

Home Pesticide Use



Risks & Benefits

- Gary Fish

Maine Board of Pesticides Control

28 State House Station

Augusta ME 04333-0028

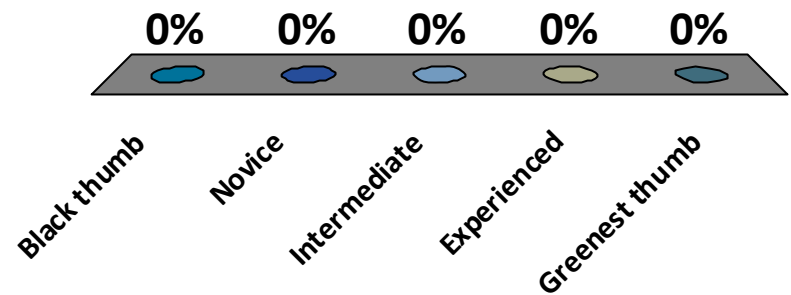
(207)287-2731

gary.fish@maine.gov



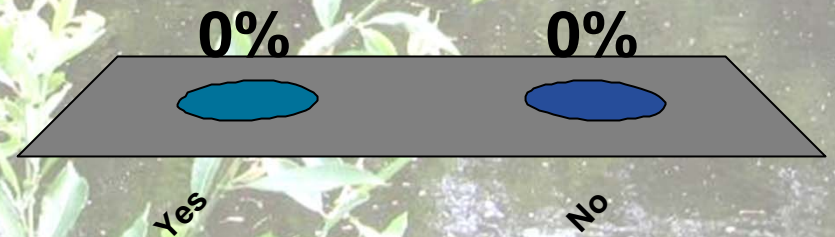
Which type of gardener are you?

1. Black thumb
2. Novice
3. Intermediate
4. Experienced
5. Greenest thumb



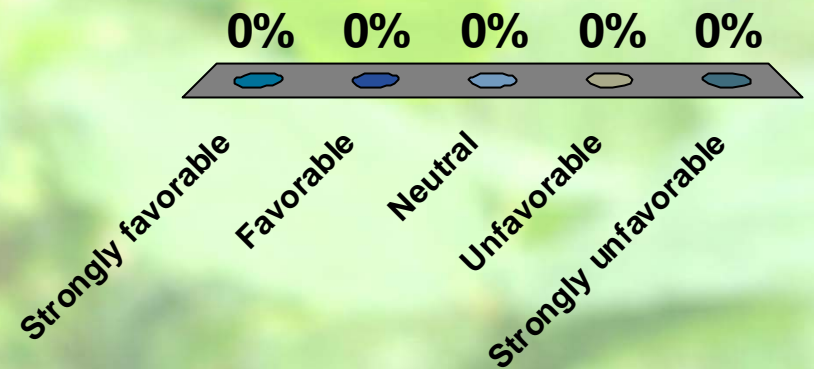
Have you ever heard of the Board of Pesticides Control (BPC)?

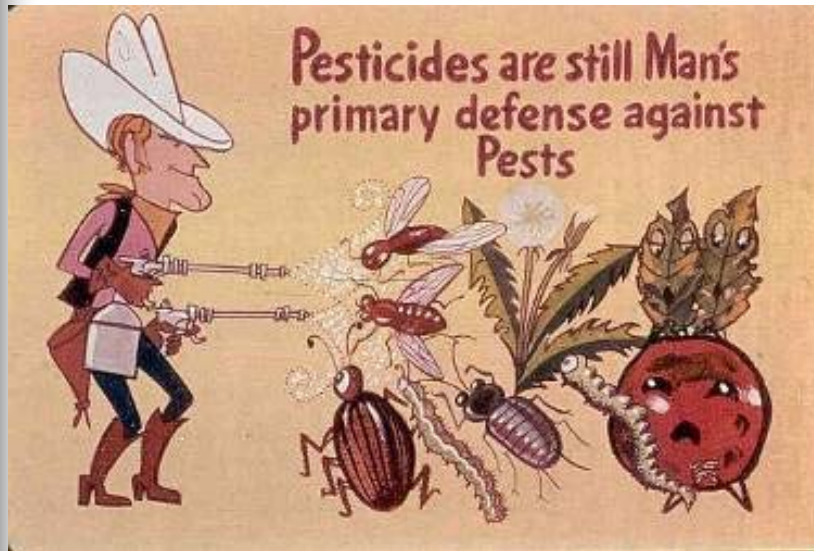
1. Yes
2. No



What is your opinion of the BPC?

1. **Strongly favorable**
2. **Favorable**
3. **Neutral**
4. **Unfavorable**
5. **Strongly unfavorable**





How we see ourselves using pesticides



Unfortunately, a not so uncommon result from our use of pesticides

boston.com

Local Search Site Search GO

HOME TODAY'S GLOBE NEWS BUSINESS SPORTS LIFESTYLE A&E THINGS TO DO

Local National World Politics Business Education Health Science Green

HOME / NEWS / NATION

Bug spray likely killed infant, injured 2 in SC

By Seanna Adcox
Associated Press Writer / November 2, 2009

E-mail Print Yahoo! Buzz ShareThis Text size - +

COLUMBIA, S.C.—Bug spray that produces a fog to kill insects is likely to blame for the death of a 10-month-old South Carolina boy, and his 2-year-old brother was critically injured by the fumes, authorities said Monday.

We've relied on pesticides in the past and still rely on them today



NO FLIES ON ME



THANKS TO DDT

Black Flag, long preferred by housewives everywhere for quickly killing flies and mosquitoes on contact, now does *double duty*. The amazing DDT ingredient now in Black Flag stays on walls, floors, doorways to *keep on* killing flies for weeks! To use wonderful DDT *safely and effectively* in your home use only a well-known and reliable insecticide—ask for *Black Flag*.

5% DDT
in Black Flag Insect Spray

10% DDT
in Black Flag Powder

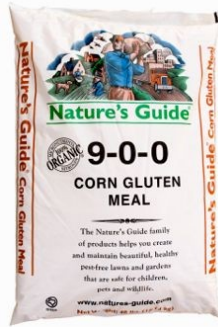


Ask for it by NAME



Which are pesticides?

1. A.



No endorsement intended or implied

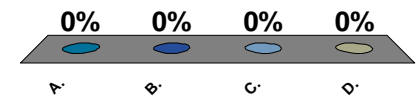
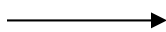
2. B.



3. C.



4. D.

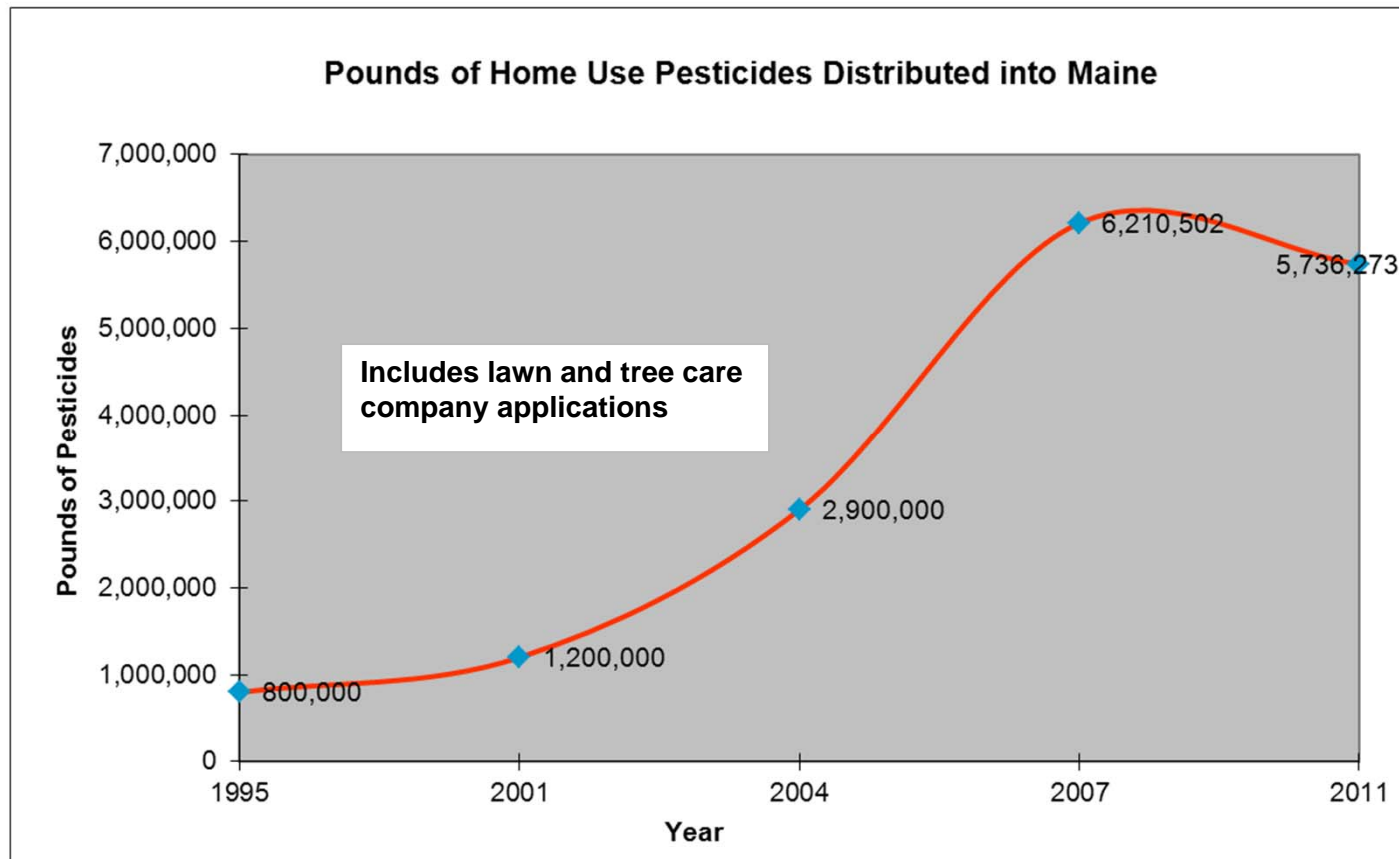


Maine pesticide use more common than perceived



No endorsement intended or implied

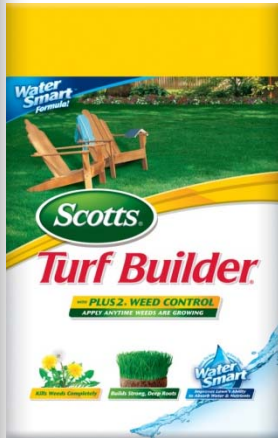
Have we finally hit the top of the curve?



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 are the risks?

- Wintergreen oil –
 - highly toxic,
 - not recommended during pregnancy,
 - causes dermatitis,
 - inhalation hazard
- Cinnamon oil –
 - powerful irritant and
 - even worse sensitizer



Introducing EcoSMART FLYING INSECT KILLER

Now there is a new, organic, fast-killing insecticide that is safe to use around children and pets. Unlike other insecticides, it is made from organic plant oils and kills bugs naturally to better protect your family. Plus, there's no pesticide residue. It's safe. It's effective. It's smart. Naturally.

To learn more about the EcoSMART story, as well as our products and technology, please visit us at www.ecosmart.com.

FRESH NATURAL SCENT SIGNALS IT'S WORKING.

DIRECTIONS FOR USE:

SHAKE WELL BEFORE USING. READ ENTIRE LABEL AND USE ACCORDINGLY.

FLYING INSECT TREATMENT: Kills flies, gnats, mosquitoes, moths, wasps and other flying insect pests on contact. Hold container upright and aim nozzle away from person. Press button firmly to spray. Direct spray at flying insects, contacting as many insects as possible. Spray in short 2-3 second bursts.

NOTE: When used indoors, wipe away excess product.

PRECAUTIONARY STATEMENTS: We recommend good safety practices when using any insecticide, such as avoiding contact with eyes and skin. If product gets in eyes, flush with water for at least 15 minutes. If on skin, wash with soap and water. If irritation persists, contact a physician.

PHYSICAL HAZARDS: Contents under pressure. Keep away from heat, sparks and open flames. Do not puncture or incinerate container. Exposure to temperatures above 130° Fahrenheit may cause container to burst.

STORAGE & DISPOSAL: CAUTION: Keep out of reach of children. Store in a cool, dry area away from heat or open flame. When container is empty, recycle if available. Do not puncture or incinerate.

LIMITATION OF LIABILITY: EcoSMART makes no warranties of merchantability or of fitness for a particular purpose, nor any other express or implied warranty except as stated above. Buyer assumes all responsibility for safety and use not in accordance with label, directions and precautionary statements.

EcoSMART represents that this product is a Minimum-Risk pest control product, and qualifies for exemption from EPA registration under the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA).

Active Ingredients: Organic Plant Oils

Peppermint Oil	2.00%
Cinnamon Oil	1.00%
Sesame Oil	1.00%
Other Ingredients*	96.00%
Total	100.00%

*Water, Wintergreen Oil, Isopropanol, Canola Oil, Lecithin, Carbon Dioxide

Questions or Comments? Call 1-877-723-3545
24 hours a day, 7 days a week



Manufactured for
EcoSMART TECHNOLOGIES, INC.
3600 Mansell Road, Suite 150
Alpharetta, GA 30022

EcoSMART®



MADE IN USA

US and Foreign Patent Pending. Item No. 01006. EcoSMART and the EcoSMART TECHNOLOGIES logo are trademarks of EcoSMART TECHNOLOGIES, INC. ©2007 EcoSMART. All Rights Reserved.

No endorsement intended or implied

Caveat emptor!

For Release: 09/10/2012

FTC Takes Action Against Companies Marketing Allegedly Unproven Natural Bed Bug and Head Lice Treatments

Cedar, Cinnamon, Lemon Grass, Peppermint, and Clove Oil? There's No Proof They Will Eradicate Bed Bugs, Agency Says

The Federal Trade Commission filed deceptive advertising charges against two marketers of remedies for bed bug infestations, who allegedly failed to back up overhyped claims that they could prevent and eliminate infestations using natural ingredients, such as cinnamon and cedar oil. One marketer also allegedly made misleading claims that its products were effective against head lice.

In one of the two cases, [RMB Group, LLC](#) and its principals have agreed to settle the charges relating to their "Rest Easy" bed bug products. In the case against CedarCide Industries, Inc. and others, challenging their marketing of "Best Yet!" bed bug and head lice treatments, the defendants have not settled, and the FTC is beginning litigation against them.





