Pesky Garden Pests – Lawns & Trees

Gary Fish
State Horticulturist
Maine DACF
gary.fish@maine.gov
207-287-7545
Do I need to manage a tree pest?

- Can it be physically removed
- Early season defoliation is most damaging
- Damage after late June is usually tolerable for trees
- Conifers are more susceptible
- Hardwoods can survive 1 – 3 years of defoliation depending on other stress factors
- Does it cause a rash
Eastern Tent Caterpillar
Browntail Moth
_Euproctis chrysorrhoea_

- Invasive insect from Europe
  - Order: Lepidoptera (moths)
  - Family: Lymantriidae
- Caterpillars have toxic hairs
Late season defoliation
Birch decline
Impacts of systemics used on trees and woody ornamentals

- Imidacloprid and dinotefuran are both highly toxic to bees.
- Low doses of these neonics may cause bees to behave in ways that lead to death or colony weakening.
- Imidacloprid changes to its olefin stage in trees and the olefin stage is 10 – 16 times more toxic to insects.
- Peak concentrations may occur 18 months after a soil treatment.

Richard Cowles Ph. D. Minnesota Turf & Grounds Foundation
Impacts of systemics used on trees and woody ornamentals

- Use in woody plants tends to concentrate systemics
  - Higher rates can be more risky to pollinators
  - Must not treat trees or shrubs that produce flowers that are highly attractive to pollinators unless they have finished flowering for that season
  - Best to use dinotefuran over imidacloroprid on trees that provide bee attractive blooms
    - Imidacloroprid can persist for as long as 8 years
    - Dinotefuran usually breaks down over one growing season

Richard Cowles Ph. D. Minnesota Turf & Grounds Foundation
Systemics can be harmful to beneficial predators and parasites

- Spider mite outbreaks have been observed after imidacloprid applications
  - May be the result of secondary poisoning of predators
  - May act as a fertility drug to the mites
  - Improves the health of the plant which feeds the mites
When’s the best time to plant grass seed or sod?

• If water is available, sod can be installed anytime

• Seeding is best done from August 15 – September 30
  – High soil temps, less weed emergence

• Seeding in May or June is less desirable
  – Low soil temps, large weed flush at same time grass emerges

Harvest Moon = best seeding time
# Turf Selection

<table>
<thead>
<tr>
<th></th>
<th>Kentucky Bluegrass</th>
<th>Perennial Ryegrasses</th>
<th>Tall Fescue</th>
<th>Fine Fescue</th>
</tr>
</thead>
<tbody>
<tr>
<td>Growth habit</td>
<td>Rhizotamous</td>
<td>Bunch</td>
<td>Bunch</td>
<td>Bunch</td>
</tr>
<tr>
<td>Leaf texture (blade width)</td>
<td>Medium–Fine</td>
<td>Medium</td>
<td>Coarse</td>
<td>Very Fine</td>
</tr>
<tr>
<td>Establishment from seed</td>
<td>Slow (approx. 30–90 days)</td>
<td>Fast (approx. 14–21 days)</td>
<td>Fast to Average (21–30 days)</td>
<td>Average (21–50 days)</td>
</tr>
<tr>
<td>Seeding rate</td>
<td>1 to 2 lb./1,000 ft.²</td>
<td>5 to 9 lb./1,000 ft.²</td>
<td>5 to 9 lb./1,000 ft.²</td>
<td>3 to 5 lb./1,000 ft.²</td>
</tr>
<tr>
<td>Annual nitrogen fertilizer</td>
<td>3 to 4 lb./1,000 ft.²</td>
<td>2 to 6 lb./1,000 ft.²</td>
<td>2 to 4 lb./1,000 ft.²</td>
<td>1 to 2 lb./1,000 ft.²</td>
</tr>
<tr>
<td>Drought tolerance</td>
<td>Poor</td>
<td>Poor</td>
<td>Some</td>
<td>Some</td>
</tr>
<tr>
<td>Shade tolerance</td>
<td>Poor</td>
<td>Poor</td>
<td>Good</td>
<td>Excellent</td>
</tr>
<tr>
<td>Wear tolerance (traffic)</td>
<td>Good</td>
<td>Good</td>
<td>Good</td>
<td>Poor</td>
</tr>
<tr>
<td>Insect tolerance</td>
<td>Some</td>
<td>Some</td>
<td>Excellent</td>
<td>Good</td>
</tr>
<tr>
<td>Disease tolerance</td>
<td>Some</td>
<td>Some</td>
<td>Good</td>
<td>Good</td>
</tr>
</tbody>
</table>
Low maintenance mixes

