



University of  
Massachusetts  
Amherst

## Pesticide Safety 2010 - Acronym Review

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1. How to Keep Safe
2. Know your products
3. PPE Review
4. Acute Toxicity vs. Chronic Toxicity
5. Heat Stress

**PPE and Keeping Safe**

6. Licensing and Certification
  - MDAR and WPS
7. Update on New Insecticides
8. Winter Moth

**Acronym review**




# MDAR

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## Massachusetts Department of Agricultural Resources

- ◆ Made up of 9 bureaus including dairy, land use and animal health
  - ◆ Includes Pesticide Bureau
- 



# MDAR

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## MA Department of Agricultural Resources

### FIVE Divisions:

- ◆ ADMINISTRATION
  - ◆ AGRICULTURAL DEVELOPMENT
  - ◆ ANIMAL HEALTH
  - ◆ CROP INSPECTIONAL SERVICES AND PEST MANAGEMENT
  - ◆ AGRICULTURAL TECHNICAL ASSISTANCE (DATA
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- 



# MDAR- Pesticide Program

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## CROP INSPECTIONAL SERVICES AND PEST MANAGEMENT

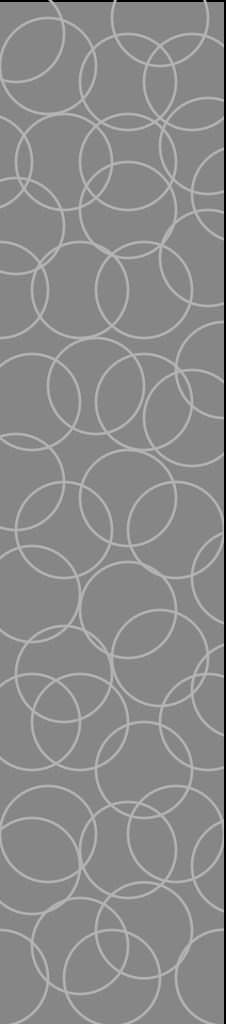
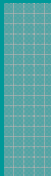
### Pesticide Program

- ✓ Protects public health and the environment by licensing individuals who apply pesticides
- ✓ Protects the public drinking water supply
- ✓ Provides guidelines for the mixing, loading, storage, and disposal of pesticides
- ✓ Registers chemicals used in MA



# MDAR - Pesticide Program

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- 
- ◆ Pesticide Licensing
    - Private Applicators Certification
    - Allows use of restricted use pesticides
  - ◆ Pesticide Enforcement - Inspections
  - ◆ Zone II issues
    - Intrepid, Bravo, Princep and Actara
  - ◆ Register pesticide products in Massachusetts
- 



# MDAR

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- ◆ Commissioner of Ag Resources

- Scott Soares      ~~Doug Peterson~~

- ◆ Division of Crop Inspectional Services and Pest Management

- ◆ Director - ~~Pesticide Bureau~~

- Lee Corte-Real      ~~Brad Mitchell~~

- ◆ Pesticide Bureau – Licensing/Certification Program Coordinator


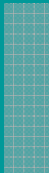
- Steve Antunes-Kenyon





# MDAR

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- 
- ◆ Environmental Analyst – Zone II
    - Hotze Wijnja     ~~Gerard Kennedy~~
  - ◆ Toxicologist – Section 18's
    - Steve Antunes-Kenyon
  - ◆ Pesticide Enforcement, Field Inspectors
    - Mike McClean
    - Laurie Rocco
    - Taryn LaScola
- 

# Pesticide Applicators Rules and Reviews

## Changes in MDAR Rules

### RESTRICTED USE COMPOUNDS WATCH OUT!!

- Working under the direct supervision of a certified individual
- Dealers must see your current license
- enforcement actions

# Pesticide Applicators Rules and Reviews

## Pesticide Applicators

- Certified applicators may apply restricted use compounds
- Licensed applicators may assist certified applicators
  
- Private applicator
- Commercial applicator


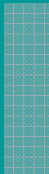
# License or Certification?

