forming grass with short rhizomes. Reaches a height of 1 to 3 feet. Seedhead has three to seven thick spikelets on alternate branches (inset). Leaf blades are smooth on both surfaces. The midvein of the leaf is very prominent.

**Control:** One option is to dig the clumps with a shovel. Another approach is spot treatment with glyphosate. Use a 2% solution of a glyphosate product containing at least 41% active ingredient. Obviously, this is going to kill some of the desirable grass and leave brown spots in the turf. Two applications of glyphosate are needed. Apply the first after active growth begins in May, and spray again when regrowth appears. This will take most of the summer. Keep the glyphosate spray off nontarget plants. A selective approach involves repeat applications of Tribute Total® (foramsulfuron + halosulfuron + thienclazuron) in late summer and early fall. This will selectively suppress dallisgrass in residential lawns. Typical timings would be September 15, October 15 and July 15 of the following season. Use Tribute Total only in bermudagrass.



John Boyd

## Annual bluegrass

**Species:** *Poa annua*

**Description:** Winter annual with leaves about 1 to 4 inches long with a boat-shaped tip (inset). There are two distinct clear lines, one on each side of the midrib of leaves. It is the most common bluegrass species in Arkansas. Blooms March through June. The seedhead is whitish.

**Control:** It is difficult to achieve complete control of annual bluegrass with a single herbicide application. Preemergence and postemergence treatments may be needed. To achieve preemergence control with herbicides such as Specticle (indaziflam), Barricade® (proflumicarb), Pendulum® (pendimethalin) and Dimension® (dithiopyr), apply on August 15 and water in immediately with 0.25 to 0.5 inch of irrigation. Specticle may be applied later because it will control small annual bluegrass postemergence.

In tolerant grasses, simazine and atrazine are effective preemergence and postemergence on small annual bluegrass. Apply between Thanksgiving and Christmas. In bermudagrass, one of the cheapest and easiest ways to control *Poa annua* is to use 41% active ingredient glyphosate at 16 fluid ounces per acre while bermudagrass is completely dormant. Completely dormant means no sign of green foliage. Revolver® (foramsulfuron), TranXit® (rimsulfuron) and Monument® (trifloxysulfuron) will provide postemergence *Poa annua* control without damaging partially green bermudagrass or zoysiagrass.



John Boyd



John Boyd

## Poison ivy

**Species:** *Toxicodendron radicans*

**Description:** Poison ivy is a perennial, woody vine that attaches by aerial rootlets to trees, posts and structures. The leaves are alternate bearing three-stalked leaflets. The leaflets are glossy, entire or variously bluntly toothed. New leaves often have a reddish-green hue. The flowers are inconspicuous and greenish-white. The fruits are small, waxy, cream-colored berries. Poison ivy has brilliant red or yellow fall color.

**Control:** Three-ways (2,4-D + dicamba + MCPP), glyphosate and triclopyr provide fair to good control. Tank mixing glyphosate + triclopyr often improves control. Repeat applications will be needed. Cutting the stems at the base and painting the cut ends with

undiluted glyphosate or triclopyr is another option. Another method is inserting a florist's water tube filled with undiluted glyphosate containing at least 41% active ingredient over the cut end of the stem. The cut should be fresh.

# Landscape Weeds



John Boyd

## Dodder

**Species:** *Cuscuta pentagona*

**Description:** Dodder is warm-season annual. The dodder plant starts independently but soon establishes a parasitic relationship with a host plant. All or nearly all of the chlorophyll (green material) is lost, and the dodder plant appears as golden yellow strings sprawling and twining indiscriminately over the host plant, with small suckers penetrating the host plant at intervals. The leaves are without chlorophyll and are small and scale-like. The flowers are small, yellowish-white, in small clusters, originating in the leaf forks. Dodder can sense volatile chemicals released by host plants and will grow toward them.

**Control:** Either pendimethalin or prodiamine applied in March will control dodder preemergence. Repeat application in 90 days for full-season control.

## Japanese honeysuckle

**Species:** *Lonicera japonica*

**Description:** Japanese honeysuckle is an evergreen, perennial, climbing vine. The leaves are opposite, oval and entire. The flowers are tubular, 1 to 2 inches long, lobed at the apex and are borne on the new growth of the season. The plants climb by twining on fences or brush a few feet to several yards high.

**Control:** A 5% solution of a glyphosate product containing at least 41% active ingredient applied in the fall controls honeysuckle. Follow-up treatments will be needed. Another option is MSM OD25® (metsulfuron). Add 0.4 ounce of MSM OD25 to 10 gallons of water and spray to wet. Include a surfactant in the mix.