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

Example



6. Eucalyptus oil

A great natural pesticide for flies, bees and wasps. Simply sprinkle a few drops of eucalyptus oil where the insects are found. They will all be gone before you know it



From Medline Plus – NLM NIH

<http://www.nlm.nih.gov/medlineplus/druginfo/natural/700.html>

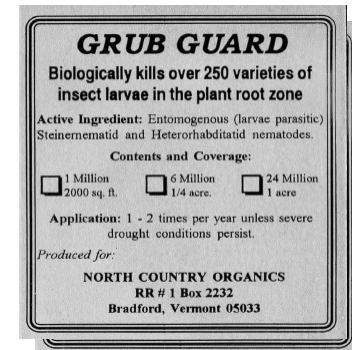
- Eucalyptus oil is **UNSAFE** when it is either taken by mouth or applied directly to the skin without first being diluted. Taking 3.5 mL of undiluted oil can be fatal. Signs of eucalyptus poisoning might include stomach pain and burning, dizziness, muscle weakness, small eye pupils, feelings of suffocation, and some others. Eucalyptus oil can also cause nausea, vomiting, and diarrhea.

Pregnancy and breast-feeding: Eucalyptus seems to be safe for pregnant and breast-feeding women when used in food amounts. But don't use eucalyptus oil. Not enough is known about safety during pregnancy or breast-feeding.

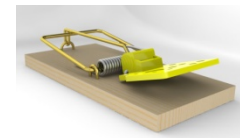
Children: Eucalyptus oil is **UNSAFE** for children. It should not be taken by mouth or applied to the skin. Not much is known about the safety of using eucalyptus leaves in children. It's best to avoid use in amounts larger than food amounts.

What products are NOT pesticides?

- Insect parasitic nematodes



- Rodent or insect traps



- Beneficial insects or mites



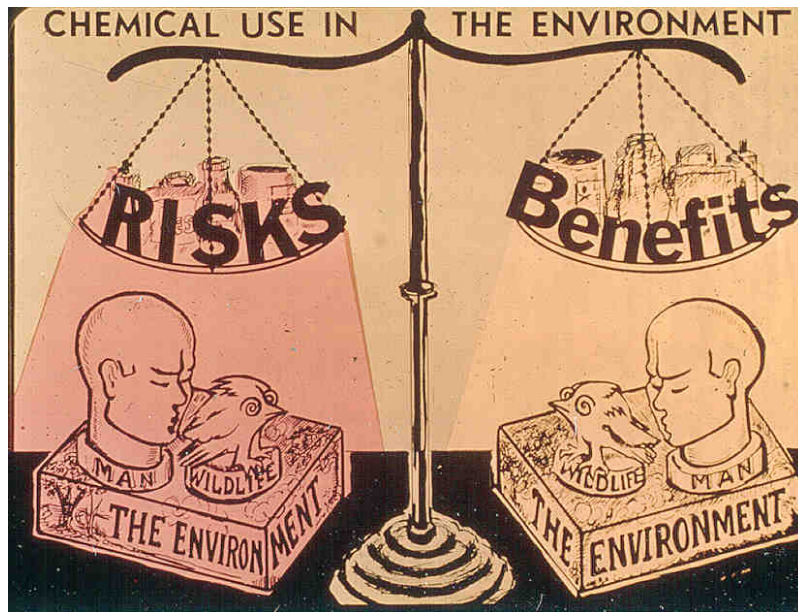
No endorsement intended or implied

What does registration mean?

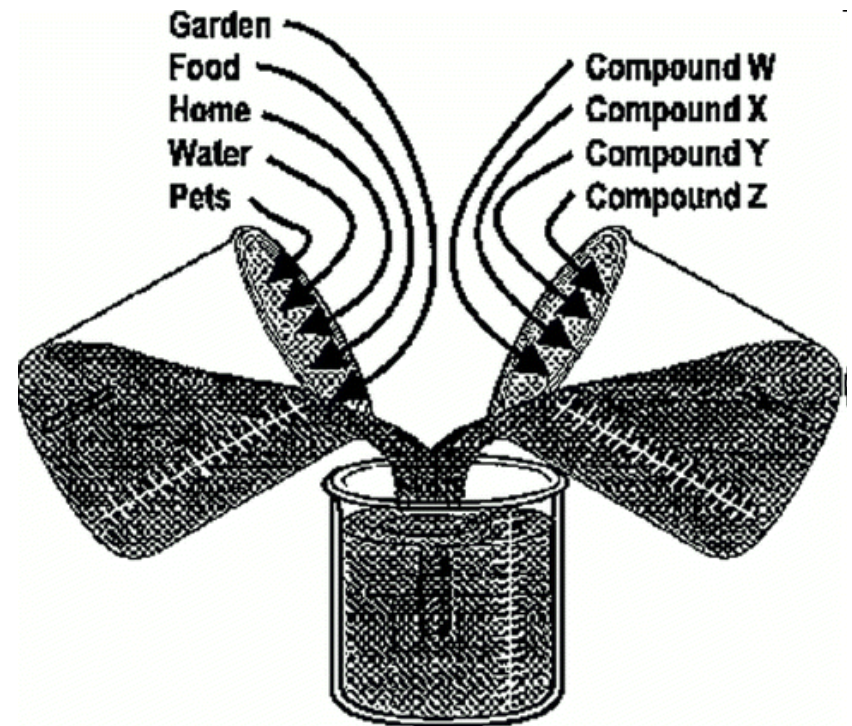
- Not a safety guarantee
- Reasonable certainty of no harm, but NOT risk free
- Must read and follow the label to manage the risk



Risk assessment



Prior to 1996 FQPA



Aggregate and Cumulative Risk Cup

After 1996 FQPA

What are the benefits?



- Aesthetics

- Healthy saleable plants & produce



What are the benefits?



- Bountiful harvest



BROWNTAIL MOTH



DEER TICK

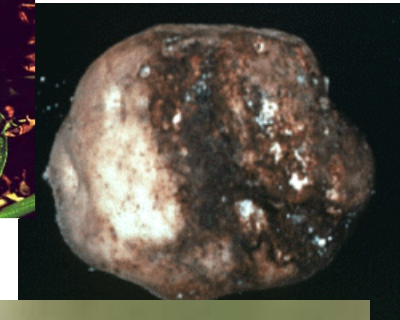
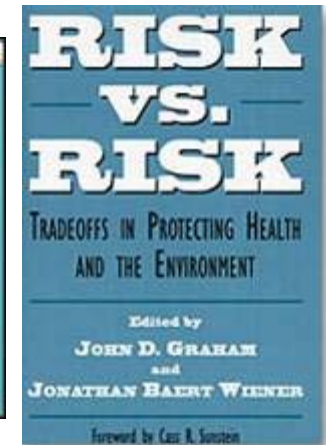
- Nuisance or public health pest control



OH FOR CRYING OUT LOUD ETHEL, STOP SCREAMING, JUST HOW BIG CAN ONE GYPSY MOTH BE?

Risk vs. Risk

- West Nile Virus & EEE
Malaria
- Potato Late Blight Disease
- Lyme Disease



Courtesy of
Kevin Byron

What are the human risks?

■ Acute

- Rash
- Nausea
- Eye ticks
- Stomach cramps

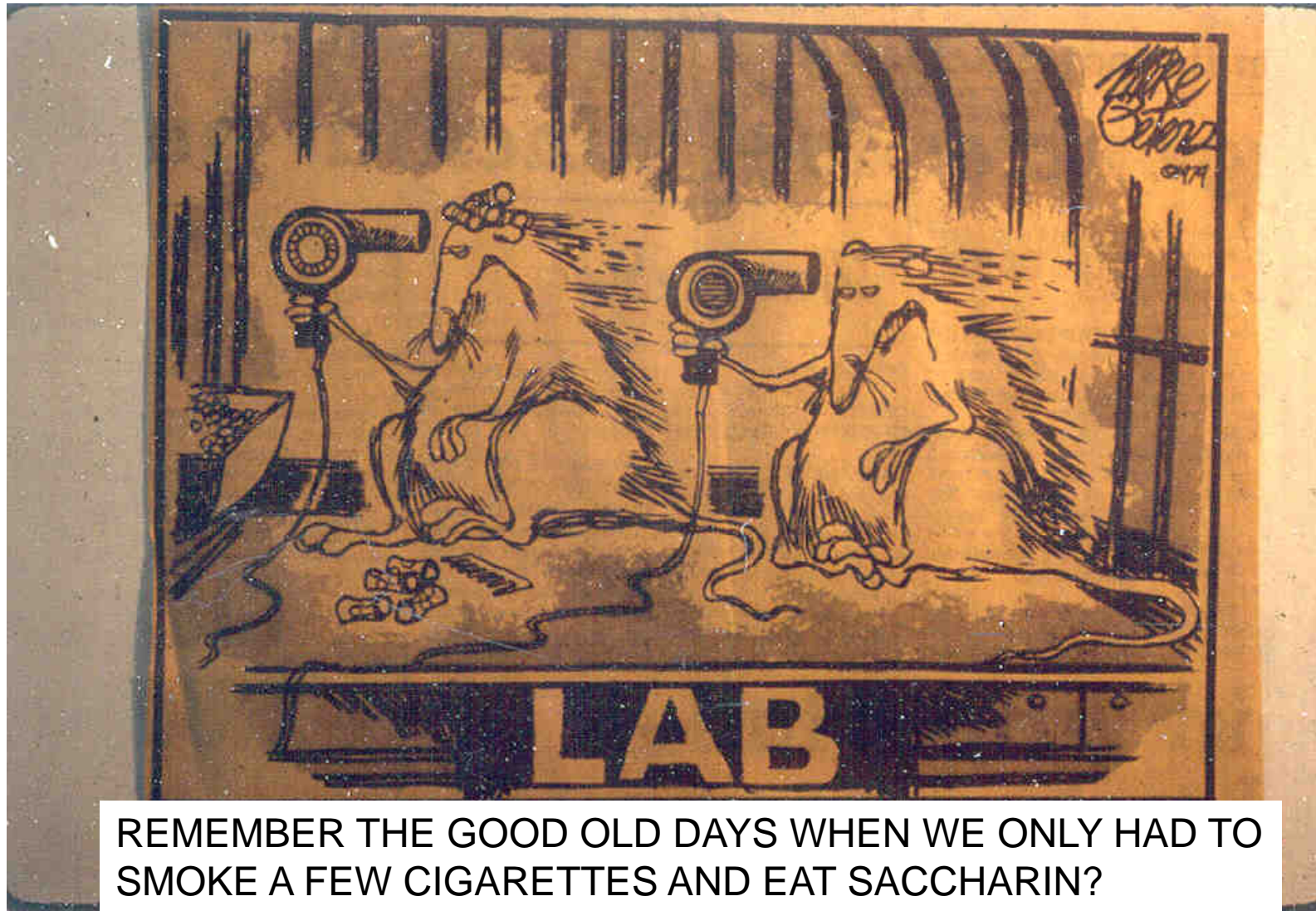


■ Chronic

- Cancer
- Birth defects
- Allergies
- Organ damage
- Endocrine effects



How are the risks determined?



REMEMBER THE GOOD OLD DAYS WHEN WE ONLY HAD TO SMOKE A FEW CIGARETTES AND EAT SACCHARIN?

All pesticides have risks!!!

■ Organic ≠ Safe

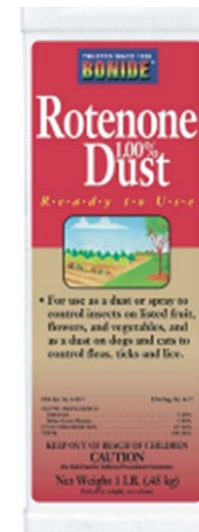


Introducing...
**ALL-NATURAL ORGANIC
Earth Friendly™**
Preemergence weed control
and fertilizer
for lawns and gardens

■ Synthetic ≠ Highly toxic



■ Natural ≠ Safe



No endorsement intended or implied

Even natural or organic products are toxic!

How Many Fold Lower is Human Exposure Than the Dose That Gave Rodents Cancer Margin of Exposure, MOE (Rodent Cancer Dose/Human Exposure)

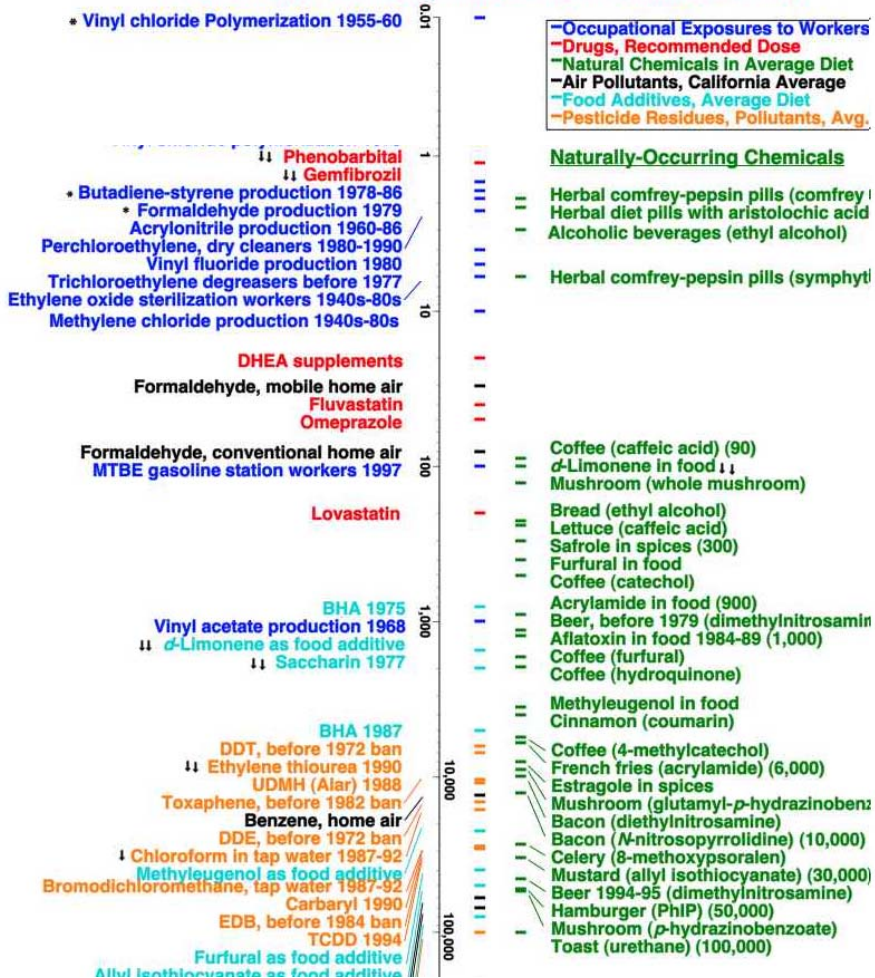


TABLE 2-12 Original chart from Pests of the Garden and Small Farm by Mary Louise Flint Amended by Gary Fish September 2007

Oral LD₅₀ Values for Some Pesticides Used in Small Farms and Gardens.

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

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

*asterisk indicates chemical was acceptable for organically grown produce.

^aLD₅₀ 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.

^bEIC 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.

¹Estimated EIO.

