YardScaping...

for a healthy Maine
The YardScaping Partnership

- Allen, Sterling & Lothrop
- Bar Mills Ecological
- Breakwater School
- Carroll Associates, Landscape Architects
- Casco Bay Estuary Partnership
- City of Portland
- Congress of Lake Associations
- Friends of Casco Bay
- Friends of Scarborough Marsh
- Gnome Landscapes, Design & Masonry
- Jacobs Edwards and Kelcey
- Kennebunkport Conservation Commission
- LakeSmart Program
- Libby’s Landscaping and Greenhouse
- Lisa Cowan, studioverde landscape architecture + design
- Maine Board of Pesticides Control
- Maine Department of Agriculture
- Maine Department of Environmental Protection
- Maine Landscape & Nursery Association
- Maine Organic Farmers & Gardeners Association
- Maine Soil & Water Conservation Districts
- Maine State Planning Office
- Maine Volunteer Lake Monitoring Program
- Natural Resources Conservation Service
- New England Organics
- O'Donal's Nurseries
- PJC & Company Ecological Land Care
- Portland Trails
- Shaw Brothers Construction
- Skillin's Greenhouses
- Southern Maine Community College
- Think Blue Maine Program
- Town of Brunswick
- University of Maine Cooperative Extension

The Partnership is very diverse!

www.yardscaping.org

for a healthy Maine
YardScaping

- A new paradigm?
- Some call it “Sustainable Landscaping” or “Ecological Landscaping”
- We want to keep it simple
- http://youtu.be/cwaSKjymQDc
YardScaping Mission

- YardScaping hopes to inspire Maine people to create and maintain healthy landscapes through ecologically based practices that minimize reliance on water, fertilizer and pesticides.

YardScaping Gardens at Back Cove

LOW MAINTENANCE PLANTS

You can grow low maintenance plants like these in your yard.

The trees, shrubs and perennials you see here:

- resist pest problems
- thrive in Maine
- are non-invasive
- grow back each year
- require less water
- require less fertilizer

Want to get involved or learn more? Visit www.yardscaping.org
Maine pesticide use more common than perceived

• No endorsement intended or implied
Have we finally hit the top of the curve?

Pounds of Home Use Pesticides Distributed into Maine

- Includes lawn and tree care
- Company applications
BayScaping Project


- Sampled runoff water from intensive lawn care areas in Cumberland, S Portland, Westbrook, Falmouth, Yarmouth, Brunswick, Freeport, Portland and Cape Elizabeth & Back Cove area
Friends of Casco Bay Sampling

- Pesticide residues detected in surface water
  - Diazinon up to (2.6 ppb)**
  - 2,4-D up to (36.4 ppb)
  - Dicamba up to (4.1 ppb)
  - MCPP up to (26 ppb)
  - MCPA up to (0.45 ppb)
  - Clopyralid up to (0.91 ppb)
  - Propiconazole up to (0.075 ppb)
  - Chlorothalonil up to (0.22 ppb)
  - Found Excess Nitrogen & Phosphorous in most samples

- Pesticide residues detected in sediments
  - Bifenthrin up to (37 ppb)
  - Permethrin up to (47 ppb)

**Values in red exceed Aquatic Life Criteria
• Sampled urban streams
  – Insecticides occurred more frequently in urban streams than they did in agricultural area streams
  – Herbicides detected in 99% of Urban stream samples
  – Phosphorous found at same levels as in agricultural streams
  • 70% of those samples exceeded the EPA level for causing excessive algal growth
The Ten-ets of YardScaping

- Promote buffers
- Promote appropriate plants - native plants and non-invasive alien plants
- Reduce lawn area
- Reduce runoff
- Reduce reliance on pesticides, fertilizers and water
- Promote low input lawns and landscapes
- Promote YardScape diversity
- Create wildlife habitats
- Right plant, right place, right use
- Commonsense pest management (IPM)
Use site appropriate, non-invasive plants

- Native plants are often well adapted
  - Fewer problems, less work, more rewards, but not all are problem free, e.g., viburnums

- Invasive plants are easy to grow but crowd out native vegetation
  - Our local forest habitats are changing rapidly
  - Invasive plants can ruin wildlife habitat
  - Invasive plants harbor more infected deer ticks
Right plant, right place, right purpose

- Choose plants based on the site conditions not just for their color
- Select plants that thrive under existing conditions rather than trying to alter the conditions to meet the needs of a plant
- Minimize disturbance of the existing landscape
Right plant, right place

Beach plum – dry sunny site

Partridgeberry – wet shady site

Staghorn Sumac – large open dry bank
Where to learn more

www.yardscaping.org/plants/index.htm

YardScaping Gardens at Back Cove

PLANT CHOICE

Plants thrive in the proper climate, soil and sun exposure.