John Boyd

# Landscape Weeds

## Peppervine

**Species:** *Ampelopsis arborea*

**Description:** Perennial vine. Leaves usually doubly compound. Leaflets have coarse teeth. Fruit is shiny and black when ripe (inset). Common throughout the state. It is found along roadsides, fencerows and in landscapes.

**Control:** A 5% solution of a glyphosate product containing at least 41% active ingredient applied in the fall controls peppervine. Follow-up treatments will be needed. Another method is inserting a florist's water tube filled with undiluted glyphosate over the cut end of the stem. The cut should be fresh.



John Boyd



John Boyd

## Greenbrier

**Species:** *Smilax bona-nox*

**Description:** Greenbrier or sawbrier is a perennial vine. The young leaves may be bronze to purple. Mature leaves have a waxy coating. There are prickles along the stem. A large underground tuber is present.

**Control:** Greenbrier control is difficult regardless of the methods or herbicides used. Treat in late April or early May with a 5% solution of a glyphosate product containing at least 41% active ingredient when the leaves are immature and pale green. The immature leaves lack a waxy coating and absorb herbicides more readily. Another method is inserting a florist's water tube filled with undiluted glyphosate over the cut end of the stem. The cut should be fresh.

# Landscape Weeds



John Boyd

## Spurweed

**Species:** *Soliva pterosperma*

**Description:** A small, low-growing, mat-forming winter annual with lacy leaves. Spurweed produces a spiny fruit (inset) from April to June. It is more common in the southern half of the state.

**Control:** Readily controlled by preemergence or early postemergence applications of atrazine or simazine in tolerant grasses. Timing is key to satisfactory control. Apply herbicides in December to prevent development of seeds. If that timing is missed, make the application before March 1. Metsulfuron (Manor<sup>®</sup>, Mansion<sup>®</sup> Blade<sup>®</sup> or MSM OD25<sup>®</sup>) or three-ways (MCP + dicamba + 2,4-D) provide postemergence control of spurweed. Metsulfuron or a three-way may be tank mixed with either simazine or atrazine to improve control.

## Henbit

**Species:** *Lamium amplexicaule*

**Description:** Henbit is a cool-season annual that reaches 3 to 10 inches in height. The leaves are opposite and stems are square. The leaf margins are bluntly toothed. The upper leaves are attached directly to the stem. The lower leaves have petioles. The flowers are small, two-lipped and purple (rarely white). Along with common chickweed, it is one of the most common winter weeds.

**Control:** Simazine or atrazine applied in late November or early December provide good to excellent control. Metsulfuron (Manor<sup>®</sup>, Mansion<sup>®</sup>, MSM OD25<sup>®</sup> or Blade<sup>®</sup>) is very effective postemergence. Three-ways (2,4-D + MCP + dicamba) alone provide only partial control of henbit. Tank mixing a three-way with simazine, atrazine or metsulfuron improves control. Apply early (between December and March 1) before the weeds get big.



John Boyd

## Chickweed

**Species:** *Stellaria media*

**Description:** Common chickweed is a many-branched winter annual with white flowers bearing five petals. Each petal is deeply lobed so that each flower appears to have ten petals. The leaves are opposite, entire and oval (inset). It often appears in shady areas. Along with henbit, it may be the most common winter annual broadleaf weed in the state.

**Control:** Simazine or atrazine applied in late November or early December provide good to excellent control. Metsulfuron (Manor<sup>®</sup>, Mansion<sup>®</sup>, MSM OD25<sup>®</sup> or Blade<sup>®</sup>) is very effective postemergence. Three-ways (2,4-D + MCPP + dicamba) alone provide only partial control of chickweed. Tank mixing a three-way with simazine, atrazine or metsulfuron solves the problem of poor control. Apply early (between December and March 1) before the weeds get big.



John Boyd



John Boyd

## Virginia copperleaf

**Species:** *Acalypha virginica*

**Description:** Virginia copperleaf is a warm-season annual that may reach a height of 1 to 2 feet. The stems are hairy, and the leaves are egg-shaped on long petioles. The small flowers are borne in clusters in the leaf axils in the upper portion of stems and branches. The seed pod contains three seeds. Another common name is three-seeded mercury. It is a common weed in landscape beds.

**Control:** Either pendimethalin or prodiamine applied in March will control Virginia copperleaf preemergence. Repeat application in 90 days for full-season control.

# Landscape Weeds



John Boyd

## Common lespedeza

**Species:** *Lespedeza striata*

**Description:** Common lespedeza is a clover-like, warm-season annual. It branches at the base and forms mats up to about 15 to 18 inches in diameter. The leaves have three oblong, smooth leaflets. The veins on the leaflets are prominent (inset). The flowers are purple and inconspicuous. It is an aggressive weed from a tough taproot. It is very common in areas of thin turf. Lespedeza is often an indicator of insufficient nitrogen fertilization.

