



clean water starts at home

Beautiful Gardens, Clean Waters



Presented by URI Cooperative Extension
Education Center Master Gardener
Speakers Bureau



Gardening is the nation's number one hobby.

Think of all the reasons why you love to garden.



clean water starts at home

Water resources are affected by our everyday activities



It may be hard to see how the everyday things we do to nurture our yard and gardens can also potentially harm our water resources.

As rain and snowmelt travel over the earth's surface and soak into the ground, it can pick up and carry pollutants. These pollutants can end up in our surface and ground water resources, affecting the water resources and the life that depends on them in different ways.

For more information, refer to URI Cooperative Extension Home*A*Syst fact sheet, *What You Can Do About Nonpoint Source Pollution*.



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maintaining your landscape
for clean water
starts with a few simple steps

- Demo sites
- Website
- Educational materials & programs



The University of Rhode Island Cooperative Extension (URI CE) Healthy Landscapes program provides tips on **landscaping best management practices**. These are practices that:

- reduce pollution risk
- conserve water
- reduce runoff and soil erosion
- enhance beauty
- save time, money and labor

The program has a detailed website, www.healthylandscapes.org that contains:

- demonstration site photos
- educational materials and resources

The URI CE Home*A*Syst Program is the lead contact for this program at (401) 874-5398.



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The Basics for a Healthy Landscape www.healthylandscapes.org

- Choose the right plant for the right spot
- Recycle your yard waste
- Use fertilizers and pesticides responsibly
- Water wisely
- Reduce runoff from your yard and increase groundwater recharge.
- Reduce soil erosion. Keep it planted and mulched.
- Pick up after your pets.
- Use and dispose of fuels and hazardous products properly



The Healthy Landscapes Program provides **8 basic principles** for achieving a healthy landscape. There are many different ways to accomplish these goals, and we will discuss some examples from our local demonstration sites.

Please visit our website, www.healthylandscapes.org for:

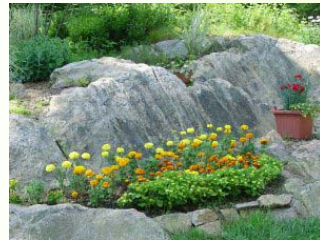
fact sheets on each one of these 8 tips

additional fact sheets and publications listed within this slide presentation

local demonstration site photos



Know your site conditions



Choose the right plant for the right spot -- know your site conditions.

Identify site conditions: sun, shade, wind/exposure, road or ocean salt.

Identify soils: sandy or fine; droughty, wet, or in-between; shallow or deep; compaction problems

Consider other land features: slope, stones/rock outcrop, water resources, woodlands

Select native and sustainable plants: plants that tolerate and even thrive in site conditions. Sustainable plants are non-invasive, and less prone to disease and pest problems.

Think of ways that you can integrate your gardening with the natural site conditions—be creative!

Refer to the URI CE GreenShare Program Sustainable Tree and Shrub Manual for more information, available on-line.

Photos of The Glen and Wickford Cove Demonstration Sites



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Once properly established, sustainable plants use less water, fertilizer & pesticides.



•Lawn converted to shade bed of native and sustainable plants



Lawn converted to shade bed of native and sustainable plants. Generally, these plants require less water, fertilizer and pest control compared to a lawn once they are well established.

Site conditions: Shade, sandy, acidic soil, ocean salt

Practices: Established shade bed of **native and sustainable plants** that tolerate conditions.

Mulch was applied to reduce weeds and soil erosion, build soil organic matter, and conserve soil moisture.

Soaker hoses are buried beneath the mulch for watering when needed.

Plants include: Ginger, Holly, Hosta, Blue Lacecap Hydrangea, Inkberry, Winterberry, Leucothoe, Mountain Laurel, Redvein Enkianthus, Sedum, Sweet Pepperbush, Doublefile Viburnum

Photos of Wickford Cove Demonstration Site

Lawn grass alternatives



•Fescue to the rescue:

Tolerates drought and low fertility

Fine fescues are shade tolerant

Turf-type tall fescue for sun and wear tolerance (look for winter hardy varieties)

• *Endophyte-enhanced lawn grasses* (fescues and perennial ryegrass) for natural pest resistance

• Consider clover – legumes fix Nitrogen from the air and make it available to plants

Lawn grasses typically require more in the way of nutrients, pest control, and water. There are lawn grasses, however, that do a better job of tolerating certain conditions.