“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



Woman dies after water-drinking contest
Water intoxication eyed in 'Hold Your Wee for a Wii' contest death

AP Associated Press

Updated: 10:24 p.m. ET Jan 13, 2007

SACRAMENTO, Calif. - A woman who competed in a radio station's contest to see how much water she could drink without going to the bathroom died of water intoxication, the coroner's office said Saturday.

Jennifer Strange, 28, was found dead Friday in her suburban Rancho Cordova home hours after taking part in the "Hold Your Wee for a Wii" contest in which KDND 107.9 promised a Nintendo Wii video game system for the winner.

"She said to one of our supervisors that she was on her way home and her head was hurting her real bad," said Laura Rios, one of Strange's co-workers at Radiological Associates of Sacramento. "She was crying and that was the last that anyone had heard from her."

NBC VIDEO



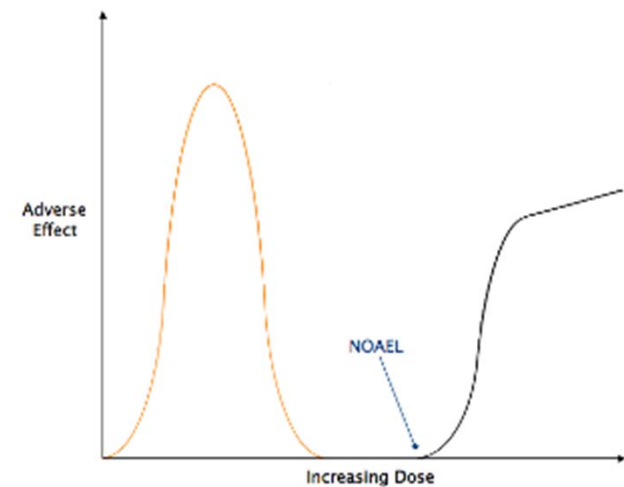
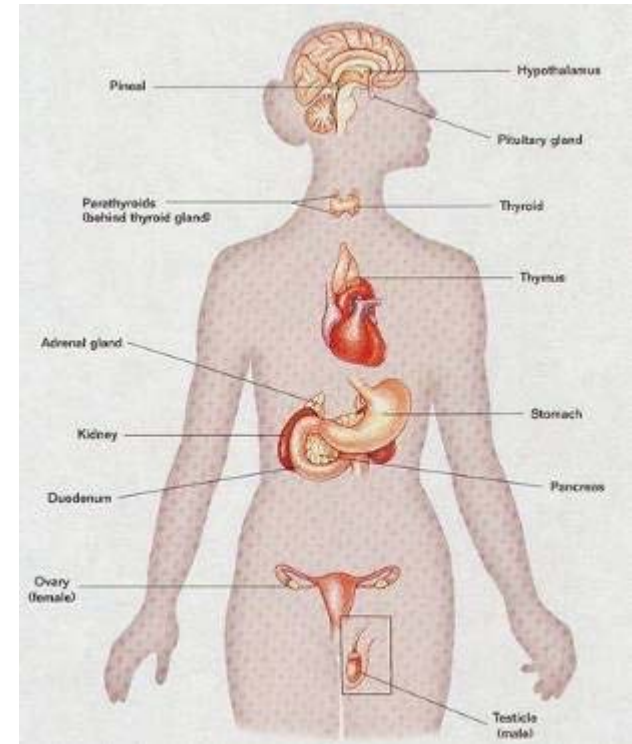
Launch

Woman in water drinking contest dies
Jan. 15: Sacramento Bee reporter Christina Jewett talks to MSNBC-TV's Contessa Brewer about the death of a woman who had competed in a radio station contest.

MSNBC

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>
- http://www.epa.gov/scipoly/oscpendo/pubs/final_list_frn_041509.pdf
- Does the dose make the poison?? What about hormesis?
- <http://www.belleonline.com/index.htm>



RESTRICTED USE PESTICIDE
ACUTE TOXICITY AND GROUND WATER CONTAMINATION
For use only by Certified Applicators or persons under the direct supervision of a Certified Applicator and only for those uses covered by the Certified Applicator's certificate.



TEMIK® brand 15G ALDICARB PESTICIDE

For Control of Certain Insects, Mites, and Nematodes.
ACTIVE INGREDIENT: Aldicarb (2-methyl-2-isothiazolidinone) 100%
INERT INGREDIENTS 85%
EPA Reg. No. 264-333 EPA Est. No. 254-GA-01

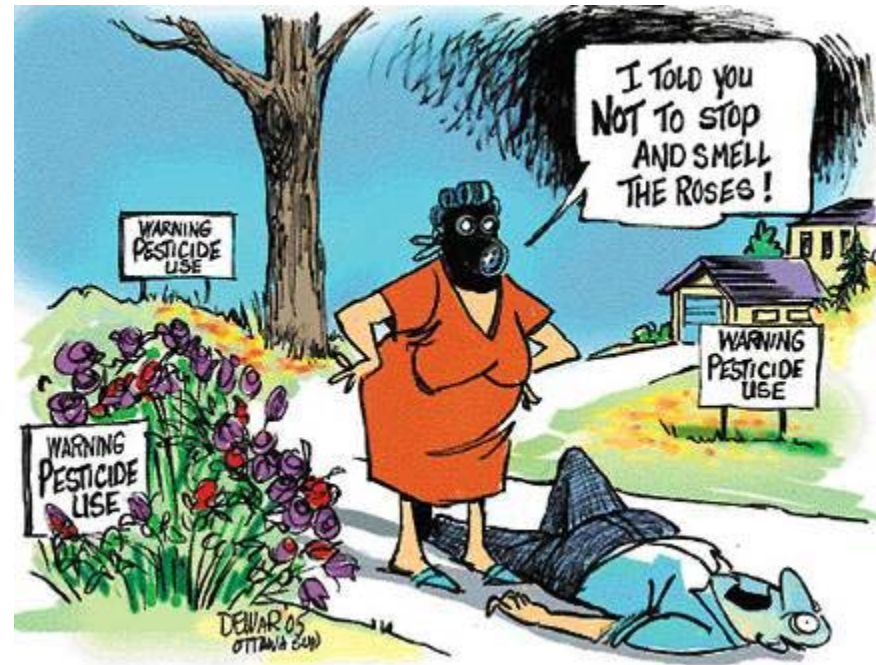


KEEP OUT OF REACH OF CHILDREN
DANGER POISON
PELIGRO



=

X



No endorsement intended or implied

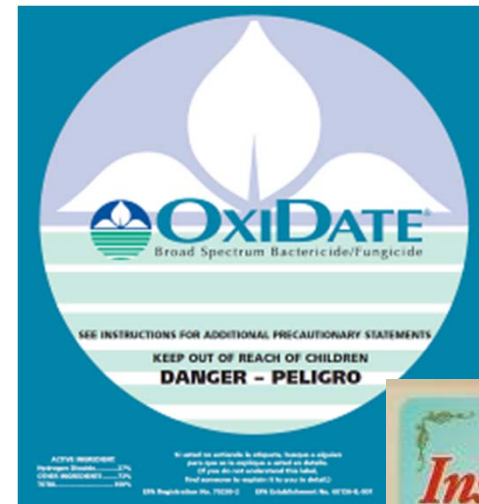
One way to quickly assess the risk?

Signal Words

Danger

Warning

Caution



ACTIVE INGREDIENT:
Bacillus thuringiensis, subsp. kurstaki, strain ABTS-351, fermentation solids, spores, and insecticidal toxins. 54%
OTHER INGREDIENTS: 46%
TOTAL: 100%

Potency: 32,000 Cabbage Looper Units (CLU) per mg (14.6 billion CLU per pound).
The percent active ingredient does not indicate product performance and potency measurements are not federally standardized.
EPA Reg. No. 73545-09
EPA Est. No. 33752-14-001
Use No. 12046



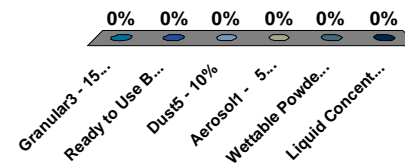
KEEP OUT OF REACH OF CHILDREN

CAUTION

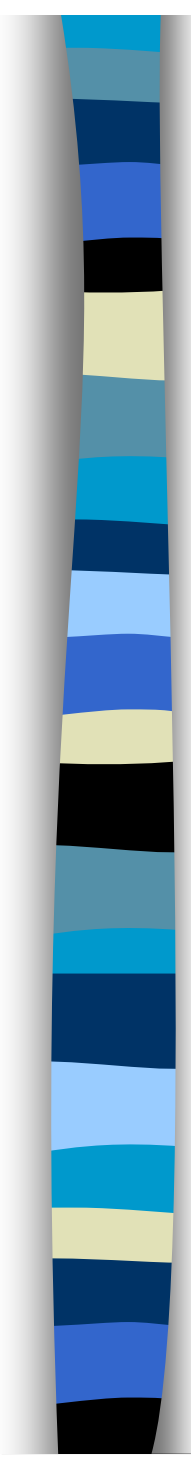
No endorsement intended or implied

Please choose the two pesticide formulation types with the lowest exposure potential

	Formulation Type	Percent Active Ingredient
1.	Granular	3 - 15%
2.	Ready to Use Baits, Gels or Liquids	1 - 15%
3.	Dust	5 - 10%
4.	Aerosol	1 - 5%
5.	Wettable Powder	50 - 85%
6.	Liquid Concentrate	40 - 90%



Reduce exposure by using targeted materials

- 
- Enclosed baits & gels
 - Spot treatments
 - Broadcast treatments

Best



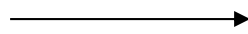
Worst

Which product do you think is the better choice?

1. A



2. B

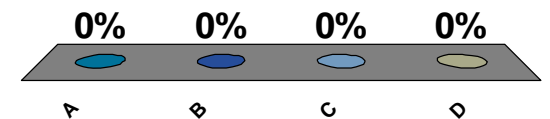
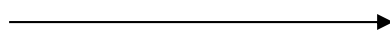


No endorsement intended or implied

3. C



4. D

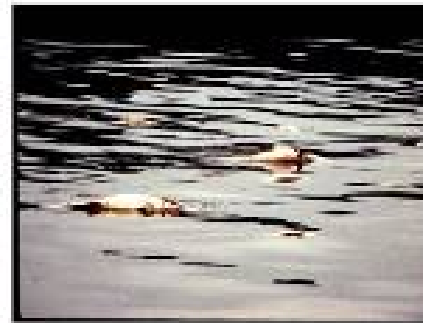


How is risk reduced?- PPE

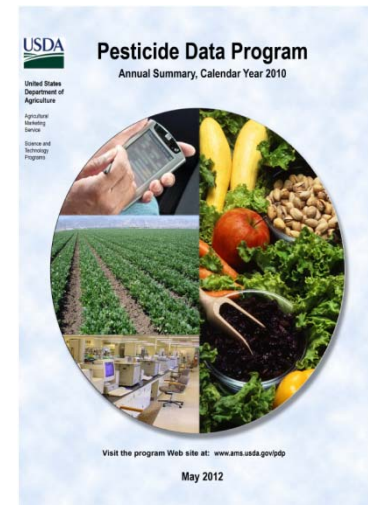


What are some “environmental” risks?

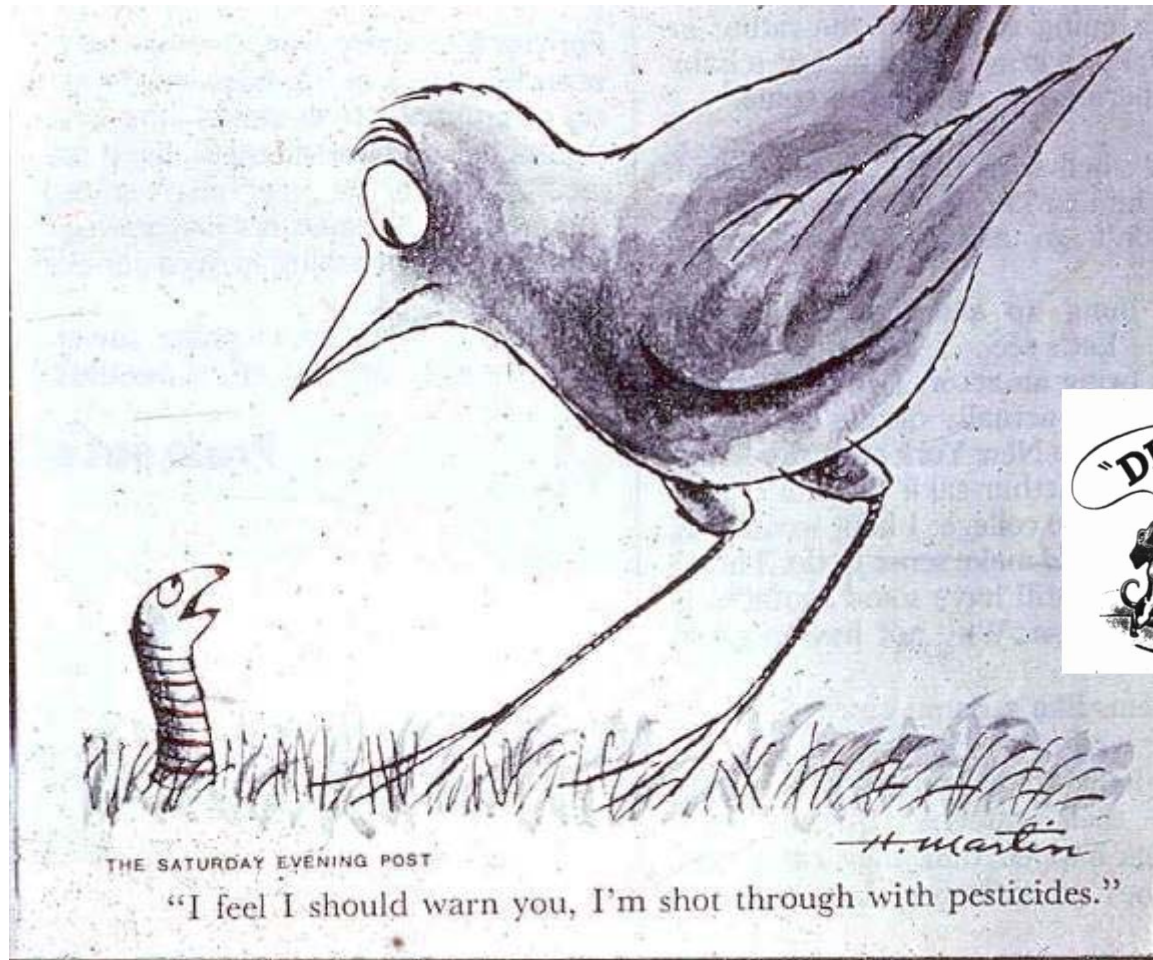
- Wildlife effects



- 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



The screenshot shows the University of Maine Cooperative Extension website. The header includes the university logo and navigation links. The main content area features a title for the 'Managed Pollinator CAP: Coordinated Agricultural Project' with a sub-header 'Bee Health Home'. It includes a 'Have a question?' button, a 'Print' button, and a 'Share / Save' button. The project description states it is a national research and extension initiative to reverse pollinator decline. A graphic of a bee and honeycomb is visible on the right side of the project description.

