Lawn Management for Master Gardeners

Gary Fish
Maine Board of Pesticides Control
Some Benefits of a quality Lawn

- Reduce noise
- Reduce glare
- Reduce surface runoff
- Reduce injury from falls
- Reduce “nuisance” pests and airborne allergens
Essential Components of Lawn Management

- Grass seed selection - different for lawns, golf courses, sport fields & right-of-ways.
- Establishment - soil preparation, sod or seed.
- Maintenance - fertilizer, water, mowing, pest control - weeds, insects & diseases.
Starting from scratch

• Where do you need a lawn?
  - Keep the lawn area as small as possible

• Proper grading and drainage
  - Remove topsoil before making grade changes
  - Should be around a 1 – 2 % grade away from the home, avoid steep grades
  - Avoid wet areas, if a lawn must be planted in wet areas, install drainage tiles
When’s the best time?

- 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.
Soil, Soil, Soil

• At Least 6 – 12 inches of sandy loam topsoil is preferable!

• Do a soil test
  – Take 10 – 15 samples/1000 sq ft
  – Take samples about 6 inches deep
  – Mix samples together in bucket and send about a 2 cup composite sample to soil lab
Adjust the soil

- Adjust soil nutrients, pH and organic matter conditions as indicated by a soil test
  - Slow release N fertilizer
  - 1LB/1000 sq ft or less of N,
  - If needed, 1LB/1000 sq ft of P,
  - K only needed if deficient
  - 50LB/1000 sq ft of lime
  - 1 – 2 inches of finished compost as needed to get soil Organic Matter level to 3 – 5%

Soil Test Results

<table>
<thead>
<tr>
<th>Soil Nutrient</th>
<th>Low</th>
<th>Medium</th>
<th>Optimum</th>
<th>Excessive</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phosphorus</td>
<td>xxxxxxxxx</td>
<td>xxxxxxxxx</td>
<td>xxxxxxxxx</td>
<td></td>
</tr>
<tr>
<td>Potassium</td>
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<td>Soil pH</td>
<td>xxxxxxxxx</td>
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<td></td>
<td></td>
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<tr>
<td>Org. Matter</td>
<td>xxxxxxxxx</td>
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</tbody>
</table>
Site preparation before planting

- Minimize soil disturbance as much as possible
- Use solarization or layers of cardboard and compost
- Use pre-emergent herbicide
- Kill existing turf and slit seed through the dead turf
Turf Selection

- AVOID “Contractor’s Blend”!!!!
- Use blend of at least three different grass cultivars or three different species!
- Fine or tall fescues are well adapted to Maine and create low maintenance lawns!
- Ryegrasses establish fast, but are disease and drought prone!
- Kentucky bluegrass establishes slow, requires extensive fertilizer & water!
- Bentgrass for golf greens and tees only
Choose the right grass varieties for Maine

- **Kentucky Bluegrass**
- **Perennial Ryegrass**
- **Fine Fescue**
- **Tall Fescue**

### Sunny, medium to high maintenance
- 66% Kentucky bluegrass blend
- 18% perennial ryegrasses
- 20% fine fescues

<table>
<thead>
<tr>
<th>Maintenance Level</th>
<th>Grass Blend</th>
<th>Seed Rate per 1,000 sq. ft.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sunny, medium to high maintenance</td>
<td>66% Kentucky bluegrass blend</td>
<td>3 to 4 lbs.</td>
</tr>
<tr>
<td></td>
<td>18% perennial ryegrasses</td>
<td>4 to 5 lbs. per 1,000 sq. ft.</td>
</tr>
<tr>
<td></td>
<td>20% fine fescue blend</td>
<td>7 to 10 lbs. per 1,000 sq. ft.</td>
</tr>
</tbody>
</table>

### Sunny, low maintenance
- 65% fine fescue blend
- 15% perennial ryegrasses
- 20% Kentucky bluegrass blend or 100% tall fescue blend

