Homeowner Pesticide Awareness

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Which type of gardener are you?

1. Black thumb
2. Novice
3. Intermediate
4. Experienced
5. Greenest thumb
How we see ourselves using pesticides

Unfortunately, a not so uncommon result from our use of pesticides
Even in Canada people still rely on pesticides.
Which are pesticides?

1. A.
2. B.
3. C.
4. D.

No endorsement intended or implied
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
What are pesticides?

- Bleaches, Lysol, pine oil
- Weed & Feed, Roundup
- Rat & mouse baits
- Plant disease controls

No endorsement intended or implied
What are Pesticides?

- Sevin, Pyrethroids, Raid
- “Organics” like pyrethrum
- Biological Controls
- Wood preservatives

No endorsement intended or implied
These are Pesticides?

- Plant incorporated protectants
  - Have the *Bt*. Crystalline protein engineered into them

No endorsement intended or implied
EPA exempt pesticides

- Some pesticides have been deregulated by EPA
  - Exempt from Federal registration
  - Must be registered by State of Maine
  - Exempt from toxicity testing
  - NOT risk free

Ingredients in some of these products:
- Rosemary oil
- Peppermint oil
- Thyme oil
- Clove oil
- Wintergreen oil
- Cinnamon oil

No endorsement intended or implied
What do we know about essential oil pesticide risks?

- Not enough since they are exempt from toxicity tests
- Rosemary oil – not well tested
- Peppermint oil –
  - sensitization,
  - irritant,
  - lung damage,
  - not recommended for children, infants or during pregnancy or breast feeding
- Clove oil –
  - allergic reactions,
  - not good for people with liver or kidney disorders,
  - increases bleeding risks,
  - interacts with drugs,
  - contains eugenol which when methylated becomes a potent carcinogen

No endorsement intended or implied
What are the risks?

- Wintergreen oil –
  - highly toxic,
  - not recommended during pregnancy,
  - causes dermatitis,
  - inhalation hazard

- Cinnamon oil –
  - powerful irritant and
  - even worse sensitizer
What does registration mean?

- Not a safety guarantee
- Reasonable certainty of no harm, but NOT risk free
- Must read and follow the label to manage the risk
What about home remedies

- Home chemistry is not recommended by the BPC
- Many of the materials used seem “safe” because we eat them or use them on our skin
- Exposure routes may be different
- What we eat may not be safe to breathe

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**Burnout II Concentrate**
Active Ingredients: Clove Oil ...... 12%
Sodium Laurel Sulfate ... 8%
Other Ingredients:
Vinegar, Lecithin, Water, Citric Acid, Mineral Oil
Total Other ...... 80%

---

**Section V - Health Hazard Data**

<table>
<thead>
<tr>
<th>Route(s) of Entry</th>
<th>Inhalation?</th>
<th>Skin?</th>
<th>Ingestion?</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yes</td>
<td>YES</td>
<td>YES</td>
</tr>
</tbody>
</table>

*Health Hazards:*
Contains acetic acid and is flammable and extremely corrosive. Contact with this product will result in severe eye irritation and possible permanent damage. Contact with this product will cause severe skin irritation and/or chemical burns. Breathing vapors will cause significant respiratory irritation, and pulmonary edema if prolonged. Ingestion of this product could cause burns and destroy tissue in the mouth, throat, and digestive tract.
What products are NOT pesticides?

- Insect parasitic nematodes
- Rodent or insect traps
- Beneficial insects or mites

No endorsement intended or implied
What are the benefits?

- Healthy saleable plants & produce
- Aesthetics
What are the benefits?

- Bountiful harvest
- Nuisance or public heath pest control

OH FOR CRYING OUT LOUD ETHEL, STOP SCREAMING, JUST HOW BIG CAN ONE GYPSY MOTH BE?
All pesticides have risks!!!

- Organic ≠ Safe
- Synthetic ≠ Highly toxic
- Natural ≠ Safe
Even natural or organic products are toxic!

