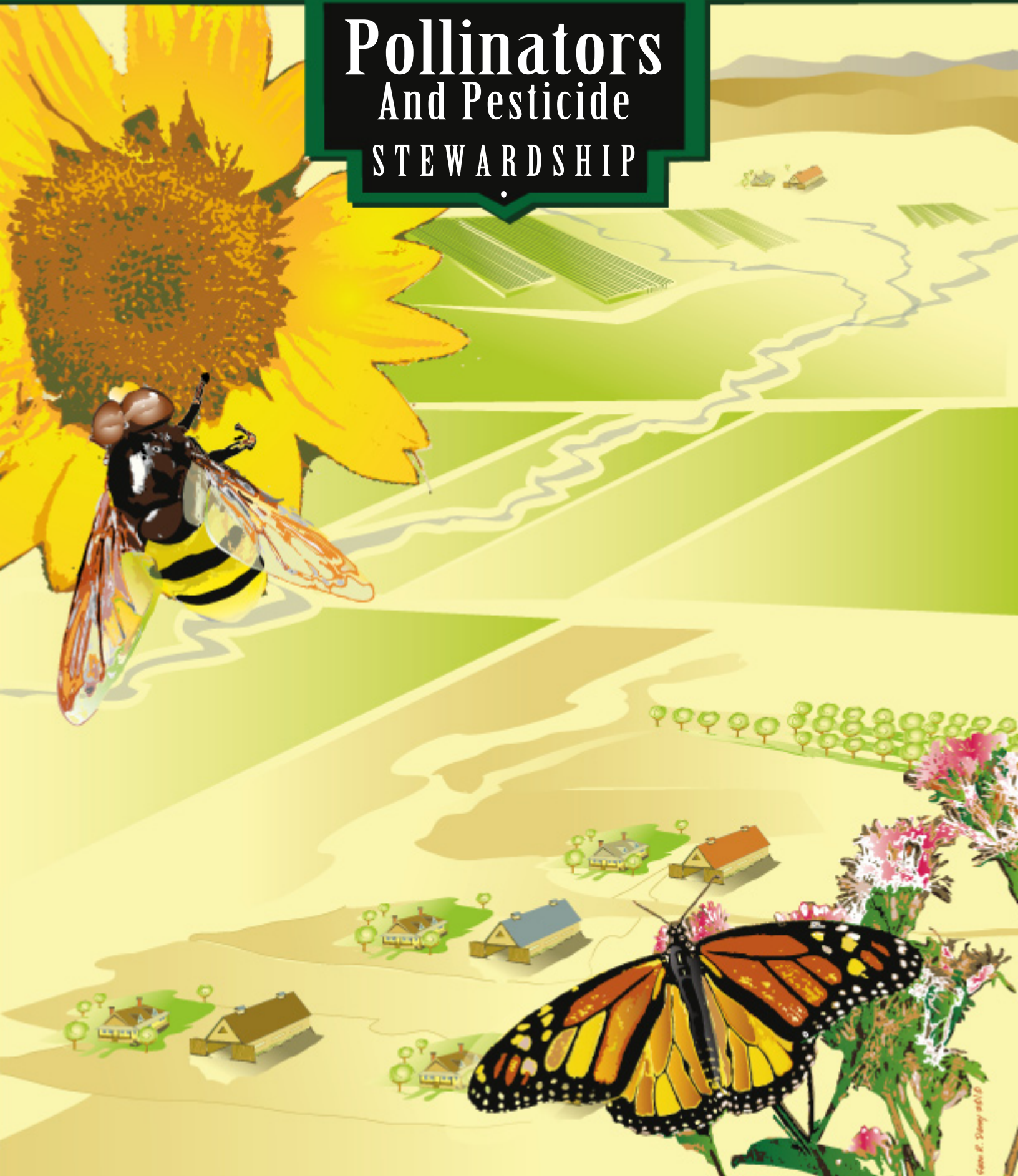


# Pollinators And Pesticide STEWARDSHIP



**Protecting Pollinators on Farms and Urban Landscapes**

# Pollinators And Pesticide STEWARDSHIP



Pesticides play an important role in controlling insects, weeds and diseases on farms and in urban landscapes. The areas treated for pests are often shared by pollinators which are attracted to blooming flowers for pollen and nectar. These pollinators can include not only honey bees but other insects such as butterflies, beetles, wasps and flies, and also birds and bats.

