

Pesky Garden Pests – Lawns & Trees

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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



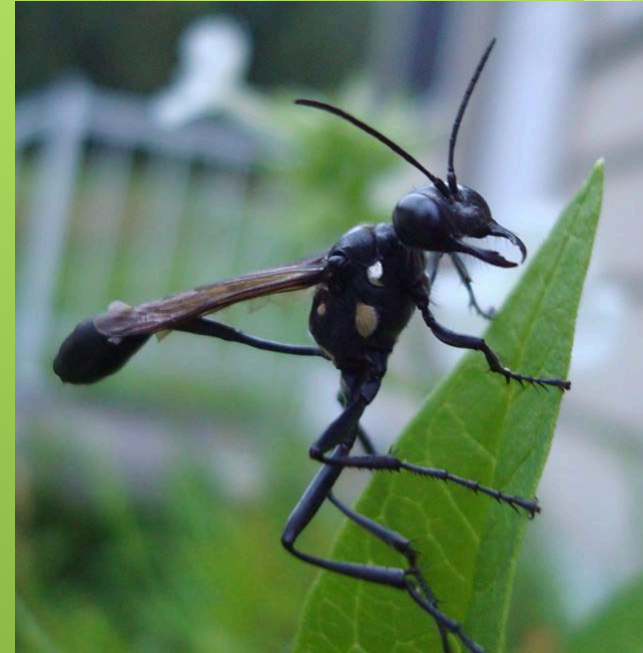
Impacts of systemics used on trees and woody ornamentals

- 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 imidacloprid on trees that provide bee attractive blooms
 - Imidacloprid can persist for as long as 8 years
 - Dinotefuran usually breaks down over one growing season



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

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

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?*

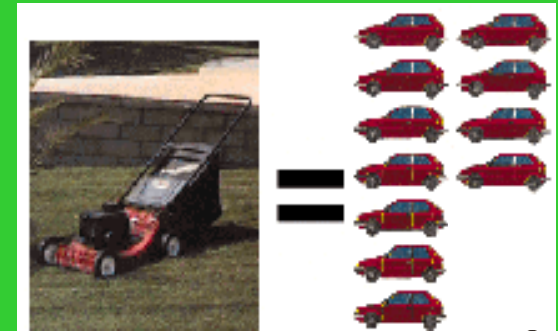
Wild
Strawberry
and
Pennsylvania
Sedge.