**Control:** Ortho Chickweed and Oxalis Killer® (8% triclopyr) is a good choice for homeowners. Do not use this product on centipedegrass, St. Augustinegrass or bermudagrass. Celsius® (thiencarbazone + iodosulfuron

+ dicamba) should be effective on lespedeza. Products containing metsulfuron are very effective on most legumes. When using three-ways (2,4-D + MCPP + dicamba), repeat applications are usually needed. 2,4-D alone will not control lespedeza or white clover.

## Prostrate spurge

**Species:** *Euphorbia humistrata*

**Description:** Summer annual with reddish to purple stems that ooze milky juice when broken (inset). The individual leaves are oval, less than 0.25 inch in length, about half as wide and may have an oval purple spot along the midrib. It is a very heat- and drought-tolerant weed found in lawns, landscape beds and container nurseries and along sidewalks and driveways. It hugs the ground while forming large, almost perfectly round mats.

**Control:** Pendimethalin and prodiamine provide partial preemergence control in turf and landscape beds. Applied postemergence, metsulfuron (Manor®, Blade®, MSM OD25® and Mansion®) is the best spurge control treatment in turfgrass. Use only in bermudagrass, centipedegrass, St. Augustinegrass and zoysiagrass.



John Boyd

## Virginia buttonweed

**Species:** *Diodia virginiana*

**Description:** Perennial with a taproot that is low-growing and mat-forming. Leaves opposite, stems hairy. Stems may root at the nodes. Leaves may take on a mottled, yellow, mosaic look. Flowers are white with four lobes. Upper surface of petals covered with hairs. Prefers low, moist areas. Tolerates close mowing.

**Control:** Herbicides provide only temporary suppression of Virginia buttonweed. Products containing fluroxypyr or triclopyr, such as Escalade 2® or Momentum FX2®, seem to be more consistent than the standard three-ways. However, multiple applications of three-way (2,4-D + MCPP + dicamba) herbicides at intervals of three to six weeks do a fair job of suppressing Virginia buttonweed. Consult the herbicide label to determine the maximum number of applications allowed per year. For limited populations, dig the plants being sure to remove the taproot.



John Boyd



John Boyd

## Mulberry weed

**Species:** *Fatoua villosa*

**Description:** A summer annual that resembles a mulberry tree seedling. Lower portions of the stem may become dark maroon. Leaves are alternate, roughly triangular in outline with prominently toothed margins. The leaf surface is glossy green and prominently veined. Petioles are about half as long as the leaf blade. Flowers are in feathery clusters, up to 0.75 inch in diameter, in the leaf axils. Flower clusters are purple when young, fading to dark brown with age. It is a prolific seed producer that spreads rapidly in landscape beds. Mulberry weed can expel seeds up to 4 feet. It is often spread by way of container nursery plants. A relative newcomer, it is one of the worst landscape weeds in Arkansas. Do not let it become established.

**Control:** Either pendimethalin or prodiamine applied in March will control mulberry weed preemergence. Gallery® (isoxaben) is also effective. Repeat application in 90 days for full-season control. Prevent introduction as much as possible. Inspect container nursery stock for mulberry weed and remove before planting. Control strategies should include exclusion, sanitation, mulching and herbicides. When pulling mulberry weed, do not discard the plants on the site. Place in a container and dispose in the trash.

# Landscape Weeds



John Boyd

## Common yellow woodsorrel

**Species:** *Oxalis stricta*

**Description:** Small perennial, 3 to 9 inches tall, often forming small rhizomes. The rhizomes give rise to nearby plants. Leaves divided into three leaflets. Leaflets are heart-shaped, partly folded and have a definite sour taste. Flowers are bright yellow with five petals (inset). Forms okra-like fruit. Stalks turn down and the okra-like fruit remains erect, forming an elbow just beneath the fruit.

**Control:** Prevention and sanitation are keys in preventing the establishment and spread of this weed. Do not let it go to seed. In landscape beds, either pendimethalin or prodiamine applied in March will control woodsorrel preemergence from seed. Gallery® (isoxaben) is also effective.

## Chamberbitter

**Species:** *Phyllanthus urinaria*

**Description:** A prolific seed producer. It spreads readily via container nursery plants. Found most often in landscape beds, occasionally in lawns. Chamberbitter is an upright-growing summer annual with a strong taproot. The stems are red to green. Leaves are thin, smooth-margined, oblong and arranged in two rows on the branchlets. The flowers are inconspicuous. Reproduces by seed; seeds have a strong light requirement for germination. The fruit is a round, warty capsule without a stalk, singly attached to the underside of the branches (inset). Each fruit capsule contains six seeds. The plant grows up to 3 feet tall.