<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
 - Fungicides may exacerbate Nosema disease
 - 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
 - Mostly found at levels that are sub-lethal



No endorsement intended or implied

Toxicity of Common Organic-Approved Pesticides to Pollinators

Toxicity of Common Organic-Approved Pesticides to Pollinators

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

Soaps and Oils,
only when directly
sprayed upon the
pollinator

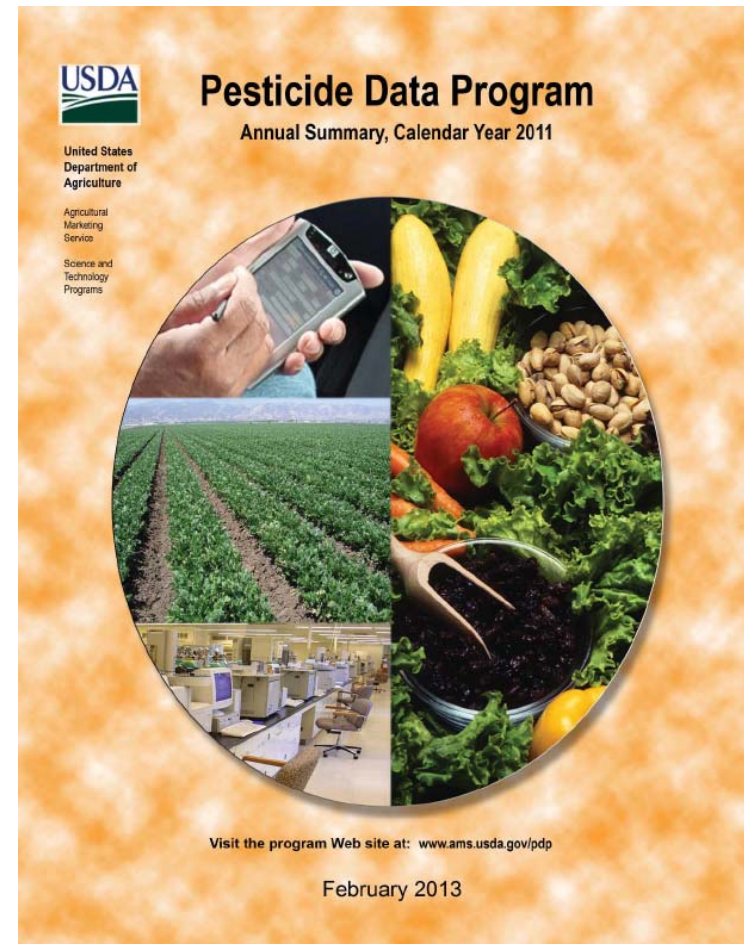


Pesticide residues are found on all types of food

- 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

2011 USDA-PDP Sampling

- USDA – PDP 2011 sampling shows that 99.73% of all samples are well below the tolerances set by EPA
- In baby food no residues were found above the tolerance levels
- 399 (3.4%) of samples contained extremely low levels of pesticides for which there is no tolerance
- “The data reported by PDP corroborate that residues found in fruits and vegetables are at levels that do not pose risk to consumers’ health”



<http://www.ams.usda.gov/AMSV1.0/getfile?dDocName=stelprdc5102692>

PDP also detects pesticide residues on organic produce

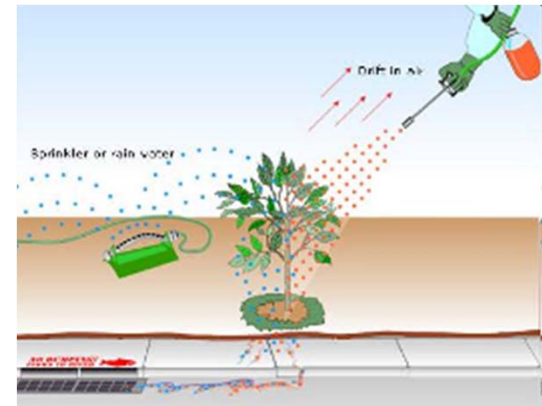
- According to the 2008 USDA Pesticide Data Program Report:
 - 43% of organic spinach samples were positive for spinosad (13 of 30 samples positive)
- According to the 2010 and 2011 USDA Pesticide Data Program Report:
 - 52% of organic baby food pear samples were positive for spinosad (16 of 31 samples) 2010
 - 49% of organic baby food pear samples were positive for spinosad (33 of 67 samples) 2011
- Spinosad is National Organic Program 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

Commodity Group	Number of Samples Collected			Number of Samples with Positive Detections			Percent of Samples with Positive Detections			Detections Above a Health Advisory		
	1994	1999	2005	1994	1999	2005	1994	1999	2005	1994	1999	2005
Potatoes	47	100	87	8	4	1	17%	4%	1%	None	None	None
Corn	49	51	28	7	0	4	14%	0%	14%	None	None	None
Blueberries	21	22	13	15	13	7	75%	59%	54%	None	None	None
Small Grains	3	9	17	0	0	1	0%	0%	6%	None	None	None
Orchards	1	5	3	1	0	0	100%	0%	0%	* One	None	None
Christmas Trees	5	4	3	0	0	0	0%	0%	0%	None	None	None
Strawberries	None	3	6	---	0	0	---	0%	0%	---	None	None
Totals:	129	194	157	31	17	13	23.3%	9.0%	8.3%	---	---	---

*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

- 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 desired goal for reducing nuisance plant growth (algae)

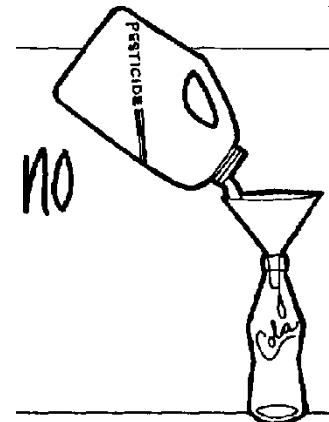
Prevent water contamination

- 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



Storage

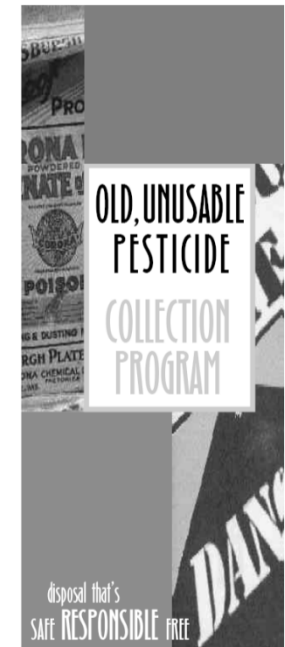
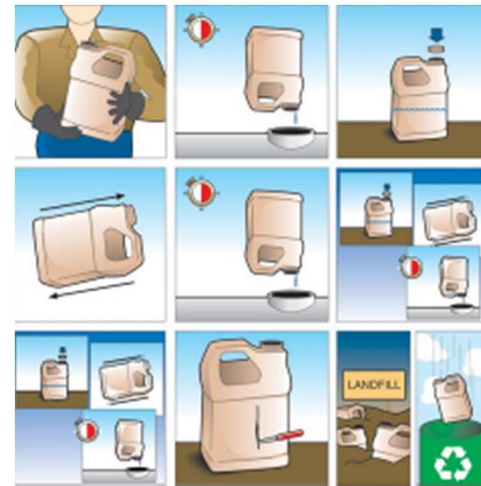
- Buy *only* what you need
- Keep them out of reach of children & lock them up
- Keep in original containers
- Never store in basement!



Disposal

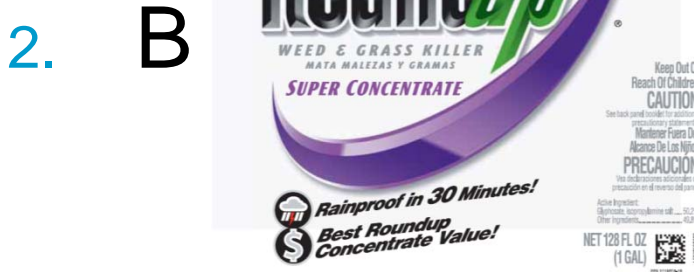
- Follow label
- Rinse containers
- Apply extra mix to labeled site
- Call BPC about obsolete pesticides

IMPORTANT- Directions for Storage and Disposal	
STORAGE	Store unused product in an area out of reach of children and animals. Do not store in areas where temperatures frequently exceed 100°F.
DISPOSAL 	If Empty: <ul style="list-style-type: none">• Do not reuse this container.• Place empty container in trash or offer for recycling if available. If Partly Filled: <ul style="list-style-type: none">• Call your local solid waste agency or toll free 1-800-CLEANUP for disposal instructions.• Never place unused product down any indoor or outdoor drain.



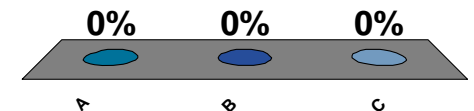
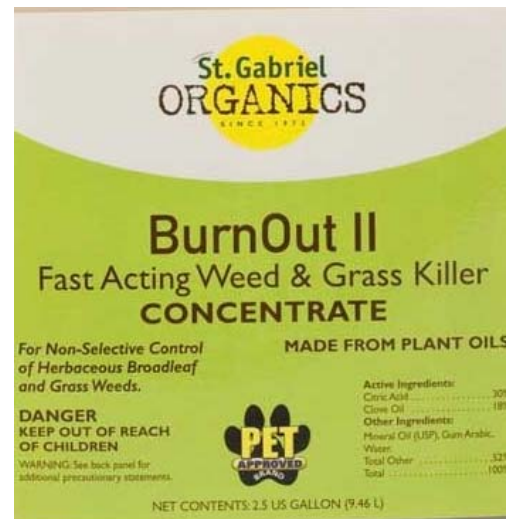
Which product is most risky to handle?

1. A →



No endorsement intended or implied

3. C →



Think First... Spray Last



- “The quick fix is neither”!

Make the benefits

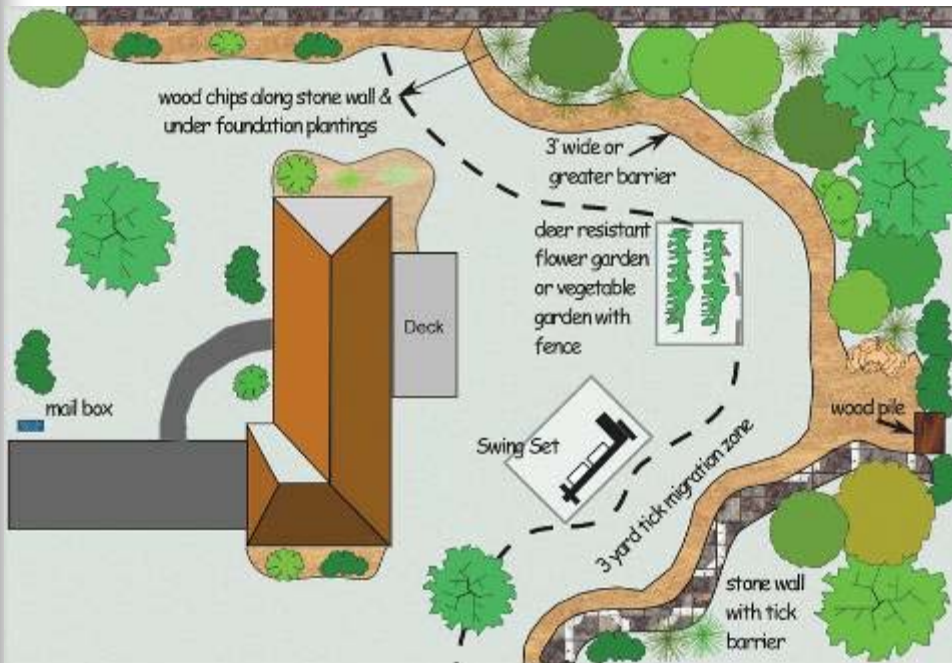
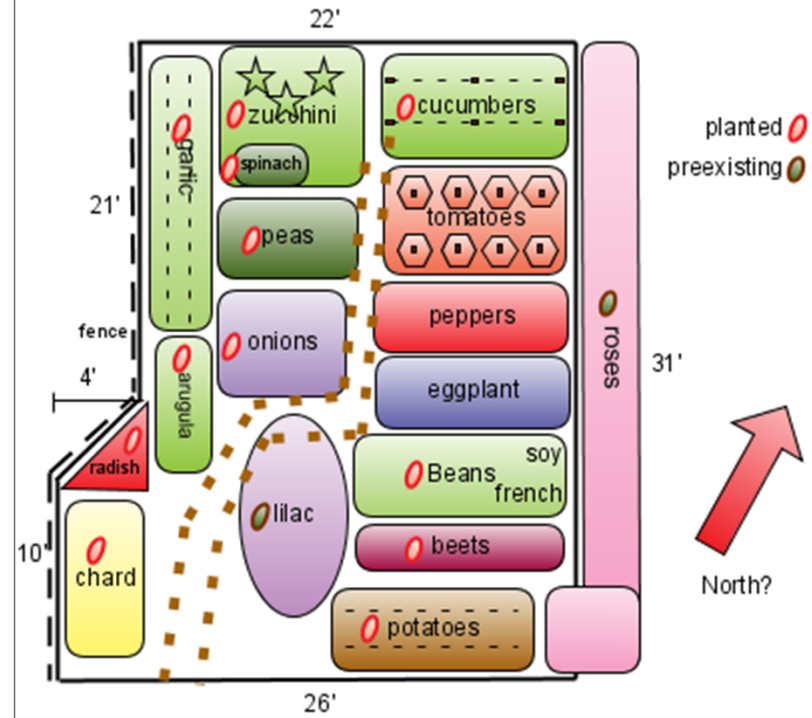
Outweigh the risks

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



Who's been chewing here?



They only
come out at
night!



Fruit Drop!



“The gardener’s best buddies”



UGA1233224



UGA1355025

Colorado potato beetle

- Cultural controls
 - **Crop Rotation:** Rotate potatoes or eggplant to a field that is at least 200 yards from the previous year's fields.
 - **Early planting:** Green sprouting, prepares whole seed potatoes to emerge rapidly, gaining about 7-10 days to harvest.
 - **Late planting:** CPB adults that do not find food leave the field in search of greener pastures. Plant after mid- June
 - **Straw mulch:** When potato or eggplants are mulched with straw, fewer Colorado potato beetle adults will settle on the plants and fewer eggs will be laid.
 - **Biological control:** There are numerous predators and parasitoids that attack CPB adults (a tachinid fly), larvae (12-spotted ladybeetle, spined soldier bug, ground beetles), and eggs. If sprays are needed, selective products will conserve beneficial.



King's Plant Barn©

Japanese Beetle

- Select non-preferred shrubs and trees (avoid linden, roses, crabapples, grapes, raspberries)
- Cover susceptible plants with protective netting
- Avoid traps
- Use a trap plant (soybean, zinnia, pole beans, etc.)



