

# 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](http://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



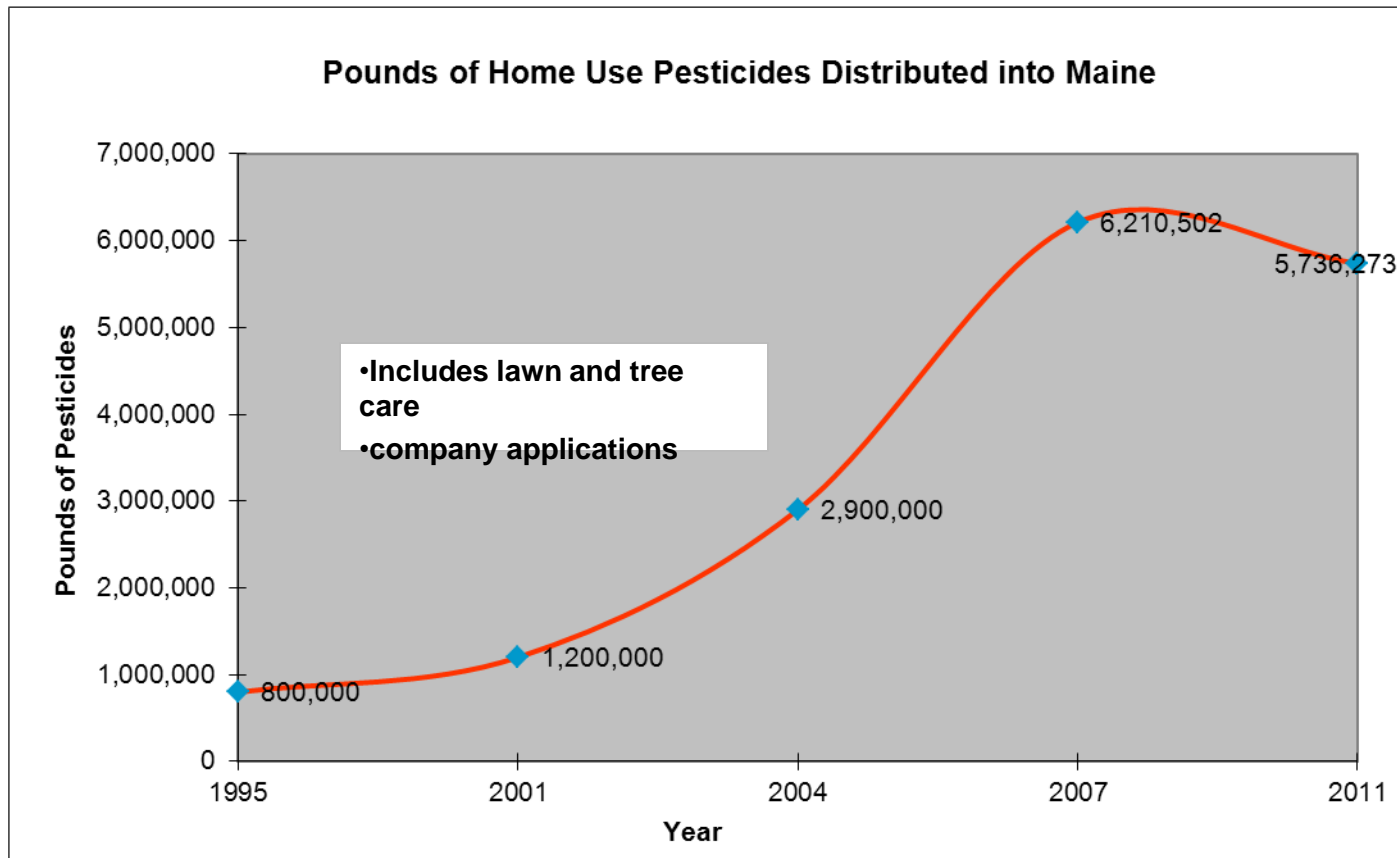
*Want to get involved or learn more?*  
**Visit [www.yardscaping.org](http://www.yardscaping.org)**

# Maine pesticide use more common than perceived



•No endorsement intended or implied

# Have we finally hit the top of the curve?



# BayScaping Project

- Friends Of Casco Bay did some detective work in 2001, 2002, 2003, 2005, 2006, 2008 and 2009
- 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



•\*\*Values in red exceed Aquatic Life Criteria

## – Pesticide residues detected in sediments

- Bifenthrin up to (37 ppb)
- Permethrin up to (47 ppb)



# USGS National Water Quality Assessment



- 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)



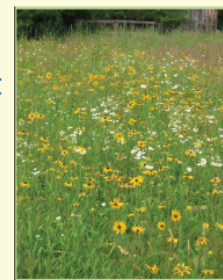
## YardScaping Gardens at Back Cove

### LOW INPUT YARD CARE

**When it comes to gardening,  
less is usually more.**

Low input yards require a little more brain, a lot less brawn and leave you with more free time:

- ◆ plant drought and pest tolerant plants
- ◆ mow lawns at the highest setting and leave the clippings
- ◆ replace lawn with shrubs or wildflowers
- ◆ mulch plants to keep moisture in and weeds out