**Control:** Inspect container nursery plants for chamberbitter and remove before planting. Do not let this weed go to seed. When hand pulling, do not shake the dirt off the roots. Place in a container and dispose in the trash. In landscape beds, either pendimethalin or prodiamine applied in March will control chamberbitter preemergence from seed. Gallery® (isoxaben) is also effective. In tolerant turfgrasses, atrazine or three-ways (2,4-D + dicamba + MCPP) provide fair to good postemergence control. Repeat applications will be needed.



John Boyd

## Violet

**Species:** *Viola* spp.

**Description:** Perennial, 2 to 5 inches tall. Leaves are all basal, not lobed, but scalloped on the margin, mostly hairless. Flowers blue violet to lilac or white. Usually found in shady areas with thin turf. Many species of violet are found in Arkansas landscapes.

**Control:** Very difficult to control. In turfgrass, Manor<sup>®</sup>, Mansion<sup>®</sup>, MSM OD25<sup>®</sup> or Blade<sup>®</sup> (metsulfuron) is an effective violet control herbicide in bermudagrass, centipedegrass, St. Augustinegrass and zoysiagrass. Products containing triclopyr and clopyralid (Confront<sup>®</sup>, Turflon<sup>®</sup>), 2,4-D + fluroxypyr + dicamba (Escalade 2<sup>®</sup>) or triclopyr + phenoxy herbicides (Cool Power<sup>®</sup>, HorsePower<sup>®</sup> or Chaser<sup>®</sup>) are fairly effective

for violet control. These products may be used on cool-season grasses such as tall fescue. Three-ways (2,4-D + dicamba + MCP) provide fair to poor postemergence control. Repeat applications are usually required. Mid to late fall applications are best followed by mid-spring to early summer applications. Ortho Chickweed and Oxalis Killer<sup>®</sup> (8% triclopyr) is a good choice for homeowners. Do not use this product on centipedegrass, St. Augustinegrass or bermudagrass. One course would be to adopt violet as a groundcover.



John Boyd



John Boyd

## American burnweed

**Species:** *Erechtites hieracifolia*

**Description:** American burnweed is a warm-season annual with alternate leaves that are sharp, pointed and have toothed margins. The flowers resemble dandelion puffs when mature. The seed is readily dispersed by wind. Without mowing, it will reach a height of 5 to 6 feet.

**Control:** American burnweed is readily controlled with the postemergence broadleaf products commonly used in lawns, such as 2,4-D + MCP + dicamba, metsulfuron, Celsius<sup>®</sup>, Blindside<sup>®</sup> and others. Preemergence products such as simazine, FreeHand<sup>®</sup> and Specticle have been effective.

# Landscape Weeds



John Boyd

## Hairy bittercress

**Species:** *Cardamine hirsuta*

**Description:** A very common cool-season annual in lawns and ornamental beds. The pinnate leaves are arranged in a basal rosette. Height ranges from 3 to 9 inches. The flowers are tiny and white with four petals. The fruit consists of long, skinny, purplish pods that explode to spread seeds.

**Control:** In landscape beds, a late fall application of Snapshot® or another ornamental herbicide containing isoxaben will provide control. In warm-season lawns, simazine or atrazine applied in late November or early December provides good to excellent preemergence and early postemergence control. Metsulfuron (Manor®, Mansion®, MSM OD25® or Blade®) is very effective

postemergence in warm-season lawns. Prodiamine, pendimethalin and dithiopyr are not effective for preemergence control of hairy bittercress.

## Purple deadnettle

**Species:** *Lamium purpureum*

**Description:** A cool-season annual that is very similar to henbit (same genus). Unlike henbit, the upper leaves have petioles. The leaves are opposite, crowd the upper stem and are commonly reddish or purplish tinged. A member of the mint family, purple deadnettle has square stems. The flowers are tubular and light purple.

**Control:** Simazine or atrazine applied in late November or early December provide good to excellent control. Metsulfuron (Manor®, Mansion®, MSM OD25® or Blade®) is very effective postemergence. Three-ways (2,4-D + MCPP + dicamba) alone provide only partial control of purple deadnettle. Tank mixing a three-way with simazine, atrazine or metsulfuron solves the problem of poor control. Apply early (between December and March 1) before the weeds get big. In landscape beds, a late fall application of Snapshot® will provide control.



John Boyd



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