Fescue grasses tolerate drought and low fertility.

Fine fescues are shade tolerant.

Turf-type tall fescue offers sun and wear tolerance – look for winter hardy varieties.

Endophyte-enhanced grasses (perennial ryegrass and fescues) offer natural pest resistance. (Endophyte is a natural fungus that lives in the grass leaf, causing toxicity to certain leaf-eating insects. Should not be used when grazing horses or livestock.)

Consider white clover. White clover is a legume that fixes nitrogen in the air and converts it to a form that plants can use. Builds natural fertility, tolerates drought and low fertility.

Visit our Healthy Lawn Care page at www.healthylandscapes.org for more information including URI CE GreenShare Fact Sheets on lawn grasses.

Photo of Davisville Demonstration Site



Riparian Buffers



- Keep shoreline edges shaded--cool and oxygenated
- Filter pollutants, sediments and nutrients
- Provide valuable habitat

Riparian or shoreline buffers are strips or areas of native vegetation that are left intact (or re-established) along surface waters—both fresh water and coastal. They protect surface waters in many important ways.

Provide shade along shoreline edges, keeping the water cool and oxygenated.

Serve as a pollutant filter, settling runoff and taking up sediments and nutrients.

Provide key wildlife habitat for many species that live within a riparian edge.

A lawn should not extend down to the water's edge. It increases the risk of runoff and pollution to the water body, including grass clippings. (Grass clippings are a source of organic nutrients that can cause algae blooms and rob the water of oxygen, resulting in fish kills.)

Minimize areas for view and access. Maintain native riparian buffers along shorelines.

Be sure to follow all laws that regulate activities near a water resource, RI DEM Office of Water Resources, RI CRMC (coastal waters), local regulations and ordinances.

For more information refer to URI CE Home*A*Syst Program Fact Sheet, *Shoreland Buffers and Water Quality Protection* and publication *Home Landscape Improvements for Water Quality Protection*.

Photo of Smith's Castle Demonstration Site

Planting Coastal Bank



Steep lawn area
converted to low-
growing shrubs
and groundcovers



Site conditions and goals: shaded, north-facing, ocean salt, sandy, acidic soil, steep slope. Fertilizers and pesticides are not used on the lawn. Maintain view and access and enhance appearance. The lawn grass was sparse and difficult to mow, and the bank area was subject to erosion and runoff due to the lack of dense vegetation.

Practice: Established low-growing, sustainable shrubs and groundcovers that:

tolerate the many difficult site conditions

stabilize the bank and reduce runoff and erosion

do not require much water, fertilizer, and pest control once established

maintain view and access

provide aesthetic enhancement

The plantings include, Russian Arborvitae, (also known as Siberian Cypress), Anthony Waterer Spirea, Bayberry, Sweet Fern, and Pachysandra. A phase II planting of groundcovers include Barrenwort, Spotted Deadnettle, and Herman's Pride Deadnettle.

Photo of Wickford Cove Demonstration Site.



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The Basics for a Healthy Landscape

www.healthylandscapes.org

- Choose the right plant for the right spot
- **Recycle your yard waste**
- Use fertilizers and pesticides responsibly
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- Pick up after your pets.
- Use and dispose of fuels and hazardous products properly





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Recycle Yard Waste



Every curb is a shoreline

- Use as mulch
- Compost it
- Use a mulching mower (leaving grass clippings on lawn can reduce fertilizer use by 50% or more)



Concerns: When grass clippings, leaves, and other yard waste wash into storm drains and surface waters, they are a source of pollutants—organic nutrients that can cause algae blooms and rob the water of oxygen, resulting in fish kills.

Most storm drains discharge directly to a surface water body and do not enter a treatment plant.

Every curb is a shoreline.

Practices: Use grass clippings, leaves, and yard trimmings (when shredded) as a mulch in beds.

Compost your yard waste to create a valuable soil amendment that is high in organic matter.

Use a mulching lawn mower to leave grass clippings on the lawn. This can reduce fertilizer needs by 50% or more. Recycling lawn clippings does not contribute to thatch problems.

