

# Healthy Lawns and Gardens

## Master Gardener/CET Outline: Integrated Pest Management

Note on format: the essential outline is in the left hand column. The right hand column contains additional examples and supporting information that can be added in, depending on time and the audience. There are notes for when to pass out handouts and when to refer to them.

Other materials:

Handouts: Display reproduction, composting fact sheets, calendar checklist (optional), HHW collection dates.

Slide show, slide show script. (optional)

Display

### I. Welcome/Introductions

#### A. Introduction

Introduce yourself, Master Gardener's Association, and CET. The Center for Ecological Technology is a non-profit resource conservation organization serving western Massachusetts since 1976. CET applied for and received funding from USDA Rural Utilities Service and the Toxics Use Reduction Institute to help people create more natural lawns and gardens using less or non-toxic chemicals.

#### B. Ice Breaker

Go around the room, ask each person to say his/her name, and what their favorite plant or flower is, and/or what his/her most troublesome pest is.

#### C. What we're going to be doing

We're going to explain a fancy term that actually means a very practical thing that takes many words to explain- which is why they give it a fancy name. You'll learn that this not-so-fancy method is the least toxic and most effective means of saving your landscape, preventing the poisoning of songbirds and protecting your drinking water. We'll show you what your next steps are and how to keep yourself doing it.

#### D. *Pass out copies of display.*

We'll be using this as a reference.

#### E. Brief definition of Integrated Pest Management:

A method of managing your environment such that effects of pests can be minimized without disrupting the natural balance.

It's Integrated because it draws on knowledge, experience, and techniques from many different fields. Pests can be insects, diseases, weeds, and other intruders that have reached intolerable levels. Management uses a balanced approach to achieve

healthy plants and soils, and tolerable pest levels. It's not a quick fix: it takes time to restore balances upset by overuse of fertilizer and pesticides.

## II. Why use Integrated Pest Management?

### A. More effective, long term

It restores a balance and helps the landscape help itself. Healthy (not stressed) plants are much better able to withstand drought, disease, and insect attack.

### B. Lower cost over time

Save on fertilizer, unnecessary and sometimes ineffective pesticide application and watering costs. Save money by not having to replace plants.

### C. Health Issues

Pesticides can cause acute poisonings, learning and developmental disabilities, cancer, and may be endocrine disruptors. Adults can be affected, but children are especially vulnerable. Pesticides accumulate through the food chain, so humans, at the top of the food chain, get the highest doses.

### D. Environmental Issues.

Pesticides can be washed in to streams, ponds, and lakes, and can end up in drinking water. Pesticides can harm wildlife, including birds, fish, frogs, butterflies, bees, and other beneficial insects. While some pesticides do break down over time, they can break down in to equally toxic chemicals.

### A.

Plants have natural defense mechanisms, just like humans have. When those mechanisms are used and kept healthy with proper nutrition, the plant can handle fluctuations and stressful times.

Example: Lawn's roots. Deep soaking of 2-3" and not watering again until the top inch of soil is dry will encourage longer roots than smaller amounts of water daily. The roots have greater reach and this will allow the lawn to resist drought and other stresses.

### B.

By encouraging and helping a plant's natural defenses, there is less need for drastic, expensive chemicals. Your landscape won't become chemical dependent, and will therefore cost less.

### C.

Pesticides can be toxic to the brain and nervous system. They can cause acute illness ranging from headaches and dizziness to respiratory distress, seizures, and very rarely death.

Pesticides can be carcinogens. Studies have linked pesticide exposure to increased likelihood of childhood brain cancer and childhood leukemia, as well as non-Hodgkin's lymphoma, prostate cancer, ovarian cancers, adult leukemias and pancreatic cancer.

Pesticides can cause birth defects, and have been linked in animal studies to development and learning disabilities. Most pesticides have not been tested for impacts on children, but children are especially vulnerable to the effects of pesticides and other toxic chemicals. Pound for pound, children eat and breathe more than adults, and are closer to the ground, where pesticides are most often found.

### D.

95% of water and fish samples from streams studied in the US Geological Survey National Air and Water Quality Assessment had one or more pesticide residues present. About 50% of the wells sampled in the same study contained one or more pesticides.

Insects: In addition to killing insects that are viewed as pests, pesticides often affect beneficial insects, both pollinator species such as bees and butterflies, and natural predators of pest insects.

Aquatic life: Some of the most frequently detected pesticides in streams and rivers are suspected endocrine disruptors which harm wildlife by interfering with their ability to mate and reproduce. Atrazine, a popular weed killer, demasculinizes male frogs and turns them in to hermaphrodites (they produce both eggs and sperm) - at concentrations 30 times lower than what the EPA considers safe.

Birds: In the US, roughly 67 million birds die annually due to exposure to pesticides on farms alone. The US Fish and Wildlife Service estimates that 50 pesticides currently used in the US have caused bird die-offs. Pesticides can kill birds directly, but they more often weaken birds, leaving them vulnerable to disease, predators and extreme temperatures. Rachel Carson's classic book "Silent Spring" detailed how DDT exposure caused birds to lay eggs with abnormally thin shells. The eggs frequently broke before they hatched, and lead to a dramatic decrease in bird populations.

