Top Tips for Pesticide Applicators

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

Sprayer Calibration



Do You Calibrate Your Sprayers?

- Keep a record of all your calibrations;
  - It is a time saver later
- Do you know how to do the 1/128th of an acre boom sprayer calibration?
- Know the value of correct calibration!


Image: Penn State Pesticide Education Program

Pesticide Spills



Prevent Spills

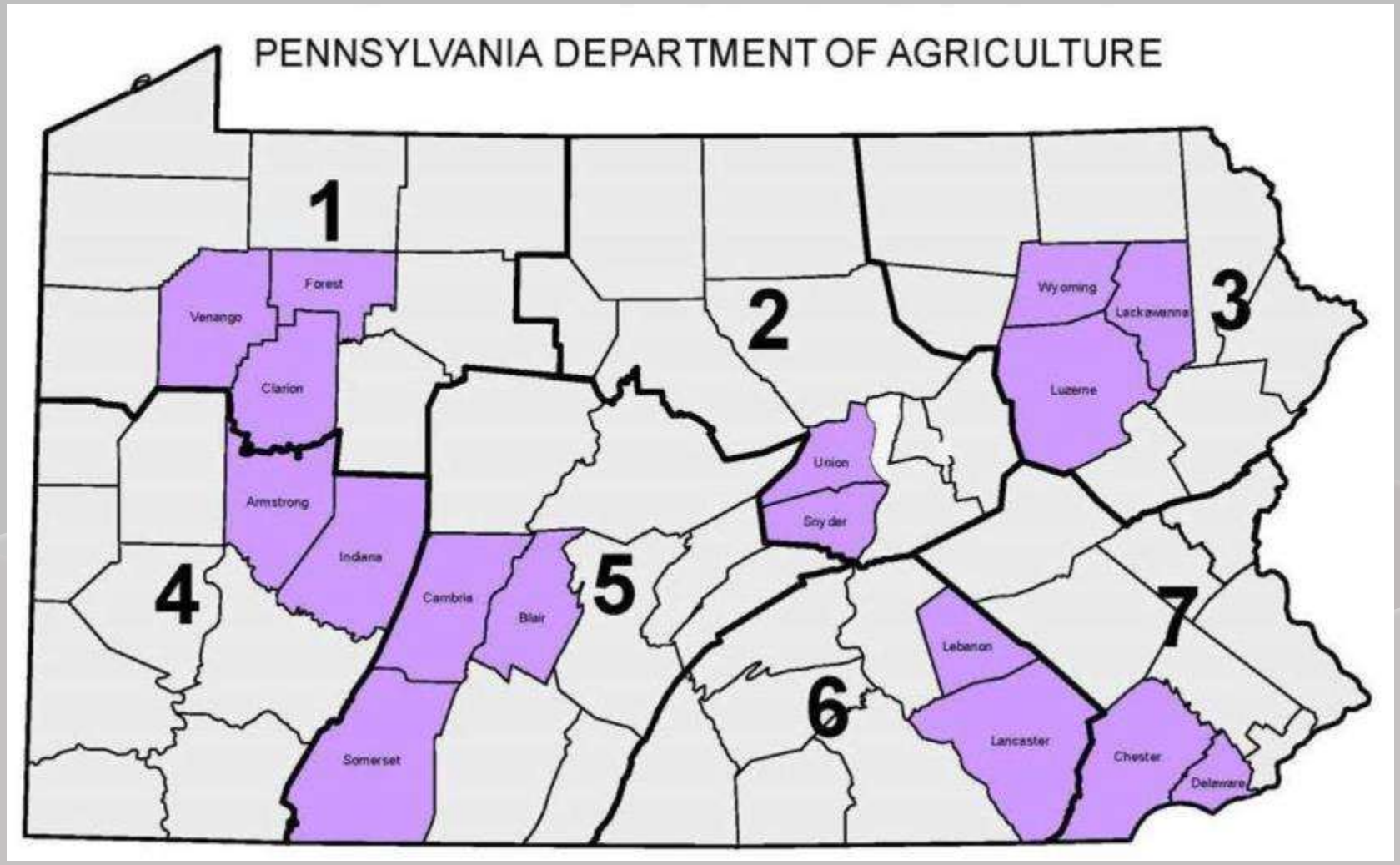
- Keep absorbent material such as cat litter readily available
- Clean up both liquid and dry spills immediately
- Dispose of pesticide spill materials properly

