Integrated Pest Management for the Garden & Landscape: Insect and Mite Pests

Diane Alston, Entomologist
Utah State University
Master Gardener Entomology Lecture
2016
USU Extension Pest Management Team

Dr. Ricardo Ramirez
Entomologist

Dr. Claudia Nischwitz
Plant Pathologist

Marion Murray
Plant Pathologist
IPM Project Leader

Ryan Davis
Arthropod Diagnostician
Utah Plant Pest Diagnostic Lab

Dr. Lori Spears
Entomologist
Invasive Pest Survey

Dr. Diane Alston
Entomologist
IPM Coordinator
Utah Pests Online Resources
www.utahpests.usu.edu

One-stop shopping for pest management information
Fact Sheets

Arthropods and plant diseases:
>230 fact sheets

Health-related
Forage & field crops
IPM (general)
Natural enemies
Nuisance
Ornamental
Pantry
Pollinators
Small fruit
Structural
Tree fruit
Vegetable
Video Fact Sheets

4-7 min how-to videos
homemade insect traps
low toxicity pest management options
insect identification
insect monitoring
Utah Pests Newsletter

Free, quarterly newsletter
Current pest topics
New research results
Useful resources
Sign up to subscribe at www.utahpests.usu.edu
Pest Advisories
(integrated pest management)

www.ipm.usu.edu
Free subscription
Timely info on pest activity
1. Tree fruit advisory
2. Small fruit & vegetable advisory
3. Landscape ornamental advisory
4. Turfgrass advisory
   - insects, mites, diseases, nutrient deficiencies, environmental stress
Lots of images!
IPM recommendations
Effective pesticides
- home garden & commercial
Pest Diagnostics

Utah Plant Pest Diagnostic Lab
$7 Diagnosis

www.uppdl.usu.edu
Look for this slideshow and others at utahpests.usu.edu

Over 100 slideshows posted

This one posted under “Home Yard and Garden”
Developing an IPM Program for your Garden and Landscape

IPM
Sustainable
Organic
IPM: Integrated Pest Management

- Plan ahead (use preventive strategies where possible)
- Use multiple pest management tools
  - Cultural
  - Mechanical
  - Biological
  - Chemical
- Treat only if needed (thresholds)
- Environmentally, economically, and socially sustainable
Keystone to IPM - Monitoring: Target & Timing

- Target susceptible life stages
  - Usually eggs and/or young
- Time the control for weak points in their life cycle
  - For severe and recurring pests - early in seasonal cycle when life stages are synchronized and before substantial injury has occurred
  - For occasional pests - wait and see if pest will be abundant
Scouting for Pests

- Look at the big picture
  - Pattern of plant decline/injury
    - Pest injury tends to be aggregated
    - Can injury be associated with irrigation or other pattern?
- Look at new growth
- Check for root/crown problems
- Hand lens for small insects and mites
- Scout every 1-2 weeks

Raspberry horntail injury to cane tips
Cultural Control: Healthy Plants – “Best Practices”

- Select plant species and cultivars adapted to the site
- Use good plant production practices
  - fertility, water, sunlight, etc.
- For annual plants, rotate location across years
  - avoid build-up of soil pests
- Stressed plants are more attractive and susceptible to pests
Cultural Control: Sanitation

- Pick up / chop up dropped fruit
- Remove structures / sites where insects may overwinter (wood piles, garden debris, etc.)
- Prune out diseased limbs (cankers)
Mechanical Control: Traps and Barriers

- Traps
  - Yellow jacket wasps, slugs,
  - spiders
- Sticky bands
  - Trees and shrubs
- Row covers
- Diatomaceous earth
Biological Control Insect Groups

- **Predator**
  - consumes (kills) two or more individuals to complete its development

- **Parasitoid**
  - consumes (kills) exactly one individual to complete its development

- **Parasite**
  - consumes, but generally does not cause the death of one or more individuals; reduces growth rate & health of host
Beneficial Insects & Mites

Cast of Common Characters in the Garden

- Common aphid predators
- Parasitic wasps & flies
- Lacewing
- Syrphid Fly
- Lady Beetle
- Predaceous mites
- Predaceous true bugs & beetles
Beneficial Insects
Lady Beetles
Lacewings

Green Lacewing

Brown Lacewing
Lacewing eggs are laid on stalks.