Photos of compost bins at The Glen and Smith's Castle Demonstration sites



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Yard care products



On average, residential landscapes use pesticides and fertilizers more intensively than agricultural lands (per acre or per square foot)



Residential landscapes may use more pesticides and fertilizers than agricultural lands on a per acre or per square foot basis.

Many residential landscapes are surrounded by paved areas, roof areas and storm drains. These are areas that generate and collect stormwater runoff, increasing pollution risk.

When using yard and garden care products, it is important to use the right amount, at the right times, in the right places, for the right reasons using sound application methods.

Low maintenance, sustainable lawn URI CE Botanical Gardens



Mostly fescues and white clover, lawn clippings recycled.
See our Healthy Lawn Care web link – links to numerous
resources on lawn care.

Most of our fertilizer, pesticides, and water go to lawn care.

The lawn at the URI CE Botanical Gardens is an example of an attractive, low maintenance lawn.

contains mostly **fescue grasses** (which use less fertilizer and water) and **white clover** (a legume that builds Nitrogen in the soil).

the **lawn clippings are left on the lawn**, providing a slow release of nutrients and improving soil moisture holding capacity.

Refer to the page on **Healthy Lawn Care** at www.healthylandscapes.org, which provides more information on lawn care and renovation, including proper mowing, and dealing with soil compaction and thatch build-up problems. The page provides numerous links to URI CE GreenShare fact sheets on lawn care.

Photo of URI CE Botanical Gardens

Nutrient Management Tips



- Soil test, apply only what's needed
- Lime lawns regularly to maintain soil pH
- Recycle lawn clippings
- Use organic or "slow-release" fertilizers
- Do not apply soluble N fertilizer after Oct. 15th
- Use lawn grasses that tolerate low fertility
- DO NOT OVER-WATER

Nutrients are essential for plant growth, but nitrogen and phosphorus are pollutants to water resources. For information on this topic refer to URI CE Home*A*Syst fact sheet, *What You Can Do About Nonpoint Source Pollution*.

The key is to apply only the amount needed to sustain the plants, while minimizing losses to the surrounding environment. Losses occur through runoff and leaching to groundwater.

Soil testing tells us how much nutrients and lime the plants need—don't guess.

Lawn grasses require a higher soil pH, between 6.0 and 7.0. Liming helps make nutrients in the soil more available for plant uptake—liming alone can improve soil fertility.

Organic or other "slow-release" (more than 50% water insoluble nitrogen) fertilizers release nutrients slowly, reducing risks of losses in runoff or leaching to groundwater.

Recycling lawn clippings can reduce fertilizer needs by 50% or more.

Do not apply soluble N fertilizer after October 15th -- this greatly increases the risk of pollution while providing no additional benefit to the lawn.

Reduce the need for added nutrients by choosing grasses that tolerate low fertility; or using white clover to build soil nitrogen.

Do not over-water, this greatly increases the risk of washing the applied nutrients into storm drains and groundwater.

Integrated Pest Management Tips



Alternative Control of the Oriental Beetle

- Identify the problem.
- Is treatment warranted?
- Are there alternatives to chemical controls – biological, mechanical, cultural?
- Chemical controls: spot treatment, less toxic alternatives, less risky formulations
- Avoid routine pesticide applications, weed & feed products.
- Scout regularly.

Pest management should not consist of routine pesticide applications or be combined with fertilizer applications (“weed and feed.”) **Proper pest management includes several steps listed on the slide.** Here is how we applied them at our Davisville Demonstration Site:

White grubs in lawn and gardens were identified as Oriental Beetle grubs.

Found at least 10 white grubs per square foot after sampling several lawn areas—this is the level (“threshold level”) at which damage can occur and treatment is warranted.

Identified biological control options for Oriental Beetles and chose a method called mass trapping and mating disruption. For more information, refer to Healthy Landscapes fact sheet *Alternative Control of the Oriental Beetle: Mass trapping and mating disruption.*

Identified granular pesticide that can be applied with a drop spreader—this is a less risky pesticide formulation than a spray.

Apply pesticides only where needed – in areas where grub population is high (10 or more per sq. ft.). White grubs do not persist in shaded areas. This is known as spot treatment.

Scout your yard and gardens regularly for pests, stay on top of the problem before it gets bad.