Disposal of Pesticides

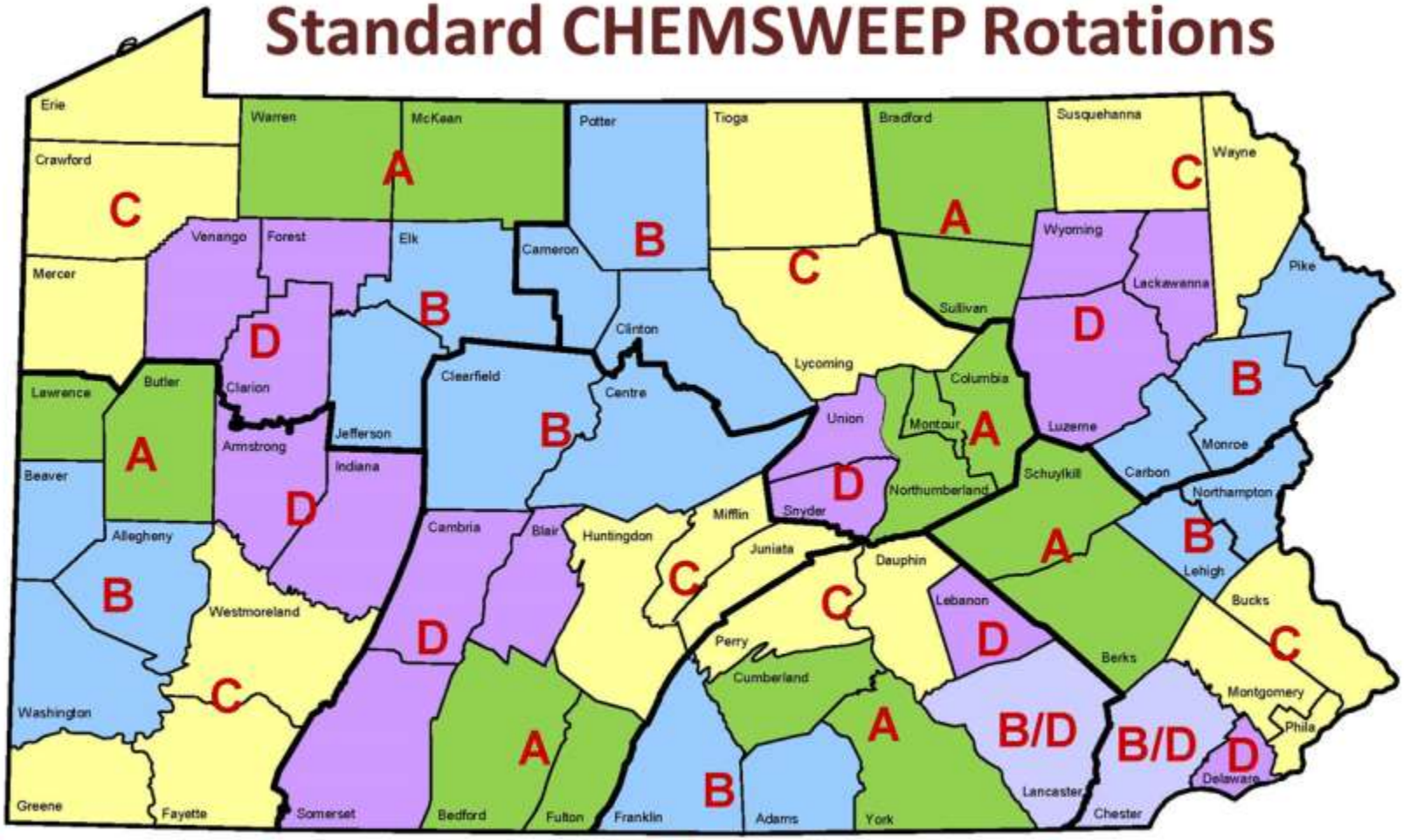
No Longer Plan To Use a Registered Pesticide

- Be aware of
  - State disposal regulations.
  - Local and municipality ordinances
- Check out CHEMSWEEP
  - **www.pda.state.pa.us/CHEMSWEEP**

Image: Penn State Pesticide Education Program


PENNSYLVANIA DEPARTMENT OF AGRICULTURE
1
2
3
4
5
6
7
Forest
Venango
Clarion
Armstrong
Indiana
Cambria
Blair
Somerset
Union
Snyder
Wyoming
Lackawanna
Luzerne
Lebanon
Lancaster
Chester
Delaware

Standard CHEMSWEEP Rotations



A=2017, 2021 **B**=2014*, 2018, 2022 **C**=2015, 2019, 2023 **D**=2016, 2020, 2024

*2014 also included Schuylkill County.