Green Lacewing Egg Cluster

Green lacewings lay their eggs in clusters.
Brown Lacewing Eggs
Laid singly
Lacewing larva preying on aphids

Siphoning mouthparts
Syrphid Fly/Hover Fly
Syrphid or Hover Fly Adult

Mimic bees & wasps – black/yellow stripes on abdomen

Flies have large eyes

Feed on nectar at flowers
Predatory Mites

Typhlodromus
Western predatory mite

Phytoseiulus
mite

Balustium mite
Parasitoids (Wasps, flies)

Ichneumon Wasp
Long ovipositor
Parasitoids (Wasps, flies)
Parasitoids

Wasps parasitizing insect eggs & scale
Aphid Parasitoids

Aphid Mummies
Misconceptions About Biological Control in the Home Garden

- Releasing insects is the best method - **No**
  - Lady beetles (or lady bugs)
  - Praying mantis
- Predatory insects will stay in your garden after release - **No**
- Other practices/activities don’t matter - **No**
Beneficial Insects Need a Diverse Diet & Shelter

- Protein and sugar food sources
  - Protein
    - Insect prey, pollen, bird droppings
  - Sugar
    - Nectar, plant nectaries, aphid honeydew
- Shelter & varied habitat
Biological Control: Enhance Biodiversity

- Diversity across the landscape
- Diversity throughout the season and from year to year
- Needs to be the right kind of diversity!!
The Attractive Garden

- Color
- Texture
- Design
- Variety
- Function

- Plant Diversity
- Continuous Bloom
- Nectar & Pollen
- Shelter
- Variety of Insect Prey
- Water & Mud
Native Pollinators
Gardening for Pollinators & Beneficial Insects

www.utahpests.usu.edu

Fact sheets: Insects-Beneficial

Garden Plant Recommendations for Wild Bees of North America

This table contains nearly 200 garden plant genera with species whose flowers are sought by wild bees of North America. The Code column is useful for Utah gardeners. Some additional species not coded as G or U are suitable for Utah but only in the hot, southermost climates (e.g., Lantana or crescent bush). G = genus in Utah, U = Utah native, W = water-wise, F = food product. Form tells whether the usable species in the genus are annual, perennial, shrub, or tree.

Plants in bold Italic are great choices for Utah gardeners.

<table>
<thead>
<tr>
<th>Genus</th>
<th>Family</th>
<th>Common Name</th>
<th>Code</th>
<th>Forms</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abelia</td>
<td>CAPRIPOLACEAE</td>
<td>abelia</td>
<td>G</td>
<td>P</td>
<td></td>
</tr>
<tr>
<td>Acacia</td>
<td>FABACEAE</td>
<td>acacia</td>
<td>U</td>
<td>ST</td>
<td></td>
</tr>
<tr>
<td>Acer</td>
<td>ACERACEAE</td>
<td>maple</td>
<td>G</td>
<td>P</td>
<td></td>
</tr>
<tr>
<td>Achillea</td>
<td>ASTERACEAE</td>
<td>yarrow</td>
<td>U</td>
<td>GU W</td>
<td>A. millefolium weedy</td>
</tr>
<tr>
<td>Aconitum</td>
<td>RANUNCULACEAE</td>
<td>mortonsosid</td>
<td>U</td>
<td>P</td>
<td></td>
</tr>
<tr>
<td>Agastache</td>
<td>LAMACEAE</td>
<td>hyssop</td>
<td>G</td>
<td>P</td>
<td></td>
</tr>
<tr>
<td>Alyssum</td>
<td>LAMACEAE</td>
<td>carpet bugle</td>
<td>G</td>
<td>P</td>
<td>see Fig. 10</td>
</tr>
<tr>
<td>Althaea</td>
<td>MALVACEAE</td>
<td>hollyhock</td>
<td>G</td>
<td>P</td>
<td>not double-flowered</td>
</tr>
<tr>
<td>Amelanchier</td>
<td>ROSEACEAE</td>
<td>serviceberry</td>
<td>U</td>
<td>GU S</td>
<td></td>
</tr>
<tr>
<td>Amorpha</td>
<td>FABACEAE</td>
<td>false indigo</td>
<td>G</td>
<td>S</td>
<td></td>
</tr>
<tr>
<td>Anchusa</td>
<td>BORAGINACEAE</td>
<td>wild forget-me-not</td>
<td>G</td>
<td>P</td>
<td></td>
</tr>
<tr>
<td>Anemone</td>
<td>APARACEAE</td>
<td>dill</td>
<td>G</td>
<td>A</td>
<td></td>
</tr>
<tr>
<td>Aquilegia</td>
<td>RANUNCULACEAE</td>
<td>columbine</td>
<td>G</td>
<td>P</td>
<td>not double-flowered</td>
</tr>
<tr>
<td>Astilbe</td>
<td>ERICACEAE</td>
<td>mountain laurel</td>
<td>G</td>
<td>S</td>
<td></td>
</tr>
</tbody>
</table>
Protect, Conserve & Promote Native Insects