Photo of Davisville Demonstration Site



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Pest management – help
with identification & options



URI Plant Protection Clinic
(401) 874-2900

URI Master Gardener
Hotline 1 (800) 448-1011



URI GreenShare Fact sheets –
numerous topics on insects, diseases,
weeds integrated pest management &
household pests

www.uri.edu/ce/factsheets/index.htm

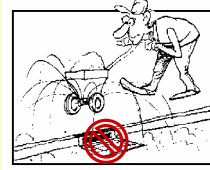


Pest management is a complicated topic.

There are many steps you need to take and lots of information needed to carry them out.

The resources on the slide can assist you.

How do you apply fertilizers and pesticides?



Drop spreader for
better control



Every curb is a
shoreline

We must be mindful of HOW we apply fertilizers and pesticides. This is often the biggest source of pollution risk. Remember every curb is a shoreline.

Be sure that fertilizers and pesticides are applied only to the designated treatment areas.

Be mindful of paved areas, storm drains, and drinking water wells--sweep up spills.

A drop spreader allows for more accurate control in critical areas.

Measure the treatment area, don't guess the square footage.

Calibrate your spreader or sprayer to be sure that you are applying the intended amount.

Watch the weather, while some products require a small application of water, do not apply these products before a heavy rain storm or when it is windy.



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The Basics for a Healthy Landscape

www.healthylandscapes.org

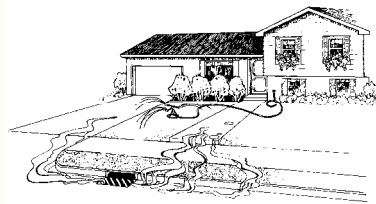
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Proper watering

Residential water use increases 40 - 50% during summer months.

- Lawns require about one inch of water per week to remain actively growing. (One inch of water over 1,000 square feet = 625 gallons.)
- Use a rain gauge to measure rainfall.
- One long, slow watering each week is best.
- Early morning watering is best to reduce evaporation.
- Do not water pavement and other non-vegetated areas.



Over-watering causes many problems including:

increased risk of pollution

shallow root depths

increased susceptibility to plant disease

stresses water supplies

wastes time, money and water

The tips on the slide provide us with proper management of irrigation water.

Another option is to allow lawns to go **naturally dormant** (shut down and turn brown) when conditions become hot and dry. Lawns will “green up” and resume growth when rain fall and cooler temperatures return.

In addition to the Healthy Landscapes fact sheet on this topic, refer to Healthy Landscapes fact sheet *Rain Gauges-Your most important garden tool* and URI CE Home*A*Syst fact sheet, *Water Conservation In and Around the Home*.

Consider this! 625 gallons of water is equivalent to 12 loads of laundry, or 25 showers, or 10,000 glasses of water. Multiply this by 5, 10 or 20 as most people’s lawns are between 5,000 and over 20,000 square feet in size.

Water Conservation Tools



Rain barrels

Soaker
hose



Drip
irrigation



Rain barrels or cisterns collect rain water and store it for use at a later time. All openings should be covered with insect screening to eliminate mosquito concerns.

Soaker hoses and drip irrigation efficiently and slowly apply water at the plant root zone, minimizing evaporation and runoff.

Refer to Healthy Landscapes fact sheets, *Rain Barrels*, *How to Build and Install a Rain Barrel*, and *Drip Irrigation for the Home Garden*.

Photos of Davisville Demonstration Site and URI Master Gardener Demonstration Vegetable Garden.

For examples of home-made rain barrels, visit the Gilbert Stuart Road Demonstration Site



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Reduce landscape watering needs



- Drought tolerant plants
- Use mulch
- Increase soil organic matter

- Permeable paving materials
- Create shaded areas



Consider ways to reduce the need for landscape watering.

Plant drought tolerant plants and lawn grasses.

Use mulch and increase soil organic matter with compost and other amendments.

Use permeable paving materials to create walk ways, patios or as a cover on trouble spots.

Create shaded areas -- trees protect against wind and sun and attract wildlife such as birds that can serve as natural pest control.

Refer to URI CE GreenShare Program *Sustainable Tree and Shrub Manual*, and URI CE Home*A*Syst publication, *Home Landscape Improvements for Water Quality Protection* for more information on drought tolerant plants, trees, and permeable paving materials.