In general, pesticides affect wildlife by altering natural ecosystems: if a pesticide kills insects or plants, then the birds and mammals that feed on those insects and plants will be affected.

Pesticide use leads to more pesticide use: Pest populations build up resistance to pesticides. As time goes on, more and more pesticide is required to achieve the same effect. Eventually the pests become completely resistant.

**Insert slide show here, if desired.**

### **III. 5 Steps to more natural lawns and gardens**

#### **A. Choose plants wisely.**

There is a plant for every type of situation, but not all plants can grow anywhere. Choose your plants to fit your site, and they'll stand a much better chance of being healthy and problem free. Most seed and gardening catalogs will include information on what growing conditions suit each plant. There are six main things to keep in mind when choosing plants.

#### **1. Light**

How much direct sunlight does a site get, and from what direction? Different plants

**A. Example:** look at the display (or the display handout). The rhododendron in the top picture is in full, hot sun and exposed to the wind. It isn't a wise plant choice for that location, since it will dry out. A better site for it is to the protected north, but the pH may not be low enough (acidic enough) that close to a foundation, so the soil pH would need to be checked and possibly adjusted.

require different amounts of light. Some love full sun, while others need some shade.

## **2. Soil structure.**

Is your soil sandy? Clay?  
Thick hummus? Does it drain well? Is it always moist?

2. Having a soil test done is very important. It's best to have one professionally done for pH, major nutrients, and organic matter. UMass does soil tests by mail at moderate cost. Master gardeners test soil in May & September at Allendale, Barrington, Lee, and Adams (farmer's markets?). Be sure to check different areas of your yard and garden.

## **3. pH**

pH is an indicator of the acidity or alkalinity of your soil. The pH will affect a plant's ability to take up nutrients, and incorrect pH will weaken a plant.

3. Examples: Rhododendrons, azaleas, and blueberries all prefer an acidic soil, and won't do well without it.

## **4. Hardiness**

Different plants and varieties are adapted to different climates. We live in hardiness zone 5; make sure to get plants adapted to our zone or colder. Better yet, choose plants that are grown locally and are adapted to our particular climate.

## **5. Disease/Pest resistance**

Choosing disease and pest resistant varieties is a simple way to avoid future problems.

5. Choosing disease and pest resistant varieties is especially important with roses, crab apples, and birches.

## **6. Initial Plant Health**

Getting plants that are healthy from the start helps ensure their health later in life. Avoid bringing home pests and diseases.

6. Inspect plants carefully at the nursery, garden center, or roadside stand. Get plants with signs of new growth, firm root balls, and no obvious signs of pests or diseases. Get plants which are relatively young and small; avoid plants with large top growth and tiny root systems. It's best to avoid vegetable plants which are already in bloom or setting fruit.

## **B. Plant with care**

75% of plant death is due to improper planting. Keep four things in mind when planting:

### **1. Proper Method**

**Annuals & Perennials:** Dig a deep hole; fill it, and amend it with compost. Dig it around, then dig the hole again and plant. Don't press down; you can add more earth later if needed. The top of the root ball should be level with the ground.

**Trees:** Don't put a \$200 tree in a \$10 hole. Holes should be 3 times the size of the root ball. Do not amend the soil in the planting hole. Don't plant too deep (over the trunk flare) or too shallow (with half the root ball above ground).

## **2. Watering**

Water the plant thoroughly before planting and let it drain. Water the hole thoroughly and allow to drain. After planting, water thoroughly to remove all air bubble around roots and settle soil.

## **3. Spacing**

Crowding plants can encourage pests and diseases.

## **4. Remove all restrictions**

Remove all burlap, twine, plastic pots, etc. from roots unless specifically instructed not to. Peat pots will degrade and allow roots through.

## **C. Promote Plant Health**

### **1. Watering**

1 inch of water per week, every week. Water deeply – check to make sure water has penetrated through root zone. Morning is the best time to water.

### **2. Mulching**

Mulching conserves water, suppresses weeds, and evens out soil temperature. Don't mulch over 3" deep.

### **3. Use compost**

Compost is decayed organic matter –grass clipping, leaves, even kitchen scraps. It nourishes roots and soil, improves soil structure, and increases the ability of soil to hold water.

### **4. Keep garden clean**

Like most housekeeping, keeping your garden clean is easiest if it's done regularly. Remove weeds and dead leaves on a regular basis.

### **5. Proper Fertilization**

Fertilize only if necessary; do a soil test first. More fertilizer is not better. If you do choose to fertilize, follow the instructions, and check the soil pH.

### **D. Keep plants well groomed**

Air circulation around and through a plant discourages disease. Removing dead or diseased areas can keep infections from spreading. Thin branches so that they don't rub against each other. Keep your tools clean.

### **E. An ounce of prevention...**

#### **1. Monitor**

4. Peat pot rims should be under soil so as to not draw water away from the root ball.

1. Watering in the morning allows time for plant foliage to dry off during the day; watering in the evening leaves plants wet at night, which is the perfect environment for some diseases.