### Shady
- 100% fine fescue blend

<table>
<thead>
<tr>
<th>Maintenance Level</th>
<th>Grass Blend</th>
<th>Seed Rate per 1,000 sq. ft.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shady</td>
<td>100% fine fescue blend</td>
<td>4 to 5 lbs. per 1,000 sq. ft.</td>
</tr>
<tr>
<td></td>
<td>Kentucky Bluegrass</td>
<td>Perennial Ryegrasses</td>
</tr>
<tr>
<td>----------------------</td>
<td>--------------------</td>
<td>----------------------</td>
</tr>
<tr>
<td>Growth habit</td>
<td>Rhizotamous</td>
<td>Bunch</td>
</tr>
<tr>
<td>Leaf texture (blade width)</td>
<td>Medium–Fine</td>
<td>Medium</td>
</tr>
<tr>
<td>Establishment from seed</td>
<td>Slow (approx. 30–90 days)</td>
<td>Fast (approx. 14–21 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>
</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>
</tr>
<tr>
<td>Drought tolerance</td>
<td>Poor</td>
<td>Poor</td>
</tr>
<tr>
<td>Shade tolerance (min. 4 hr. of direct sun)</td>
<td>Poor</td>
<td>Poor</td>
</tr>
<tr>
<td>Wear tolerance (traffic)</td>
<td>Good</td>
<td>Good</td>
</tr>
</tbody>
</table>

| Insect tolerance | Some | Some | Excellent | Good |
| Disease tolerance | Some | Some | Good | Good |
Plant or over-seed with low maintenance grass types

- Fine Fescues 40 - 50%
  - Creeping Red Fescue
  - Hard Fescue
  - Chewings Fescue
- Tall Fescue
- Common Kentucky Bluegrass
- Endophyte enhanced fescues or perennial rye
- Plant grass seed in late summer/early fall
- Avoid sod

**Example Mix**

40% Endophyte Enhanced Creeping Red Fescue
10% Southport Chewings Fescue
30% Endophyte Enhanced Perennial Ryegrass
20% Kenblue KBG
Low Maintenance Lawn
Benefits – 2000 CMHC study of 30 residences

• Residents with low-maintenance lawns spent
  – 50 per cent less time,
  – 85 per cent less money, and

• used
  – 50 per cent less fuel,
  – 85 per cent less fertilizer,
  – 100 per cent less water and
  – 100 per cent less pesticides per year

How about **low/no** mow grass? How about adding clover?

No Mow Mix
Low Input Lawn Demonstration Sites

• 14 Varieties in Trials
  - Rogers Farm,
    University of Maine,
    Orono
Seed or sod?

• Sod is generally high input KBG
  – Needs lots of $\text{H}_2\text{O}$ & N
  – Not shade tolerant
  – Good for slopes, But?

• Seed is more flexible
  – Can adjust for shade
  – Less inputs, etc
Water is essential at this stage

- Seed or sod must be watered until it is established

- Keep seed moist throughout the day
  - May have to water 2 – 3 times/day
  - Keep top \( \frac{1}{2} \) inch of soil moist
  - Takes about 3 weeks for KBG & Fescues to fully germinate
Mow after grass is established

• Once grass reaches 2 inches it is time to cut it

• Mowing at this stage reduces weeds

• Cut to 1½ inches for the first 3 mowings

• Then mow at 3 – 3½ inches
Maintenance of established lawns

- Mowing
- Watering
- Aeration & Dethatching
- Soil Amendments
- Pest Management
“High Input” Lawn Maintenance Program

- Fertilize 4 to 6 times per year (4 to 5 pounds of Nitrogen per 1000 ft.sq./year!)
- Preemergence herbicide annually (crab grass and other annual weeds)!
- Broadleaf herbicide annually (dandelions and other broadleaf weeds)!
- Mow once to twice per week!
- Irrigate during drought!
- Grub or surface insecticide when needed!
“Low Input” Lawn Maintenance Program

- Select or introduce lower maintenance turf species. (Tall or Fine Fescues)
- Use slow release fertilizers, no more than 2 pounds of Nitrogen per 1000 sq.ft./year.
- Mow high.
- Don’t irrigate, let go dormant.
- Use pesticides (herbicides and insecticides) only when needed (monitor/sample pest populations before applying).
Start from the ground up

- Minimum of 6 – 12 inches topsoil is ideal
  - May need to build topsoil by topdressing with high quality soil and/or compost
- Soil test every 1 - 3 years
# Nutrient tips