Triple- or Pressure-Rinse "Empty" Liquid Product Containers

- Dispose of properly.
- Use the Plastic Pesticide Container Recycling Program
  - Find recycling partner drop-off locations:
    - **www.pda.state.pa.us/pesticiderecycling**

Pollinator Protection Checklist

- ✓ Determine if the pesticide may be toxic to pollinators
  - The Environmental Hazard section of a label will indicate if a PTP is moderately or highly toxic to bees if they come in contact with the pesticide
  - There is also a “practically non-toxic to pollinators” category of pesticides

THE NEW EPA BEE ADVISORY BOX

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

PROTECTION OF POLLINATORS

APPLICATION R ...EXIST FOR THIS PRODUCT BECAUSE OF RISK TO BEES AND APPLICATION RESTRICTIONS FOUND IN TH... POLLINATORS.

Look for the bee hazard icon ... application site for specific use res... other insect pollinators.

This product can kill bees and o...

Bees and other insect pollinators will forage on plants when they flower. ... produce nectar.

Bees and other insect pollinators can be exposed to this pesticide from:

- Direct contact during foliar applications, or contact with residues on plant surfaces after foliar applications
- Ingestion of residues in nectar and pollen when the pesticide is applied as a seed treatment, soil, tree injection, as well as foliar applications.

When Using This Product Take Steps To:

- Minimize exposure of this product to bees and other insect pollinators when they are foraging on pollinator attractive plants around the application site.
- Minimize drift of this product on to beehives or to off-site pollinator attractive habitat. Drift of this product onto beehives can result in bee kills.

Information on protecting bees and other insect pollinators may be found at the Pesticide Environmental Stewardship website at:
http://pesticidestewardship.org/pollinatorprotection/Pages/default.aspx

Pesticide incidents (for example, bee kills) should immediately be reported to the state/tribal lead agency. For contact information for your state/tribe, go to: www.aapco.org. Pesticide incidents can also be reported to the National Pesticide Information Center at: www.npic.orst.edu or directly to EPA at: beekill@epa.gov

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.

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.

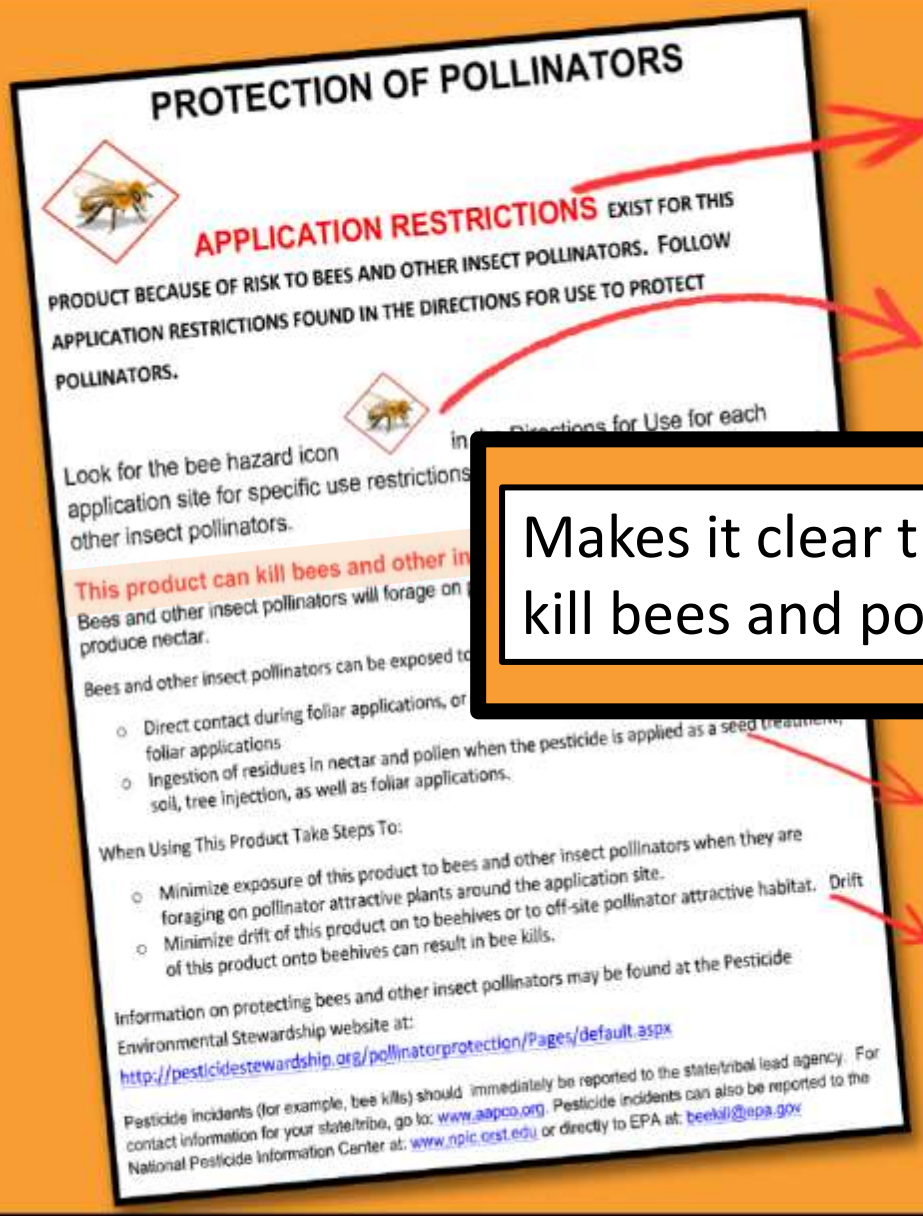
The science says that there are many causes for a decline in pollinator health, including pesticide exposure. EPA's new label will help protect pollinators.