**Want to get involved or learn more?  
Visit [www.yardscaping.org](http://www.yardscaping.org)**

# 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



Wild Columbine



Viburnum Leaf Beetle



Oriental Bittersweet

# 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



Wild Cranberry Bog

# Right plant, right place



Beach plum –  
dry sunny site

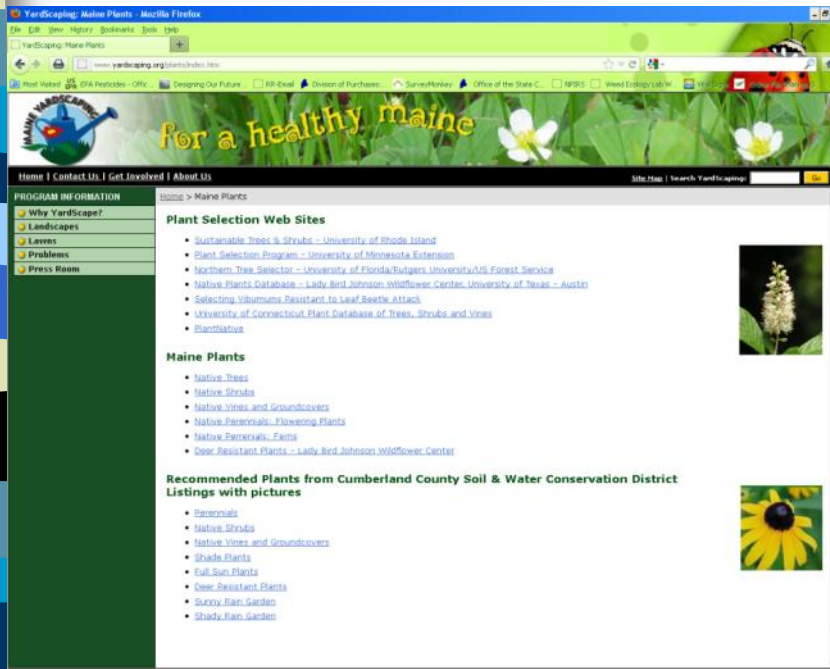


Partridgeberry –  
wet shady site



Staghorn Sumac –  
large open dry bank

# Where to learn more



[www.yardscaping.org/plants/index.htm](http://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](http://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

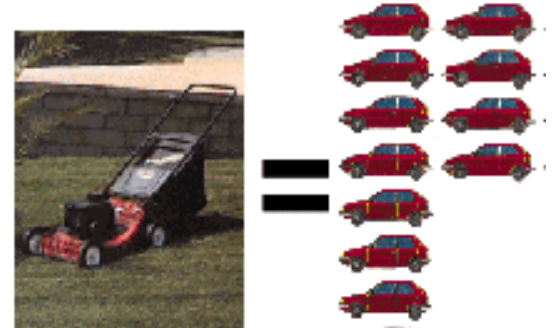
Add water, walls, feeders, woody debris





# 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



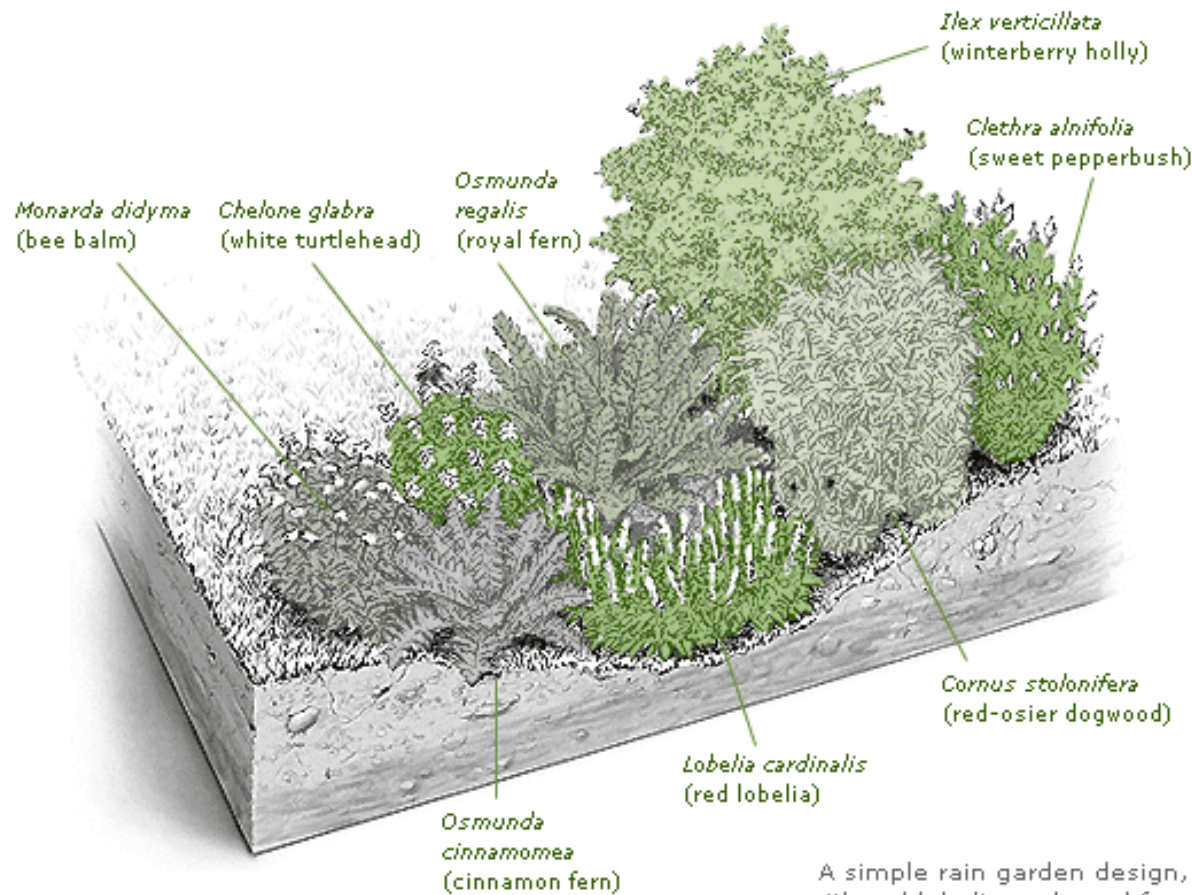
# Protect lakes & streams with buffers

- 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



White Fir



Sweet Fern

# 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



## YardScaping Gardens at Back Cove

### MANAGE PESTS WISELY

**Weed, insect and disease control products present both risks and benefits.**

Follow these simple steps to protect people, pets, plants and watersheds:

- ◆ know the pest
- ◆ pull, squash or trap it
- ◆ use control products as a last resort, *if at all*
- ◆ spot treat only
- ◆ protect beneficial organisms