Pollinator habitat includes both crop and non-crop areas. Pollinators are attracted to a variety of blooming flowers on crops, trees, shrubs, weeds, and native vegetation, and may visit multiple plant species for nectar and pollen throughout the growing season. In forested and other natural areas, pollinators assist in the production of fruits and seeds that are essential to the diets of wildlife such as small and large mammals and especially migratory birds and game birds. In addition to European honey bees, there are more than 4000 bee species and various other pollinators in the United States.

Most pesticides are not toxic to honey bees and other insect pollinators. As a general rule, insecticides are more toxic to pollinators than fungicides and herbicides, but not all insecticides are toxic to pollinators. (Any pesticide that is toxic to insect pollinators is referred to in this brochure as a “pollinator-toxic pesticide” or a “PTP”).

Proper pesticide use avoids harm to pollinators and can even serve to protect pollinators and their food sources, water and habitat. Proper pesticide use starts with following the product label. Also, the use of Integrated Pest Management (IPM) and good pesticide stewardship practices wherever pollinators are present will reduce the potential for exposure of pollinators to PTPs.

## Read and Follow All Pesticide Label Directions and Precautions


Pesticide label directions are designed to protect wildlife, including bees and other pollinators. Should a pesticide be potentially toxic to pollinators, the product label will list precautions that need to be taken during application. For example, a label may prohibit applications when pollinators are foraging or plants are in bloom.

## Determine If a Pesticide May Be Toxic to Pollinators

Most PTPs are insecticides, but not all insecticides are toxic to bees and other pollinators. **READ THE LABEL** carefully to understand pollinator and other precautions for the specific pesticide.

Extensive research has been conducted to prepare the Environmental Hazard section of a label which will indicate if a PTP is moderately or highly toxic to bees when the application contacts them directly. The Honey Bee Acute Contact LD50 indicates the contact dose that will kill 50% of the exposed bee population in a laboratory test. PTPs are either moderately toxic (LD50 greater than 2 micrograms/bee but less than 11 micrograms/bee) or highly toxic (LD50 of 2 micrograms/bee or less) to bees in laboratory tests.





In addition to toxicity caused by direct contact, PTPs may or may not have extended residual toxicity to bees and other pollinators. When a PTP has extended residual toxicity, it can not only harm pollinators when the application contacts them directly, **but also** residues on the plants can harm pollinators that visit the treated area later (“visiting”). If a PTP does not have extended residual toxicity, it can harm pollinators exposed to direct treatment only (“actively visiting”). A PTP that does not have extended residual toxicity can often be applied after evening pollinator foraging is complete without harming pollinators that arrive the following day. A PTP with extended residual toxicity requires stricter application restrictions. In either case, follow the label directions and precautions carefully.

Environmental conditions can also affect residual toxicity. When low temperatures or heavy dews are forecast for the night following application of PTPs, duration of residual toxicity may increase.

