

#### How Pesticide Applicators Can Protect Bees from Pesticide Poisoning.



#### 1) Did You Know Bees Are On The Decline?

2) Why Should We Care About Pollinators?

3) Are You Aware of Risks To Pollinators?

4) How Many Of You Presently Take Steps To Protect Pollinators?

2

# What Are Pollinators?

- Honey bees
- Bumble bees
- Butterflies
- Beetles
- Flies
- ► Wasps



#### When a pollinator is visiting a bloom, it is called "foraging."

## Why Are Pollinators Important?

- Essential for production of <90 crops in the U.S.</p>
- One out of every three bites of food we eat daily



## The European Honey Bee

Honey bees perform most commercial pollination.





#### Some Crops Need NO Pollination

6

- Corn
- ► Wheat
- Rice
- Soybeans
- Sorghum
- Bananas
- Potatoes

# PNW Crops Dependent On Pollinator

- Most All Tree Fruits
- Alfalfa Seeds
- Vegetable Seeds
- Potato Seeds
- Onion Seeds
- Sugar Beet Seeds
- Clover Seeds
- Safflower Seeds

- Tomatoes
- Watermelons
- Cucumbers
- Strawberries
- Apples
- Cherries
- Pears
- Most All Berries

#### 750,000+ acres of almonds in CA 1.5 million colonies of honey bees



#### No Bees, No Nuts

Slide source: M. Spivak, UMinn

# Why Should We Protect Pollinators?

- a) We rely on pollinators for crop production
- **b)** Many plants need pollination
- c) Pollinators are important for wildlife food production
- d) All of the above



# Animals That Pollinate Flowers?

- a) Honeybees
- **b)** Butterflies
- c) Hummingbirds
- d) Flies
- e) All of the above



## **Causes of Pollinator Decline?**



#### Varroa mite is the chief menace

Large mite sucks bee blood Circulates bee **viruses** 





Mite feeding on adult bee





Mite feeding on immature bees (brood)

Photo Source: M. Spivak, UMinn

#### Applicators Can Reduce Risks to Bees And Other Pollinators

- Understand How Pesticides Can Harm Bees
- Read the Label
- Recognize Pollinator Foraging Habits
- Use IPM
- Follow Best Management Practices



## A Honey Bee's (Daily) Life

Honey bees forage sun up to sun down unless it's raining



## Best time for application: Sun Down to Sun Up



## Did You Know?

- Most pesticides are not toxic to pollinators.
- Insecticides are more toxic to pollinators than fungicides and herbicides.
- Not all insecticides are toxic to pollinators.





# Pollinator poisonings

- Direct exposure during application Residues picked up through foraging (pollen and nectar) and taken back to the hive
- Residues from non-crop plants (ground cover, field edges, ditches, etc.)
- Water sources from drift



## Recognize Residual toxicity

Some pesticides remain toxic to bees for some time after the application is made via contact with residues on the treated plant, including bloom.

This is residual toxicity.



# Applicators Should Pay Special Attention To

#### Organophosphates:

acephate (Orthene) chlorpyrifos (Dursban, Lorsban) malathion (Malathion, Carbofos)

Carbamates: carbaryl (Sevin)

*Pyrethroids*: deltamethrin (Suspend, Viper) cyfluthrin (Temprid, Tempo) Pollinator Protections Statements On The Label

- This pesticide is highly toxic to bees exposed to direct treatment on blooming crops or weeds. Do not apply this product or allow it to drift to blooming crops or weeds when bees are foraging in the treatment area.
- Know this BEFORE you schedule an application



Pesticides Applicators Should Pay Special Attention To

Neonicotinoids:

## The "Bee Advisory Box"

#### THE NEW EPA BEE ADVISORY BOX

On EPA's new and strengthened pesticide label to protect pollinators



Alerts users to separate restrictions on the label. These prohibit certain pesticide use when bees are present.

The new bee icon helps signal the pesticide's potential hazard to bees.