**Want to get involved or learn more?  
Visit [www.yardscaping.org](http://www.yardscaping.org)**

# Creating Healthy Maine Lawns

- Maximize Benefits
- Minimize Risk
- Practice Integrated Pest Management

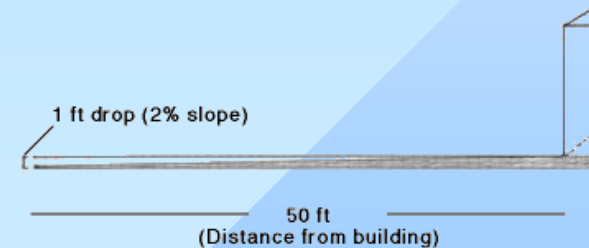
**Think  
First...**



**Spray  
Last!**

# 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

| Soil Nutrient | Low                | Medium | Optimum | Excessive |
|---------------|--------------------|--------|---------|-----------|
| Phosphorus    | XXXXXXXXXXXXXXXXXX |        |         |           |
| Potassium     | XXXXXXXX           |        |         |           |
| Calcium       | XXXXXX             |        |         |           |
| Magnesium     | XXXXXXXX           |        |         |           |
| Soil pH       | XXXXXXXXXX         |        |         |           |
| Org. Matter   | XXXXXXX            |        |         |           |

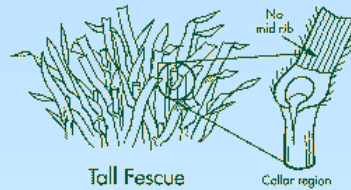
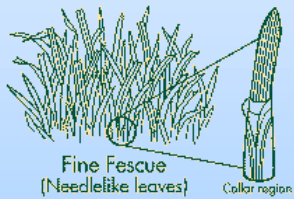
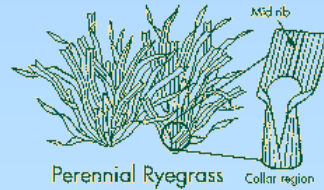
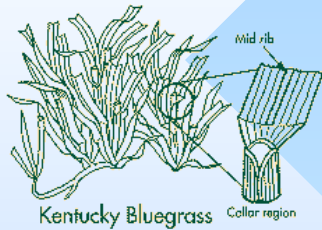


# Site preparation before planting

- 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



|   |   |
|---|---|
| <b>Sunny, medium to high maintenance</b>  |   |
| 65% Kentucky bluegrass blend<br>15% perennial ryegrasses<br>20% fine fescues                                      | 3 to 4 lbs.<br>per 1,000 sq. ft.  |
| <b>Sunny, low maintenance</b>   |   |
| 65% fine fescue blend<br>15% perennial ryegrasses<br>20% Kentucky bluegrass blend<br>or<br>100% tall fescue blend | 4 to 5 lbs.<br>per 1,000 sq. ft.<br><br>7 to 10 lbs.<br>per 1,000 sq. ft. |
| <b>Shady</b>  |   |
| 100% fine fescue blend  | 4 to 5 lbs.<br>per 1,000 sq. ft.  |

|  | <b><i>Kentucky Bluegrass</i></b>  | <b><i>Perennial Ryegrasses</i></b> | <b><i>Tall Fescue</i></b>          | <b><i>Fine Fescue</i></b>         |
|--|-----------------------------------|------------------------------------|------------------------------------|-----------------------------------|
| 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. <sup>2</sup> | 5 to 9 lb./1,000 ft. <sup>2</sup>  | 5 to 9 lb. /1,000 ft. <sup>2</sup> | 3 to 5 lb./1,000 ft. <sup>2</sup> |
| Annual nitrogen fertilizer                 | 3 to 4 lb./1,000 ft. <sup>2</sup> | 2 to 6 lb./1,000 ft. <sup>2</sup>  | 2 to 4 lb./1,000 ft. <sup>2</sup>  | 1 to 2 lb./1,000 ft. <sup>2</sup> |
| 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 |
|-------------------|------|------|------|------|

# 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
- 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

# Sustainable landscapes cost less long term

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



### Project Facts

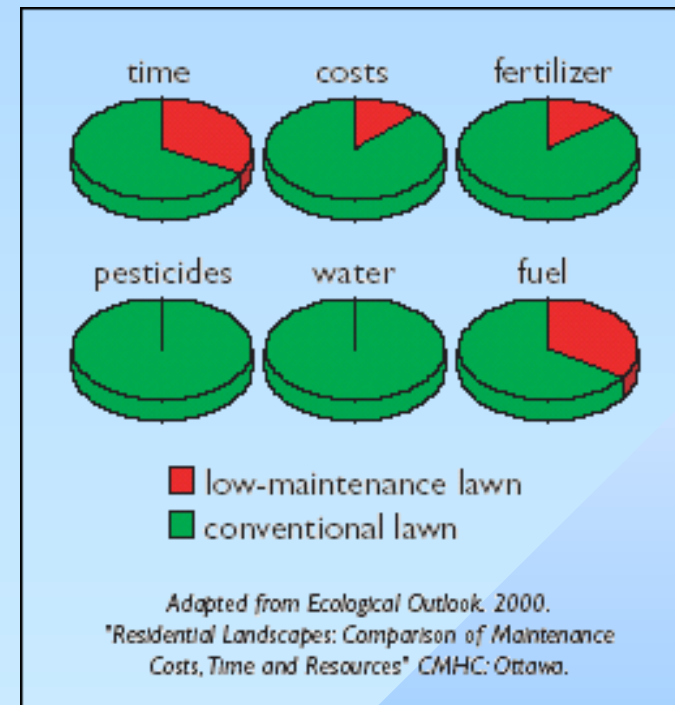
- Santa Monica imports more than 90 percent of its water from Northern California and the Colorado River, more than 400 miles away.
- In 2004, the city of Santa Monica constructed two 1,900-square-foot demonstration gardens on two adjacent front yards to demonstrate the many benefits of sustainable gardens. 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 \$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.