- Diverse, healthy garden with flowering plants
  - Continuity in food & shelter in space & time
- Quality pollen & nectar
  - Wildflowers, herbs, fruit trees
- No toxic pesticides
  - Use cultural & mechanical pest management practices
  - Use selective, “soft” pesticides
- Tolerate some plant-feeding insects
  - Natural enemies must have food to survive

Start from the bottom up – healthy soil
Fruit Insect Pests
Codling Moth

- Caterpillars bore into fruit
- Moths emerge in spring
- Eggs laid on fruit & leaves
- 1st instar larva bores into fruit w/in 24 hr
- Chemical control: target newly hatched larva; timing based on moth trap catch info. & degree-days in your area
  - Tree Fruit IPM Advisory
    - acetamiprid/Ortho (14 d)
    - carbaryl/Sevin (14-21 d)
    - gamma cyhalothrin/Spectracide (14 d)
    - spinosad (7 d)
    - malathion (7 d)
    - CM virus (CydX; 7 d)
- Sanitation: pick up dropped fruit
Mechanical Control: Codling Moth

Pupate inside silken cocoons on trunk
Corrugated cardboard band - “mass-trap” to reduce population

Fruit bags to exclude codling moth eggs
Place bags over 3/4” diameter fruit
Peach Twig Borer

- Over winter as young larvae on limbs; brown caterpillars burrow inside twigs from bloom to petal fall; 2nd & 3rd generations enter fruit, usually at the stem end
- **Delayed Dormant Spray:** Dormant oil + permethrin or gamma-cyhalothrin (by first pink) – targets twig boring OR At-Bloom Sprays: 2 Bt sprays (early & full to late bloom)
- **Fruit Protection:** same insecticides as for CM timed with trap catch and degree-day info. or apply at shuck-fall & repeat if needed
  - **Tree Fruit IPM Advisory**
Fruit-Eating Wasps: Paper wasps

**European paper wasp (fruit-eater):**
- Thin waist, more black than yellow,
- Upside down umbrella-shaped nests

**Yellow jacket:**
- “Chunky” body, more yellow than black
- Paper nests in ground & under dense vegetation
- Aggressively defend nest (painful sting!)
Wasp traps

- Place around perimeter of garden and yard and in spots slightly away from high human activity
- Yellow jacket – predator/scavenger
  - Commercial traps with heptyl butyrate bait
  - Homemade trap with raw meat
  - Locate ground nests in area - treat with insecticides & remove
- European paper wasp – fruit-eater
  - Homemade trap - liter plastic bottle with diluted fruit juice (1 part juice: 10 parts water) – ferment juice (1/4 tsp yeast) + 1/4 tsp liquid dish detergent (add piece of ripe fruit to excel fermentation)
  - Treat & remove nests
Aphids

- Suck fluids from leaves & stems; curl leaves; produce sticky honeydew; black sooty mold growth
- Protect young trees, older trees can tolerate more aphid feeding
- **Controls:** Dormant oil at green tip stage
- Insecticidal soap, horticultural oil, azadirachtin, malathion
- **Biological control:** lady beetles, lacewings, syrphid flies, parasitic wasps
Spider Mites

- Feed on leaves; produce webbing; injury appears as white speckles; severe feeding leads to bronzing
- Mites build up on broadleaf weeds (bindweed, knotweed, mallow, prickly lettuce); reproduce rapidly in hot weather
- Cultural controls: Avoid mowing, herbicides, drying of vegetation - prompts mites to move into trees
- Avoid multiple applications of pyrethroid insecticides (permethrin, gamma-cyhalothrin)
- Biological control: naturally occurring predatory mites & small lady beetle
- Chemicals: horticultural oil, insecticidal soap
Aphid & Mite Mechanical Control