EPA

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

THE NEW EPA BEE ADVISORY BOX

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



PROTECTION OF POLLINATORS

APPLICATION RESTRICTIONS EXIST FOR THIS PRODUCT BECAUSE OF RISK TO BEES AND OTHER INSECT POLLINATORS. FOLLOW APPLICATION RESTRICTIONS FOUND IN THE DIRECTIONS FOR USE TO PROTECT POLLINATORS.

Look for the bee hazard icon in the Directions for Use for each application site for specific use restrictions to protect other insect pollinators.

This product can kill bees and other in

Bees and other insect pollinators will forage on flowering plants that produce nectar.

Bees and other insect pollinators can be exposed to

- Direct contact during foliar applications, or
- Ingestion of residues in nectar and pollen when the pesticide is applied as a seed treatment, soil, tree injection, as well as foliar applications.

When Using This Product Take Steps To:

- Minimize exposure of this product to bees and other insect pollinators when they are foraging on pollinator attractive plants around the application site.
- Minimize drift of this product on to beehives or to off-site pollinator attractive habitat. Drift of this product onto beehives can result in bee kills.

Information on protecting bees and other insect pollinators may be found at the Pesticide Environmental Stewardship website at:

http://pesticidestewardship.org/pollinatorprotection/Pages/default.aspx

Pesticide incidents (for example, bee kills) should immediately be reported to the state/tribal lead agency. For contact information for your state/tribe, go to: www.aapco.org. Pesticide incidents can also be reported to the National Pesticide Information Center at: www.npic.orst.edu or directly to EPA at: beekill@epa.gov

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 it clear that pesticide products can kill bees and pollinators.

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.

EPA

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

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.

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.

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.

EPA

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

THE NEW EPA BEE ADVISORY BOX

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

PROTECTION OF POLLINATORS

APPLICATION RESTRICTIONS EXIST FOR THIS PRODUCT BECAUSE OF RISK TO BEES AND OTHER INSECT POLLINATORS. FOLLOW APPLICATION RESTRICTIONS FOUND IN THE DIRECTIONS FOR USE TO PROTECT POLLINATORS.

Look for the bee hazard icon in the Directions for Use for each application site for specific use restrictions and instructions to protect bees and other insect pollinators.

This product can kill bees and other insect pollinators.

Bees and other insect pollinators will forage on plants when they flower, shed pollen, or produce nectar.