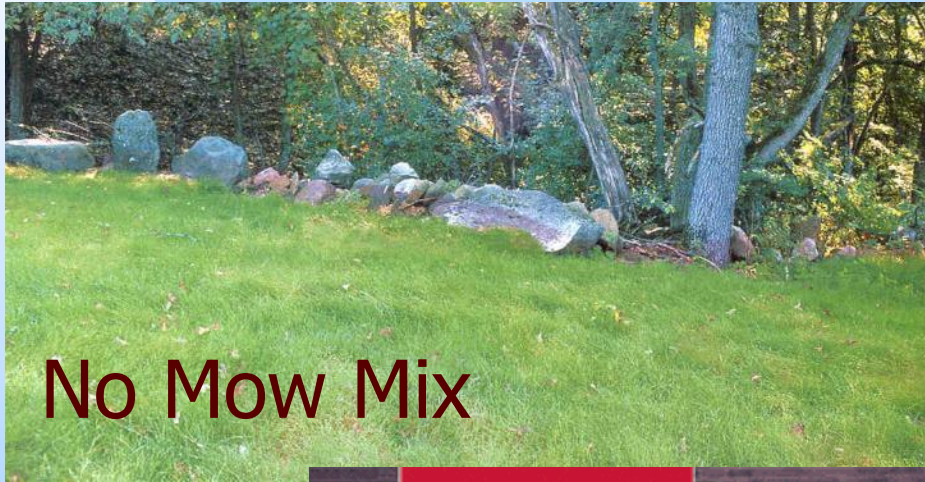
# Low Maintenance Lawn

## 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



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



No Mow Mix



# 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 1/2 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<sup>1/2</sup> inches for the first 3 mowings
- Then mow at 2<sup>1/2</sup> – 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



Soil  
a lawn's  
foundation



# Nutrient tips

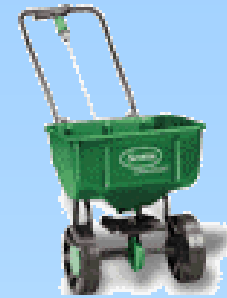


- Soil test
- Measure carefully
- How much
  - 1 - 2 lbs N/1000 sq ft
  - 0 – 1 lb for low input grasses
- When
  - late August - mid November
  - not when ground is frozen

## Soil Test Results

| Soil Nutrient | Low                | Medium | Optimum | Excessive |
|---------------|--------------------|--------|---------|-----------|
| Phosphorus    | XXXXXXXXXXXXXXXXXX |        |         |           |
| Potassium     | XXXXXXX            |        |         |           |
| Calcium       | XXXXXX             |        |         |           |
| Magnesium     | XXXXXXXXXX         |        |         |           |
| Soil pH       | XXXXXXXXXXXX       |        |         |           |
| Org. Matter   | XXXXXXX            |        |         |           |

# 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

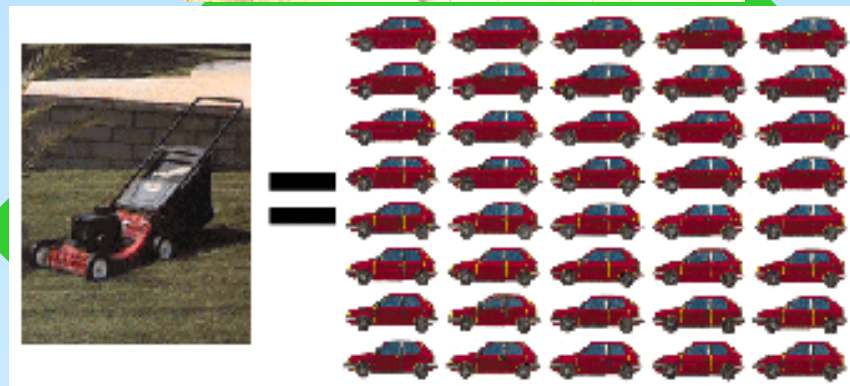
| Fertilizer Name           | Analysis | Source of N                     | <u>Moisture Dependence</u> | <u>Low Temperature Response</u> | <u>Residual N Activity</u> | <u>Salt index (per N unit)</u> | <u>Leaching Potential</u> |
|---------------------------|----------|---------------------------------|----------------------------|---------------------------------|----------------------------|--------------------------------|---------------------------|
| <b>Quickly Available</b>  |          |                                 |                            |                                 |                            |                                |                           |
| Ammonium-nitrate          | 33-0-0   | ammonium nitrate                | minimal                    | rapid                           | 4-6 weeks                  | 3.2                            | high                      |
| Ammonium-sulfate          | 21-0-0   | ammonium sulfate                | minimal                    | rapid                           | 4-6 weeks                  | 3.3                            | high                      |
| Ammonium-phosphate        | 18-46-0  | diammonium phosphate            | minimal                    | rapid                           | 4-6 weeks                  | 1.6                            | high                      |
| <u>Urea</u>               | 46-0-0   | urea                            | minimal                    | rapid                           | 4/6 weeks                  | 1.6                            | moderate                  |
| <b>Slow-Release</b>       |          |                                 |                            |                                 |                            |                                |                           |
| <u>Sulfur-coated urea</u> | 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                       |
| <b>Slowly-soluble</b>     |          |                                 |                            |                                 |                            |                                |                           |
| <u>IBDU</u>               | 31-0-0   | isobutylidene diurea            | high                       | moderately rapid                | 10-16 weeks                | 0.2                            | low                       |

# Select slow release fertilizers

| Fertilizer Name                    | Analysis | Source of N             | <u>Moisture Dependence</u> | <u>Low Temperature Response</u> | <u>Residual N Activity</u> | <u>Salt index (per N unit)</u> | <u>Leaching Potential</u> |
|------------------------------------|----------|-------------------------|----------------------------|---------------------------------|----------------------------|--------------------------------|---------------------------|
| <u>Ureaform reaction</u>           |          |                         |                            |                                 |                            |                                |                           |
| Nitroform                          | 38-0-0   | ureaformaldehyde        | high                       | slow                            | 10-30 weeks+               | 0.3                            | very low                  |
| FLUF                               | 18-0-0   | urea/ureaformaldehyde   | moderate                   | medium                          | 6-10 weeks                 | not applicable                 | low                       |
| Nutralene                          | 40-0-0   | methylene ureas         | moderate                   | medium                          | 7-12 weeks                 | not applicable                 | low                       |
| Methylene urea                     | 39-0-0   | methylene ureas         | moderate                   | medium                          | 7-9 weeks                  | 0.7                            | low                       |
| Coron                              | 28-0-0   | urea/methylene ureas    | minimal                    | moderately rapid                | 7-9 weeks                  | not applicable                 | moderate                  |
| N-Sure                             | 28-0-0   | triazone/urea sol.      | minimal                    | moderately rapid                | 6-9 weeks                  | not applicable                 | moderate                  |
| <u>Natural Organic fertilizers</u> |          |                         |                            |                                 |                            |                                |                           |
| Ringers                            | 6-1-3    | blood, bone, seed meals | high                       | medium                          | 10-12 weeks                | 0.7                            | low                       |
| Sustaine                           | 5-2-4    | composted turkey waste  | high                       | medium                          | 10-12 weeks                | 0.7                            | low                       |
| Milorganite                        | 6-2-0    | activated sludge        | high                       | slow                            | 10-12 weeks                | 0.7                            | low                       |