Kentucky wonder pole beans

Look for varieties that are resistant to disease

Defender is the only U.S. commercial potato with late-blight-resistant leaves and tubers.

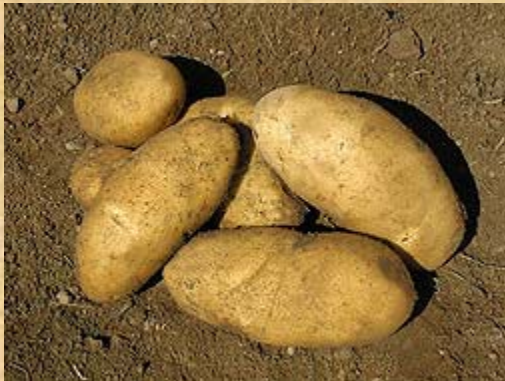


Photo by Peggy Bain

Figure 5 – Potato Varieties

Better	Worse
<i>Red Cloud</i>	Carola
Red Dale	Shepody
Butte	<i>Red Cloud</i>
<i>Kennebec</i>	<i>Red Norland</i>
Russet	<i>Kennebec</i>
<i>Chieftan</i>	<i>Chieftan</i>
Elba	
<i>Red Norland</i>	
* Island Sunshine	

* – Commonly reported
Italic – reported both better and worse

<http://www.mofga.org/>

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 decrease pest/disease potential**
- **Sanitation: removing diseased vegetation from garden (rogueing)**



Cultural controls – Late Blight

- Do not keep cull piles of potatoes
- Do not save questionable potato seed
- Do not compost diseased tubers, because parts of the compost pile may not be hot enough to kill the tubers, providing the pathogen with living tissue for overwintering
- Buy seed from a good source
- In the spring, scout, pull and destroy all volunteer potatoes



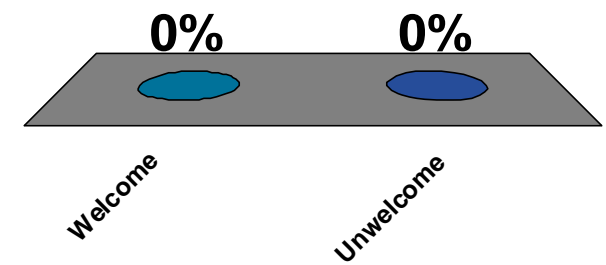
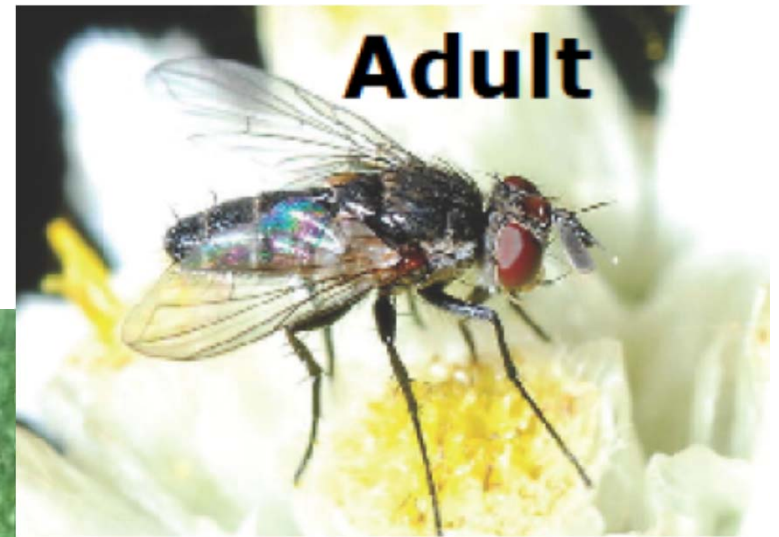
Mechanical controls

- 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



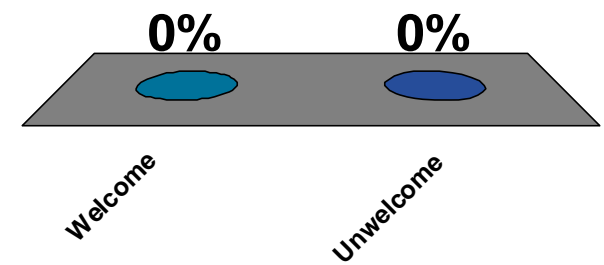
Joshua P. Basham
T.S.U. Otis L. Floyd Nursery Research Center
McMinnville, TN 37110-1367
From Point Sebago Golf Course, Casco, Maine

We love the good “bugs!”



Welcome or Unwelcome?

1. Welcome
2. Unwelcome

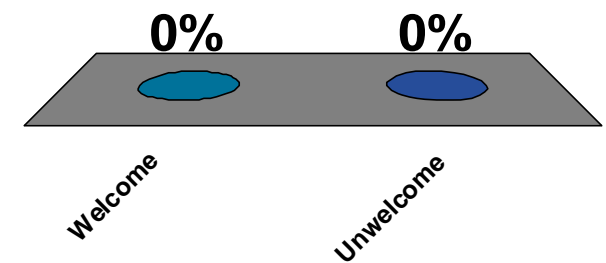


Ladybird beetles eat pests as adults and larvae



Welcome or Unwelcome?

1. Welcome
2. Unwelcome



Flower fly larvae eat aphids!



Science fiction monster?



Delicate beauty – Green lacewing



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

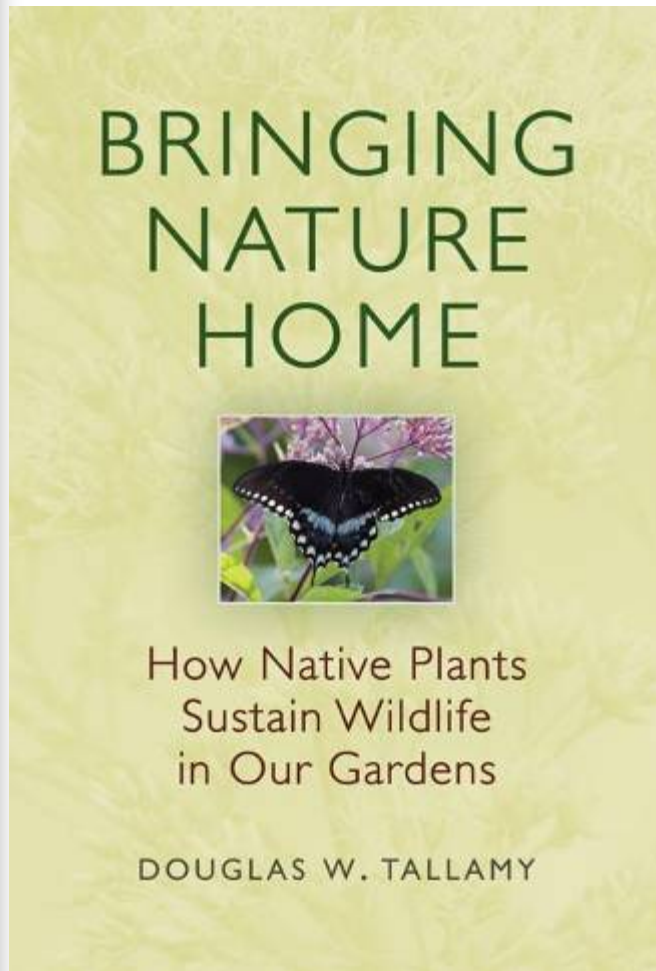


Bloom Timing of Native Plants Attractive to Beneficial Insects

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

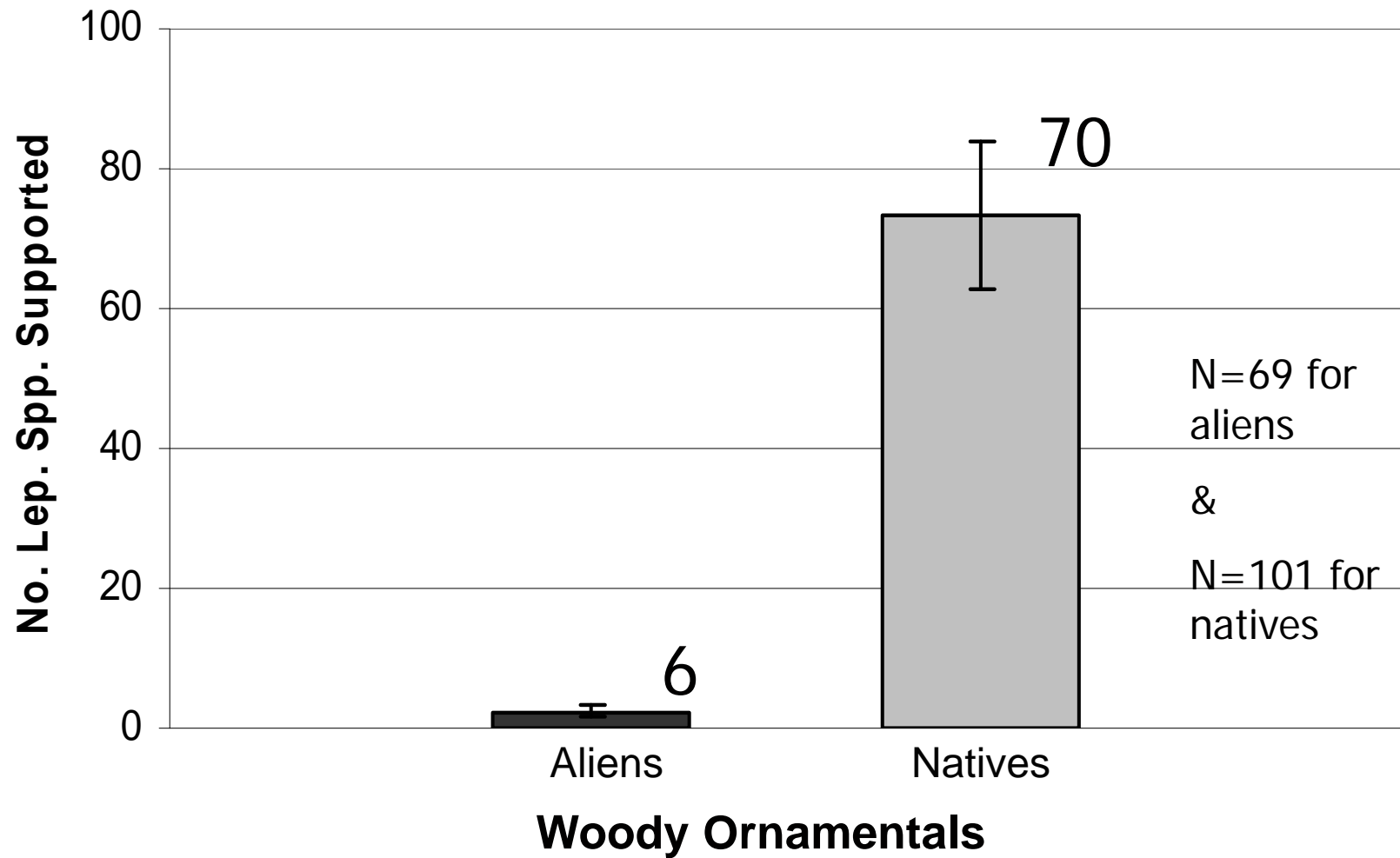
KEY
 * good
 ** better
 *** best

Birds can also be our allies



<http://www.bringingnaturehome.net/>

On average natives support 12x more lepidopteran species



Pretty ornamentals? Or Pests?



Who you gonna call?



BOARD OF PESTICIDES CONTROL
Think First...
Spray Last!
STATE OF MAINE

www.thinkfirstspraylast.org • www.gotpests.org • www.yardscaping.org

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

BPC Web Pages

The screenshot shows the homepage of the Maine Board of Pesticides Control. At the top, it features the Maine.gov logo and navigation links for Agencies, Online Services, and Help. The main header includes the text "Maine Board of Pesticides Control" and a search bar. Below this, there are tabs for "PUBLIC", "APPLICATORS", "DEALERS", and "REGISTRANTS". The left sidebar contains a menu with categories like "ABOUT BPC", "CERTIFICATION & LICENSING", "PRODUCT REGISTRATIONS", "LAWS & REGULATIONS", "ENFORCEMENT", "WATER QUALITY PROGRAM", "DOWNLOAD LIBRARY", and "CONTACT BPC". The main content area is titled "Board Biz and Other News" and includes several news items: "Next Board Meeting: Nov. 5", "Got Pests? We have solutions!", "Credit Meeting Calendar", "BPC Inspector Vacancy—Bangor Area", "New Maine Pesticide Notification Registry" with "SIGN UP" and "DOWNLOAD" buttons, "Bed Bugs: What schools need to know", "School IPM: What you should know", "Chapter 26: Standards for Indoor Pesticide Applications", "Turf Best Management Practices", and an "IMPORTANT!" notice about the notification registry. A "Popular Links" section on the right lists various resources like "Late Report of Toxicities/Injuries", "Your Flight to Home: Pesticide Notifications", "DI Crop Online Training Video & Exam", "Obsolete Pesticide Collection", "Master Gardener Info", "Market Protection Standard", "Credit Meeting Calendar", "Got Pests? We Have Solutions?", "Mosquito & Tick-borne Diseases", and "Pesticide Resources on the Web". At the bottom, it says "ME Department of Agriculture".

www.gotpests.org

www.thinkfirstspraylast.org

The screenshot shows the "Got Pests?" website. The header includes the Maine.gov logo and navigation links. The main heading is "Got Pests?" with a search bar. Below the heading, there are several sections: "Got Pests?" with a sub-heading "Do you know the name of your pest?" and a text input field with a "Go" button; "If not, select from the options below." followed by a grid of icons for "HOME", "LAWNS & YARDS", "TREES & SHRUBS", "FLOWERS", "FRUIT", "VEGETABLES", "PEOPLE & PETS", "WEED", "PLANT DISEASE", "BUG", and "OTHER CRITTER". A "What kind of pest is it?" section is also visible. The right sidebar contains a "QUICK FIND" section with links to "Bed Bugs", "Booklet Page", "Late Report of Toxicities/Injuries", "Resolutions", "FAQ", "What's New?", "Links", "Maine Board of Pesticides Control", "Maine Center for Invasive Control & Prevention", "Maine Department of Agriculture", "Maine Plant Review", "Maine Statewide Pest Management Council", "Maine Land Grants", "Maine Wildlife", "Maine State University", "Maine State Police", "Maine State Fire Marshal", "Maine State Police", "Maine State Police", "Maine State Police", "Maine State Police". At the bottom, there is a disclaimer: "It is the policy of the State of Maine to minimize reliance on pesticides. The Maine Department of Agriculture and the Maine BPC encourage everyone to practice integrated pest management and to use pesticides only as a last resort. The mention of pesticides in the fact sheets linked to these pages does not imply an endorsement of any product. Be sure that any product used is currently registered and follow all label directions." The footer includes "Maine.gov | State Department of Agriculture | State BPC Control | Site Policies" and "Copyright © 2008 All rights reserved."