- **Commercial Applicator License:** Licensing for an individual to use General Use pesticides, or any restricted use pesticide under the direct supervision of a certified applicator, for hire or compensation for any purpose or on any property other than as provided by the definition of "private applicator certification". 
- **Commercial Applicator Certification:** Certification for pesticide applicators who use or supervise the use of any pesticide which is classified for Restricted-Use for hire or compensation for any purpose or on any property other than as provided by the definition of "private applicator certification". 
- **Private Applicator Certification:** Certification for private applicators who use or supervise the use of Restricted-Use or state limited use pesticides for the purpose of producing any agricultural commodity on property owned or rented by him or his employer or without compensation other than trading of personal services between producers of agricultural commodities on the land of another person. 



# EPA's WPS

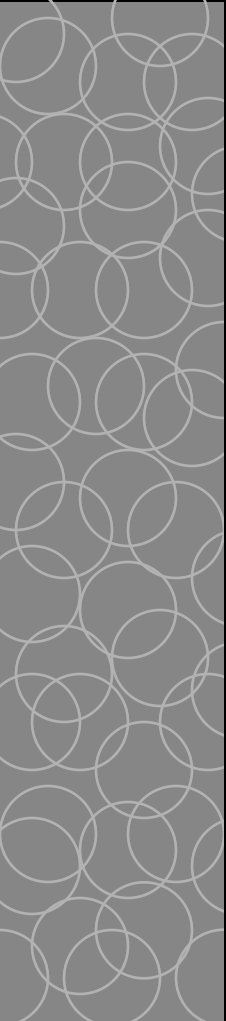
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- ◆ Worker Protection Standard
  - ◆ protect agricultural workers from the effects of exposure to pesticides
  - ◆ aimed at reducing the risk of pesticide poisonings and injuries among agricultural workers and handlers of agricultural pesticides
- 



# Requirements of WPS

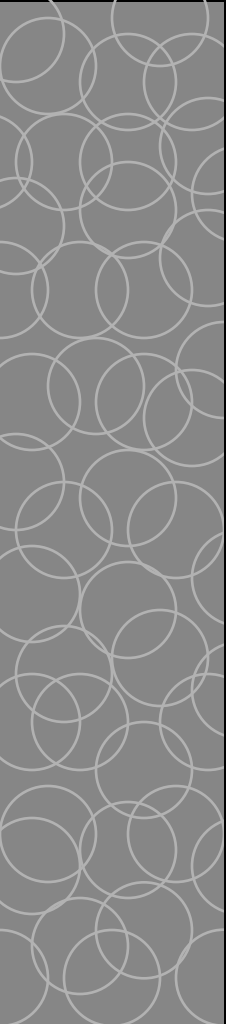
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- ◆ pesticide safety training
  - ◆ notification of pesticide applications
  - ◆ use of personal protective equipment
  - ◆ restricted entry intervals following pesticide application
  - ◆ decontamination supplies
  - ◆ emergency medical assistance



# Workers exposed to pesticides?

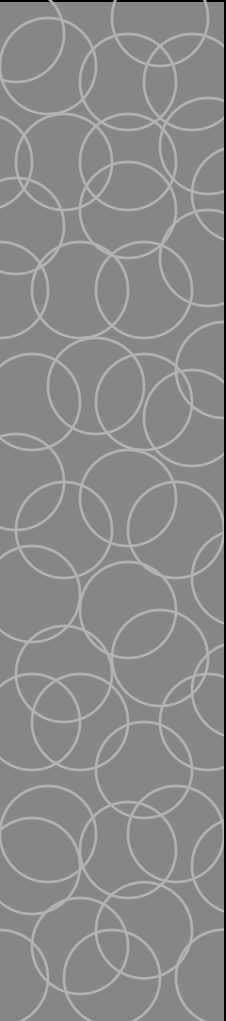
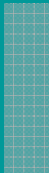
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- 
- ◆ mixing and loading the pesticide into application equipment, but not restricted use!
  - ◆ Applying pesticides, like roundup
  - ◆ Handling irrigation/chemigation heads
  - ◆ Entering areas where pesticides have been applied to scout, weed, or repair heads, after the REI is up!
  