# Mow properly

- Mow high 2 <sup>1</sup>/<sub>2</sub> 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



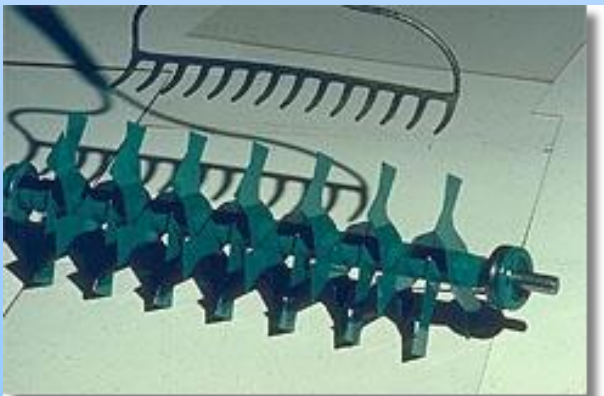
# Water only when needed



- Water deeply  $3/4$  -  $1\frac{1}{2}$  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





# How do you use your lawn?

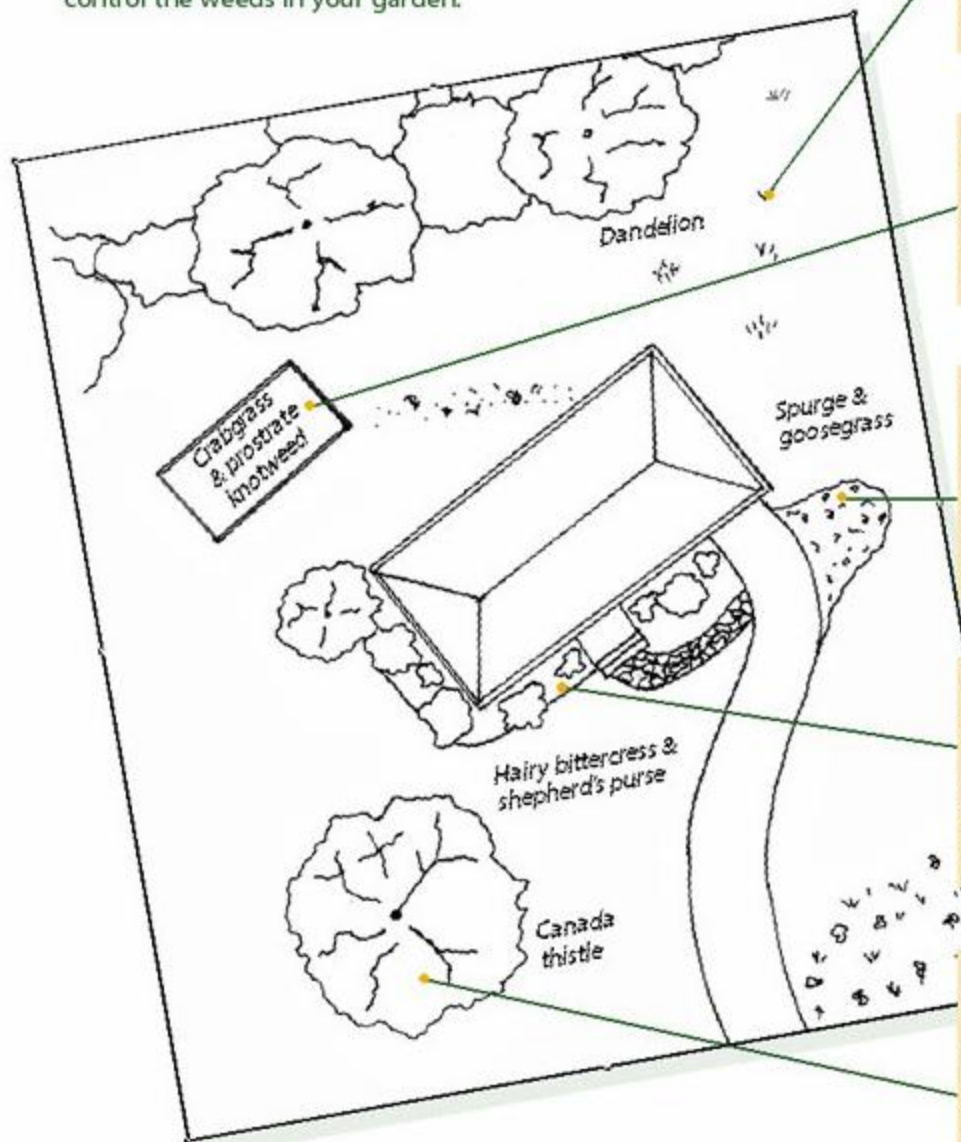
- Do you tread lightly?  
or
- Do you rough it up?
- What areas need help?



# 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 hirsuta*) and shepherd's purse (*Capsella bursa-pastoris*) in the garden beds around the house.

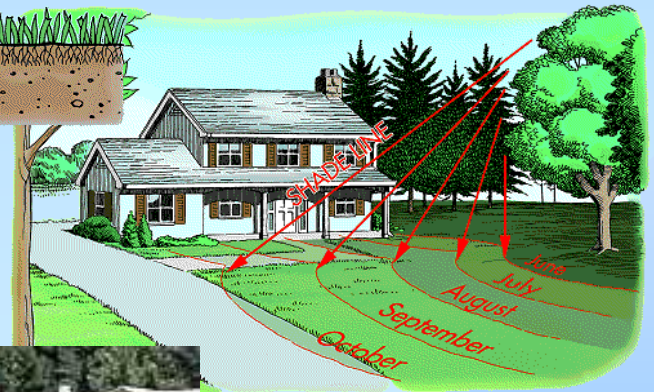
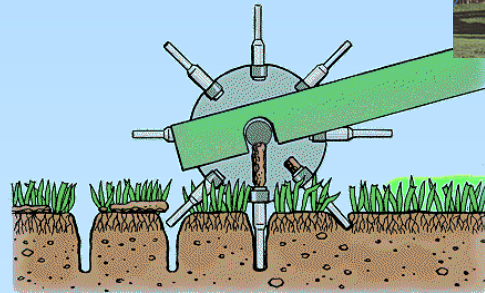
**SOLUTION:** These are both winter annuals that prefer moist, shady spots and cool weather, so watch for them during the fall, winter, and spring, and hand-pull them before they set seed.