Bees and other insect pollinators can be exposed to this pesticide from:

- Direct contact during foliar applications, or contact with residues on plant surfaces after foliar applications
- Ingestion of residues in nectar and pollen wh… soil, tree injection, as well as foliar applicatio…

When Using This Product Take Steps To:

- Minimize exposure of this product to bees a… foraging on pollinator attractive plants arou…
- Minimize drift of this product on to beehive… of this product onto beehives can result in …

Information on protecting bees and other insect p… Environmental Stewardship website at:

http://pesticidestewardship.org/pollinatorprotec…

Pesticide incidents (for example, bee kills) should … contact information for your state/tribe, go to: www.a… National Pesticide Information Center at: www.npic.…

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.

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

EPA

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

Water Quality

Quality of the Water Used to Spray Pesticides

- Over 95% of the spray solution is water!

- **FACT:** Research clearly shows that the quality of water used for spraying **can affect** pesticide performance!

Why is this Seldom Noticed?

- Water is viewed as a relatively clean input
- Concise, easy-to-read information on water quality and the effects on pesticide performance is scarce

Poor Water Quality Causes Problems

- Interact with product
- Reduce solubility of pesticide
- Decrease absorption by target pest

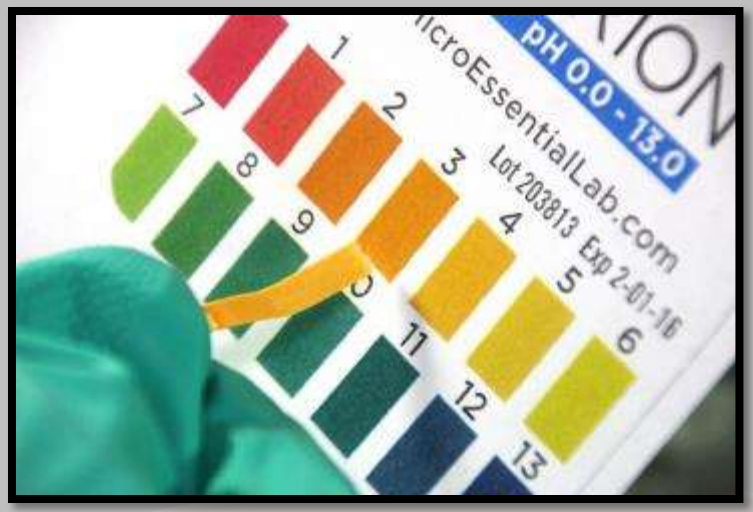
These performance issues may not be obvious!
We tend to blame other factors!

pH Value

- Most herbicides, insecticides, and fungicides perform best in slightly acidic water
  - A pH of 4 to 6.5
- However, some pesticides, such as sulfonylurea herbicides perform better in water that is slightly alkaline
  - A pH above 7

pH Rule

- When water pH falls outside of the preferred upper and lower boundaries, product performance can be compromised
- In some cases, the pesticide will precipitate out of solution



Images: Penn State Pesticide Education Program

pH Rule

- pH can influence how long a pesticide product remains active
- The effect of pH usually proceeds faster as the temperature of the water increases

Effect of pH on Pesticides

- Example: Flumioxazin Herbicide
- As pH varies, so does the Half-life:
  - pH 5 = Stable
  - pH 7 = Half-life of 24 hours
  - pH 9 = Half-life of 15 minutes

Effect of pH on Pesticides

Selected Half-Life of Common Pesticides		
Captan / Orthocide	pH 9	2 minutes
Dimethoate / Cygon	pH 9	1 hour?
Phosmet / Imidan	pH 10	1 minute
Endosulfan / Thiodan	pH 8-9	Unstable ? (12 hours)
Malathion / Cythion	pH 8-9	5 hours? (no data)

Service Container Tags

Service Container Tags


SERVICE CONTAINER
CONTENEDOR DE SERVICIO

☐ Concentrate Concentrado ☐ Dilution Dilución (Mark One) (Marque Uno)

Product(s) Producto(s) _____

EPA Reg. No.(s) No.(s) Reg. EPA _____

Active Ingredient(s) Ingrediente(s) Activo (s) _____

% Dilution or Concentrate % Dilución o Concentrado _____

EPA Signal Word(s) - Palabra(s) de Advertencia EPA

☐ Danger ☐ Poison ☐ Danger ☐ Warning ☐ Caution

Personal Protective Equipment Equipo de Protección Personal _____

Resticted Entry Interval Intervalo de Entrada Restringida _____ Hours Horas

Preharvest Interval Intervalo de Pre-Cosecha _____

Image: Penn State Pesticide Education Program

- Service Containers: filled with an EPA-registered pesticide
- Transported to a use site where the pesticide will be applied by the applicator