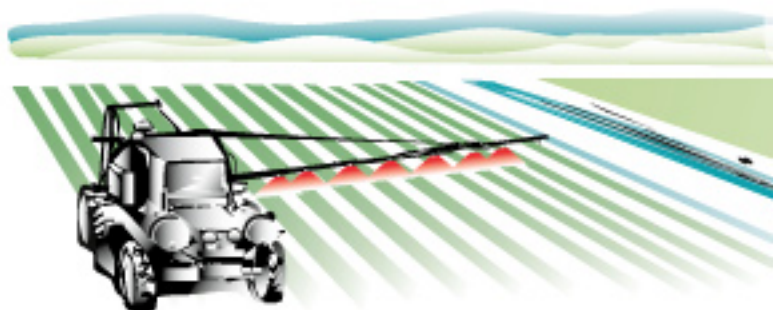
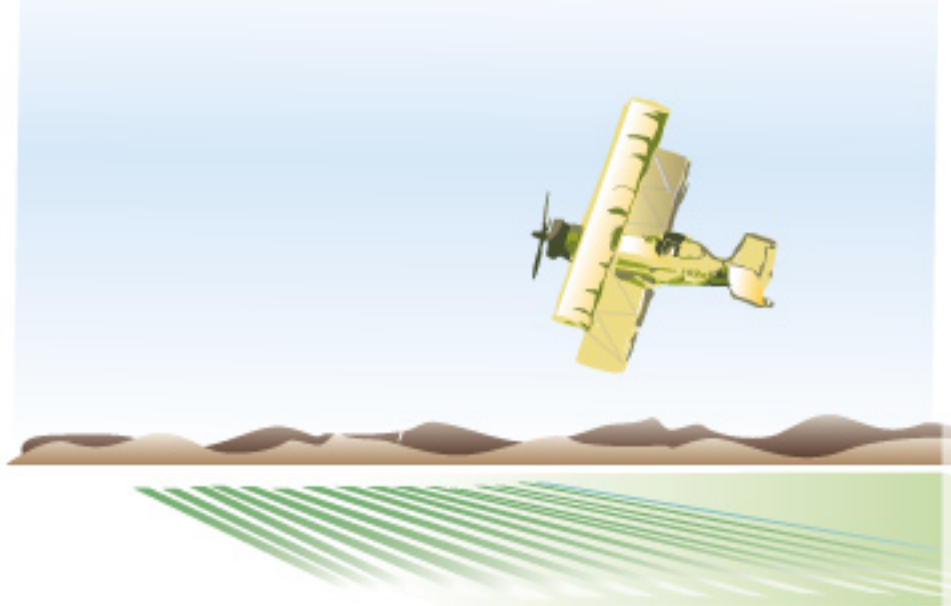
The EPA registration process considers these and other characteristics of the pesticide prior to approving label directions and precautions that allow the PTP to be used without harming pollinators, and requires additional studies when warranted.

Certain pesticides (for example, some systemic pesticides and insect growth regulators) are now being evaluated for their potential to have residual, sublethal, indirect, delayed and/or brood effects on bees and other insect pollinators. The pesticide manufacturer can provide up-to-date product-specific information on stewardship measures that can help protect pollinators. Your pesticide label, supplier or the internet can provide contact information for individual pesticide manufacturers.

## Understand Pollinator Visitation Habits

Bees and other pollinators are most at risk of poisoning when PTPs are applied to crops, weeds or other vegetation that is blooming. The blossom is often the only part of a plant that pollinators will visit, but understand the pollination characteristics of the specific crop before making an application. To avoid exposing pollinators, strictly observe the application **timing** on the label relative to the blooming stage of the crop and other plants in the area. In addition, realize that the application **window** (period when the timing is right) may be reduced due to factors such as extended crop bloom or unfavorable weather conditions.

Pollinators can range as far as several miles from their hives. The time and intensity of pollinator visitation to a crop or vegetated area depends on the abundance and attractiveness of the bloom. For example, apple trees or clover may be attractive to honey bees all day while cucumbers and corn are usually only attractive in the morning or early afternoon. Evening or nighttime applications are generally the least harmful to honey bees and other pollinators that typically forage during the daytime, but stricter application restrictions may be necessary when a PTP has extended residual toxicity.



## Use an Integrated Pest Management (IPM) Approach

An Integrated Pest Management (IPM) approach combines chemical, cultural, mechanical and other suitable practices for controlling pests. Select the best combination of pest control options that minimizes risks to pollinators. Basic steps of IPM include:

- Use cultural practices that discourage pests from using a crop or landscape as habitat.
- Carefully diagnose your pest problem.
- Monitor and assess pest populations to determine if levels warrant pesticide treatment.
- Determine your best combination of pest control options.
- Use the recommended pesticide at the lowest appropriate labeled rate with the proper timing and placement. Do not use amounts below the labeled rate because this could result in loss of control and development of pest resistance.

## Always Follow Good Stewardship Practices

European honey bees provide important pollination to millions of acres of fruits, nuts and vegetables in the U.S. All pesticide users must take precautions that minimize risks to both honey bees and native pollinators. Stewardship must be practiced throughout the life cycle of every pesticide, from storage to application to disposal. Good stewardship will provide benefits that extend far beyond protecting pollinators and their habitat.