- Fine Fescues 40 - 50% of mix
  - Creeping Red Fescue
  - Hard Fescue
  - Chewings Fescue
- Tall Fescue 100% of mix, 2 – 3 varieties
- Common Kentucky Bluegrass
- Endophyte enhanced fescues or perennial rye

Example Mix

40% Endophyte Enhanced Creeping Red Fescue
10% Southport Chewings Fescue
30% Endophyte Enhanced Perennial Ryegrass
20% Kenblue KBG
How about *native plant alternatives* for a lawn?

Wild Strawberry and Pennsylvania Sedge.

Photos courtesy Native Plant Trust
Mow properly

- Mow high at 3 - 4 inches or highest setting
- Mow regularly
- Keep mower sharp
- Return clippings
- Vary mowing pattern

Mower exhaust = 11 cars’ exhaust
One hour of mowing = driving 400 miles
Mowers spew 87 lbs of greenhouse gases and 40 pounds of other pollutants annually
Water only when needed

- Deepen the roots by holding off on watering in the spring until you see signs of stress (turf has a blue or purple cast)

- Water deeply 3/4 - 1 1/2 inches per week
  - Don’t water every day (use a rain gauge)
  - 1 - 2 times a week is best
  - Water early in the morning (to reduce disease)

- To reduce water needs allow the turf to go dormant in the summer
  - apply 1/4 - 1/2 inch water every 3 weeks
Let it breathe

- Keep thatch under 1/2 inch
- Cut back on pesticide use
- Core aerate in the late summer or early spring
#1 Killer of grass
To much shade?

- Must have at least 6 hours of direct sunlight to grow lawn grasses
- Trees in shaded areas must be thinned and lower branches pruned
- Better yet leave the trees and plant shade tolerant ground cover
Weeds are the **RESULT** of a poor turf, not the **CAUSE** of a poor turf.
red or sheep sorrel

May indicate low soil pH

bluets
Crabgrass and goosegrass are found in dry or drought prone areas.
COMPACTATION!!
Change the growing environment

- adjust soil pH
- adjust soil moisture
- adjust sun exposure
- adjust air circulation

---

**Indicator weeds and soil conditions**

<table>
<thead>
<tr>
<th>Wet, waterlogged, poor drainage</th>
<th>Acidic or low lime</th>
</tr>
</thead>
<tbody>
<tr>
<td>Creeper buttercup, Coltsfoot, Ox-eye daisy, Curled dock, Moss, Plantain, Garden sorrel, Perennial sow thistle, Broad-leaved meadowsweet</td>
<td>Eastern bracken, Silvery cinquefoil, Coltsfoot, Ox-eye daisy, Dandelion, Curled dock, Hawkweed, Field horsetail, Knapweed, Prostrate knotweed, Moss, Common mullein, Nettle, Plantain, Garden sorrel, Sheep sorrel</td>
</tr>
<tr>
<td>Hardpan</td>
<td>Tilled or cultivated soil</td>
</tr>
<tr>
<td>Field bindweed, Quackgrass, Pineappleweed, Stinkweed</td>
<td>Buttercup, Chickweed, Prostrate knotweed, Lamb's quarters, Prickly lettuce, Mustard, Nettle, Redroot pigweed, Plantain</td>
</tr>
<tr>
<td>Alkaline</td>
<td>Heavy clay soil</td>
</tr>
<tr>
<td>Bladder campion, White mustard, Perennial sow thistle, Foxtail barley</td>
<td>Chicory, Coltsfoot, Dandelion, Annual sow thistle, Canada thistle</td>
</tr>
<tr>
<td>Dry soil</td>
<td>Overgrazed</td>
</tr>
<tr>
<td>Silvery cinquefoil, Field horsetail</td>
<td>Perennial bluegrasses, Bentgrasses</td>
</tr>
<tr>
<td>Nutrient imbalance</td>
<td>Saline soils</td>
</tr>
<tr>
<td>Eastern bracken (low K, low P), Yarrow (low K), Stinkweed (high lime)</td>
<td>Shepherd's purse, Russian thistle</td>
</tr>
<tr>
<td>Compacted</td>
<td></td>
</tr>
<tr>
<td>Velvetleaf, Jimsonweed</td>
<td></td>
</tr>
</tbody>
</table>