Do you need a pesticide?

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



Don't apply when you can't hit a susceptible target

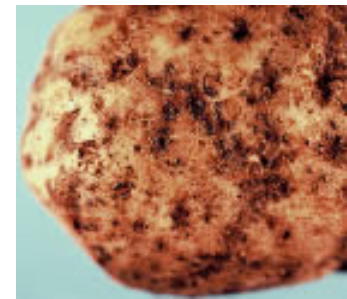


Timing and hitting the target is everything?



What is the threshold for control!

- Potato flea beetles
- 15 shot holes in a leaf
- Must stop them early
- Row covers can help



Nobody home!



Eriophyid gall
mite



Oak apple gall wasp

The key to proper use

■ Read the label!

Biological Insecticide

DiPel® DF

Dry Flowable

FOR ORGANIC PRODUCTION

ACTIVE INGREDIENT:
Bacillus thuringiensis, subsp. *kurstaki*, strain ABTS-351, fermentation solids, spores, and insecticidal toxins. 54%

OTHER INGREDIENTS 46%

TOTAL 100%

Potency: 32,000 Cabbage Looper Units (CLU) per mg (14.5 billion CLU per pound).

The percent active ingredient does not indicate product performance and potency measurements are not federally standardized.

EPA Reg. No. 73049-39
 EPA Est. No. 33762-IA-001 List No. 12046

INDEX:

- 1.0 First Aid
- 2.0 Precautionary Statements
 - 2.1 Hazard to Humans and Domestic Animals
 - 2.2 Personal Protective Equipment (PPE)
 - 2.3 User Safety Recommendations
 - 2.4 Environmental Hazards
- 3.0 Directions for Use
 - 4.0 Agricultural Use Requirements
 - 5.0 Non-Agricultural Use Requirements
 - 6.0 Storage and Disposal
 - 7.0 Directions for Use
 - 8.1 Spray Preparation
- 8.0 Chemigation Use Directions
 - 8.1 Spray Preparation
- 9.0 General Precautions For Applications Through Sprinkler Irrigation Systems
- 10.0 Application Rate
 - 10.1 DiPel DF for Miscellaneous Crop Groups
 - 10.2 DiPel DF for Other Crops
 - 10.3 DiPel DF for Stored Agricultural Commodities
- 11.0 Notice to User

1.0 FIRST AID

If on skin or clothing	<ul style="list-style-type: none"> • Take off contaminated clothing. • Rinse skin immediately with plenty of water for 15-20 minutes. • Call a poison control center or doctor for treatment advice.
If inhaled	<ul style="list-style-type: none"> • Move person to fresh air. • If person is not breathing, call 911 or an ambulance, then give artificial respiration, preferably by mouth-to-mouth, if possible. • Call a poison control center or doctor for treatment advice.
If in eyes	<ul style="list-style-type: none"> • Hold eye open and rinse slowly and gently with water for 15-20 minutes. • Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye. • Call a poison control center or doctor for treatment advice.

HOT LINE NUMBER

Have the product container or label with you when calling a poison control center or doctor, or going for treatment. You may also contact 800-892-0099 (24 hours) for emergency medical treatment and/or transport emergency information. For all other information, call 800-4-VALENT (855-5365).

2.0 PRECAUTIONARY STATEMENTS

2.1 HAZARD TO HUMANS AND DOMESTIC ANIMALS CAUTION

Harmful if inhaled or absorbed through the skin. Causes moderate eye irritation. Avoid breathing dust or spray mist. Avoid contact with skin, eyes or clothing. Wash thoroughly with soap and water after handling. Remove contaminated clothing and wash before reuse. Mixer/loaders and applicators must wear a dust/mist filtering respirator meeting NIOSH standards of at least N-95, R-95, or P-95. Repeated exposure to high concentrations of microbial proteins can cause allergic sensitization.

2.2 Personal Protective Equipment (PPE)

Applicators and other handlers must wear:

- Long-sleeved shirt and long pants
- Waterproof gloves
- Shoes plus socks

Follow the manufacturer's instructions for cleaning/maintaining PPE. If no such instructions for washables, use detergent and hot water. Keep and wash PPE separately from other laundry.

2.3 User Safety Recommendations

- Users should wash hands before eating, drinking, chewing gum, using tobacco or using the toilet.
- Users should remove clothing immediately if pesticide gets inside. Then wash thoroughly and put on clean clothing.
- User should remove PPE immediately after handling this product. Wash the outside of gloves before removing. As soon as possible, wash thoroughly and change into clean clothing.

2.4 Environmental Hazards

Do not apply directly to water, or to areas where surface water is present or to intertidal areas below the mean high water mark. Do not contaminate water when cleaning equipment or disposing of equipment washwaters.

This product must not be applied aerially within 1/4 mile of any habitats of endangered species or threatened lepidoptera. No manual application can be made within 300 feet of any threatened or endangered lepidoptera.

3.0 DIRECTIONS FOR USE

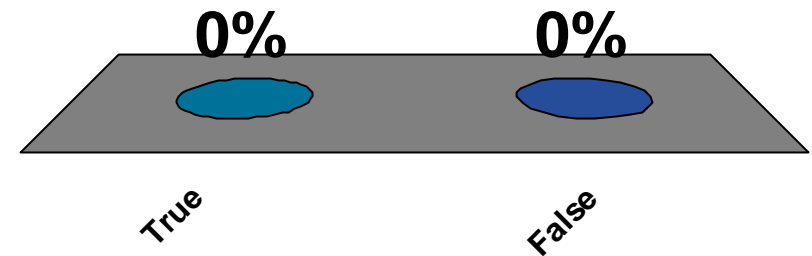
It is a violation of Federal law to use this product in a manner inconsistent with its labeling. For any requirements specific to your State or Tribe, consult the agency responsible for pesticide regulation.

**KEEP OUT OF REACH OF CHILDREN
CAUTION**



Colorado Potato Beetle Beater is a moderately hazardous pesticide.

1. True
2. False



False – Caution = slight hazard



**Colorado
Potato Beetle
Beater**

BONIDE®
TRUSTED SINCE 1926

Concentrate
MAKES UP TO 8 GALLONS OF SPRAY

Kills Colorado Potato Beetle

Controls certain insects in vegetable gardens

ACTIVE INGREDIENT:
spinosad (a mixture of spinosyn A
and spinosyn D) 0.5%

OTHER INGREDIENTS: 99.5%

TOTAL 100.0%

EPA Est. No. 4-NY-1, EPA Reg. No. 62719-314-4

Keep Out Of Reach Of Children
CAUTION (Refer to back panel for Directions
for Use including Storage & Disposal)

Net Contents 16 FL OZ (473 ML)

XXXXXXXX



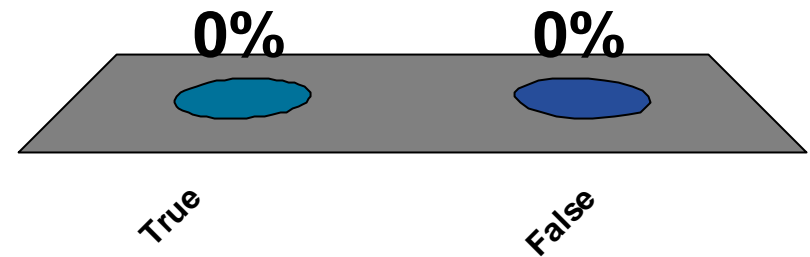
**FOR ORGANIC
PRODUCTION**

687



Colorado Potato Beetle Beater should be applied before the pest is seen.

1. True
2. False





False

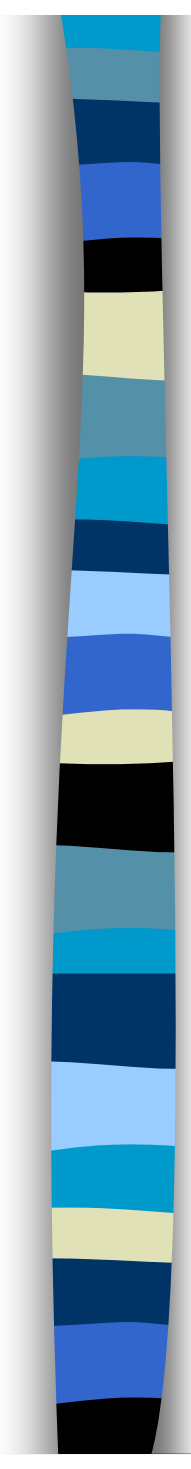
Page 4

WHEN TO APPLY

Apply when listed pests are present. Repeat applications may be made as indicated in the Home Gardens section. See your state extension service recommendations for treatment guidelines in your area.

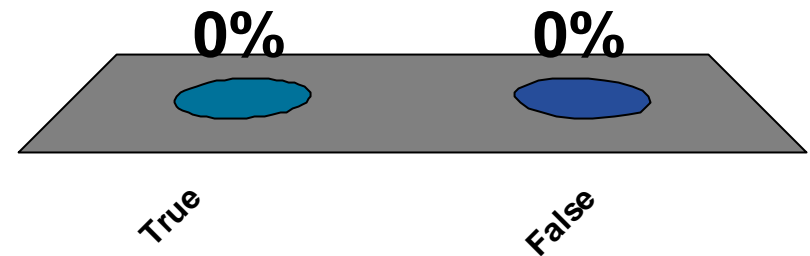
HOME GARDENS

In the state of Georgia, do not apply this product to: Broccoli Raab, Chinese Cabbage (Bok Choy), Collards, Kale, Mizuna, Mustard Greens, Mustard Spinach, Rape Greens.



Colorado Potato Beetle Beater is approved for organic production so it is not harmful to the environment.

1. True
2. False





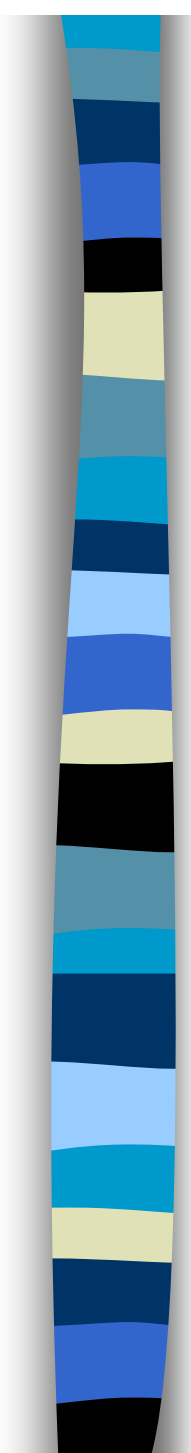
False

Page 8

This product is toxic to aquatic invertebrates. To protect the environment, do not allow pesticide to enter or run off into storm drains, drainage ditches, gutters or surface waters. Applying this product in calm weather when rain is not predicted for the next 24 hours will help to ensure that wind or rain does not blow or wash pesticide off the treatment area. Rinsing application equipment over the treated area will help avoid run off to water bodies or drainage systems.

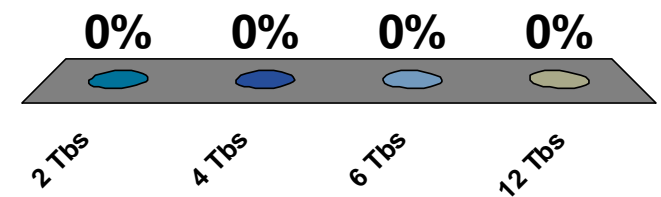
Physical or Chemical Hazards

Combustible. Do not use or store near heat or open flame.



How many tablespoons of Colorado Potato Beetle Beater should you add to a 3 gallon sprayer?

1. 2 Tbs
2. 4 Tbs
3. 6 Tbs
4. 12 Tbs



12 Tbs for 3 gallons of spray

HOW TO MIX

Add the required amount of this product to the recommended amount of water, mix thoroughly, and apply uniformly to both upper and lower surfaces of plant foliage. It is recommended to mix only as much spray as needed for a single treatment. In vegetable gardens it is recommended to use not more than 3 gallons of spray for 1000 sq ft of area. Do not use kitchen utensils for measuring. Keep measuring utensils with product and away from children.

Unit of Measure*	Amount of this product to Use per Pint, Quart or Gallon of Spray		
	Per Pint (16 fl oz) of Spray	Per Quart (32 fl oz) of Spray	Per Gallon (128 fl oz) of Spray
Fluid Ounces (fl oz)	0.25 fl oz	0.5 fl oz	2.0 fl oz
Milliliters (mL)	7.5 mL	15 mL	60 mL
Tablespoons (Tbs)	½ Tbs	1 Tbs	4 Tbs
Teaspoons (tsp)	1 ½ tsp	3 tsp	12 tsp

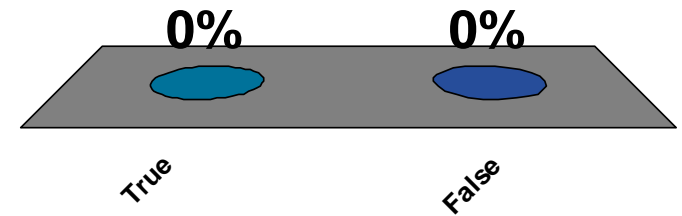
* Conversion factors: 1 fl oz = 30 mL = 2 tablespoons (Tbs) = 6 teaspoons (tsp)
(1 teaspoon = 1/3 tablespoon)

HOW TO APPLY



Colorado Potato Beetle Beater is a good choice for treating asparagus spears for asparagus beetle damage

1. True
2. **False**



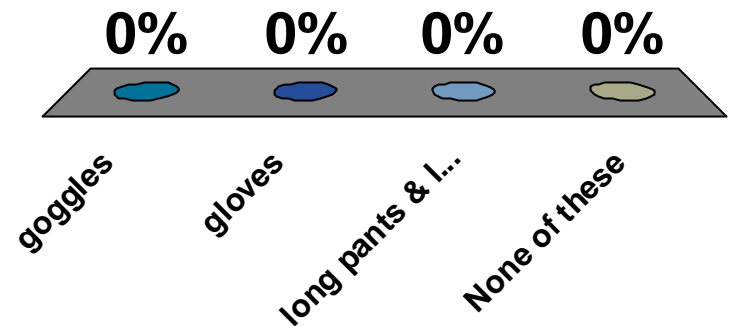
False – may only treat post harvest

Page 4

Crops	Pests Controlled	Maximum Number of Applications per Season	Minimum Days to Wait before Reapplying	Minimum Days to Wait from Last Application to Harvest
apple and other pome fruits including crabapples, mayhaw, pears, and quince	codling moth, leafminers, leafrollers, Oriental fruit moth, tufted apple budmoth	6	10	7
asparagus (post-harvest to protect ferns)	asparagus beetles	4	7	60
bushberries and caneberries, including blackberry, blueberry, currant, elderberry, gooseberry, huckleberry, juneberry, lingonberry, loganberry, raspberry, and salal	armyworms, fireworms, fruitfly (suppression), fruitworms, leafrollers, loopers, thrips	6	6	3

What protective equipment must be worn when mixing Colorado Potato Beetle Beater?