**PROBLEM:** Canada thistle (*Cirsium arvense*) on the edge of a mulch bed at the base of a tree.

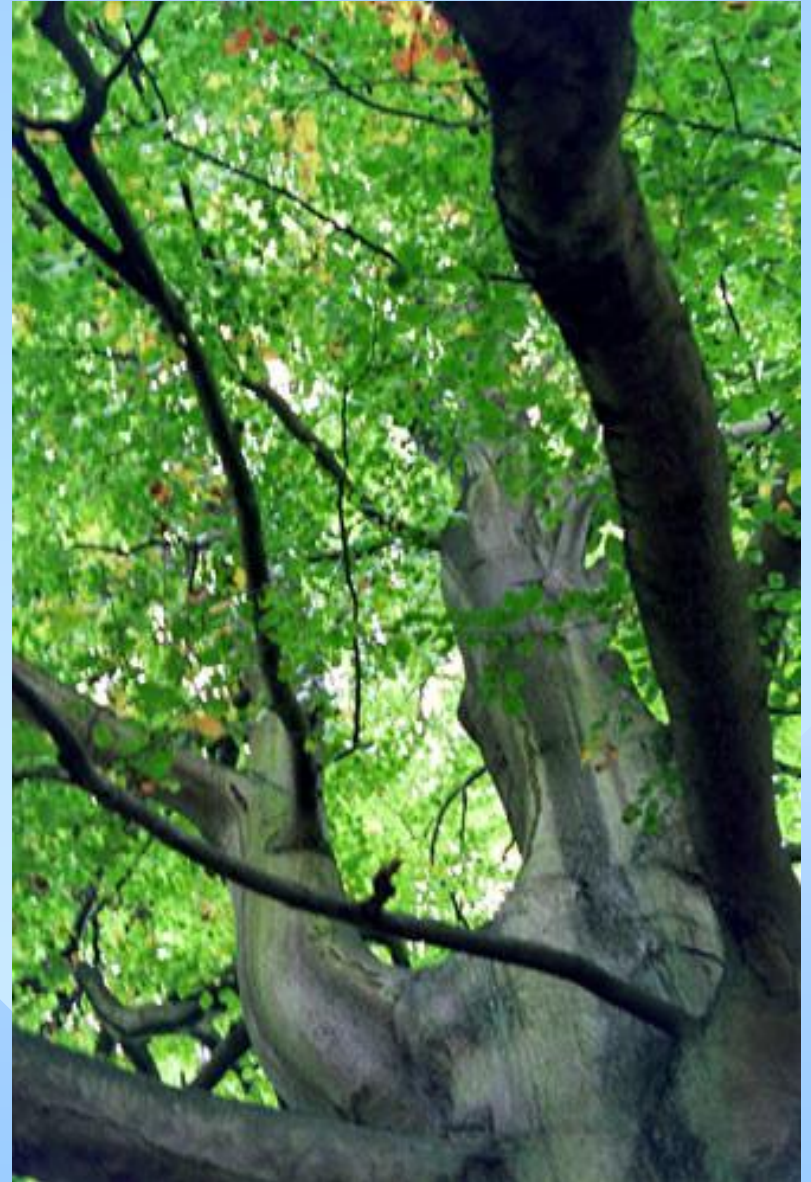
**SOLUTION:** This has probably come over from the meadow on the other side of the driveway. It is an invasive plant that can be hand-pulled when young. Monitor for seedlings in the garden and pull them immediately.

# 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

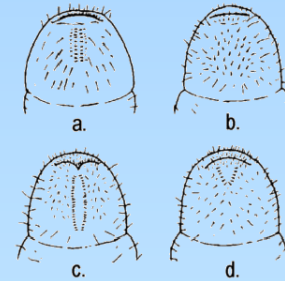


Is this stress free turf?



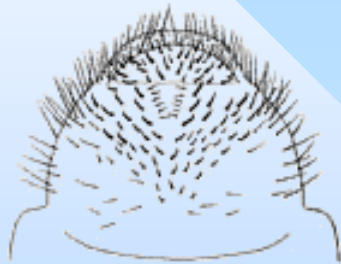
# Integrated Pest Management

- Identify the pest
- Pull it out or mow it off
- Irrigate

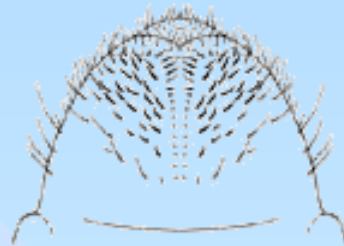


# Pest Identification is crucial

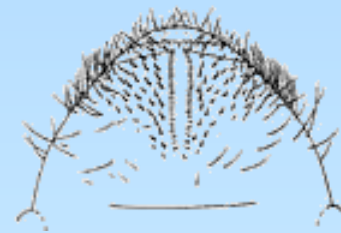
## White grub rastral patterns



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



# IPM Principles and Concepts

## 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

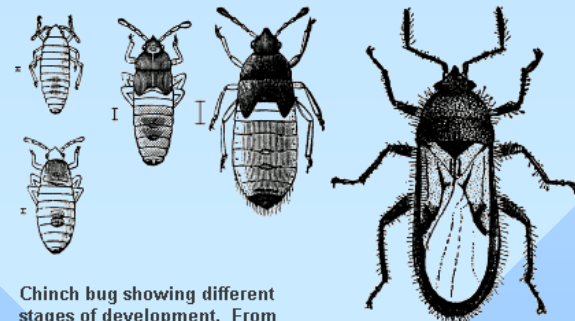


Punto



# Integrated Pest Management – Insect Pests

- White Grubs
- Chinch Bugs



Chinch bug showing different stages of development. From left to right: newly hatched bug (top), after the first molt (bottom), second molt, third molt and adult chinch bug.