Stiff spray of water every 2-3 days until aphid or mite numbers decline

Best if initiated before leaves are tightly curled (aphids) or extensive webbing & leaf injury occurs (mites)
VEGETABLE AND HERB INSECT PESTS
Squash Bug

- Adults & nymphs suck fluids from plant leaves, stems & fruit
- “Sudden wilt” – disruption of xylem vessels
- Congregate in plant debris under plants
- **Cultural controls:** Remove garden debris in fall, nearby woodpiles or other protected sites (adults over winter)
- Hand pick or destroy eggs & nymphs
- **Chemicals:** spray when first detect nymphs, drench undersides of leaves & stems
  - kaolin clay (Surround), malathion, carbaryl, neem oil
Corn Earworm

- Caterpillars feed on new silks & ear tips; reduce pollination & damage ear tips; allow entry of molds & attract other insects (sap beetles, earwigs)
- **Cultural control:** Early crops avoid injury (silk before mid July)
- Protect young silk; difficult to control worms once inside ear tip
- **Chemicals:** carbaryl, permethrin, pyrethrin, neem oil, oils applied to silks (reapply every few days)
Tomato Hornworm

- LARGE green caterpillars with horn on tail
- Feed on tomato, eggplant, potato
- Consume large amounts of foliage and buds in a short time period
- Remove by hand
- Chemicals: Bt (Dipel, Thuricide), spinosad, many others
- Parasitic wasp – white cocoons on caterpillars
Landscape Ornamental Pests
Conditions that Promote Bark Beetles

- **Drought**
- Trees on dry, sloping sites
  - Tree stress
  - Dry soils in spring and fall
    - Supplemental irrigation is absent or inadequate
- Longer, hotter growing seasons
  - More bark beetle generations
- Warmer winters
  - Higher overwinter survival, more generations
- Cyclic populations of bark beetles
  - Established populations in an area
  - Spread from foci / sources
Primary bark beetles in urban landscapes of Utah

- *Ips hunteri* & *I. pilifrons*
  - blue & Engelmann spruce
- *Ips pini*
  - ponderosa & lodgepole pine
- *Ips confusus*
  - pinyon & singleleaf pine
- Banded elm bark beetle
  - *Scolytus schevyrewi*
  - elm
- Shot hole borer
  - *Scolytus rugulosus*
  - apple, pear, cherry, hawthorn
- Black walnut twig beetle
  - *Pityophthorus juglandis*
  - black walnut

*Ips* have obvious spines on rear of outer wings and a concave depression.

*Ips* are tiny! 1/8 – 3/8 inch long.
Distinguishing characteristics of bark beetles

- Spruce Ips galleries: “octopus arms”
- Elm bark beetle galleries: “radiating arms”
- Adult Pinyon Ips hind end
- Banded elm bark beetle adult

How do they feed and tunnel in trees?

Size, shape, and color & spine patterns on adults
Key Ips management strategy: Prevent tree stress

- Avoid dry planting sites
  - slopes, south-facing
  - fast-draining soils, inadequate irrigation
- Provide deep irrigation
  - 2-4 inches water/month for established trees
- Avoid over-crowded plantings
- Avoid compacted soils
  - construction sites
- Prevent mechanical injuries
- Remove Ips-infested trees (foci)
  - remove infested wood
  - properly dispose: chip & dry, remove bark, burn
Ips control: Insecticides

- Preventive application
  - when infested trees are in the neighborhood
- Save trees infested < 30%
  - Loss of central leader will permanently distort tree shape
- Apply insecticide to entire bole & interior of lateral limbs
  - Spring (March) before beetle flight
  - Daily temps >50°F
  - Kill beetles when chew thru insecticide-soaked bark
  - Fall (Sept)
- High pressure (> 250 psi), drenching spray to run-off, professional applicator & equipment
  - Thorough coverage!
Examples of effective insecticides

- Carbaryl (carbamate)
  - Carbaryl 4L, Sevin XLR
- Bifenthrin (pyrethroid)
  - Bifen XTS
  - Onyx
- Permethrin (pyrethroid)
  - Astro
  - Hi Yield 38 Plus<sup>Homeowner</sup>