TABLE 2-12

<table>
<thead>
<tr>
<th>CHEMICAL</th>
<th>COMMON TRADE NAMES</th>
<th>ORAL LD$_{50}^{a}$</th>
<th>EIC$^{b}$</th>
<th>TYPE OF PESTICIDE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nicotine</td>
<td>Black Leaf 40</td>
<td>55</td>
<td>45$^{1}$</td>
<td>insecticide</td>
</tr>
<tr>
<td>Rotenone*</td>
<td></td>
<td>132</td>
<td>33</td>
<td>insecticide</td>
</tr>
<tr>
<td>Bordeaux*</td>
<td></td>
<td>300</td>
<td>68</td>
<td>fungicide</td>
</tr>
<tr>
<td>Diazinon</td>
<td></td>
<td>300</td>
<td>43</td>
<td>insecticide</td>
</tr>
<tr>
<td>2,4-D</td>
<td></td>
<td>375</td>
<td>17</td>
<td>herbicide</td>
</tr>
<tr>
<td>Carbaryl</td>
<td>Sevin</td>
<td>500</td>
<td>21</td>
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<td>Acephate</td>
<td>Orthene</td>
<td>866</td>
<td>23</td>
<td>insecticide</td>
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<tr>
<td>Copper hydroxide*</td>
<td>Kocide</td>
<td>1000</td>
<td>33</td>
<td>fungicide</td>
</tr>
<tr>
<td>Copper oxychloride sulfate*</td>
<td>C-O-C-S</td>
<td>1000</td>
<td>33$^{1}$</td>
<td>fungicide</td>
</tr>
<tr>
<td>Ryania*</td>
<td></td>
<td>1200</td>
<td>55</td>
<td>insecticide</td>
</tr>
<tr>
<td>Malathion</td>
<td></td>
<td>1375</td>
<td>24</td>
<td>insecticide</td>
</tr>
<tr>
<td>Pyrethrum*</td>
<td></td>
<td>1500</td>
<td>18</td>
<td>insecticide</td>
</tr>
<tr>
<td>Propargite</td>
<td>Omite</td>
<td>2200</td>
<td>43</td>
<td>acaricide</td>
</tr>
<tr>
<td>Sabadilla*</td>
<td></td>
<td>4000</td>
<td>36</td>
<td>insecticide</td>
</tr>
<tr>
<td>Glyphosate</td>
<td>Round-up</td>
<td>4300</td>
<td>15</td>
<td>herbicide</td>
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<tr>
<td>Cryolite*</td>
<td>Kryocide</td>
<td>10,000</td>
<td>21</td>
<td>insecticide</td>
</tr>
<tr>
<td>Benomyl</td>
<td>Benlate</td>
<td>&gt;10,000</td>
<td>53</td>
<td>fungicide</td>
</tr>
<tr>
<td>Bacillus thuringiensis*</td>
<td>Dipel</td>
<td>15,000</td>
<td>8</td>
<td>insecticide</td>
</tr>
</tbody>
</table>

NOTE: Some materials on this list may not be currently registered as pesticides or their use may be restricted.

*a asterisk indicates chemical was acceptable for organically grown produce.

$^{1}$LD$_{50}$ indicates the amount of pesticide that will kill half of a group of test animals. These values are for milligrams of pesticide per kilogram of body weight. These figures do not provide an indication of the chronic health risk or persistence in the environment.

$^{b}$EIC or Environmental Impact Quotient is a method to calculate the environmental impact of most common fruit and vegetable pesticides (insecticides, acaricides, fungicides and herbicides) used in commercial agriculture. The values obtained from these calculations can be used to compare different pesticides and pest management programs to ultimately determine which program or pesticide is likely to have the lower environmental impact.

$^{2}$Estimated EIC.
“All substances are poisons; there is none which is not a poison. The right DOSE differentiates a poison from a remedy.”

—Paracelsus (1493-1541)

Even too much water can kill – over 1.5 liters/hour
Endocrine effects

- EPA is just beginning to do endocrine disrupter screening for pesticide active and inert ingredients
  - http://www.epa.gov/scipoly/oscpendo/index.htm

- Does the dose make the poison?? What about hormesis?
  - http://www.belleonline.com/index.htm
Risk assessment

Prior to 1996 FQPA

Aggregate and Cumulative Risk Cup

After 1996 FQPA
How are the risks determined?

REMEMBER THE GOOD OLD DAYS WHEN WE ONLY HAD TO SMOKE A FEW CIGARETTES AND EAT SACCHARIN?
What are the human risks?

- **Acute**
  - Rash
  - Nausea
  - Eye ticks
  - Stomach cramps

- **Chronic**
  - Cancer
  - Birth defects
  - Allergies
  - Organ damage
  - Endocrine effects
Risk vs. Risk

- West Nile Virus & EEE
- Malaria
- Potato Late Blight Disease
- Lyme Disease
One way to quickly assess the risk?