Plant a plant where its needs and your needs are met:

- plant natives whenever possible
- don’t plant invasive alien species
- choose plants that provide homes, food and shelter for wildlife
- put plants in the right climate, soil and sun exposure

Want to get involved or learn more? Visit www.yardscaping.org
Use a diversity of plants & grasses

- Less noticeable damage from pests and disease
- Incorporate many layers of plant types
  - Trees
  - Shrubs
  - Ground covers
  - Perennials, and
  - Lawns
Create wildlife habitats

Diversity and plant layers go hand in hand with habitat creation

Add nectar and fruit producing plants

Strive for continuous blooms

Add water, walls, feeders, woody debris
Reduce lawn area

- Reduces
  - Water & air pollution
  - Water usage
  - Maintenance
  - Costs

- Gives
  - More free time

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
Use low input plant varieties

- No-mow fescue vs Kentucky bluegrass
- Pagoda dogwood vs flowering cherry
- River birch vs paper birch
Protect lakes & streams with buffers

- Preserve existing landscape
- Winding paths
- Don’t mow to the water’s edge
- Leave the duff
Reduce runoff

- Reduce amount of impervious (hard) surfaces
- Create rain gardens or install rain barrels
- Direct water into vegetated areas
- Irrigate properly and only when needed
Reduce reliance on pesticides, fertilizers and water

- Grow plants that are resistant to insects & diseases
- Use plants that tolerate low fertility
- Use drought resistant plants
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
Creating Healthy Maine Lawns

- Maximize Benefits
- Minimize Risk
- Practice Integrated Pest Management
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 4 – 6 inches of sandy loam topsoil!
- 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 nutrient, pH and OM conditions as indicated by soil test
  - Slow release N fertilizer
  - 1LB/1000 sq ft or less of N,
  - 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

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></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Potassium</td>
<td>xxxxxxxx</td>
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<tr>
<td>Calcium</td>
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<tr>
<td>Magnesium</td>
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<tr>
<td>Soil pH</td>
<td>xxxxxxxxx</td>
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<tr>
<td>Org. Matter</td>
<td>xxxxxxxxx</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Site preparation before planting

- Minimize soil disturbance as much as possible
- Use solarization
- Use pre-emergent herbicide
- Kill existing turf and slit seed through the dead turf
Choose the right grass varieties for Maine

<table>
<thead>
<tr>
<th>Sunny, medium to high maintenance</th>
<th>Sunny, low maintenance</th>
<th>Shady</th>
</tr>
</thead>
<tbody>
<tr>
<td>65% Kentucky bluegrass blend</td>
<td>65% fine fescue blend</td>
<td>100% fine fescue blend</td>
</tr>
<tr>
<td>15% perennial ryegrasses</td>
<td>15% perennial ryegrasses</td>
<td>20% Kentucky bluegrass blend or 100% tall fescue blend</td>
</tr>
<tr>
<td>20% fine fescues</td>
<td>20% Kentucky bluegrass blend</td>
<td>4 to 5 lbs. per 1,000 sq. ft.</td>
</tr>
<tr>
<td></td>
<td>or 100% tall fescue blend</td>
<td>7 to 10 lbs. per 1,000 sq. ft.</td>
</tr>
<tr>
<td></td>
<td></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>
<tr>
<td>Insect tolerance</td>
<td>Some</td>
<td>Some</td>
</tr>
<tr>
<td>Disease tolerance</td>
<td>Some</td>
<td>Some</td>
</tr>
</tbody>
</table>
Plant or over-seed with low maintenance grass types

- Fine Fescues 40 - 50%
  - Creeping Red
  - Hard
  - Chewings
- Tall Fescue
- Common Kentucky Bluegrass
- Endophyte enhanced perennial rye or fescues

Example Mix
40% Endophyte Enhanced Creeping Red Fescue
10% Southport Chewings Fescue
30% Endophyte Enhanced Perennial Ryegrass
20% Kenblue KBG

- Plant grass seed in late summer/early fall
- Avoid sod
Sustainable landscapes cost less long term

Garden/Garden — A Comparison in Santa Monica
Santa Monica, California, U.S.A.