  - ◆ DO NOT NEED TRAINING IF YOU HAVE A LICENSE!



# Changes in WPS Trainings

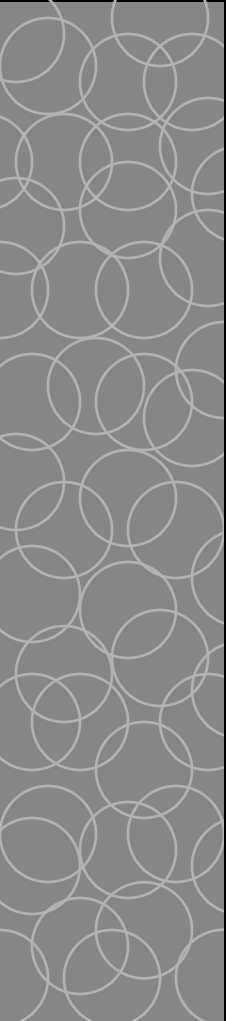

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- ◆ Requires untrained workers to be provided basic pesticide information before entering pesticide-treated areas
    - You can do this, word of mouth
      - ◆ Pesticides, protection, signs, washing
    - Then official training within 5 days of working in pesticide-treated areas
    - Still good for 5 years
- 



# WPS Trainings

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- 
- ◆ At the Cranberry Station Library
  - ◆ Last Wednesday of upcoming months
    - ◆ April 28 2-4
    - ◆ May 26 2-4
    - ◆ June 30 2-4
  - ◆ Send any workers, weeders, scouts, and mechanics. Training good for 5 years!
  - ◆ \$5 cost
- 

## 1988

- Diazinon
- ~~Guthion~~
- Lorsban
- ~~Malathion~~
- Orthene
- ~~Parathion~~
- Sevin
- ~~Omite~~

## 2000

- BT products
- Confirm
- Nematodes
- Pyrenone
- Sprayable pheromones
- Diazinon
- ~~Guthion~~
- Lorsban
- Orthene
- Sevin

## 2010

- Actara
- Admire
- Avaunt
- Spintor
- Diazinon
- Lorsban
- Orthene
- Imidan
- Sevin
- BT products
- Confirm
- Intrepid
- Nematodes
- Pyrenone
- Oberon
- Nexter
- Delegate
- Assail
- Belay

# Chemistries of New Compounds

– Tipworm control	2014	
– HGW (2 <sup>nd</sup> generation)	2014	Diamide
– Zone II NeoNic	2011	NeoNic
– E2Y (1 <sup>st</sup> generation)	2011	Diamide
– Oberon (spiromefesin)	2010	
– Belay (clothianidin)	2010	NeoNic
– Assail (acetamiprid)	2008	NeoNic
– Delegate (spinetoram)	2008	Spinosyn
– Avaunt (indoxacarb)	2007	
– Actara (thiamethoxam)	2005	NeoNic
– Intrepid (methoxyfenozide)	2004	IGR
– Admire (imidacloprid)	2004	NeoNic
– Spintor (spinosad)	2002	Spinosyn
– Nexter, Pyramite (pyridaben)	2001	

# Labeled for 2008

## DELEGATE

### New Spinosyn compound

- Cranberry tolerance thru EPA
- Federal label , approved state registration with cranberry and chemigation

**Reduced Risk  
Environmentally clean  
No Zone II issues**

## ASSAIL

### New Neonicotinoid compound

- Cranberry tolerance thru EPA
- Federal label with Cranberry on it
- developed label for chemigation State Registration