Signal Words

Danger

Warning

Caution

No endorsement intended or implied
Please choose the two pesticide formulation types with the lowest exposure potential

<table>
<thead>
<tr>
<th>Formulation Type</th>
<th>Percent Active Ingredient</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Granular</td>
<td>3 - 15%</td>
</tr>
<tr>
<td>2. Ready to Use Baits, Gels or Liquids</td>
<td>1 - 15%</td>
</tr>
<tr>
<td>3. Dust</td>
<td>5 - 10%</td>
</tr>
<tr>
<td>4. Aerosol</td>
<td>1 - 5%</td>
</tr>
<tr>
<td>5. Wettable Powder</td>
<td>50 - 85%</td>
</tr>
<tr>
<td>6. Liquid Concentrate</td>
<td>40 - 90%</td>
</tr>
</tbody>
</table>
Reduce exposure by using targeted materials

- Enclosed baits & gels
- Spot treatments
- Broadcast treatments

Best

Worst
Which product do you think is the better choice?

1. A
2. B
3. C
4. D

No endorsement intended or implied.
How is risk reduced? - PPE
What are some “environmental” risks?

- Wildlife effects
- Residues on food
Remember “Silent Spring”

* Biomagnification of chlorinated hydrocarbons like DDT or Dieldrin was a problem in the 60’s & 70’s
Today’s wildlife concerns

- Biomagnification is not a big issue any more – the old persistent products were cancelled

- Pollinators are now a focus area

http://www.extension.org/pages/24315/managed-pollinator-cap:-coordinated-agricultural-project
Multiple Universities’ Pollinator Project

- The answers are only beginning to emerge, but current research has revealed some results
  - Mites and viruses appear to be the main culprits along with the mite controls
  - For honey bees low levels of pesticides have been shown to reduce associative learning of individual bees in laboratory studies
    - These changes in learning and behavior can potentially alter normal colony level functions, yet colony-level impacts remain to be verified
  - Neonicotinoids like this one can be expressed in ornamental plant pollen and nectar at levels much higher than in agricultural uses

No endorsement intended or implied
Toxicity of Common Organic-Approved Pesticides to Pollinators

<table>
<thead>
<tr>
<th>PESTICIDE</th>
<th>NON-TOXIC</th>
<th>LOW TOXICITY</th>
<th>HIGHLY TOXIC</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Insecticides/Repellants/Pest Barriers</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bacillus thuringiensis (Bt)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Beauveria bassiana</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cydia pomonella granulosis</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Diatomaceous Earth</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Garlic</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Insecticidal Soap</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kaolin Clay</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Neem</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Horticultural Oil</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pyrethrins</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rotenone</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sabadilla</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spinosad</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Herbicides/Plant Growth Regulators/Adjuvants</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adjuvants</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Corn Gluten</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gibberellic Acid</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Horticultural Vinegar</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Fungicides</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Copper</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Copper Sulfate</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lime Sulfur</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sulfur</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Soaps and Oils, only when directly sprayed upon the pollinator.
Pesticide residues are found on all types of food

- Samples are randomly chosen near the point of consumption, and
- reflect what is typically available to the consumer throughout the year
- Samples are selected without regard to country of origin, variety, or organic labeling
2010 USDA-PDP Sampling

- USDA – PDP 2010 sampling shows that 99.75% of all samples are well below the tolerances set by EPA

- In baby food no residues were found above the tolerance levels

- A few samples contained extremely low levels of pesticides for which there is no tolerance which are not a food safety risk

http://www.ams.usda.gov/AMSv1.0/getfile?dDocName=stelprdc5098550
PDP also detects pesticide residues on organic produce

- According to the 2008 USDA Pesticide Data Program Report:
  - 43% of organic spinach samples were positive for spinosad
  (13 of 30 samples positive)

- According to the 2010 USDA Pesticide Data Program Report:
  - 52% of organic baby food pear samples were positive for spinosad
  (16 of 31 samples)

- Spinosad is NOP approved and is derived from a naturally occurring soil bacteria

No endorsement intended or implied
Other pesticide risks

- Drift
- Water contamination
- Storage
- Disposal
Drift

- Check for sensitive areas first!
- Watch the wind speed
- Keep the spray low
- Spray with the breeze
- Don’t apply when over 85°F
Pesticides Can Leach Into Groundwater
## Home pesticide use - Worst case