- Soil test!!!!
- Measure carefully
- How much
  - 1 - 2 lbs N/1000 sq ft
  - 0 - 1 lb for low input grasses
- When
  - late August - mid October
  - not when ground is frozen

### Soil Test Results

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Nutrient tips Con’t

• Adjust soil pH to 5.5 – 6.5 with lime
  – Pelletized dolomitic limestone preferred unless soil test shows excess magnesium

• Unless soil test indicates deficiency, **skip the phosphorous!**

• Apply potassium only when a soil test indicates need
## Select slow release fertilizers

<table>
<thead>
<tr>
<th>Fertilizer Name</th>
<th>Analysis</th>
<th>Source of N</th>
<th>Moisture Dependence</th>
<th>Low Temperature Response</th>
<th>Residual N Activity</th>
<th>Salt index (per N unit)</th>
<th>Leaching Potential</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quickly Available</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Ammonium-nitrate</td>
<td>33-0-0</td>
<td>ammonium nitrate</td>
<td>minimal</td>
<td>rapid</td>
<td>4-6 weeks</td>
<td>3.2</td>
<td>high</td>
</tr>
<tr>
<td>Ammonium-sulfate</td>
<td>21-0-0</td>
<td>ammonium sulfate</td>
<td>minimal</td>
<td>rapid</td>
<td>4-6 weeks</td>
<td>3.3</td>
<td>high</td>
</tr>
<tr>
<td>Ammonium-phosphate</td>
<td>18-46-0</td>
<td>diammonium phosphate</td>
<td>minimal</td>
<td>rapid</td>
<td>4-6 weeks</td>
<td>1.6</td>
<td>high</td>
</tr>
<tr>
<td>Urea</td>
<td>46-0-0</td>
<td>urea</td>
<td>minimal</td>
<td>rapid</td>
<td>4/6 weeks</td>
<td>1.6</td>
<td>moderate</td>
</tr>
<tr>
<td>Slow-Release</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sulfur-coated urea</td>
<td>22-38% N</td>
<td>urea</td>
<td>moderate</td>
<td>moderately rapid</td>
<td>10-15 weeks</td>
<td>not applicable</td>
<td>low</td>
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<tr>
<td>ONCE</td>
<td>24-25% N</td>
<td>urea, nitrate, ammonium nitrate</td>
<td>moderate</td>
<td>moderately rapid</td>
<td>15-38 weeks</td>
<td>not applicable</td>
<td>low</td>
</tr>
<tr>
<td>Slowly-soluble</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IBDU</td>
<td>31-0-0</td>
<td>isobutylidine diurea</td>
<td>high</td>
<td>moderately rapid</td>
<td>10-16 weeks</td>
<td>0.2</td>
<td>low</td>
</tr>
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<tr>
<td>Nitroform</td>
<td>38-0-0</td>
<td>ureaformaldehyde</td>
<td>high</td>
<td>slow</td>
<td>10-30 weeks+</td>
<td>0.3</td>
<td>very low</td>
</tr>
<tr>
<td>FLUF</td>
<td>18-0-0</td>
<td>urea/ureaformaldehyde</td>
<td>moderate</td>
<td>medium</td>
<td>6-10 weeks</td>
<td>not applicable</td>
<td>low</td>
</tr>
<tr>
<td>Nutralene</td>
<td>40-0-0</td>
<td>methylene ureas</td>
<td>moderate</td>
<td>medium</td>
<td>7-12 weeks</td>
<td>not applicable</td>
<td>low</td>
</tr>
<tr>
<td>Methylene urea</td>
<td>39-0-0</td>
<td>methylene ureas</td>
<td>moderate</td>
<td>medium</td>
<td>7-9 weeks</td>
<td>0.7</td>
<td>low</td>
</tr>
<tr>
<td>Coron</td>
<td>28-0-0</td>
<td>urea/methylene ureas</td>
<td>minimal</td>
<td>moderately rapid</td>
<td>7-9 weeks</td>
<td>not applicable</td>
<td>moderate</td>
</tr>
<tr>
<td>N-Sure</td>
<td>28-0-0</td>
<td>triazine/urea sol.</td>
<td>minimal</td>
<td>moderately rapid</td>
<td>6-9 weeks</td>
<td>not applicable</td>
<td>moderate</td>
</tr>
</tbody>
</table>