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

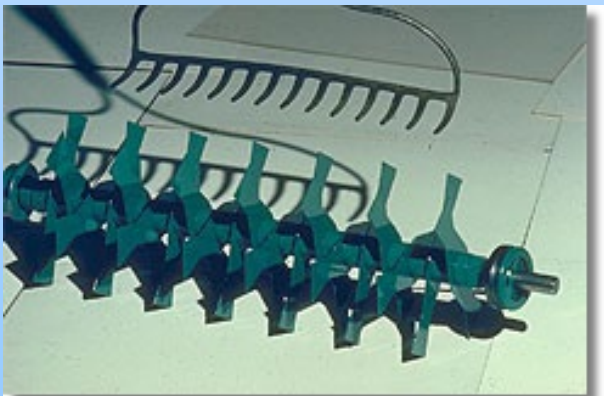
Water only when needed



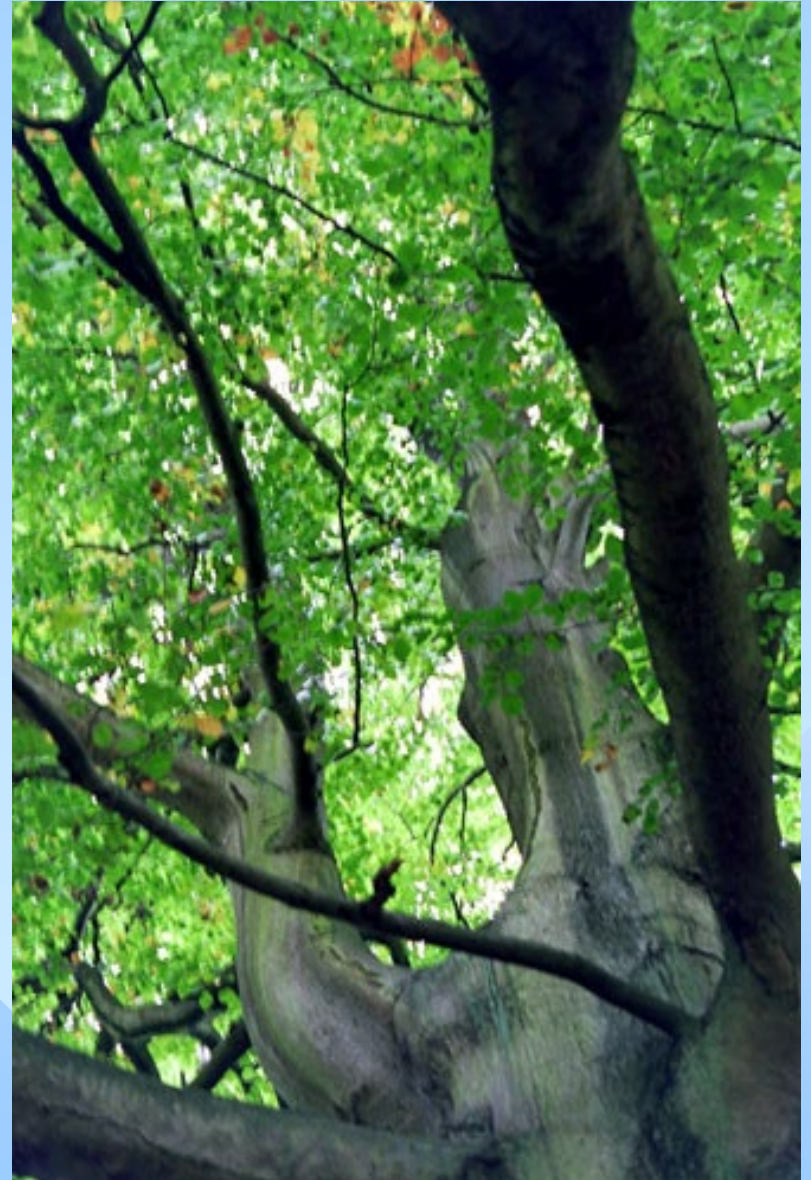
- Deepen the roots by holding off on watering in the spring until you see signs of stress (turf has a blue or purple cast)
- Water deeply $3/4 - 1\frac{1}{2}$ inches per week
 - Don't water every day (use a rain gauge)
 - 1 - 2 times a week is best
 - Water early in the morning (to reduce disease)
- 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



spotted spurge



goosegrass

Found in dry or drought prone areas

COMPACTION!!





prostrate knotweed



pineappleweed



goosegrass



broadleaf plantain



path rush

Change the growing environment

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

Indicator weeds and soil conditions	
<p>Wet, waterlogged, poor drainage Creeping buttercup, Coltsfoot, Ox-eye daisy, Curled dock, Moss, Plantain, Garden sorrel, Perennial sow thistle, Broad-leaved meadowsweet</p>	<p>Acidic or low lime 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</p>
<p>Hardpan Field bindweed, Quackgrass, Pineappleweed, Stinkweed</p>	<p>Tilled or cultivated soil Buttercup, Chickweed, Prostrate knotweed, Lamb's quarters, Prickly lettuce, Mustard, Nettle, Redroot pigweed, Plantain</p>
<p>Alkaline Bladder campion, White mustard, Perennial sow thistle, Foxtail barley</p>	<p>Heavy clay soil Chicory, Coltsfoot, Dandelion, Annual sow thistle, Canada thistle</p>
<p>Dry soil Silvery cinquefoil, Field horsetail</p>	<p>Overgrazed Perennial bluegrasses, Bentgrasses</p>
<p>Nutrient imbalance Eastern bracken (low K, low P), Yarrow (low K), Stinkweed (high lime)</p>	<p>Saline soils Shepherd's purse, Russian thistle</p>
<p>Compacted Velvetleaf, Jimsonweed</p>	
<p><small>Adapted from a handout by Stuart Hill and Jennifer Ramsey for Ecological Agricultural Projects at MacDonald Campus of McGill and published in <i>The Soul of the Soil, A Guide to Ecological Soil Management</i>, 2nd Edition, by Grace Gershuny and Joseph Smillie.</small></p>	