# 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

---

## **P** Predators

Ants & Wasps  
Beetles  
Spiders

Bugs (damselfly, big-eyed, stink)  
Mites  
Others

## **P** Parasites

Wasps

Flower Flies

## **P** 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!!**

# Classic Cultural Controls

---

## *P* Physical/mechanical

Hand crushing

Syringing

Traps

Barriers

## *P* Plant Resistance/Tolerance

Site Plants

Fertilizer & Water

# White Grubs



# Entomopathogenic Nematodes

---

*Steinernema carpocapsae*

*Ambush Nematodes*

*S. riobravis*

*S. scapterisci*

*Heterorhabditis bacteriophora*

*Cruiser nematodes*





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* -  $\delta$ -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





# 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



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



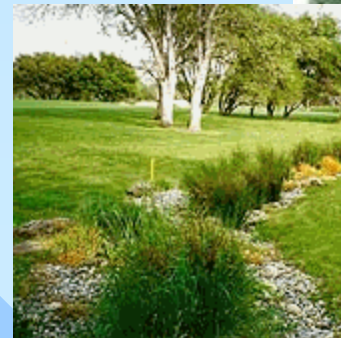
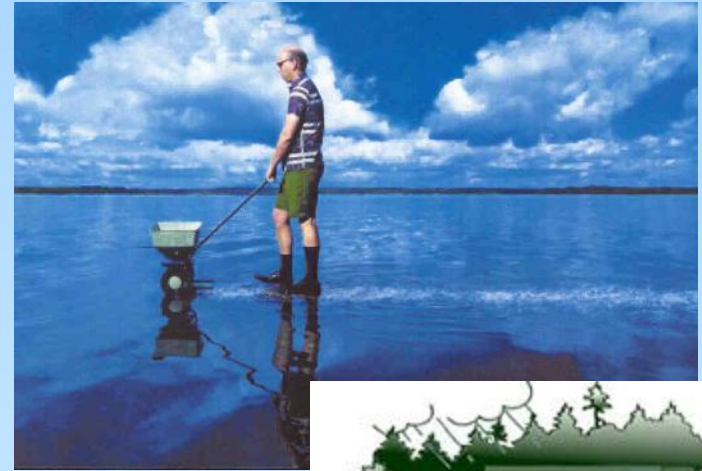
- Do not apply to saturated soils or when 0.5 inch or more rainfall expected
- Don't put pesticides and fertilizers onto sidewalks, driveways, etc.
- Reduce urban runoff – install more pervious surfaces (turf, prairie, woodlots, turf pavers, etc.)

# 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



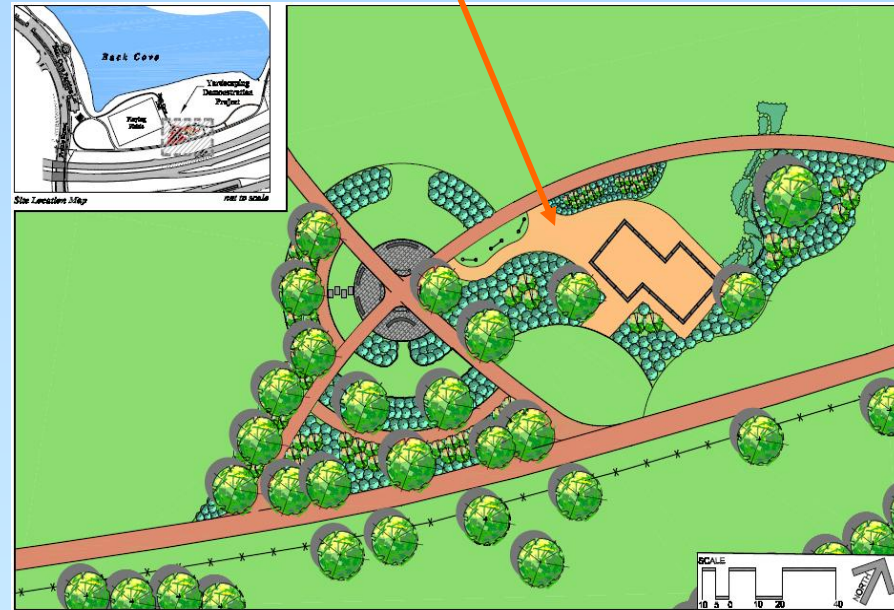
# Suburban/Rural

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



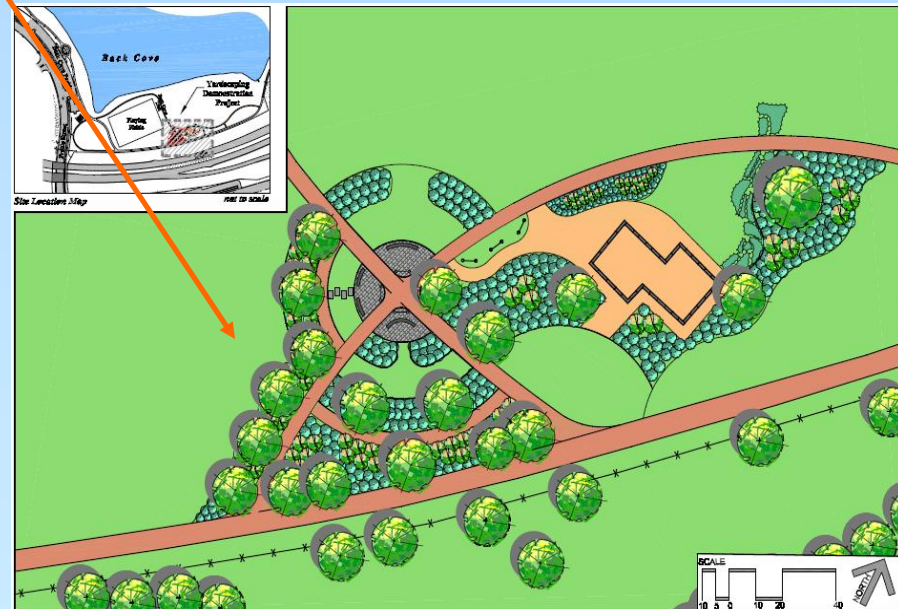
# Urban/Suburban

- Very low input grasses
- Very low input native and non-invasive alien trees & shrubs
- Stone dust paths?
- More benches
- Grass mown at 3 inches



# Urban

- YardScaping grass mix
- Low input native and non-invasive alien trees & shrubs
- Crushed stone paths?
- Inviting archway





- PROGRAM INFORMATION**
- Why YardScape?
  - Landscapes
  - Lawns
  - Problems
  - Press Room

### 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!

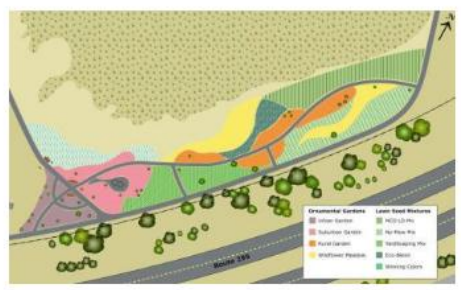
Whether you've been wringing your hands over Japanese beetles or you're tired of slaving away on your lawn, **YARDSCAPING** is for you.