### Ureaform reaction

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<tr>
<th>Fertilizer Name</th>
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<th>Leaching Potential</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ringers</td>
<td>6-1-3</td>
<td>blood, bone, seed meals</td>
<td>high</td>
<td>medium</td>
<td>10-12 weeks</td>
<td>0.7</td>
<td>low</td>
</tr>
<tr>
<td>Sustaine</td>
<td>5-2-4</td>
<td>composted turkey waste</td>
<td>high</td>
<td>medium</td>
<td>10-12 weeks</td>
<td>0.7</td>
<td>low</td>
</tr>
<tr>
<td>Milorganite</td>
<td>6-2-0</td>
<td>activated sludge</td>
<td>high</td>
<td>slow</td>
<td>10-12 weeks</td>
<td>0.7</td>
<td>low</td>
</tr>
</tbody>
</table>

### Natural Organic fertilizers
Mow properly

- Mow high at 3 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
Add organic matter

- **Top dress with**
  1/8 - 1/4 inch of compost
  - reduces thatch
  - improves nutrient and water holding capacity

- **Some composts may be high in nutrients**
  - use a source that has been tested
  - test the soil after application
  - watch for development of layers and high phosphorus levels

No endorsement intended or implied
• 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
How do you use your lawn?

- Do you tread lightly?
  - or
- Do you rough it up?
- What areas need help?
Problems are inevitable
Where are the problem areas?

- High traffic
- Compaction
- Shade
- Pest problems
#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
Ground covers

- Non-native

Periwinkle or Myrtle

Pachysandra

English Ivy

May be invasive

May be invasive
Ground Covers

- Native

- Bunchberry
- Wintergreen/checkerberry
- Partridgeberry
Integrated Pest Management

- Grow stress-free turf
- Accept a few weeds or insects
- Keep an eye on the lawn

Is this stress-free turf?
Integrated Pest Management

- Identify the pest
- Pull it out or mow it off
- Irrigate
Pest Identification is crucial

White grub rastral patterns

Japanese beetle

European chafer

May/June beetle

Rose chafer
Integrated Pest Management

- Encourage biological controls
- Use pesticides as a last resort
- Read and follow labels carefully

No endorsement intended or implied
IPM Core Concepts

- No single pest control method will be successful.
- Monitoring (sampling) of the pest is constantly needed.
- Mere presence of a pest is no reason to justify action.
IPM Principles and Concepts

IPM is NOT:

- a biological control program
- an organic program
- a pesticide free program
- the most expensive approach
- the least expensive approach
Weed Management-
weeds are indicators of “problems”
Common broadleaf weeds

Plantain

Hawkweed

Creeping Charlie/ Ground Ivy
Common grassy weeds

Nutsedge

Crabgrass

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

- Mow high, 2.5 - 3 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*
Are there alternatives?

- Corn gluten meal has demonstrated pre-emergent herbicide activity
  - Rather expensive and a weak herbicide
  - Most effect comes from the nitrogen released as the meal breaks down - added fertility thickens turf and reduces weed germination (9% Nitrogen!)

- Weed flamers and spikes “Punto”
- Hot water foam and steamers
  - Mostly used in cities where herbicides have been banned
Turf Insect Pests

• Surface or thatch pests

• Root-feeding pests

White grubs

Sod Webworm
Integrated Pest Management – Insect Pests

- White Grubs
- Chinch Bugs
- Sod Webworms
- Billbugs
Grub biology

- One generation per year
- Grubs active in spring (April-May) and fall (mid August through October)
- Adults active in summer months
Pest Identification is crucial

White grub rastral patterns

Japanese beetle
European chafer
May/June beetle
Rose chafer
New grub species

- Asiatic garden beetle

- Grubs are slightly smaller than Japanese beetle and European chafer

- Adults are drawn to bright lights at night
Japanese beetles

- Most widely distributed species in New England
- Most are susceptible to insecticides
  - Some resistance to imidaclorpid (Merit)
- Adults feed on over 300 species of ornamental plants
Look for the short "V"
European chafers