**EPA reviewed  
under small  
berry grouping**

# Labeled for 2009

## DELEGATE

New Spinosyn compound

- Longer residual
- Broader spectrum

## ASSAIL

New Neonicotinoid compound

- Not so bad on bees

Cutworms  
Spanworms  
BHF, Spag, CFW

cutworm  
Gypsy Moth  
Spag, CFW

# Labeled for 2010

Belay (clothianidin) Valent

New Neonicotinoid compound

- Similar to Actara, no Zone II
- Summer ONLY, bad bee tox



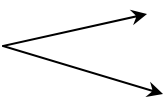
Rimon (novaluron) Chemtura

New Insect Growth Regulator

- Not so bad on bees
- Takes time to work



# Neonicotinoids

- Already labelled 
  - Actara (thiamethoxam)
  - Admire (imidacloprid)
- Belay (clothianidin)
  - More active than Actara
  - IR4 Cranberry residues done in 2005
  - Submitted to EPA in 2008, granted 2010
- ASSAIL (acetamiprid)
  - tolerance on cranberry granted in January
  - First tolerance granted through berry grouping
  - Nisso and UPI developed label with chemigation
- NEO C widely used in other crops
  - IR4 residue scheduled for 2008
- NEO D widely used in other crops

# Neurotoxins

**Flea Beetle**  
**Cranberry Weevil**

**Fireworm**  
**CFW**

# Neonicotinoids

- Now labelled in cranberry
  - Actara (thiamethoxam)
  - Admire (imidacloprid) Widow/
  - Assail (acetamiprid)
  - Belay (clothianidin) Clutch/Arena
- Mite flair-ups
  - Lay more eggs
  - Kills predatory mites

**UMass Cranberry Station Research Update  
Plymouth, MA January 20, 2010**

**Winter Moth Warning  
for Cranberry!**



***Martha Sylvia  
Entomology Lab  
Cranberry Station  
UMass Amherst***

**Thanks to  
Robert D. Childs and Joe Elkington  
Plant, Soil, and Insect Sciences Dept.  
University of Massachusetts, Amherst**



## **Winter Moth:**

- **Native to Europe, including England**
- **Has been in Nova Scotia for decades (1949) - in apples and oaks**
- **British Columbia (Vancouver 1976)**
- **Only other finds in USA:**
  - **Washington state and Oregon.**
  - **in commercial blueberries.**
- **Now, well-established in eastern MA and RI**

# Winter Moth: where did it come from?



# Life Cycle



Eggs over-winter,  
larvae hatch early  
spring



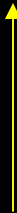
Larvae feed all  
spring and pupate in  
late May