Photos of Davisville Demonstration Site



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Reducing runoff and soil erosion



- Border beds
- Permeable paving materials



Reducing runoff and soil erosion from your property restores balance in the water cycle, replenishes groundwater, reduces flooding, and protects water quality, reducing pollution. **Stormwater runoff is the nation's number one pollution problem.**

Use **border beds** along buildings, property edges and driveways to settle and soak up runoff.

Use **permeable paving** materials such as crushed stone in driveways, heavy traffic areas, and runoff prone areas to reduce erosion, runoff and increase infiltration.

Keep soil covered with a healthy vegetative cover, mulch or permeable paving materials.

In addition to Healthy Landscapes fact sheets on these topics, refer to URI CE Home*A*Syst publication, *Home Landscape Improvements for Water Quality Protection*.

Photos of Davisville, Wickford Cove, and Gilbert Stuart Road demonstration sites.



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Demonstration Rain Garden North Kingstown Town Hall



- Captures and soaks up stormwater runoff
- Plants that tolerate temporary ponding



A rain garden is a natural or dug shallow depression that captures and soaks up stormwater runoff from roof areas, paved areas, or even compacted lawn areas.

A rain garden is planted to native and sustainable plants that can tolerate temporary pooling of water, as well as dry periods.

A rain garden should not pool for more than 6 hours after a storm event due to both plant and mosquito concerns. Do not locate in areas that are already poorly drained.

There are several methods for planning, sizing and locating a rain garden, and many important factors need to be considered. Refer to Healthy Landscapes fact sheet, *Rain Gardens – Enhancing your home landscape and protecting water quality*.

Photos of North Kingstown Town Hall Demonstration Rain Garden



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Pet waste management

Pet waste is a potential source of nutrients and pathogens



Pick up after your pets:

- Seal in bag and dispose in trash.

- In-ground disposal options with proper site conditions.

- Do not locate dog yards/runs, livestock pens, or animal waste storage facilities near wells, storm drains or surface waters.



Animal waste can pollute water resources—proper management is the key to protection. Pick up after your pets and dispose of solid waste properly.

Seal in a plastic bag and dispose in the trash.

In-ground disposal system (pictured bottom right) under proper site conditions. Factors to consider include distance from a drinking water well, storm drain, other water resources, or vegetable gardens. Soil type is also important—some soils are not suitable for this method.

Proper location of dog run or dog yard (also sources of concentrated animal waste.)

Factors to consider include:

Distance to drinking water wells, storm drains, other water resources, vegetable gardens.

Locate in level areas that are surrounded by dense vegetation that can soak up and settle runoff.

In addition to the Healthy Landscapes fact sheet on this topic, refer to URI CE Home*A*Syst Program fact sheet, *Pet Waste and Water Quality Protection*.

For small acreage livestock owners, refer to Healthy Landscapes Small Acreage Livestock Fact Sheet Series, at www.healthylandscapes.org.

Photos of Gilbert Stuart Road Demonstration Site



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Use and dispose of fuels and hazardous products properly



Washing car on lawn reduces runoff to street and storm drains



- Use safe substitutes
- Do not use near well or storm drain
- RI Eco-depot for disposal 942-1430 xt. 241



There are many specific tips for the proper use, storage and disposal of fuels and other hazardous products. Among the most important include:

Consider using a safe substitute where possible. For example use a latex, water-based stain instead of oil-based stains.

Be mindful of where you store and use these products—stay away from wells, storm drains and other water resources.

Buy only the amount of product needed.

Give surplus away to neighbors and others that can use them. Keep in properly labeled original containers.

If disposal is necessary, contact the RI Eco-depot at the RI Resource Recovery Corp. at 942-1430 xt. 241

In addition to the Healthy Landscapes fact sheet on this topic, refer to URI CE Home*A*Syst fact sheet, *Household Hazardous Waste and Water Quality Protection*.



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Take the Healthy Landscapes Challenge!

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Take the Healthy Landscapes Challenge!

Can you identify at least one practice that you would like to adopt in your own yard and garden?

Determine what additional information you need and plan an appropriate time frame for applying the practice.



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For more information

Visit our website:

www.healthylandscapes.org

- View our demonstration sites
- Publications & resource links

For more assistance:

URI CE Home*A*Syst Program, residential pollution prevention and water quality protection, (401) 874-5398

URI Master Gardener Hotline
1 (800) 448-1011; www.urimga.org





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Thank-you !