- Active in southern and mid coast Maine
- Life cycle two weeks EARLIER than J B’s
- Least sensitive to cold temperatures
  - Feeds all winter under snow covered grass
- Most damaging species (grub for grub)
European chafer adults
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
- 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
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
Nematodes for grub control

- *Heterorhabditis bacteriophora*
- *Heterorhabditis zealandica*
  - These work on white grubs
- *Steinernema carpocapsae* - Do NOT use for grubs under any circumstances!!!
Entomopathogenic nematodes

- “living hypodermic needles”
- Very sensitive to high temperatures and sunlight
- MUST be watered in immediately

Infective juveniles

Female
Life Cycle of Entomopathogenic Nematodes

- Life cycle of beneficial nematodes
- infective juveniles
- infective juvenile production
- mating in next generation
- enter via natural openings (or via cuticle for *Heterorhabditis*)
- RELEASE OF BACTERIAL CELLS
- HOST DIES

(Xenorhabdus sp.)
(Photorhabdus luminescence)
Wax worms infected with ---

*Heterorhabditis* sp  
*Steinernema* sp
Beneficial nematode products

No endorsement intended or implied
Rural capacity hydraulic nozzles (type) are recommended for nematode application.
• *Bacillus popilliae* (milky disease)
  - Inconsistent in Maine
  - When it works - only effective against Japanese Beetles
  - Most researchers say it just does not work!
Tachinid fly (the so-called “winsome fly”) laying an egg on a Japanese beetle adult

*Istocheta (=Hyperecteina) aldrichi*

Introduced into US from Japan in 1922

Adults emerge Late June/July, feed on honeydew, nectar

- Lay up 100 eggs in two weeks
- Eggs hatch 1 day later, dig into beetle
- Kills beetle in 5-6 days
- Just before death, beetle digs into ground where fly spend winter as pupa
Hairy chinch bugs in thatch

Hairy chinch bug adults - long wing & short wing forms
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 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*
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
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
Simple slit seeding of endophytic grasses into an existing lawn resulted in a 30 to 50% stand of endophytic grasses - enough to control surface insects!
Sod Webworms

Spring damage

Adult bluegrass webworm

Larva and frass

© D.J. Sheflar, 2004
Sod Webworms

- Adults: moth. No damage.
- Larvae: up to 1” long whitish worm w/ rows of sm. black spots. Make silk-lined tunnels in thatch, feed on grass blades.
- 2 generations/yr. Overwinters in soil as a caterpillar
- Damage: turf thinning or irregular dead patches mostly mid-late August.
- Seldom cause damage that warrants treatment
Sod Webworm Monitoring

• Mark 2 or 3 damaged and undamaged areas (2’x2’) of turf. Drench each area with soapy water (1 oz/gal water). Wait 5 mins, then count larvae.

Threshold

• If unacceptable damage seen and 4-6 larvae/4 ft²

Pour 1 gal. soapy water on each plot

3 plots, ea. 4 ft sq.
Bluegrass Billbug

Adult and larva

Larva in crown

© D.J. Shetlar, 2004
Cultural management for other surface feeders

- Use endophytic cultivars (fescues and perennial ryegrasses) - for some webworms?
- Manage thatch
- Minimize drought stress (!)
Entomopathogenic Fungi

**Beauveria spp.** "White" Fungus

**Metarhizium spp.** "Green" Fungus

(Net-52 not registered in US yet)

One drawback to the fungal controls is that they are not selective and will harm beneficial insects and pollinators

No endorsement intended or implied
A bluegrass billbug adult (above) and Japanese beetle larva (right) infected with *Beauveria*.
Fire ant queen with *Metarhizium anisopliae* fungus.
Other biorationals

- *Bacillus thuringiensis* - δ-endotoxin

- *Saccharopolyspora spinosa* - spinosyns (=Conserve)

No endorsement intended or implied
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

Diseases:
- 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
#1 Killer of grass
Vertebrate problems

- Birds
  - Starlings, crows, grackles

- Moles
  - Eastern or star-nosed

- Skunks, squirrels, raccoons
If you must apply pesticides
apply properly & be cautious

- Only treat infested areas

- Spot treatments conserve beneficial organisms
Prevent Environmental Contamination

• Avoid misapplication to impervious surfaces
  - Use drop spreaders
  - Sweep up misapplications
  - Pervious surfaces become impervious when frozen!
Prevent Environmental Contamination

- Do not apply to saturated soils or when 0.5 inch or more rainfall expected

- Don’t put pesticides and fertilizers onto sidewalks, driveways, etc.