Pupae in soil  
all summer  
and fall until  
adult  
emergence



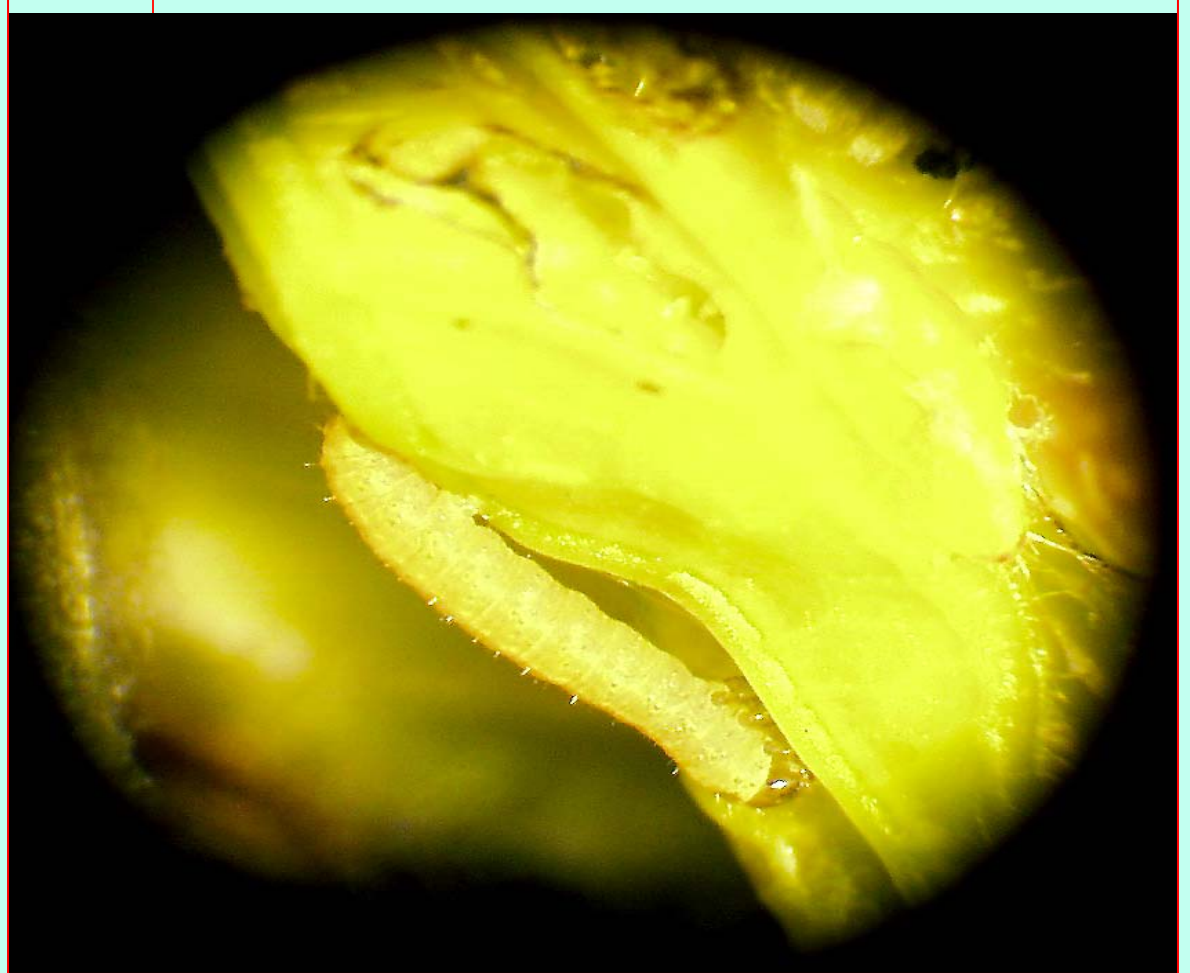
Adults emerge  
November-January,  
mate, lay eggs and die