- 1-2 applications per year
- To date, systemic insecticides have not shown good efficacy
Sanitation: Treating infested wood

- Promptly remove wood from the landscape
  - >2-3 miles from host trees
- Check wood for live beetles
- Kill beetles within wood
  - Remove bark
  - Chip wood & spread to dry
  - Cover log pile with clear plastic
    - >130°F for a month (summer)
  - Burn wood

Ips pupa, larva, and adult within gallery tunnels

Cover infested logs with clear plastic to kill bark beetles with heat
**Scolytus spp.: Elm bark beetles**

- **Banded elm bark beetle**
  - *Scolytus schevyrewi* (1/8 inch)
  - Spine

- **European elm bark beetle**
  - *Scolytus multistriatus* (1/16-1/8 inch)

- **Dying elm trees**

**Attack elm** (American, Siberian, English, rock), *Prunus* spp., willow, Russian olive, possibly Zelkova

**Vector Dutch elm disease** (fungus)

**Galleries with “radiating arms”**

**External twig & branch crotch feeding**
Elm bark beetle & Dutch elm disease (DED) management

- DED resistant elm cultivars

- Preventive insecticides
  - adult emergence: May-June (1-3 gens/yr)
  - canopy, limbs, and upper trunk
  - bifenthrin, cypermethrin, permethrin, carbaryl

- Prune out infected limbs
  - brown vascular tissue in limbs, twigs

- Sever root graphs between elm trees (fungus spread)
Elm bark beetle & DED fact sheet

www.utahpests.usu.edu
Fact sheets:
Insects – Landscape Orn.
Shothole Borer: *Scolytus rugulosus*

Hosts: *Prunus* spp.
- cherry, apple, pear, hawthorn

< 1/16 inch diam holes
1/8 inch long beetle

- Entry holes with sap
- Exit holes: "shothole"

- Cut out infested limbs
- Keep trees healthy
- Attack stressed trees
- Insecticides at peak adult flights:
  - spring & fall

- Keep trees healthy
- Attack stressed trees
- Insecticides at peak adult flights:
  - spring & fall
Walnut twig beetle
Pityophthorus juglandis

- Vectors tree-killing fungus
- Thousand Cankers Disease
- Primary host: black walnut
- can attack & kill other walnuts
- Primarily attack limbs ≥ ¾ inch diam
- Colorado State Univ. Pest Alert (online)
- USU Fact Sheet
- www.utahpests.usu.edu
Thousand Cankers Disease Symptoms

- Yellowing & thinning of upper crown
- Death of progressively larger branches
- Rapid wilt of foliage (final stages)
- ~ 3 yrs to kill trees

Geosmithia morbida cankers and black walnut limb death
Distribution of walnut twig beetle & thousands cankers disease

- Black walnut tree death in Utah first noticed in early 1990's
- First UT WTB specimen – 1988
- Arizona walnut, *Juglans major*, may be native host for WTB
- Earliest specimens: 1898 (NM)

Walnut twig beetle adult ~ 1/16 inch, yellowish-brown color
Management of WTB and TCD

- No controls for fungus – prevention of beetle attack
- Preventive insecticides
  - Spring & summer – same products as for other BBs
- Sanitation
  - Pruning
  - Removal & disposal of infested wood
- Quarantines on transport of black walnut wood to some states
Monitoring walnut twig beetle

- USFS Entomology Team developed pheromone trap
- Identified aggregation pheromone
- Pheromone-baited funnel trap
- Trapped WTB from Richmond (N) to Cedar City (S)
- Contech pheromone lure & funnel trap available from Forestry Distributing
  - www.forestrydistributing.com

Place traps ~10 ft high near host trees
Bark Beetle Take-Home Points

- Prevention!!
  - Maintain tree health / prevent stress
    - Planting site, irrigation, protection
- Sanitation!
  - Promptly prune affected limbs or remove infested trees
  - Properly dispose of infested wood
    - Chip, tarp, burn, dispose ≥3-4 miles
- Insecticides (preventive)
  - Timed for spring and fall (adult flight periods)
  - Good coverage, high pressure, soak bark

Mountain pine beetle has devastated Uinta Mountain pines in some areas.
Scale Insects