Makes clear that pesticide products can kill bees and pollinators.

Bees are often present and foraging when plants and trees flower. EPA's new label makes it clear that pesticides cannot be applied until all petals have fallen.

Warns users that direct contact and ingestion could harm pollinators. EPA is working with beekeepers, growers, pesticide companies, and others to advance pesticide management practices.

Highlights the importance of avoiding drift. Sometimes, wind can cause pesticides to drift to new areas and can cause bee kills.

The science says that there are many causes for a decline in pollinator health, including pesticide exposure. EPA's new label will help protect pollinators.



Read EPA's new and strengthened label requirements: http://go.usa.gov/jHH4

## New Pollinator Protections Statements On The Label

If ... managed bees are at the treatment site, the beekeeper providing the pollination services must be notified no less than 48-hours prior to the time of the planned application so that the bees can be removed, covered or otherwise protected prior to spraying.

## New Pollinator Protections Statements On The Label

Do not apply this product while bees are foraging.

- Do not apply this product until flowering is complete and all petals have fallen unless one of the following conditions is met:
  - Application is made ... after sunset
  - Application is made ... temperatures are below 55°F

## New Pollinator Protections Statements On The Label

Non-Agricultural Products:

- Do not apply ... while bees are foraging.
- Do not apply ... to plants that are flowering.
- Apply after all flower petals have fallen off.

#### **Communicate with Beekeepers**

- Locate beekeepers in the area
- Contact them prior to application
- Have a conversation before problems arise
- Work with beekeepers



## Develop an IPM Plan

- Use options other than chemical controls
- Use pesticides only when needed
- Scout and monitor for pests prior to making the treatment
- When using pesticides
  Follow the label
  - Prevent drift

## Key questions to consider

- What is the growth cycle of the crop?
- When will the crop be in bloom?
- When do you need to make the application?
- What else is blooming in or near the field?
  - Cover crops
  - Weeds
  - Fencerow vegetation
  - Adjacent crops or orchards
- What pollinator activity is nearby?

## **Pollinator Protection Checklist**

- 1. Read and follow the label
- 2. Determine if the pesticide is toxic to pollinators
- 3. Understand local pollinator habits
- 4. Follow pesticide stewardship practices
- 5. Use Integrated Pest Management
- 6. Cooperate and communicate with beekeepers

# What's Affecting Pollinators?

- a) Mites and parasites
- b) Nutrition and forage
- c) Pesticides
- d) All of the above



### EPA Recently Changed Some Pesticide Labels To Protect Pollinators?

a) Pollinator protection languageb) Added a bee hazard iconc) All the above



# If Bees Are Foraging In Field

- a) You can apply any pesticide when you like
- b) You can't apply any pesticide
- c) You can apply some pesticides but you must read the label to ensure pollinators are protected



# When Are Pollinator Poisonings Likely To Occur

- a) Whenever pesticides are used
- **b)** Whenever pesticides are sprayed from the air
- c) When pesticides are applied to crops during the bloom period



### What Information Might Be Useful When Deciding To Treat a Field

- a) Location of the field
- b) What crop is in the field
- c) What is flowering in, around, and downwind of the field
- d) Are there bee boxes downwind of the target field
- e) All the above

#### 1) Are Bees Are On The Decline?

2) Why Should We Care About Pollinators?

3) Are You Aware of Risks To Pollinators?

4) How Many Of You Will Take Steps To Protect Pollinators In The Future?

#### Resources

Much of this presentation comes from Wayne Buhler and Bill Skelton, NCSU, 2015. They used photos and text taken from a presentation entitled, Bees: Protecting our Pollinators. Marla Spivak, PhD, University of Minnesota.

Pollinators and Pesticide Stewardship. Penn State Pesticide Education Program. extension.psu.edu/pesticide-education

Protecting Pollinators, A Training Module for Certified Pesticide Applicators. North American Pollinator Protection Campaign.







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37