1. goggles
2. gloves
3. long pants & long sleeves
4. **None of these**





Nothing is required... But

Page 8

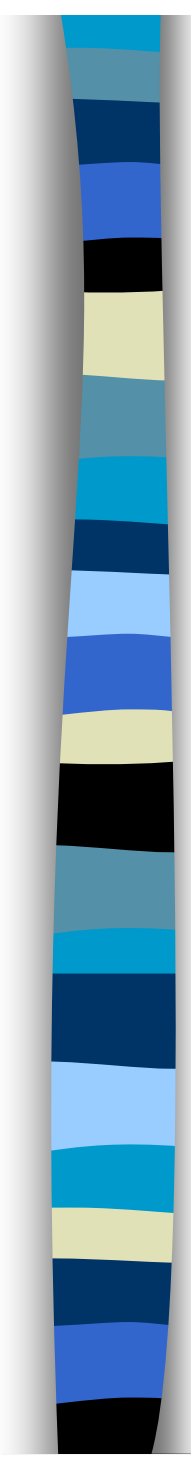
PRECAUTIONARY STATEMENTS

Environmental Hazards

This product is toxic to bees exposed to treatment for 3 hours following treatment. Do not apply this pesticide to blooming, pollen-shedding or nectar-producing parts of plants if bees may forage on the plants during this time period. This product is toxic to aquatic invertebrates. To protect the environment, do not allow pesticide to enter or run off into storm drains, drainage ditches, gutters or surface waters. Applying this product in calm weather when rain is not predicted for the next 24 hours will help to ensure that wind or rain does not blow or wash pesticide off the treatment area. Rinsing application equipment over the treated area will help avoid run off to water bodies or drainage systems.

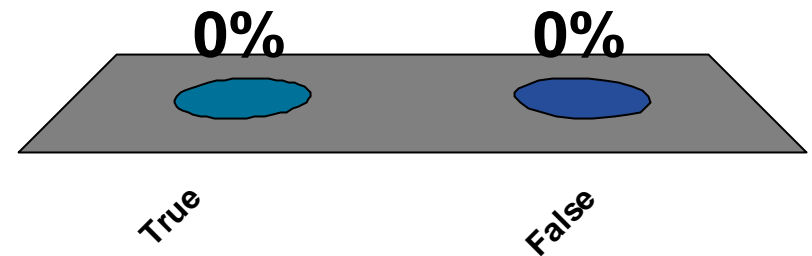
Physical or Chemical Hazards

Combustible. Do not use or store near heat or open flame.



You must wait 10 days before re-applying Colorado Potato Beetle Beater to apples.

1. True
2. False



True

Page 4

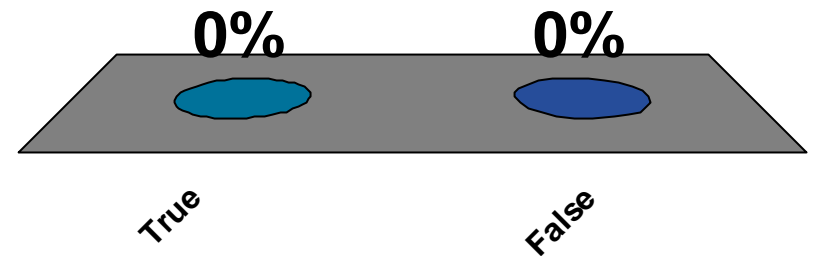
HOME GARDENS

In the state of Georgia, do not apply this product to: Broccoli Raab, Chinese Cabbage (Bok Choy), Collards, Kale, Mizuna, Mustard Greens, Mustard Spinach, Rape Greens.

Crops	Pests Controlled	Maximum Number of Applications per Season	Minimum Days to Wait before Reapplying	Minimum Days to Wait from Last Application to Harvest
apple and other pome fruits including crabapples, mayhaw, pears, and quince	codling moth, leafminers, leafrollers, Oriental fruit moth, tufted apple budmoth	6	10	7
asparagus (post-harvest to protect ferns)	asparagus beetles	4	7	60

It is appropriate to use Colorado Potato Beetle Beater if you will be selling your produce.

1. True
2. **False**





False

Pages 2 & 3

COLORADO POTATO BEETLE BEATER CONCENTRATE

- **DO-IT-YOURSELF HOME GARDEN INSECT CONTROL.**

DIRECTIONS FOR USE

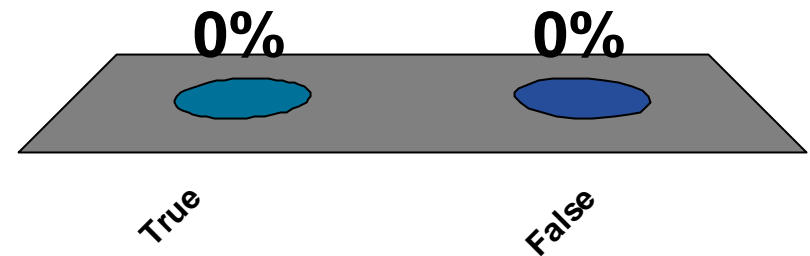
It is a violation of Federal law to use this product in a manner inconsistent with its labeling. Read all Directions for Use carefully before applying.

For residential use in home gardens, lawns and ornamentals. Not for use on plants being grown for sale or other commercial use, or for commercial seed production, or for research purposes.



Colorado Potato Beetle Beater is best applied to apple trees just as they reach full bloom.

1. True
2. False





False

Page 8

PRECAUTIONARY STATEMENTS

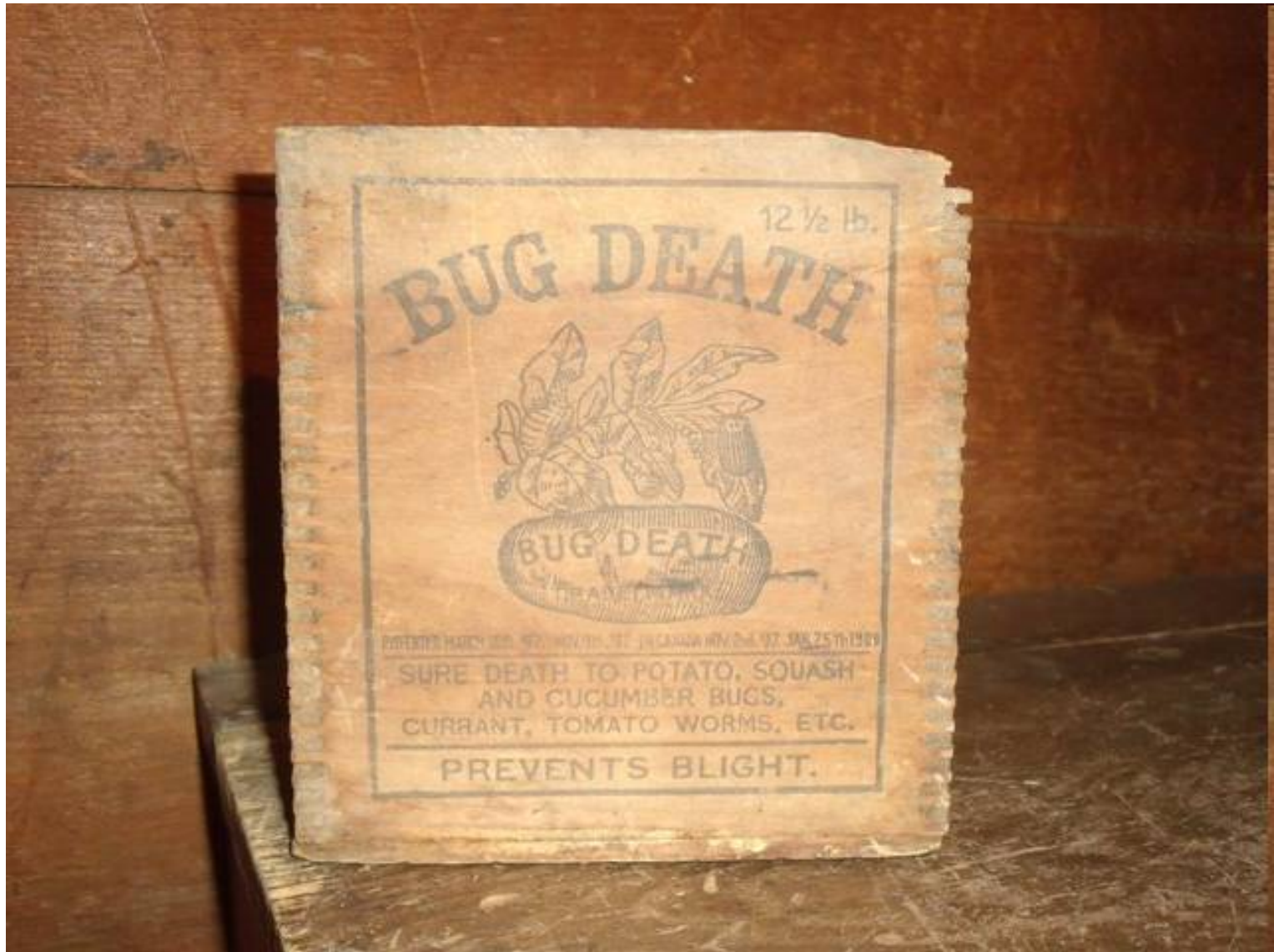
Environmental Hazards

This product is toxic to bees exposed to treatment for 3 hours following treatment. Do not apply this pesticide to blooming, pollen-shedding or nectar-producing parts of plants if bees may forage on the plants during this time period. This product is toxic to aquatic invertebrates. To protect the environment, do not allow pesticide to enter or run off into storm drains, drainage ditches, gutters or surface waters. Applying this product in calm weather when rain is not predicted for the next 24 hours will help to ensure that wind or rain does not blow or wash pesticide off the treatment area. Rinsing application equipment over the treated area will help avoid run off to water bodies or drainage systems.

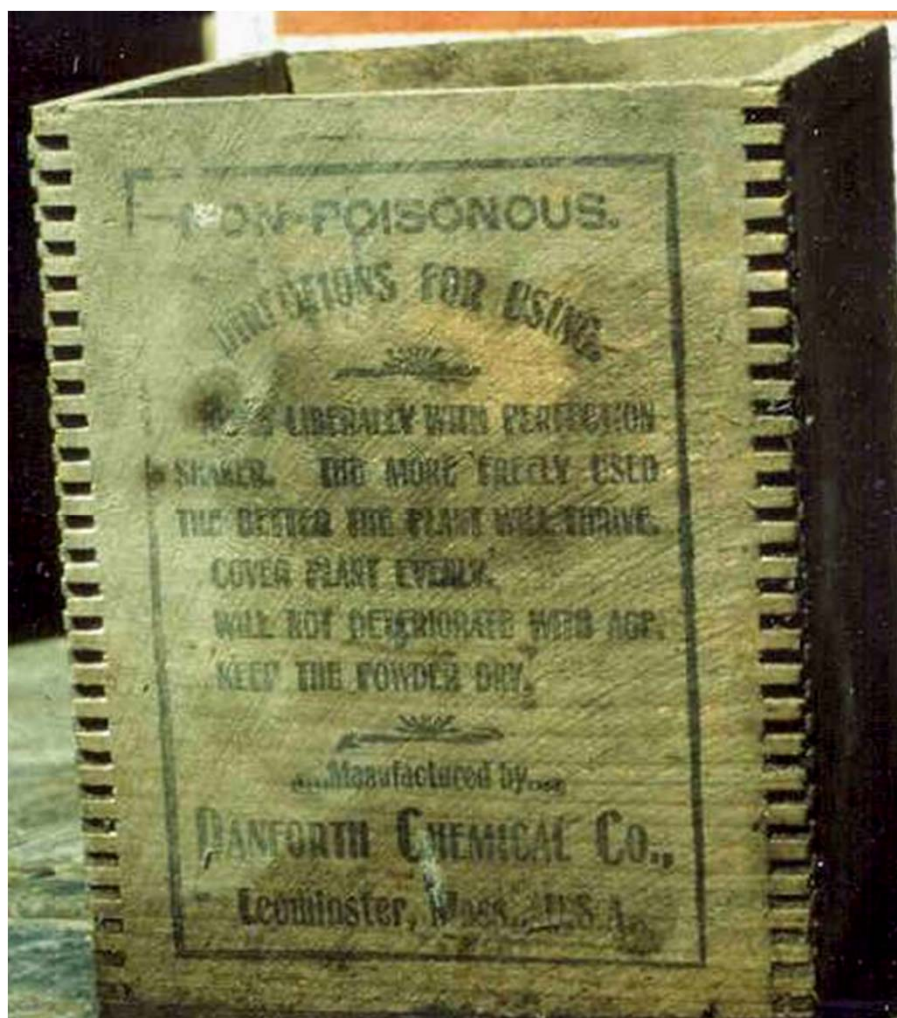
Physical or Chemical Hazards

Combustible. Do not use or store near heat or open flame.

The old days



Great directions!



Contained 5% lead oxide & 47% zinc oxide

“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.”

Today's label



ORTHOMAX[®]
GARDEN INSECT DUST

USE ON VEGETABLES, FRUITS, FLOWERS & SHRUBS

QUICK CONNECT[®] SPRAYER



Remove sprayer. Pull cord **ALL THE WAY OUT**.

Insert red plug into spout (on cap) until it clicks.

Flip up spout. Open nozzle at end of sprayer.

Ortho Bug-B-Gon[®] MAX[®] controls more than 100 garden and nuisance pests without harming roses, flowers or shrubs. Reapply as directed for a more beautiful garden.

PRODUCT FACTS

KILLS BUGS	Garden Pests: Aphids, beetles, caterpillars, whiteflies and other garden pests. Nuisance Pests (outdoors): Ants, cockroaches, spiders, ticks (including ticks that transmit Lyme disease) and other nuisance pests.
WHERE TO USE	On roses, flowers, shrubs, vegetables and fruits. Outdoor surface of buildings, porches and patios.

Questions, Comments or Medical Information?
Call 1-800-225-2883 www.ortho.com

Specially formulated for residential use.

80% SIZE
12-dram UPC
(not FPO-licensed)
For Position Only
0 71549 01703 5
5-26-05



Directions for Use
It is a violation of Federal law to use this product in a manner inconsistent with its labeling.

FOR BEST RESULTS
SHAKE WELL BEFORE USE
HOW TO APPLY
Adjust spray nozzle to give a fine spray. When done, flip down spout to close. **NO NEED TO DISCONNECT TRIGGER SPRAYER**. Close nozzle on trigger sprayer. Snap sprayer back in place.

Garden Pests: Hold sprayer about 12 inches from plant. Thoroughly cover all plant surfaces until slightly wet, but not to the point of runoff.

WHEN TO APPLY
Apply as necessary to maintain control, waiting at least 7 days between each application.