Traditional Landscape

- 57,000 Gallons
- 620 Pounds
- 80 Hours

Sustainable Landscape

- 6,000 Gallons
- 250 Pounds
- 15 Hours

Project Facts

* Santa Monica imports more than 90 percent of its water from Northern California and the Colorado River, more than 400 miles away.

* In 2004, the city of Santa Monica constructed two 1,900-square-foot demonstration gardens on two adjacent front yards to demonstrate the many benefits of sustainable gardens. The "Traditional Garden" incorporates commonly used exotic species and lawn while the "Native Garden," the sustainable alternative, uses exclusively native California plants.

* The native garden cost $16,700 to install compared to $12,400 for the traditional garden. Despite its higher initial cost, the native garden's lower maintenance requirements translate into $2,200 per year in cost savings.

* The native garden uses 77 percent less water, produces 66 percent less waste, and requires 68 percent less labor than the traditional garden.
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

Adapted from Ecological Outlook, 2000.
"Residential Landscapes: Comparison of Maintenance Costs, Time and Resources" CMHC: Ottawa.

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

No Mow Mix

NEW FROM TURF-SEED!
MOW-LESS
Brand Tall Fescue Blend
Low Input Lawn Demonstration Sites

- 3 plantings in fall of 2004
  - Southern Maine Community College, S. Portland
  - Pine Tree State Arboretum, Augusta
  - Rogers Farm, University of Maine, Orono

BayScaper Mix
Seed or sod?

- Sod is generally high input Kentucky BG
  - Needs lots of H<sub>2</sub>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 ½ inch of soil moist
  - Takes KBG & Fescues about 3 weeks 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 1\(\frac{1}{2}\) inches for the first 3 mowings

• Then mow at 2\(\frac{1}{2}\) – 3 inches
Maintenance of established lawns

- Mowing
- Watering
- Aeration & Dethatching
- Soil Amendments
- Pest Management
Start from the ground up

- Minimum of 4 - 6 inches topsoil
- 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 November
  – not when ground is frozen

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<td>Org. Matter</td>
<td>xxxxxxxxxx</td>
<td></td>
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</table>
Nutrient tips Con’t

• Adjust soil pH to 6.0 - 7.0 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>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>
</tbody>
</table>

Quickly Available

| Sulfur-coated urea    | 22-38\% N | urea                | moderate            | moderately rapid       | 10-15 weeks         | not applicable           | low                |
| ONCE                  | 24-25\% N | urea, nitrate, ammonium nitrate | moderate            | moderately rapid       | 15-38 weeks         | not applicable           | low                |

Slowly-soluble

| IBDU                  | 31-0-0    | isobutylidine diurea | high                | moderately rapid       | 10-16 weeks         | 0.2                      | low                |
# Select slow release fertilizers

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</tr>
</thead>
<tbody>
<tr>
<td><strong>Ureaform reaction</strong></td>
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<td></td>
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<td></td>
<td></td>
</tr>
<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>
<tr>
<td><strong>Natural Organic fertilizers</strong></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<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>
Mow properly

- Mow high 2 1/2 to 3 inches
- Mow regularly
- Keep mower sharp
- Return clippings
- Vary mowing pattern

Mower exhaust = 40 small cars’ exhaust
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
Water only when needed

- 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
Begin by sketching a map of your yard. Label it with the names of the weeds you find and their locations. Once you assemble this information, you can do some research and make decisions about how and when to control the weeds in your garden.

**PROBLEM:** Dandelion (*Taraxacum officinale*) scattered throughout the lawn.
**SOLUTION:** The best solution for dandelions is to learn to enjoy their presence, or you can hand-pull them using a dandelion weeder.

**PROBLEM:** Crabgrass (*Digitaria spp.*) and prostrate knotweed (*Polygonum aviculare*) in the children’s play area.
**SOLUTION:** Define the edges of the area and add a deep layer of sand or mulch. It will keep weeds down and provide a good playing surface for children.