Service Container Tags


SERVICE CONTAINER
CONTENEDOR DE SERVICIO

☐ Concentrate Concentrado ☐ Dilution Dilución (Mark One) (Marque Uno)

Product(s) Producto(s) _____

EPA Reg. No.(s) No.(s) Reg. EPA _____

Active Ingredient(s) Ingrediente(s) Activo (s) _____

% Dilution or Concentrate % Dilución o Concentrado _____

EPA Signal Word(s) - Palabra(s) de Advertencia EPA

☐ Danger = Poison ☐ Danger ☐ Warning ☐ Caution

Personal Protective Equipment Equipo de Protección Personal _____

Resticted Entry Interval Intervalo de Entrada Restringida _____ Hours Horas

Preharvest Interval Intervalo de Pre-Cosecha _____

Image: Penn State Pesticide Education Program

- Service Containers:
  - Not intended for long-term storage
  - Are not used to sell or distribute the pesticide (That is illegal!)

Service Container Tags


SERVICE CONTAINER
CONTENEDOR DE SERVICIO

☐ Concentrate Concentrado ☐ Dilution Dilución (Mark One) (Marque Uno)

Product(s) Producto(s) _____

EPA Reg. No.(s) No.(s) Reg. EPA _____

Active Ingredient(s) Ingrediente(s) Activo (s) _____

% Dilution or Concentrate % Dilución o Concentrado _____

EPA Signal Word(s) - Palabra(s) de Advertencia EPA

☐ Danger = Poison ☐ Danger ☐ Warning ☐ Caution

Personal Protective Equipment Equipo de Protección Personal _____

Resticted Entry Interval Intervalo de Entrada Restringida _____ Hours Horas

Preharvest Interval Intervalo de Pre-Cosecha _____

Image: Penn State Pesticide Education Program

- Must*:
  - Indicate the name and percentage of active ingredients
  - Be accompanied by a readily available copy of the registered label that represents the pesticides contained therein.

*Under § 128.103. Handling, transportation, storage, use and disposal of pesticides of the Pennsylvania Pesticide Control Act

Service Container Tags


SERVICE CONTAINER
CONTENEDOR DE SERVICIO

☐ Concentrate Concentrado ☐ Dilution Dilución (Mark One) (Marque Uno)

Product(s) Producto(s) _____

EPA Reg. No.(s) No.(s) Reg. EPA _____

Active Ingredient(s) Ingrediente(s) Activo (s) _____

% Dilution or Concentrate % Dilución o Concentrado _____

EPA Signal Word(s) - Palabra(s) de Advertencia EPA

☐ Danger – Poison ☐ Danger ☐ Warning ☐ Caution

Personal Protective Equipment Equipo de Protección Personal _____

Restricted Entry Interval Intervalo de Entrada Restringida _____ Hours Horas

Preharvest Interval Intervalo de Pre-Cosecha _____

Image: Penn State Pesticide Education Program

- Remember:
  - The service container tag is not a substitute for the label
  - The tag identifies the material in the container in the event of a spill or other emergency

Service Container Tags

Image: Penn State Pesticide Education Program

- Back side of tag to correspond to the new SDS information

Service Container Tags

Image: Penn State Pesticide Education Program

- Back side of tag to correspond to the new SDS information
- Example after being filled in and ready for self lamination

Try Our Online Recert Courses!

- Go to: **extension.psu.edu/pested/online-recert**
- **Six 1-Credit** CORE courses that cost $20 and include topics on:
  - Labeling, formulations, transportation, emergencies, application planning, and application procedures
- **Two 2-Credit** courses that cost $35 are titled:
  - Pest Management and Pesticides in the Environment
- **Two 1-Credit SPANISH** courses that cost $20:
  - Pest Management and Pesticides in the Environment

Discover our Program and Connect with our Resources

pested.psu.edu

Penn State Pesticide Education Program

@PSUpestEd

PSUPestEd

This presentation was created in partnership with the Pesticide Education Program, Penn State Cooperative Extension, and the Pennsylvania Department of Agriculture.

For more information on this and other resources, please visit:

extension.psu.edu/pesticide-education

October 2015