European Elm Scale

Soft Scales

Lecanium Scale

Oystershell Scale

Armored Scales

Black Pineleaf Scale
Scale Infestation

Symptoms

- Twigs & limbs encrusted in scale insect bodies
- Chlorotic leaves
- Necrotic spots on leaves & fruit
- Soft Scales: honeydew (because feeding in tree phloem)
- Limb dieback when scales are abundant
Scale Mechanical Control

- Prune out infested limbs
- Place sticky bands to trap the young “crawler” stage (late May – July; timing varies with species)
- Primarily a monitoring tool
Scale Insecticides

- Dormant Oil Spray (2-4%)
  - Spring – at bud break – smothers overwintering scales
- Systemic soil drench or injection
  - Spring (Post-bloom)
    - Soft Scales – imidacloprid (Merit, Bayer Advanced, others)
    - Armored Scales – dinotefuran (Safari) – ornamentals only
- Target Crawlers
  - June to July (varies with species; sticky bands to monitor)
    - horticultural oil, insecticidal soap, carbaryl (Sevin), dinotefuran (Safari), pyriproxyfen (Distance), buprofezin (Talus), azadirachtin (Azatin, Neem oil), synthetic pyrethroids (Tempo, Talstar, others), malathion
High Alert for New Invasive: Emerald Ash Borer
Emerald Ash Borer: Invasive – not in Utah, yet…

Emerald Ash Borer is on our doorstep
- Native to Asia
- Flatheaded beetle (Buprestidae) (~1/2 inch)
- Larvae feed on inner bark disrupting water & nutrient transport
- First found in the U.S. in MI in 2002
- Killed nearly 60 million ash trees (~50 million in southern Michigan)
- Attacks mature trees (olive family, Oleaceae)
  - Ash: all species of North American ash
  - White fringetree (Chioanthus virginicus L.)
Monitoring

D-shaped exit hole
Monitoring
Knowing When or Whether to Treat

- No threshold has been set
- When present, trees should be protected
  - within two miles of attacked tree
- Protective trunk, branch & foliage sprays
  - Pyrethroids: bifenthrin, cyfluthrin, permethrin
    - carbaryl
- Systemics – inject, drench, or bark spray
  - dinotefuran
  - imidacloprid
Don’t move infested wood!
Turfgrass Insects
**Turfgrass IPM Advisory**

**Seasonal Turfgrass Pest Update, Utah State University Extension, Fall 2014**

**Turfgrass Integrated Pest Management**

An integrative approach to the management of turfgrass insect pests, diseases, and weeds is most effective. Often, prevention is the best strategy and management practices can help grasses to resist and recover from pest damage.

**News/What to Watch For**

New information is available regarding billing activity and management in the state, including a new insecticide option. We also have a new insect pest to contend with in Utah. Cranefly fly has been found in the state for the first time this year. Of course, routine fall management practices are also a priority now.

**Billbug: Activity in Turf and a New Insecticide Option**

Billbugs (Sphenophorus spp.) are a primary pest of turfgrass in the Intermountain West. Adult weevils deposit eggs in turf stems. Larvae then emerge from the eggs and feed within the stems. Plumes later feed on roots below ground, and eventually pupate with adults emerging from the soil. Although the adults do feed on turf, the majority of turf damage results from larval feeding and is seen as severe discoloration resembling drought stressed turf, and in severe cases plant death.

Most of what we know about billbugs comes from research conducted in the eastern U.S., yet we find many differences in Utah and the Intermountain West. In the Intermountain West, there is a complex of three billing species that occurs simultaneously including the bluegrass, turfgrass, and Rocky Mountain billbugs. In some isolated spots, the Phoenix billing also occurs. In other regions of the U.S., only one and sometimes two of these species will be present as major pests.

Current predictive models for billing activity do not appear to be as good for predicting billing populations in the Intermountain West. For example, first occurrence of billbugs in Logan, UT in 2014 was more than one month earlier (60 degree days; April 12) than what would be predicted by the current Base 50 degree day (CDD) model used in the west (210-332DD; May 26-13). Recognizing these differences is key to improving the timing and reducing efficacy of management strategies that are available.

**Summer Patch (Magnaporthe poae)**

Favorable Conditions: warm temperatures (60-70°F) and high soil pH. Excessive N fertilization in the spring.