### Groundwater monitoring results

<table>
<thead>
<tr>
<th>Commodity Group</th>
<th>Number of Samples Collected</th>
<th>Number of Samples with Positive Detections</th>
<th>Percent of Samples with Positive Detections</th>
<th>Detections Above a Health Advisory</th>
</tr>
</thead>
<tbody>
<tr>
<td>Potatoes</td>
<td>47</td>
<td>100</td>
<td>87</td>
<td>8</td>
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<tr>
<td>Corn</td>
<td>49</td>
<td>51</td>
<td>28</td>
<td>7</td>
</tr>
<tr>
<td>Blueberries</td>
<td>21</td>
<td>22</td>
<td>13</td>
<td>15</td>
</tr>
<tr>
<td>Small Grains</td>
<td>3</td>
<td>9</td>
<td>17</td>
<td>0</td>
</tr>
<tr>
<td>Orchards</td>
<td>1</td>
<td>5</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>Christmas Trees</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>Strawberries</td>
<td>None</td>
<td>3</td>
<td>6</td>
<td>---</td>
</tr>
<tr>
<td><strong>Totals:</strong></td>
<td>129</td>
<td>194</td>
<td>157</td>
<td>31</td>
</tr>
</tbody>
</table>

*Homeowner application of diazinon to control ants – 10x over MCL*
Groundwater monitoring results

- We sampled wells near blueberry fields in 2011
  - the number of wells with detections dropped to 38%
  - 2 different herbicides found
    - hexazinone
    - terbacil
Pesticides Can Run-off Into Surface Waters
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
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 desired goal for reducing nuisance plant growth (algae)
Prevent water contamination

- Locate & stay away from wells
- Stay away from ledge
- Stay away from wetlands & water
- Do not apply to slopes near water
- Do not apply before heavy rains
- Spot applications
- Vegetative buffers
Think First.... Spray Last

- “The quick fix is neither”!

Make the benefits

Outweigh the risks
1997 Legislative Mandate

- It is the policy of the State to Minimize reliance on pesticides!
Look at the big picture

Make plans to manage specific problems
Do you need a pesticide?

- First identify the pest
- Is it *really a problem*
- Try cultural or sanitary controls
- Encourage the “Good bugs”
- Replace with resistant varieties
Diagnosis murder??

- Is it a pest problem?
  - Often what’s normal for the plant is mistaken for a pest or disease
    - Variegation
    - Reproductive structures
Is this a disease?
Who’s been chewing here?
They only come out at night.
The real culprit!

Black vine weevil larvae and adult near the stem of a small yew.
“The gardener’s best buddies”
Japanese Beetle

- Select non-preferred shrubs and trees (avoid linden, roses, crabapples, grapes, raspberries)
- Hand-pick beetles (but leave the parasitized beetles)
- Cover susceptible plants with protective netting
- Treat turf in early August if above threshold (8-20 grubs/sq. ft)
- Avoid traps
- Use a trap plant (soybean, zinnia, pole beans, etc.)
Lily Leaf Beetle

- Plant daylilies instead of true lilies
- Hand pick beetles and larvae. Squish eggs.
- Space plantings to allow good sunlight penetration.
- Least-risk pesticide if needed.
- Maybe *Tetrastichus setifer* will save us
Viburnum leaf beetle

• Over-winters as egg deposited into holes chewed into twigs, then capped. Twig has rough appearance.
• Eggs hatch in May, larvae feed together in groups on leaves.
• Adults found mid-July to first frost.

T. Murray; WSU
Viburnum Leaf Beetle Control

- Prune out or apply horticultural oil to egg-infested branches in fall.
- Apply insecticidal soap (eg Safer’s Soap) to larvae about 1-week after egg hatch in spring.
- Plant resistant cultivars
  (www.hort.cornell.edu/vlb/suscept.html)
  - **Some ‘resistant’ cultivars:**
    - *V. cassinoides*, witherod viburnum - native
    - *V. plicatum* var. *tomentosum* (doublefile viburnum),
    - *V. carlesii* (Koreanspice viburnum),
    - *V. burkwoodii* (Burkwood viburnum),
    - *V. × juddii* (Judd viburnum),
    - *V. lantanoides* (alnifolium) (Hobblebush) - native
    - *V. lentago* (Nannyberry) - native
Cultural controls