# Potential Host Plants

## Winter Moth

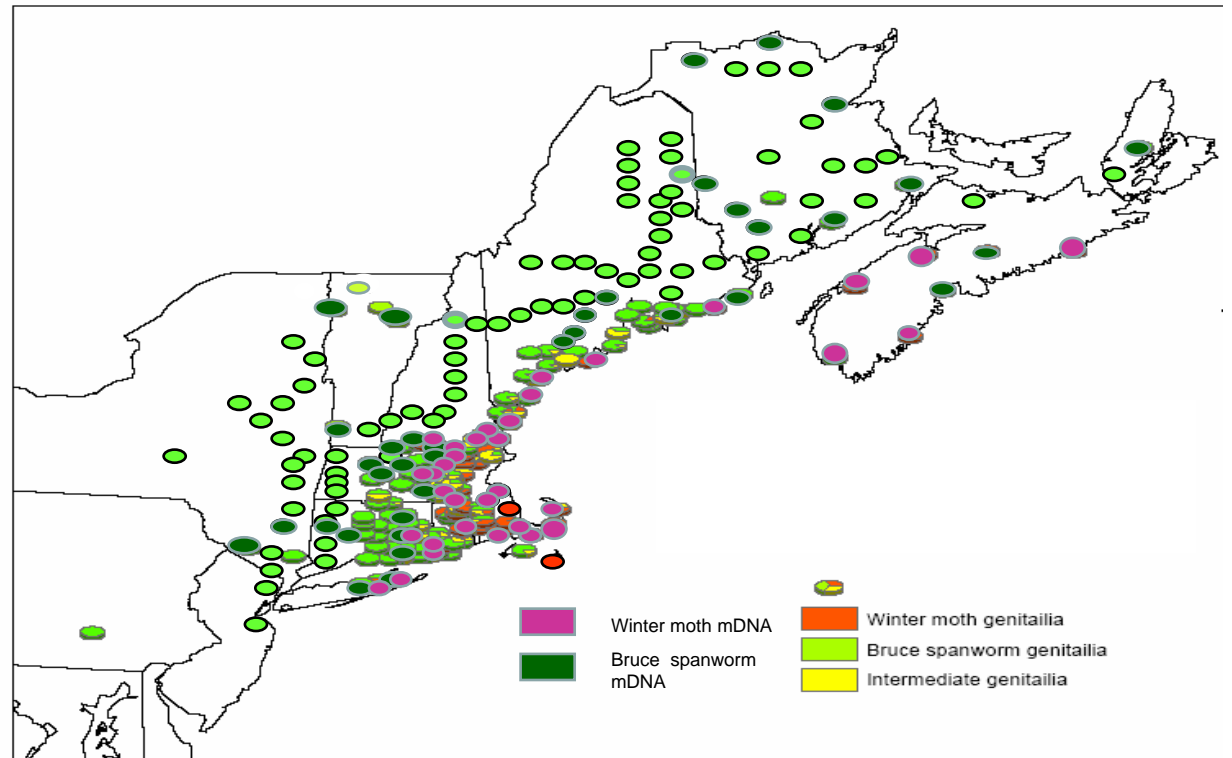