Summer patch (SP) damage appears as circular patches, or rings from 4 inches to 3 feet in diameter. Patches are initially off-color and prone to wilt, eventually turning yellow or straw-colored. Outer edges of the patches are usually orange or brown. Affected plants have rotted roots, browning, and crowns and pull readily from the turf. SP has been positively identified in Millard, San Pete and Salt Lake counties this summerfall.

**Cultural Practices**

Fertilization with sulfur-coated products or ammonium sulfates can help moderate pH and minimize SP development. Practice deep and infrequent irrigation. Avoid thatch buildup and compaction.

**Resistant Turfgrass Varieties**

**Kentucky Bluegrass**

- Midnight, Everglade, Everest, NuDestiny, Granite Seed Co., Corsair, America, and Blue Velvet show resistance to SP and are still susceptible under high disease pressure. Perennial ryegrass is immune to the disease.

**Fungicide Options**

- Azoxystrobin (Heritage), mycoplastalin (Tagte), propiconazole (Bayer’s MAX, Propiconazole Pro), and azoxystrobin + propiconazole (Haywood).

**Neocrotic Ring Spot (Ophiobolus gramineus)**

Favorable Conditions: cool (40-60°F) and moist conditions, may be compounded by drought and compaction.

Neocrotic ring spot (NRS) primary fly infests Kentucky bluegrass; though it may also be seen in annual bluegrasses and tall fescues. The disease damages the roots and crowns of the grass plants and the first symptoms are small, light green patches of turf that get larger over time. Frequently, the turf will survive the infection and re-grow in the center of the patches, giving them a ring-like (“rings eye”) appearance. NRS has been positively identified in Beaver, Cache, Davis, Salt Lake, San Pete, Utah, Wasatch, and Weber counties this summerfall.

**Cultural Practices**

Maintain the highest mowing height possible and prevent drought stress. Core aerate once annually to reduce thatch and avoid over application of N fertilizers.

**Resistant Turfgrass Varieties**

**Kentucky Bluegrass**

- Midnight, Award, NuDestiny, Blue Velvet, America, Jump Start, Everglade, Everest, Gimmy II, and Rome. These varieties are resistant to NRS and are still susceptible to high disease pressure. Perennial ryegrass is also highly resistant to the disease.

**Fungicide Options**

- Azoxystrobin (Heritage), mycoplastalin (Tagte), propiconazole (Bayer’s MAX, Propiconazole Pro), and azoxystrobin + propiconazole (Haywood).

**Cyanobacteria (cont’d)**

**Solutions**

Eradication of cyanobacteria is not possible. However, increasing mowing height can reduce the problem. Grass will be less stressed and can tolerate the toxins better and the bacteria will not be able to crowd all the way to the tip of the grass where they cause the most damage.

When cyanobacteria are a severe problem three weekly applications of fungicides containing chlorothalonil can help control the problem. Fungicides with other active ingredients like mycoplastalin or azoxystrobin are not effective.

More information can be found at [http://www.pacerturfl.org/PFiles/Documents/0608b.pdf](http://www.pacerturfl.org/PFiles/Documents/0608b.pdf)

- Claudia Nachtritz, USU Extension Pathology Specialist

**Chinch Bugs (Blissus spp.)**

We’re continuing to see chinch bug activity this summer in several Utah counties. Typical chinch bug damage is comprised of patchy dead or brown larger patches and in severe cases, complete lawn loss. Feeding damage can often mimic drought stress; however, chinch bug damage will not respond to increased watering as a drought-affected lawn would. Feeding damage is often worse on plants that are already stressed by drought.

In Utah, chinch bugs seldom require insecticidal treatment unless the population has exceeded threshold levels and damage is evident. Effective insecticides include bifenthrin and other pyrethroids. Preventive management practices include proper irrigation, regular fertilization, reducing thatch via power raking and core aeration, avoiding the use of broad-spectrum insecticides that can reduce beneficial insects, and overseeding or replacing a lawn using endophyte-enhanced grass seed (see Spring 2013 Turfgrass IPM Advisory).