- **Landscape design**
  - replace “susceptible” or chronically pest-prone plants with resistant or non-susceptible plants
  - increased plant diversity and habitat complexity can increase natural enemies present (Shrewsbury 1996)
Cultural controls

- Plant health and cultural requirements
  - fertilization: over fertilization (the “aphid effect”)
    - Overfertilizing may help the pest more than the plant
  - water management: proper irrigation
  - planting site: choose the right plant for the site
  - mulching: pull mulch away from the trunk to decreases pest/disease potential

- Sanitation: raking leaves to reduce fungi
Mechanical controls

- Exclusion by screens, barriers
- Pruning infested plants
- Hand removal
- Shake & capture
Welcome or Unwelcome?

1. Welcome
2. Unwelcome
Tachinid fly (the so-called “winsome fly”) laying an egg on a Japanese beetle adult

*Istocheta (=Hyperecteina) aldrichi*
Introduced into US from Japan in 1922
Adults emerge Late June/July, feed on honeydew, nectar

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

Joshua P. Basham
T.S.U. Otis L. Floyd Nursery Research Center
McMinnville, TN 37110-1367
From Point Sebago Golf Course, Casco, Maine
We love the good “bugs!”
Welcome or Unwelcome?

1. Welcome
2. Unwelcome
Good bug in action
Welcome or Unwelcome?

1. Welcome
2. Unwelcome
Flower fly larvae eat aphids!
Science fiction monster?
Delicate beauty
Spare the Sprays to Protect Beneficial Insects

- Dragonflies
- Spiders
- Small parasitic wasps
- Predatory mites
- Syrphid flies
- Ground beetles
Habitat enhancement for beneficials

Many beneficials, as adults, larvae, or both, require pollen and/or nectar as dietary supplements.

Key is to provide a series of plants that, collectively, provide continuous nectar/pollen supply.

Many of the same plants that provide food and habitat for natural enemies also provide resources for pollinators.
# Bloom Timing of Native Plants Attractive to Beneficial Insects

<table>
<thead>
<tr>
<th>Native plant</th>
<th>Natural enemies</th>
<th>Bees</th>
<th>Bloom Period</th>
</tr>
</thead>
<tbody>
<tr>
<td>wild strawberry</td>
<td>**</td>
<td>*</td>
<td>May</td>
</tr>
<tr>
<td>golden Alexanders</td>
<td>****</td>
<td>**</td>
<td>Jun</td>
</tr>
<tr>
<td>Canada anemone</td>
<td>****</td>
<td>*</td>
<td>Jul</td>
</tr>
<tr>
<td>penstemon</td>
<td>**</td>
<td>**</td>
<td>Aug</td>
</tr>
<tr>
<td>angelica</td>
<td>****</td>
<td></td>
<td>Sep</td>
</tr>
<tr>
<td>cow parsnip</td>
<td>****</td>
<td>*</td>
<td>Oct</td>
</tr>
<tr>
<td>sand coreopsis</td>
<td>****</td>
<td></td>
<td></td>
</tr>
<tr>
<td>shrubby cinquefoil</td>
<td>****</td>
<td>*</td>
<td></td>
</tr>
<tr>
<td>Indian hemp</td>
<td>****</td>
<td>*</td>
<td></td>
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<tr>
<td>late figwort</td>
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<td>swamp milkweed</td>
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<tr>
<td>Culver’s root</td>
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<tr>
<td>yellow coneflower</td>
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<tr>
<td>nodding wild onion</td>
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<tr>
<td>meadowsweet</td>
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<tr>
<td>yellow giant hyssop</td>
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<tr>
<td>horsemint</td>
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<tr>
<td>Missouri ironweed</td>
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<tr>
<td>cup plant</td>
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<tr>
<td>pale Indian plantain</td>
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<tr>
<td>boneset</td>
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<tr>
<td>blue lobelia</td>
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<tr>
<td>pale-leaved sunflower</td>
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<tr>
<td>Riddell’s goldenrod</td>
<td>****</td>
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<tr>
<td>New England aster</td>
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<tr>
<td>smooth aster</td>
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</table>

**KEY**
- * good
- ** better
- *** best
Pretty ornamentals? Or Pests?
Who you gonna call?

PESTICIDE REGULATIONS
• Board of Pesticides Control
  207-287-2731

PEST PROBLEMS
• Cooperative Extension
  800-287-0279
• Maine Forest Service
  207-287-2431

PESTICIDE POISONING
• Northern New England Poison Center
  800-222-1222
Do you need a pesticide?