Weed control approach

- First rule of weed management – Exclusion!
- Mow as high as possible!

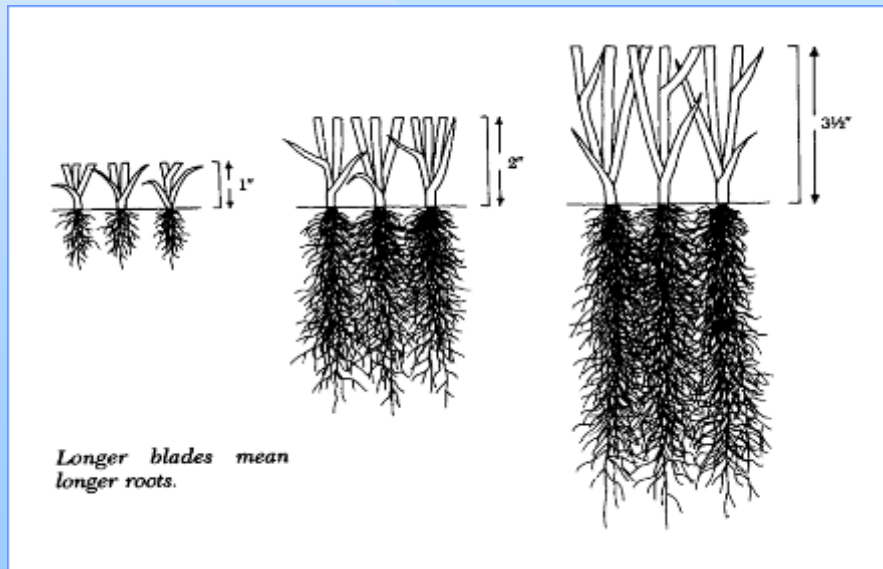


Illustration courtesy of Paul Wheaton, richsoil.com

Weed Control Approach (BASIC STRATEGY - dense, tall turf tends to reduce weed invasion)

- Mow high, 3 - 4inches 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.

White Grubs



Grub biology



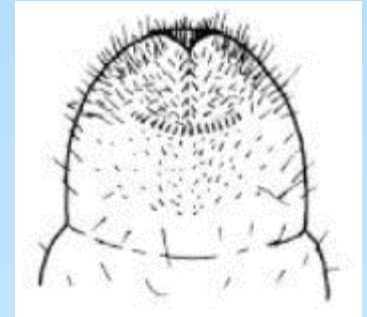
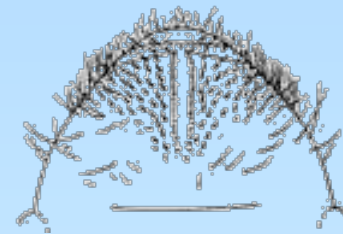
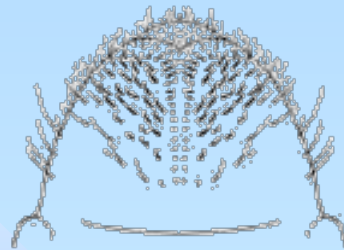
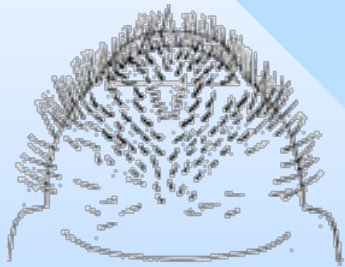
- One generation per year
- Grubs active in spring (April-May) and fall (mid August through October)
- European Chafer active through the winter under snow
- Adults active in summer months