Use drip irrigation or soaker hose for trees and shrubs (can also use them for vegetable gardens, yes?)

2. Mulching deeper than 3" makes it difficult for water to penetrate to the root zone.

3. Composting is easy, inexpensive, a great way to recycle organic waste, and it's good for your lawn and garden. CET has several handouts on how to have a healthy compost pile.

Spreading a ¼- ½ inch layer of compost over a problem lawn area and seeding it with grass will help renew that area.

4. Removing dead leaves, flowers, and debris at the end of the season will keep pests and diseases from over wintering and re-infecting plants the next spring.

5. Example: Too much fertilizer can attract insects to tender new growth. Excessive nitrogen from fertilizer can encourage foliage growth rather than fruit set in vegetables.

D. There are various classes and books on proper pruning. Know the right time to prune; prune spring flowering shrubs after bloom, trees in the late winter, etc. When you're working with diseased plants, it's a good idea to sterilize your tools with alcohol between cuts, to avoid spreading infections.

1. *Depending on the audience, pass out the*

Inspect plants regularly for insects, diseases or signs of illness. The idea here is to catch problems before they get out of hand.

## **2. Know the good bugs and bad bugs**

Remember that not all insects are bad, and even if you see an insect on an unhealthy plant, that insect isn't necessarily the problem.

## **3. Record keeping**

Keeping records can help you avoid having the same problems year after year. It also is a good way to get to know your lawn and garden. Records can be as simple as notes on a calendar or as complete as a garden journal.

## **4. Controls**

Sometimes even plants chosen wisely, planted correctly, and maintained well can have pest problems that are beyond our tolerance. There are many different methods for controlling pests, and it's important to try the least toxic methods first. If you go to a garden center for help, be sure to ask for the least toxic solution to your problem. Also remember that an insect free yard is not the goal; learn to tolerate some insects, some damage.

### **a. Physical**

Physical controls are almost always completely non-toxic and very inexpensive. They include removing the pest by hand, barriers such as row covers, sticky traps and trunk wraps, spraying pests off with water, removing diseased portions of the plant, or even removing an entire diseased plant.

*calendar check list.* It has a lot of information about what sorts of things to be looking for in your lawn and garden each month.

2. Some examples of good bugs that everyone is familiar with – lady beetles (lady bugs to the lay person), garden spiders, praying mantis, parasitic wasps.

If you have any questions about an insect, bad it and bring it to a garden center, or call the Master Gardener hotline.

**Point out: useful resources, books, websites to help identify insects.**

It's important to be able to identify pests in all life stages, since different control methods work at different life stages.

## **3.**

Good basic things to keep a record of: first and last frost date, what you planted and when. Any pest problems, what you did about the pest problems. Unusual weather patterns (for example, last year it would have been worth noting the unusually warm winter and drought conditions).

*If you're using the calendar checklist:* Your calendar checklist has a place for you to make notes; if you have a problem or suspect a problem, make a note of it and what you did about it, if anything. The next year, use the same checklist and determine your progress, if any.

Keeping records helps you to learn about your garden and the pests you might have. Knowing when pests arrived in previous years can help you decide what and when to plant.

**a.** Examples: Aphids can often be removed from a plant just by washing them off with water. Squash bug eggs can be scraped off leaves before they even hatch. Row covers keep adult squash bugs from landing on plants and laying eggs. Slugs can be trapped in shallow containers of beer.

### **b. Biological**

Biological **controls** also tend to be relatively non-toxic. They include both biorational **controls**, introducing predators, and companion plantings. Biorational pesticides are selective, non-persistent pesticides, which do not kill beneficials.

**Biorational control examples:** Horticultural oils – suffocates insects because they breathe through their “skin” (exoskeleton).

Insecticidal soap – makes insects “leak” vital body fluids.

Bt – a naturally occurring bacterium produces a protein that is toxic to some insect pests but harmless to most other organisms.

**b. Introducing predators:** Mantids, lacewings, and lady beetles can often be purchased and introduced to control pests. You can also lure predatory insects to your lawn and garden by planting (or not pulling) plants that attract them. Queen Anne’s Lace is a good example of a “weed” which attracts beneficial insects.

### **c. Chemical**

Sometimes pesticides provide the best control for a pest; however, they should be a last resort, and should always be used correctly.

#### **1. Read Labels**

Read pesticide labels carefully both before buying and before using. (*Refer to display and handout*). Chemical pesticides vary in toxicity; get the least toxic product that will work for your pest. Follow the instructions on the label.

#### **2. Minimize environmental**

**impact.**

Use common sense to keep the environmental impact of the pesticide to a minimum. Don’t spray on windy days. If the pesticide is water soluble, don’t apply just before it rains. Don’t use more than necessary, and use it as infrequently as possible.

#### **3. Protect yourself, your**

**family, and your pets.**

Remember that pesticides are toxic; keep children and pets out of treated areas for as long as the product label states. Wear protective clothing and gloves when handling pesticides, and remove your shoes before going inside to avoid tracking in any pesticides.

#### **4. Disposal**

Save any leftover product and used containers for Hazardous Household Waste collection days; **DON’T** throw it in the trash.

## **IV. Questions and Answers**