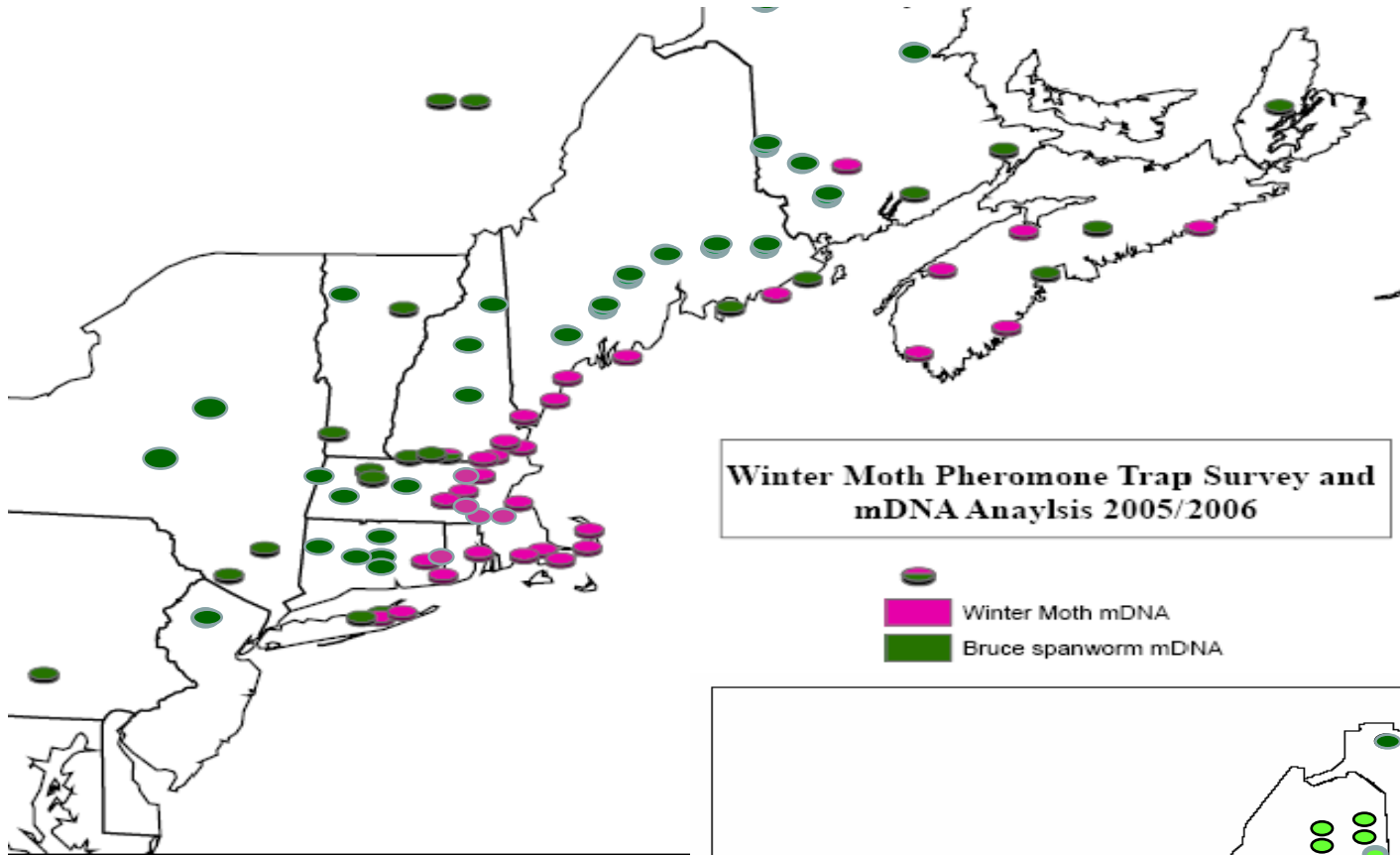
- Oaks
- Maples
- Birches
- Crabapples
- Apple
- Blueberry
- Cranberry...