Weed control approach

• First rule of weed management – Exclusion!

• Mow as high as possible!

Illustration courtesy of Paul Wheaton, richsoil.com
Weed Control Approach
(BASIC STRATEGY - dense, tall turf tends to reduce weed invasion)

- Mow high, 3 - 4 inches MINIMUM
- Promote root growth – fertilize in late summer/early fall
- Reduce wear and compaction - encourage foot traffic away from turf; core aerify twice per year
- Overseed or slit-seed open areas ASAP
- Seed is the best weed control!
- Spot treatment with herbicides only when necessary.
Grub biology

- One generation per year
- Grubs active in spring (April-May) and fall (mid August through October)
- European Chafers active through the winter under snow
- Adults active in summer months

<table>
<thead>
<tr>
<th>Insect</th>
<th>Jan-Mar</th>
<th>April</th>
<th>May</th>
<th>June</th>
<th>July</th>
<th>August</th>
<th>Sept</th>
<th>Oct</th>
<th>Nov-Dec</th>
</tr>
</thead>
<tbody>
<tr>
<td>European chafer</td>
<td>3rd instar larvae –</td>
<td>3rd instar larvae –</td>
<td>Adults emerge, mate &amp; lay eggs – no feeding</td>
<td>1st instar larvae – feeding</td>
<td>2nd instar larvae – feeding</td>
<td>3rd instar larvae – feeding</td>
<td>3rd instar larvae – overwintering</td>
<td></td>
<td></td>
</tr>
<tr>
<td>June beetle</td>
<td>2nd instar larvae –</td>
<td>Adults emerge, mate and lay eggs</td>
<td>Eggs hatch – 1st instar larvae – feeding</td>
<td>2nd instar larvae – feeding</td>
<td>2nd instar larvae – overwintering</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yr 1</td>
<td>overwintering in soil</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yr 2</td>
<td>2nd instar larvae –</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yr 3</td>
<td>3rd instar larvae –</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Japanese beetle</td>
<td>3rd instar larvae –</td>
<td>3rd instar larvae –</td>
<td>Adults emerge, mate &amp; lay eggs – no feeding</td>
<td>1st instar larvae – feeding</td>
<td>2nd and 3rd instar larvae – feeding</td>
<td>3rd instar larvae – overwintering</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>overwintering</td>
<td>feeding</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Pest Identification is crucial

White grub rastral patterns

Japanese beetle

European chafer

May/June beetle

Asiatic garden beetle
New grub species

- Asiatic garden beetle
- Grubs are slightly smaller than Japanese beetle and European chafer
- Adults are drawn to bright lights at night
European chafers

- Active mostly in coastal areas of Maine
  - Bangor area has been heavily infested last 3 years
- Life cycle two weeks EARLIER than JB’s
- Least sensitive to cold temperatures
  - Feeds all winter under snow covered grass
- Most damaging species (grub for grub)
Look for the extended “V”
Monitoring Grubs

- Most grub damage happens in September - October or April - May

- Turn over 1 sq. ft patch of turf, count grubs or Cup cutter plug (0.1 sq. ft.)