-Ryan Davis, USU Anthropod Diagnostician
White Grubs

- Immature stage of scarab beetles
- Eat turfgrass roots
- 3 kinds established in UT
  - May/June beetle
  - Masked chafer
  - Black turfgrass Ataenius
  - Japanese beetle – Orem eradication program

Not to scale!
**White Grubs**

- When mature, grubs range from 3/8 to 2 inches long
- C-shape when at rest
- 3-pairs of legs (obvious)
- Life cycle length
  - Several gens per yr – black turfgrass Ataenius
  - 1 gen per yr – masked chafer
  - 1 gen every 2-3 yr – May/June beetle
- Brown turf patches apparent in late summer
- Damaged turf feels “spongy”
- Turf pulls up easily from roots
White Grubs
1-3-year life cycle

Spring

Systemics

Summer

Contact materials

Fall/Winter

Pupate

Can spend 1-2 years as 2nd to 3rd instar larva

2nd-3rd instars move 3” to 12” deep for winter
White Grub Management

- Apply systemic insecticides in early summer before eggs hatch to allow adequate time for plant uptake
  - Acelepryn (chlorantraniliprole)
  - Arena (clothianidin)
  - Merit (imidacloprid)
- Apply contact insecticides in mid summer through early fall before the grubs move deeper in the soil zone to spend the winter
  - Broad-spectrum
    - Dylox (trichlorfon)
    - Sevin (carbaryl)
  - Selective, reduced-risk
    - Concern (azadirachtin)
    - Mach 2 (halofenozide)
White Grub Management

- Before applying insecticides, reduce thatch layer to $\leq \frac{1}{2}$ in or aerate turf to increase penetration.
- Apply $\frac{1}{2}$ to $\frac{3}{4}$ in water to move insecticides into the root zone.
- Repeat irrigation every 4-5 days to continue chemical movement into the soil.
- Long-lasting clean-up of white grubs often requires several years of treatment.
Nuisance Bee Problems
Nuisance Bees: Sweat Bees

Do You Know?
- About 1,200 species of native bees reside in Utah, few of them rare or local.
- Some wild bees excel at pollinating bees such as tulips, raspberries, squash, melons, and cucumbers.
- Most of these native bees are solitary or parasitic.
- Others nest above ground in hollow dry stems, or bee holes, and are usually ground-dwelling.
- Smoke or other unsightly practices can provide essential nesting needs at any time of year.

Gardening and Landscaping Practices for Nesting Native Bees

James H. Cook, Research Entomologist, USDA, ARS

Ground Nesting

At least these four species of native bee species nest in the ground. Among these, only some sweat bees and all carpenter bees are adapted to soil nesting, meaning that each female has her own nest. Ground nests make a cylindrical nest tunnel. On the ground, the entrance is typically centered in a small cone of excavated soil that remains unremoved by rain or wind. Other insects also tend to soil, however, so to be certain no other insects live there, the resident bee must be seen coming or going.

Attractive Substrates

The goal of using a seemingly suitable site can be achieved, but many years may pass before the site is discovered by a native bee. Moreover, nests of many bee species have never been seen or described. For these reasons, there is little experimental evidence to guide gardeners and landscapers in the creation of attractive substrates for bees. Recent research shows that at least one common ground-nesting bee, a mason bee, is attracted to a mixture of mowed weeds, prairies, and disturbed sites that resemble the nests of native bees (Fig. 2). Vertical holes of bee tunnels are effective in attracting nesting by some bees, especially solitary sweat bees. In nature, these are like nests in a prairie or streamside, so keeping some small patches of well-established bee or soil surfaces can attract nesting too.

Ground substrates for nesting native bees can be created by using a mowed lawn, prairie, or garden with a mix of native plants. Bees prefer areas with at least one native plant species, so for the best results, these areas should be at least 20 feet in diameter.

Landscaping Practices to Avoid

Sprinkle irrigation. Avoid adding too much water to the soil. Watering can wash away soil and nutrients, making the soil more susceptible to erosion. Bees prefer to be in well-drained areas, so it is important to avoid oversaturating the soil with water.

Use native plants. Native plants are adapted to the local climate and soil conditions, making them more resistant to pests and diseases. They also provide food and shelter for native bees.

Avoid using pesticides. Pesticides can harm bees and other pollinators. Instead, use natural methods such as hand-picking or using physical barriers to control pests.

Avoid using lawn mowers. Lawn mowers can damage the soil and kill bee nests. Instead, use hand tools to cut the grass or leave some areas unmowed to provide nesting sites for bees.
Find this slideshow and others at www.utahpests.usu.edu

for your attention...

Contact us

Slideshows: Home Yard & Garden