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



Be a YardScaper: Plant a sign in your yard today!

### What's New



Portland's YardScaping Gardens at Back Cove are complete and ready for your enjoyment!

### QUICK TIPS

- GotPests.org
- IPM: The Yard Saver
- Sustainable Plant Selection
- Plants to Avoid
- Native Plants: Where to buy 'em:
- Hiring a Landscape Professional
- Ecological Yard Care Resources [PDF]

### LINKS

- YardScaping Experts
- BayScaping
- Healthy Lawncare Tips—Cumberland County Soil & Water Conservation District
- Kennebunkport Conservation Commission—Lawns for Lobsters
- Grass Seed Sources
- Maine Board of Pesticides Control
- University of Maine Cooperative Extension
- LakeSmart
- Congress of Lake Associations
- The Friends of Casco Bay
- Maine Soil and Water Conservation Districts
- The University of Maine Cooperative Extension Water Quality
- ThinkBlueMaine.org
- Portland Water District
- PlantNative



Got Pests? - Mozilla Firefox

www.maine.gov/agriculture/pesticides/gotpests/index.html

Maine.gov Agencies | Online Services | Help

# Got Pests?

Home | Contact Us

Site Index | Search Got Pests:  Go

**GOT PESTS?**

- About Got Pests?
- Is It Really a Pest?
- Pest Solutions
- A Word About Pesticides
- Want to Know More?

**ASK THE EXPERT**

**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:

If not, select from the options below.

Where is it found?

What kind of pest is it?

Teaching kids to identify and manage pests? [K-12 IPM Curricula](#)

**QUICK FIND**

- Bed Bugs
- Invasive Pests
- Late Blight of Potatoes/Tomatoes
- Mosquitoes
- Ticks
- What's New?

**LINKS**

- Maine Board of Pesticides Control
- Maine Center for Disease Control & Prevention
- Maine Department of Agriculture
- Maine Forest Service
- Maine Integrated Pest Management Council
- Maine YardScaping Partnership
- PRO New England
- University of Maine Cooperative Extension IPM for Maine Homeowners
  - Have Your Pest Identified (Diagnostic Lab)
- USDA APHIS Wildlife Services

http://www.gotpests.org


Home: Sustainable Trees and Shrubs - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Back Forward Stop Home Search Favorites Media Print Copy Paste

Address [http://131.128.91.217/maynard\\_susplants/html\\_spl2000/index.htm](http://131.128.91.217/maynard_susplants/html_spl2000/index.htm) Go Links

# 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

Based on **Sustainable Trees and Shrubs, 3rd ed.**, 1999.  
URI Cooperative Extension—Landscape Horticulture.

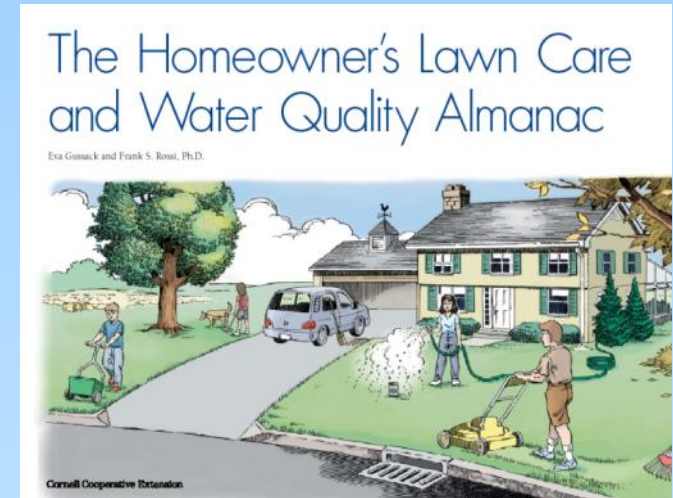
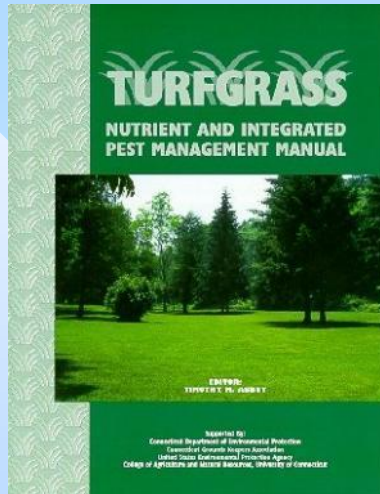
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RI Cooperative Extension | University of Rhode Island  
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Internet

[http://131.128.91.217/maynard\\_susplants/html\\_spl2000/index.htm](http://131.128.91.217/maynard_susplants/html_spl2000/index.htm)

# Other resources

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

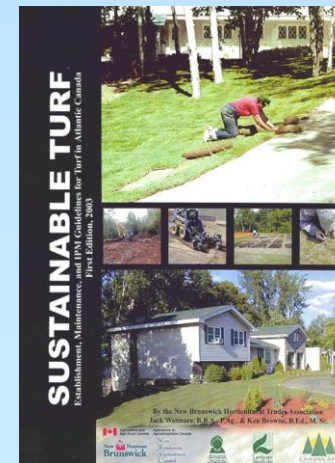


<http://www.gardening.cornell.edu/lawn/almanac>

UNIVERSITY  
of GUELPH

Guelph  
Turfgrass  
Institute  
& Environmental Research  
Centre

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



[http://www.nbhta.ca/sustainable\\_turf\\_manual.htm](http://www.nbhta.ca/sustainable_turf_manual.htm)

# YardScaping... Protecting the beauty of Maine