- Threshold:
  - Japanese beetles 8 - 15 / sq. ft.
  - European chafers 4 - 10 / sq. ft.
  - May / June beetles 3 - 8 / sq. ft.

- **These levels are doubled on irrigated turf**
Cultural controls for grubs

- Avoid use of bluegrass
- Tall fescue may be more tolerant
- Let turf go dormant in July/August
- ¾ - 1 ½ inches of water every 5-7 days
- High pressure water injection (done on golf courses)
- Core aeration may also help
Water reduces grub damage

• Water deeply \( \frac{3}{4} \) - \( 1\frac{1}{2} \) inches per week
  – Don’t water every day (use a rain gauge)
  – 1 - 2 times a week is best
  – Water early in the morning (to reduce disease)

• Light watering (Syringing) on very hot afternoons is also acceptable

• Avoid irrigation 24 hours prior to sporting events
Biocontrols for grub control

- *Heterorhabditis bacteriophora* - nematodes
- *Bt galleriae* (GrubGone! G) – Soil bacteria
- Do Not use milky spore

Chinchbugs
Hairy Chinch Bug

- Small (<1/4” long) red to black, white wings
- Adults and nymphs suck grass sap causing injury
- 1-2 gens/yr. Overwinters as adult in protected areas near turf.
Chinch Bug Prevention and Monitoring

- **Prevention**: Irrigate regularly during hot, dry months

- **Monitoring**:
  - Insert bottomless coffee can into turf, fill with water, poke turf with stick.
  - Visual inspection - esp. when turf seems to be under drought stress

- **Threshold**: 15 bugs/6” diam. can
Biological Control - Chinchbugs

- Endophytes
- Protect big-eyed bugs
- *Beauveria bassiana*???

*Big-eyed bug*
Insect Control Approach
(BASIC STRATEGY - use resistant turf species and create deep root systems)

- Fescues and Ryegrasses with endophytes are resistant to surface feeding insects.

- Endophytes also make grasses more disease resistant and help exclude weed competition

Morning Star
- High Endophyte level for natural insect resistance (+90%)
- Excellent disease resistance
- Beautiful, dark green color
- Fine leaf texture
- Superb summer and fall density
- Excellent drought tolerance
- Seeding rate: 6-8 lbs./1,000 sq. ft.

No endorsement intended or implied
Cultural Control - Chinchbugs

- Use endophytic grass cultivars (fescues and ryegrasses)
- Minimize thatch – Core aeration
- Avoid drought stress
Let it breathe

- Keep thatch under 1/2 inch
- Cut back on pesticide use
- Core aerate in the late summer or early spring
Core Aeration Guidelines

- Do not aerate during the heat of the summer
- Aerate when the soil is moist but not wet
- Leave cores on the ground and drag them in
- Seed bare areas at the same time as coring
- Irrigate after coring & dragging to facilitate recovery
Lawn disease management

- Avoid sod
- Improve air circulation
- Water in early morning only
- Reduce thatch with aeration
- Plant resistant varieties
- Convert shady areas to ground covers
- Apply nitrogen
Other disease-like problems

- Mushrooms
  - Buried wood
  - Infected soil

- Moss
  - Too wet
  - Too shady
  - Too acid
  - Too compacted
  - Low fertility
  - Scalping
Vertebrate problems

- Birds
  - Starlings, crows, grackles

- Moles
  - Eastern or star-nosed

- Skunks, squirrels, raccoons
Identifying Pests and Beneficials

• Gotpests.org
Resources

- Maine Department of Agriculture, Conservation and Forestry Plant Health Division
  - Apiary • Arborist • Ginseng • Horticulture • Hemp • IPM - Programs
  - 207-287-3891

- Cooperative Extension: Insect Pests, Ticks, and Plant Diseases
  - 207.581.3880 or 800.287.0279 (in Maine)
  - [extension.diagnosticlab@maine.edu](mailto:extension.diagnosticlab@maine.edu)