Insect		Jan-Mar	April	May	June	July	August	Sept	Oct	Nov-Dec
European chafer		3rd instar larvae – overwintering	3rd instar larvae – feeding and pupation	Adults emerge, mate & lay eggs – no feeding	1st instar larvae – feeding	2nd instar larvae – feeding	3rd instar larvae – feeding	3rd instar larvae – overwintering		
June beetle	Yr 1	Adults overwintering in soil	Adults emerge, mate and lay eggs	Eggs hatch – 1st instar larvae – feeding	2nd instar larvae – feeding	2nd instar larvae – overwintering				
	Yr 2	2nd instar larvae – overwintering	2nd instar larvae – feeding	3rd instar larvae – feeding	3rd instar larvae – overwintering					
	Yr 3	3rd instar larvae – overwintering	3rd instar larvae – feeding	Pupation and adults remain in soil to hibernate and overwinter						
Japanese beetle		3rd instar larvae – overwintering	3rd instar larvae – feeding	Adults emerge, mate & lay eggs – no feeding	1st instar larvae – feeding	2nd and 3rd instar larvae – feeding	3rd instar larvae – overwintering			



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



Fig. 2. Grub of an Asiatic garden beetle

©C. Laub

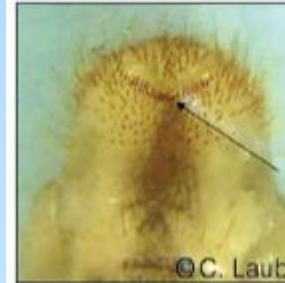


Fig. 3. Raster pattern of an Asiatic garden beetle grub

©C. Laub



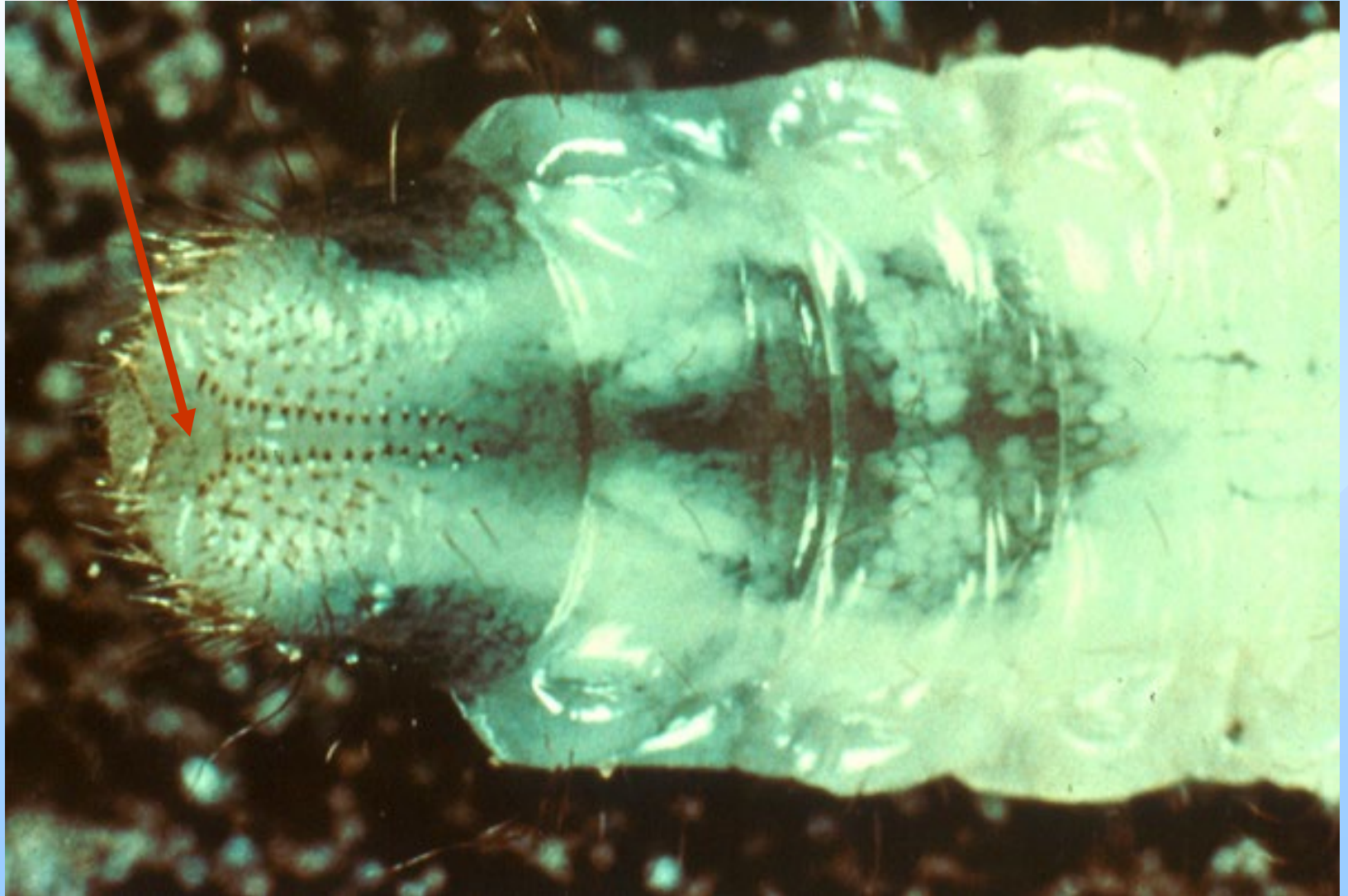
Photo: D. Shetlar

European chafer

- 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)

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	Yr 2	2nd instar larvae – overwintering	2nd instar larvae – feeding	3rd instar larvae – feeding	3rd instar larvae – overwintering				
	Yr 3	3rd instar larvae – overwintering	3rd instar larvae – feeding	Pupation and adults remain in soil to hibernate and overwinter					
Japanese beetle	3rd instar larvae – overwintering	3rd instar larvae – feeding	Adults emerge, mate & lay eggs – no feeding	1st instar larvae – feeding	2nd and 3rd instar larvae – feeding	3rd instar larvae – overwintering			

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
- $\frac{3}{4}$ - 1 $\frac{1}{2}$ 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