**PROBLEM:** Spurges (*Euphorbia spp.*) and goosegrass (*Eleusine indica*) in the area next to the driveway where the car backs up when leaving the garage.
**SOLUTION:** These plants are indicators of compacted, dry soil with low fertility. Either pave the area or stop driving over it and turn it back into lawn by aerating, fertilizing, and seeding.

**PROBLEM:** Hairy bittercress (*Cardamine hisuta*) and shepherd’s purse (*Capsella bursa-pastoris*) in the garden beds around the house.
**SOLUTION:** These are both winter annuals that prefer moist, shady spots and cool weather, so watch for them during the fall, winter, and spring, and hand-pull them before they set seed.

**PROBLEM:** Canada thistle (*Cirsium arvense*) on the edge of a mulch bed at the base of a tree.
**SOLUTION:** This has probably come over from the meadow on the other side of the driveway. It is an invasive plant that can be hand-pulled when young. Monitor for seedlings in the garden and pull them immediately.
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
  Full sun or shade
  May be invasive

Pachysandra
  Full/partial shade

English Ivy
  Full/partial shade
  May be invasive
Ground Covers

- Native

Bunchberry
Partial sun/shade

Wintergreen/checkerberry
Shade

Bearberry
Full sun
Integrated Pest Management

- Grow stress-free turf
- Accept a few weeds or insects
- Keep a 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

Japanese beetle
European chafer
May/June beetle
Rose chafer

White grub rastral patterns
Integrated Pest Management

- Encourage biological controls
- Use pesticides as a last resort
- Read and follow labels carefully
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
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 inches MINIMUM
- Promote root growth – fertilize in early fall
- Reduce wear and compaction - encourage foot traffic away from turf; core aerify twice per year
- Overseed or slit-seed open areas ASAP
- 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 action nutrient value from meal breakdown - added fertility thickens turf and reduces weed germination
- Weed flamers and spikes “Punto”
- Hot water foam and steamers
  - Mostly used in cities where herbicides have been banned
Integrated Pest Management – Insect Pests

- White Grubs
- Chinch Bugs
Insect Control Approach
(BASIC STRATEGY - use resistant turf species and create deep root systems)

- Ryegrasses and fescues with endophytes are resistant to surface insects.
- Fertilize in spring & fall, reduce irrigation in summer to discourage grubs.
- Use insecticides only when monitoring indicates a need.

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.
Are there alternatives to higher risk insecticides?

- Insect parasitic nematodes are effective, but must be applied with care.
- Milky disease of Japanese beetles does not affect other species of grubs. In Maine, the disease is a weak pathogen and very expensive to apply.
- Endophytes provide long term, consistent control (of surface insects).
Simple slit seeding of endophytic grasses into KBG resulted in a 30 to 50% stand of endophyte - enough to control surface insects!
Classic Biocontrols

**Predators**
- Ants & Wasps
- Beetles
- Spiders
- Bugs (damsel, bigeyed, stink)
- Mites
- Others

**Parasites**
- Wasps
- Flower Flies

**Pathogens**
- Bacteria
- Fungi
- Virus
- Entomopathogenic Nematodes
Conserving Biological Controls

- Learn to recognize biocontrols
- Provide food and habitat
- Use least toxic pesticides
- Target pesticides WHERE needed
- BE PATIENT!!
Classical Cultural Controls

- **Physical/mechanical**
  - Hand crushing
  - Traps
  - Barriers
  - Syringing

- **Plant Resistance/Tolerance**
  - Site Plants
  - Fertilizer & Water
White Grubs
Entomopathogenic Nematodes

Steinernema carpocapsae
Ambush Nematodes

S. riobravis

S. scapterisci

Heterorhabditis bacteriophora
Cruiser nematodes

© D.J. Shetlar, 2004
Insects infected with *Steinernema* nematodes are usually light tan in color.

Note the adults (larger nematodes) and the infective juveniles (the tiny nematodes forming a cloud around the grub.