GARDEN INSECTS CONTROLLED
On Ornamental Plants Including: Roses, Flowers, Shrubs and Small Trees
Aphid, armyworm, balsam woolly adelgid, buckhorn aphid, cabbage looper, cucumber beetle (adults—spotted & striped), cutworm, European pine sawfly, fall webworm, flea beetle, grasshopper, gypsy moth, imported cabbageworm, Japanese beetle, leafhopper, looper, Northern pine weevil, pine chafar, pine coreid bug, red pine sawfly, redheaded pine sawfly, saltmarsh caterpillar, spittlebugs, tent caterpillar, and whitefly.

On Listed Vegetables and Melons
Alfalfa caterpillar, alfalfa looper, aphid, armyworm, artichoke plume moth, beet armyworm, buckhorn aphid, cabbage looper, carrot weevil, celery looper, drench bug, Colorado potato beetle, corn earworm, corn rootworm (adult), cowpea curculio, cucumber beetle (adults—spotted & striped), cutworm, diamondback moth, European corn borer, flea beetle, grasshopper, green cloverworm, imported cabbageworm, leafhopper, looper, lygus bug, Mexican bean beetle, painted lady caterpillar, pea aphid, pea weevil, pepper weevil, pickleworm, potato leafhopper, potato psyllid, potato tuberworm, ringworm, saltmarsh caterpillar, sap beetle, Southwestern corn borer, squash bug, squash vine borer, stalk borer, stinkbug, tarnished plant bug, tobacco hornworm, tomato fruitworm, tomato hornworm, tomato pinworm, vegetable leafminer, velvetbean caterpillar, Western bean cutworm, and whitefly.

On Listed Berries and Small Fruit & Nut Trees
Apple aphid, black cherry aphid, codling moth, leafrollers, leafhoppers, green fruit worm, plant bugs, oblique banded leafroller, variegated leafroller, tentiform leafminer, San Jose scale (on fruit only), tufted apple budmoth, plum curculio, Oriental fruit moth, apple maggot, red-banded leafroller, lesser appleworm, rosey apple aphid, periodical cicada, pear psylla, pear slug, navel orangeworm, peach twig borer, filbert worm, peach tree borer, lesser peach tree borer, cherry fruit fly, American plum borer, pecan weevil, hickory shuckworm, pecan nut casebearer, pecan aphids, pecan spittlebug, pecan stem phylloxera, pecan leaf phylloxera, walnut aphid and walnut husk fly.

Manufactured for The Ortho Group
P.O. BOX 190
Marysville, OH 43040
Form LB00000000X

EPA Reg. No. 1021-1582-239
EPA Est. 239-1A-3, 5896-MO-1A
Superscript is first letter
of lot number
Made in USA

VEGETABLES	DAYS TO WAIT TO HARVEST
Artichoke	7
Broccoli	3
Cabbage	3
Carrots	7
Cauliflower	3
Collards	7
Cucumbers	3
Dry Beans	21
Dry Peas	21
Eggplant	7
Green Peas	3
Peppers	7
Potatoes	7
Pumpkin	3
Radishes	7
Snap Beans	3
Squash	3
Sweet Corn	1
Tomatoes	1

BERRIES & MELONS	DAYS TO WAIT TO HARVEST
Caneberries (blackberries, loganberries, red raspberries & black raspberries)	21
Elderberries	21
Gooseberries	21
Melons	3

SMALL FRUIT & NUT TREES (Such as container grown, dwarf or young trees)	DAYS TO WAIT TO HARVEST
Almond	21
Apple	21
Apricot	14
Cherries	14
Filberts	21
Nectarines	14
Peaches	14
Pecans	21
Pears	28
Plums	14
Prunes	14
Walnuts	21

NUISANCE PESTS CONTROLLED


Ants, cockroaches (including German and Asian cockroaches), crickets, palmetto bugs, sowbugs, pillbugs, spiders, and ticks that transmit Lyme disease.

HOW TO APPLY

NUISANCE PESTS: Apply directly to listed pests in outdoor areas.
OUTDOOR SURFACES: Spray buildings, porches, patios, garages, and other areas where bugs have been seen or are found. Do not spray near fishponds or other bodies of water.

WHEN TO APPLY

Apply as necessary to maintain control, waiting at least 7 days between each application.

 People and pets may enter treated area after spray has dried.

Avoid contamination of food or feedstuffs.

No endorsement intended or implied

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?



Dogwood borer on apple



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



No endorsement intended or implied

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

Pesticide Application Log														
Date	Time Start and Finish	Address, Town, and Specific Location	Size of Treated Area	Sensitive Area Yes/No	Site or Crop	Target Pest	Weather Conditions ¹ (outdoor applications only)			Pesticides and Diluent Applied	Rate			Applicator Name and license No.
							Wind ² (outdoor applications only)	Temperature	Cloud Cover		Time Spent	Unifluted	Mix	
										1. Brand Name, 2. Active Ingredients, 3. EPA Registration No., 4. Restricted Entry Interval				
										1. 2. 3. 4.				
										1. 2. 3. 4.				
										1. 2. 3. 4.				

If you must apply a pesticide

- Clean yourself and you equipment
- Apply rinse water to the application site
- Wash contaminated clothing separately


UA
UNIVERSITY OF ARKANSAS
DIVISION OF AGRICULTURE

PRERINSE:
USE 1 OF THE 2 methods:
-Rinse in separate tub or pail
-Agitate in automatic washer
-Rinse off garments outdoors

WASHER LOAD
-Wash SEPARATELY from all clothes
-Wash contaminated clothing with the SAME pesticide together
-Rinse 2 or 3 times, if necessary

LOAD SIZE
-Wash only a FEW garments at a time
-Laundry garments DAILY when applying pesticide daily

RINSE MACHINE THOROUGHLY AFTER LAUNDERING CONTAMINATED CLOTHING



Tips for Laundering Pesticide-Contaminated Clothing

WATER LEVEL
-Use FULL water level

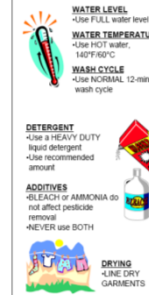
WATER TEMPERATURE
-Use HOT water, 140°F/60°C

WASH CYCLE
-Use NORMAL 12-minute wash cycle

DETERGENT
-Use a HEAVY DUTY liquid detergent
-Use recommended amount

ADDITIVES
-BLEACH or AMMONIA do not affect pesticide removal
-NEVER use BOTH

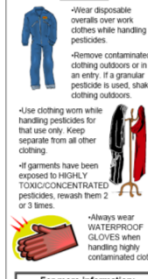
DRYING
-LINE DRY GARMENTS



Cooperative Extension Service

OTHER TIPS:
-Wear disposable overalls over work clothes while handling pesticides.
-Remove contaminated clothing outdoors or in an entry. If a genuine pesticide is used, shake clothing outdoors.
-Use clothing worn while handling pesticides for that use only. Keep separate from all other clothing.
-If garments have been exposed to HIGHLY TOXIC CONCENTRATED pesticides, rewash them 2 or 3 times.
-Always wear WATERPROOF GLOVES when handling highly contaminated clothing.

For more information: Contact Your Local County Cooperative Extension Office



YardScaping...

for a healthy Maine



The YardScaping Partnership

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

The Partnership is very diverse!

www.yardscaping.org



for a healthy Maine

YardScaping

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



YardScaping Mission

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



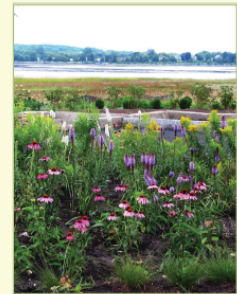
YardScaping Gardens *at Back Cove*

LOW MAINTENANCE PLANTS

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

The trees, shrubs and perennials you see here:

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



Want to get involved or learn more?
Visit www.yardscaping.org

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)



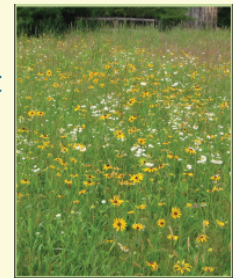
YardScaping Gardens at Back Cove

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**

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

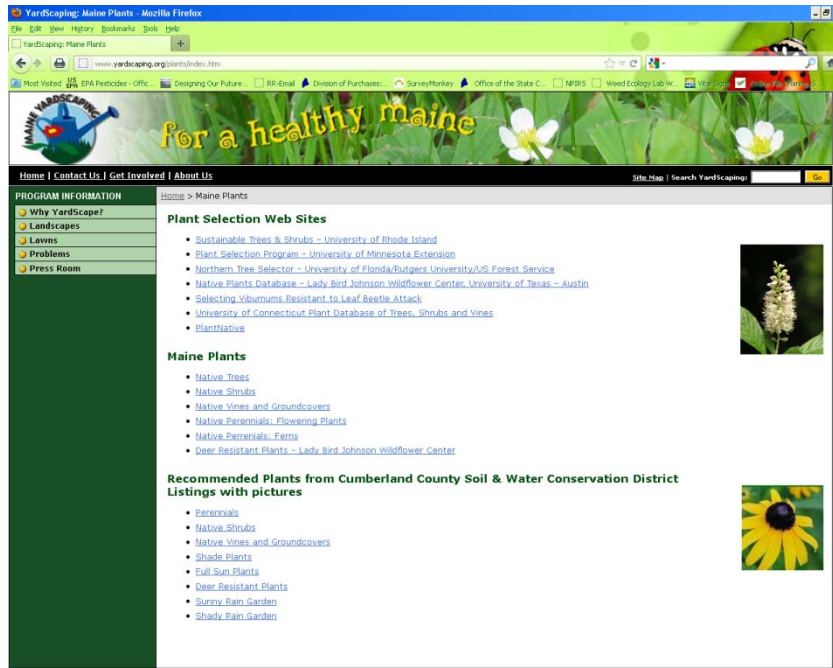
Right plant, right place, right purpose

- 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

Where to learn more



www.yardscaping.org/plants/index.htm



YardScaping Gardens at Back Cove

PLANT CHOICE

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

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

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



**Want to get involved or learn more?
Visit www.yardscaping.org**

Use a diversity of plants & grasses

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



Create wildlife habitats

Diversity and plant layers go hand in hand with habitat creation

■ Add nectar and fruit producing plants

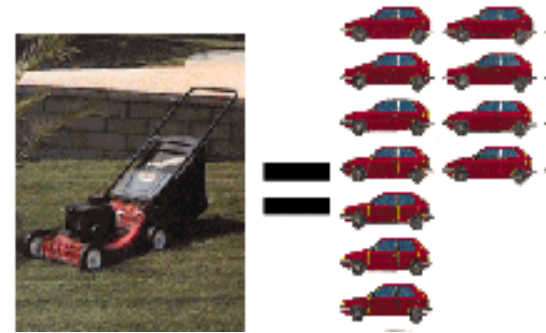
■ Strive for continuous blooms

■ Add water, walls, feeders, woody debris



Reduce lawn area

- Reduces
 - Water & air pollution
 - Water usage
 - Maintenance
 - Costs
- Gives
 - More free time



Mower exhaust = 11 cars' exhaust

One hour of mowing = driving 400 miles

Mowers spew 87 lbs of greenhouse gases and 40 pounds of other pollutants annually



Use low input plant varieties

- No-mow fescue vs Kentucky bluegrass
- Pagoda dogwood vs flowering cherry
- River birch vs paper birch



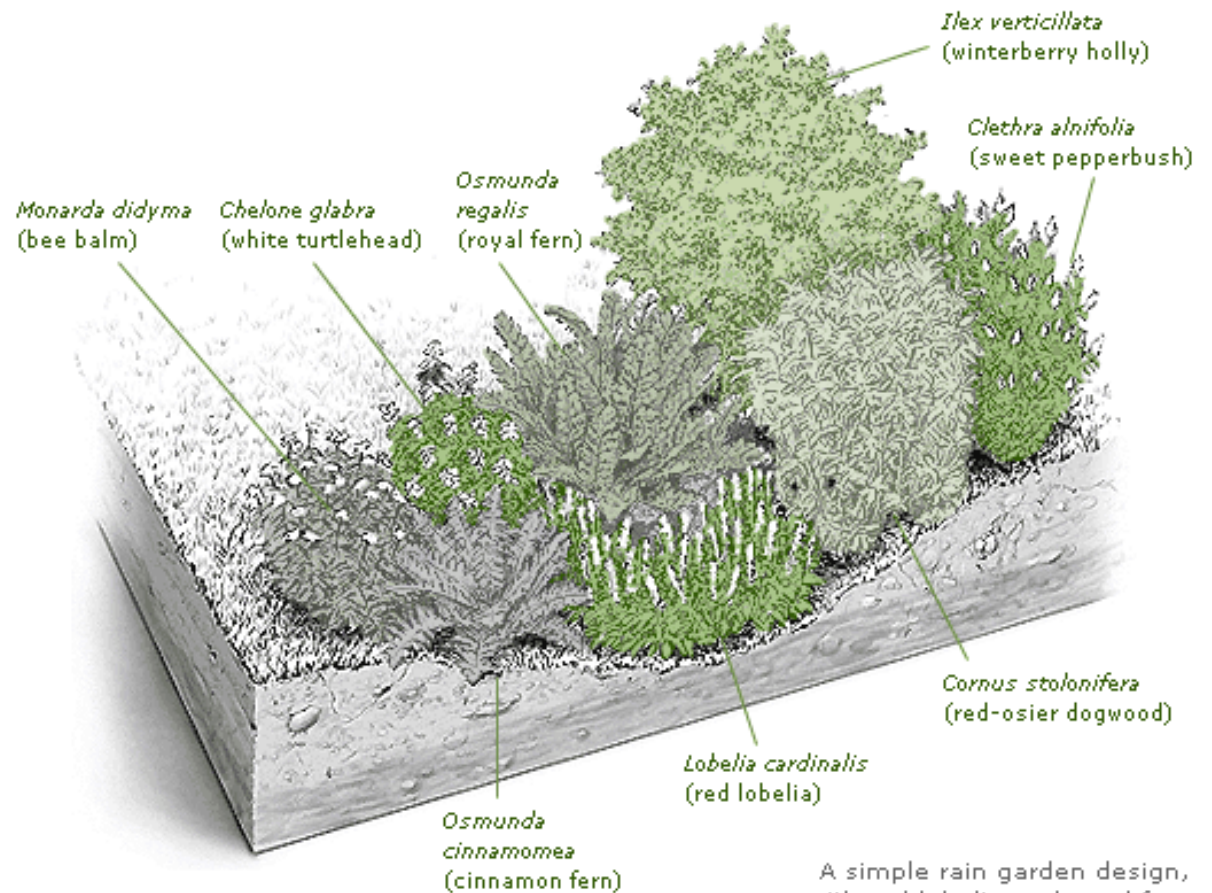
Protect lakes & streams with buffers

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



Reduce runoff

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



Reduce reliance on pesticides, fertilizers and water

- Grow plants that are resistant to insects & diseases
- Use plants that tolerate low fertility
- Use drought resistant plants



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**

Please rate this presentation

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



Summary

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