- Is the pest in a susceptible stage?
- Application timing is critical
- Is the pest still present?
Is the pest protected?

Birch leafminer

Birch leafminer
Don’t apply when you can’t hit a susceptible target

- Colorado potato beetle
- Lace bugs
Timing is everything?
Nobody home!

Eriophyid gall mite

Oak apple gall wasp
The key to proper use

- Read the label!

**Systemic Insect Control**

- **Controls**: Aphids, Flower Thrips, Leafminers, Mealybugs, Spider Mites, Tent Caterpillars, Whiteflies, and other listed insects.

- **Use on**: Roses, Flowers, Ornamentals, Shrubs, and Trees.

**PRECAUTIONARY STATEMENTS**

**HAZARDS TO HUMANS & DOMESTIC ANIMALS**

**CAUTION**: Harmful if swallowed. Causes moderate eye irritation. Avoid contact with eyes or clothing. Prolonged or frequently repeated skin contact may cause allergic reactions in some individuals. When handling this product, wear safety glasses, chemical resistant gloves (such as barrier laminate, butyl rubber, nitrile rubber, neoprene rubber, polyvinyl chloride or viton), long pants, and long-sleeved shirt. When using outdoors, spray with the wind to your back and do not use when wind speeds are 10 mph or more. Wash the outside of the gloves with soap and water before removing. Wash hands before eating, drinking, chewing gum, using tobacco, or using the toilet. Remove contaminated clothing and wash clothing before reuse.

**ENVIRONMENTAL HAZARDS**: This pesticide is toxic to birds. Do not apply directly to water. Do not contaminate water by cleaning of equipment or disposal of wastes. Cover soil-incorporate spills. This product is highly toxic to bees exposed to direct treatment or residues on blooming crops or weeds. Do not apply this product, or allow it to drift to blooming crops or weeds, if bees are visiting treatment area.

**PHYSICAL OR CHEMICAL HAZARDS**: Flammable. Keep away from heat and open flame.

**NOTICE**: To the extent consistent with applicable law, buyer assumes all risks of use, storage or handling of this product not in accordance with directions.

No endorsement intended or implied
The old days
Great directions!

“Bug Death is a patented non-poisonous powder, and is entirely different from anything that has ever been placed on the market, and overcomes all the objections to the deadly poisons that the farmers have been obliged to use in the past. It is just as effectual as Paris Green and other dangerous insect powders. It is sure death to the potato, squash and cucumber bugs, currant and tomato worms, also other plant and vine eating pests.

The deadly effect on bugs will not always be as quick, but it is just as sure. Contrary to the arsenic preparations, it is a benefit to the plant, and the more freely used the better the plant will thrive, and for potatoes when blight is prevalent, the extra yield will more than pay all expense of Bug Death.”
Purchase wisely

- Measure the area needing treatment

- Only purchase what you need “right now”

- Check the label for:
  - re-entry
  - site & pest
  - days to harvest
  - personal protective equipment needs
Prepare for the application

- Read the label
- Wear all PPE
- Mix carefully
- More is NOT better
- Never use more than the label directs
Apply properly & be cautious

- Only treat infested areas
- Spot treatments conserve beneficial organisms
- Avoid broadcast treatments
- Keep the plant’s condition in mind
- Check coverage & monitor control
- Only repeat application if the label allows
Why treat the whole tree?

Bronze birch borer
Why treat the whole tree?

Eastern tent caterpillar
Broadcast applications

- Broadcast applications of lawn herbicides can cause weird results.

- Broadcast applications of any pesticide are prohibited within 25 feet of any wetland or water body.
If you must apply a pesticide

- Wait long enough for the product to work

- Examples
If you must apply a pesticide

- Keeps records of what was used and how well it worked
- Review your records before treating again next season
If you must apply a pesticide

- Clean yourself and your equipment
- Apply rinse water to the application site
- Wash contaminated clothing separately
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
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.
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
Where to learn more

www.yardscaping.org/plants/index.htm
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
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 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.
Summary

- Risk = Toxicity x Exposure
- All pesticides have risks
- Reduce risks - wear PPE
- Make the benefits outweigh the risks
Please rate this presentation

1. Wow
2. Helpful
3. Ho Hum
4. Crap
5. Bull Crap