# Winter Moth

They do  
live on  
cranberry!





# WINTER MOTH: ON CRANBERRY?

YES, YES, and YES

- Picked up in cranberry sweeps
  - 40-60 per sweep set
- Completed development on cranberry
- Big fall flight 2009

Multiple reports, Multiple regions

- Carver
- Plympton
- Plymouth
- Sandwich
- Harwich
- Brewster

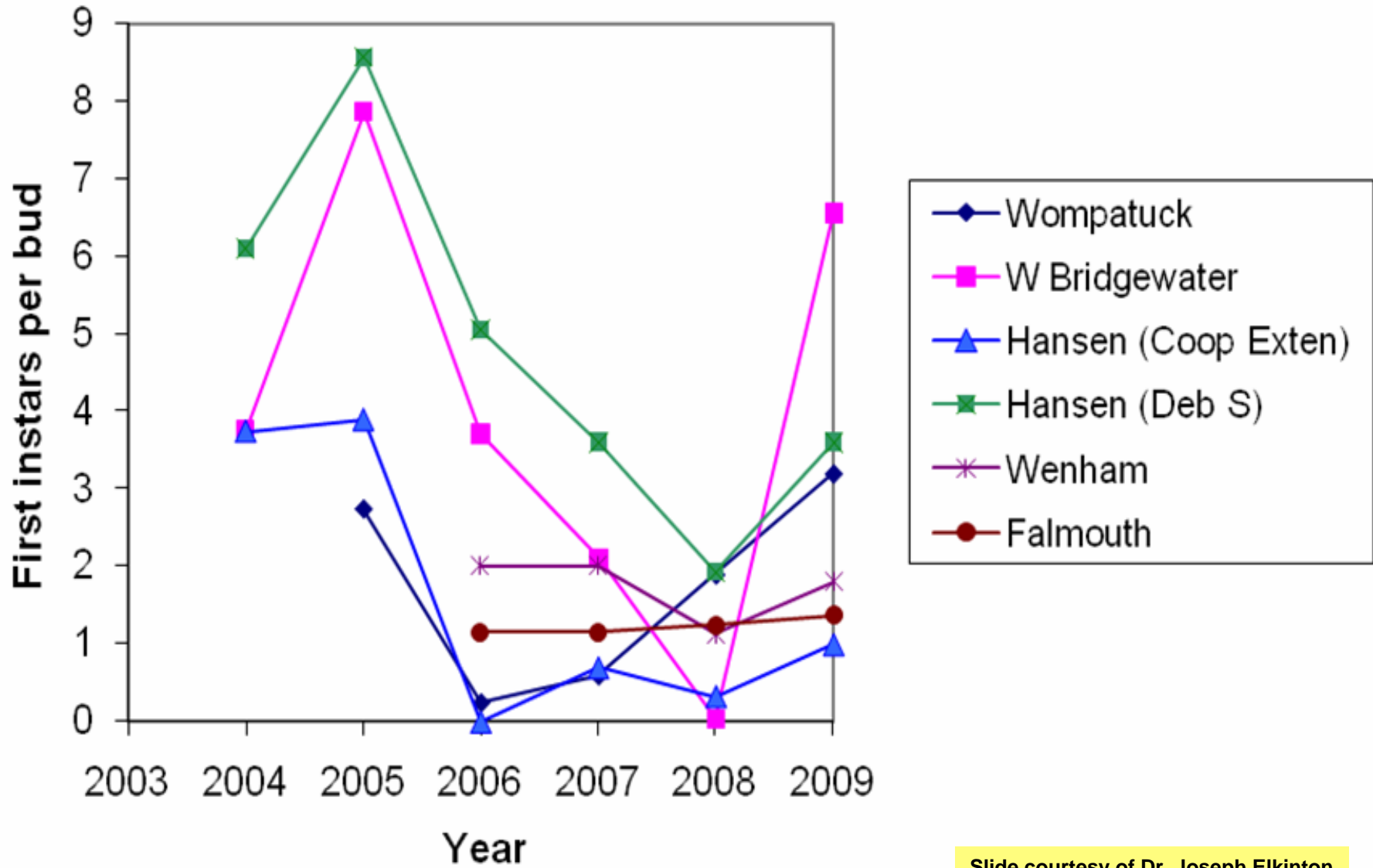


Flightless female

# **Winter Moth** *Operophtera brumata*

- **Big infestation 2005**
- **Reduced numbers in 2006**
- **Flight in 2007 - 2008 was less than previous years (snow?)**
- **Countless dead and dying trees in southeastern MA**
- **Heavy flight seen in Fall 2009**
- **Watch your bog 2010!**

## Winter moth larvae per bud ( red oak)



Slide courtesy of Dr. Joseph Elkinton



# Winter Moth

- Sampling is going to be difficult
- Hard to detect when small
- Very similar to black-headed fireworm when tiny!



# Winter Moth Life Cycle

- Eggs hatch approximately mid-April
- Larvae weasel into buds and feed
  - Very hard to detect
- Become free-feeders once buds open
- Larvae drop to the soil to pupate late May into early June in MA.
- Adult moths start to appear from Thanksgiving...into January.



Winter moth is a green spanworm.

Spanworms = Inchworms = GEOMETRIDS = 1000 different species!!

Winter moth is *Operophtera brumata*  
Green Spanworm is *Itame Sulphurea*  
**Bruce Spanworm**  
**Fall Cankerworm**



# Fall Cankerworm

*Alsophila pometaria* (Harris)



"1/2" pair of prolegs

# WINTER MOTH Management

- Intrepid
- Delegate
- Avaunt
  
- Orthene
  - (only if early)
  
- Flood during flight?!
- Late Water?!



# Introducing parasitoid from Europe: Release of *C. albicans* 2005-2009

2005 200 mated females  
2006 200 mated females  
2007 1200 at 3 sites  
2008 3000 at 3 sites  
2009 2040 at 1 site

Biological  
control!