- Reduce urban runoff – install more pervious surfaces (turf, prairie, woodlots, turf pavers, etc.)
Prevent Environmental Contamination

- Choose pesticides and nutrients with low runoff potential based on their physical and chemical properties
- Use slow release N fertilizers
  - Water insoluble N, Composts, sulfur coated
- Use wettable powder pesticides, pesticides with lower water solubilities and stronger soil adsorption properties
Prevent runoff

• Does it puddle up?

• Does it runoff fast?

• Do you have vegetative buffers?
The beauty of buffers

- No buffer – High runoff & high pollution potential. Lots of mowing!

- Good buffer – Reduced runoff, less pollution, cleaner water and lower maintenance too!
Conclusions of 1995 - 96 Oklahoma study

- Buffers can significantly reduce pesticide and nutrient runoff
- Untreated (no fertilizer or pesticides) turf buffers as little as 8 feet wide can significantly reduce nutrient and pesticide losses to surface waters
Where to learn more

- Web sources
- Many resources are available free of charge
- See BPC list of low input lawn resources

On the web
http://www.thinkfirstspraylast.org/lilac.htm
Use common sense pest management

• Integrated pest management
  – Know your pest
  – Pick it, trap it or exclude it
  – Know the good bugs
  – Mow, prune or water
  – Use pesticides as last resort
Where to learn more

http://www.yardscaping.org
Where to learn more

http://www.gotpests.org
Other resources

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Is Your Lawn Truly Green? Sage Advice from Top Northeast Experts
by Paul Schwem
Maine Turfgrass Partnership

Concerns about environmental impact and effects on human health have brought the perfect, lush green lawn—an enduring symbol of American prosperity—to the spotlight. What it takes to create and maintain that lawn needs some scrutiny. A high-maintenance lawn can become dependent upon frequent pesticide, fertilizer, and water use to keep it “healthy” and looking green, and these potentially harmful substances may end up in our precious waterways, living rooms, and bodies.

**CAN WE HAVE OUR LAWN AND A HEALTHY ENVIRONMENT?**
Do we have to fence off our lawns altogether to save ourselves and the planet? Probably not, if we are willing to rethink our ideas of perfection. An attractive lawn can be green without regular use of pesticides (weed, insect, or disease controls) and fertilizer or any added fertilizer. Research has been showing every facet of lawn production and maintenance to see what works and what doesn’t. Old guidelines have been refined and new ones invented. Following these extended guidelines will help us achieve truly “green” lawns that can significantly reduce the risks for our children, pets, and the environment.

The following information has been prepared with the help of four Northeast university turfgrass specialists:

**FERTILIZATION—REDUCED RATES OF NITROGEN ONLY, NO PORK (PHOSPHORUS OR POTASSIUM)**
Here’s where critical care standards have come to light. When soils are adequate, only newly established and young lawns need fertilizer 2 or 3 times; after that, only nitrogen—phosphorus and potassium are seldom needed, unless indicated by a soil test. The guideline of applying 4–5 pounds of nitrogen fertilizer per 1,000 square feet of lawn has been revised to one-quarter to one-half that amount. Basically, lawns need only one or two applications per year at half the labeled application rate.

Lawns 15 years and older store necessary nutrients and may never need fertilizer. Grass clippings are free fertilizer—if these are returned to the lawn with a mowing service, chances are, additional fertilizer will not be needed.

When to fertilize: Contrary to popular belief and common practice, spring is not the better time to fertilize lawns. At that time, nitrogen will encourage very growth at the expense of roots and will promote germination of weed seeds. If and when fertilizer is applied, ideally it should be done

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The Homeowner’s Lawn Care and Water Quality Almanac

http://www.gardening.cornell.edu/lawn/almanac

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Lawn Care without Pesticides

http://www.thinkfirstspraylast.org/ppt/Master Gardener/index.htm

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Research-based on

http://ecommons.cornell.edu/handle/1813/3574
YardScaping...
Protecting the beauty of Maine