Insects infected with *Heterorhabditis* nematodes are usually a reddish color.
Biorationals

Paenibacillus popillae – grub milky disease

Bacillus thuringiensis - δ-endotoxin

Saccharopolyspora spinosa - spinosyns (=Conserve)
Normal grub (left) and a milky disease infected grub (right). Note color of blood droplet where the tip of the leg was pinched off.
Sod Webworms

Spring damage

Adult bluegrass webworm

Larva and frass

© D.J. Shetlar, 2004
Bluegrass Billbug

Adult and larva

Larva in crown
Entomopathogenic Fungi

*Beauveria* spp.  "White" Fungus

*Naturalis-T®*

*Metarhizium* spp.  "Green" Fungus

(Met-52 not registered in US yet)
A bluegrass billbug adult (above) and Japanese beetle larva (right) infected with *Beauveria*.
Fire ant queen with *Metarhizium anisopliae* fungus.
Hairy chinch bugs in thatch

Hairy chinch bug adults - long wing & short wing forms
Hairy chinchbug control

Big-eyed bug
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

Disease images: 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
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
How will it work

• Our first project will be a demonstration area at the Back Cove in Portland
The current Back Cove plan
Back Cove demonstration area

• It is a 2 acre +/- site that will be developed over two years

• We hope to have 4 “yards” featuring different types of landscapes
  – Rural – Field & wildflowers with native trees and wildlife habitat enhancements
  – Suburban/Rural – No-mow grass with native trees & shrubs
  – Urban/Suburban – Very low input lawn grasses that are mowed with very low input native and non-invasive alien trees & shrubs
  – Urban – YardScaping lawn mix with low input native and non-invasive alien trees & shrubs
Rural/Meadow Area

- We will try to re-establish the native coastline
- Few trees & shrubs
- Meadow areas
- Rough paths
- Bird boxes
- Wildlife shelters
- Bush hog 1x/year
Suburban/Rural

- No-mow lawn
- Maintenance free native trees and shrubs
- Mulched paths?
- Benches
- Mown 2x/year
Urban/Suburban

- Very low input grasses
- Very low input native and non-invasive alien trees & shrubs
- Stone dust paths?
- More benches
- Grass mown at 3 inches
• YardScaping grass mix
• Low input native and non-invasive alien trees & shrubs
• Crushed stone paths?
• Inviting archway
Welcome to YardScaping

Can anything be more satisfying than a fertile carpet of green grass? How about a healthy landscape that features less lawn and beautiful plantings—all grown without the excessive use of pesticides, fertilizers, and water?

Whether you’ve been wringing your hands over Japanese beetles or you’re tired of slaving away on your lawn, YARDSCAPING is for you.

Join the growing number of Mainers who have decided to change their yard care ways—for the health of the environment, people, and wildlife.

What’s New

Portland’s YardScaping Gardens at Back Cove are complete and ready for your enjoyment!
Got Pests?
Pests can be insects, weeds, fungi, mice and other animals, or microorganisms, like bacteria and viruses. Before you swat, stamp, or spray, know your enemy and, most importantly, know that it is an enemy, and not a beneficial or harmless plant or animal.

Do you know the name of your pest?
Type the name of your pest here: [ ] Go.

If not, select from the options below.

Where is it found?
- HOME
- LAWNS & YARDS
- TREES & SHRUBS
- FLOWERS
- FRUIT
- VEGETABLES
- PEOPLE & PETS

What kind of pest is it?
- WEED
- PLANT DISEASE
- BUG
- OTHER CRITTER

http://www.gotpests.org
Sustainable Trees and Shrubs

Screen (HTML) Version
- Introduction
- Planting
- List of Sustainable Trees and Shrubs
  - Full Listing
  - Warning: Long Download
- Common Names
- Appendices:
  - Crabapple Evaluations
  - Selections for Demanding Situations
  - Cross-reference
    - Demanding Situations
  - USDA Plant Hardiness Zones—New England

Shorter Listings
- No Illustrations
- Species A-H Only
- Species I-Z Only

Searchable Database
- Selections for Demanding Situations

URI Cooperative Extension—Landscape Horticulture.

About This Site | Comments? | Site Technology
Department of Plant Sciences & Entomology / College of Life and Environmental Sciences
RI Cooperative Extension / University of Rhode Island
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Other resources

• http://www.hort.uconn.edu/ipm/turf/htms/turfman.htm

http://www.uoguelph.ca/GTI/

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

http://www.nbhta.ca/sustainable_turf_manual.htm
YardScaping...
Protecting the beauty of Maine