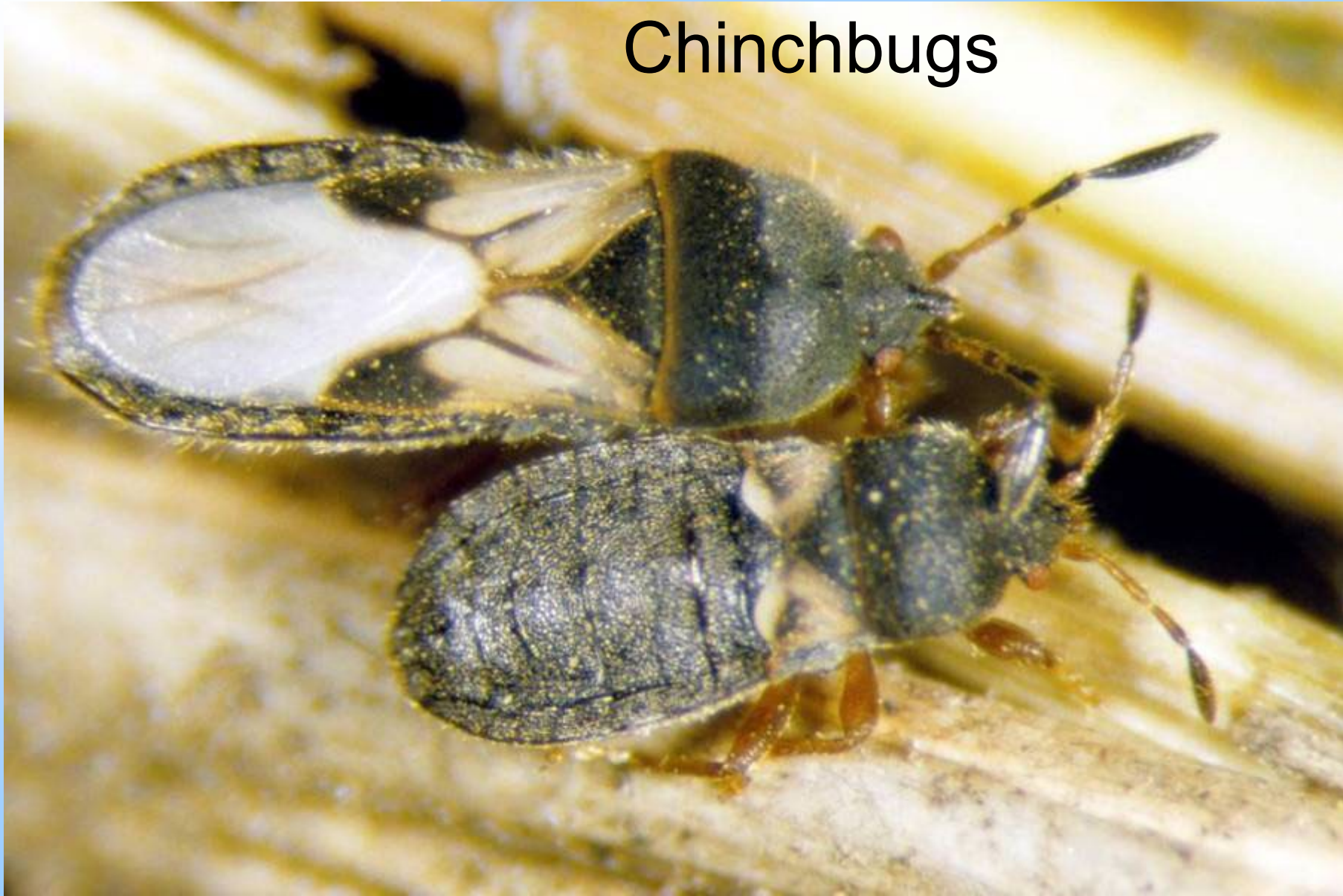
- *Heterorhabditis bacteriophora* - nematodes
- *Bt galleriae* (GrubGone! G) – Soil bacteria
- **Do Not use milky spore**



<https://www.maine.gov/dacf/php/gotpests/bugs/documents/nematodes-for-grub-control-maine.pdf>



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.
- Damage: irreg. Yellow patches 2-3' diam. Usu. During hot dry weather in mid-summer & early fall (S. ME) or July (C. and N. ME). Looks like draught damage.



Chinch Bug Prevention and Monitoring

- Prevention: Irrigate regularly during hot, dry months
- Monitoring:
 - insert bottomless coffee can into turf, fill with water, poke turf w/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

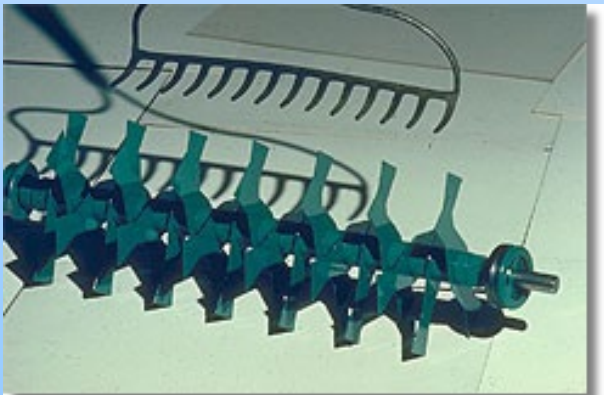
- High Endophyte level for natural insect resistance (+90%)
- Excellent disease resistance
- Beautiful, dark green color
- Fine leaf texture
- Superb summer and fall density
- Excellent drought tolerance
- Seeding rate:
6-8 lbs./
1,000 sq. ft.

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



Dollar Spot



Red Thread



Brown Patch

Other disease-like problems

- Mushrooms
 - Buried wood
 - Infected soil
- Moss
 - Too wet
 - Too shady
 - Too acid
 - Too compacted
 - Low fertility
 - Scalping



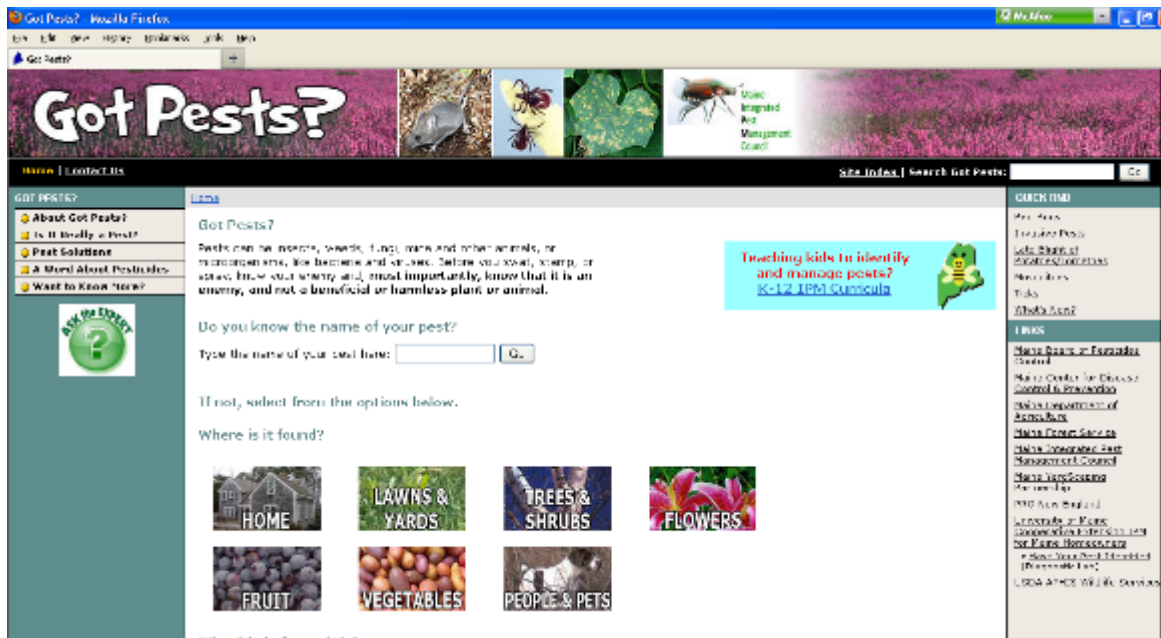
Vertebrate problems

- Birds
 - Starlings, crows, grackles
- Moles
 - Eastern or star-nosed
- Skunks, squirrels, raccoons



Identifying Pests and Beneficials

- Gotpests.org



Bugs? Plant Diseases?
Weeds? Critters?
In Your Garden?
Yard? Home?

www.GotPests.org

Maine Integrated Pest
Management Council

Resources

- ▶ **Maine Department of Agriculture, Conservation and Forestry Plant Health Division**
 - ▶ **Apiary • Arborist • Ginseng • Horticulture • Hemp • IPM - Programs**
207-287-3891
 - ▶ <https://www.maine.gov/dacf/php/index.shtml>
 - ▶ **Cooperative Extension: Insect Pests, Ticks, and Plant Diseases**
 - ▶ 207.581.3880 or 800.287.0279 (in Maine)
 - ▶ extension.diagnosticlab@maine.edu