## Minimize Spray Drift

### *Specific Label Information Takes Precedence*

- Establish appropriate buffers (no-spray zones) between treated areas and pollinator habitat or hives.
- Check the weather forecast before application and be mindful of changing weather conditions during application. Preferred conditions for application of pesticides include:
  - Wind Speed - 3 to 10 mph, no gusty conditions.
  - Wind Direction - away from adjoining crops or sensitive areas.
  - Temperature - below 90° F.
  - Humidity - above 50% RH.

- Do not spray when wind is blowing toward pollinator habitat or areas where beehives are stored.
- Calibrate the sprayer often, checking individual nozzle output and pattern.
- Always shut off the sprayer when making turns at the end of fields or gardens.
- Shut off the sprayer near ponds, irrigation ditches and other sources of water that may be used by pollinators. Pesticide labels typically prohibit applications in close proximity to surface water.
- Shut off sprayer or individual nozzles where it is not necessary to spray such as gaps in the crop or shrubbery.
- Consider sprayer technologies that reduce drift such as hooded, tower, wrap-around, tunnel and target-sensing sprayers.
- Choose low pressure or low-drift nozzles that reduce drift by producing a medium to coarse droplet size spectrum and minimizing the fine droplets < 150 microns, which tend to drift further.

## Minimize Vapor Drift

### *Specific Label Information Takes Precedence*

Vapor drift can occur after applications of certain pesticides, particularly those formulated as emulsifiable concentrates (ECs).

- Spray during cool temperatures to minimize vaporizing action of the product.
- Soil-incorporate volatile products soon after application.
- Minimize vaporization during applications by using a relatively coarse spray.



## Cooperate and Communicate with Others

Cooperation and communication among growers, applicators, beekeepers, crop advisors and county officials greatly increase the likelihood of success in protecting pollinators, their hives and habitats from PTPs.

## Grower and Commercial Beekeeper Cooperation

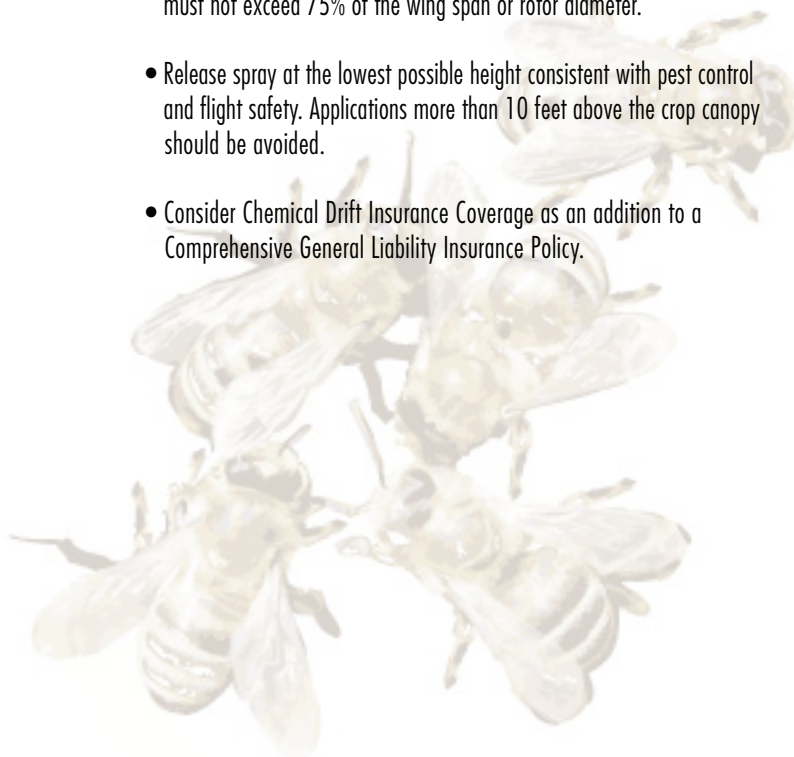
Cooperation between the grower and beekeeper is essential. Specifically, growers and beekeepers should work together to:

- Review the cropping system and pest management practices in the area before the beehives are delivered.
- Develop a written agreement outlining the crop timing, period for using the hives and important considerations.
- Clearly define responsibilities for providing supplemental water and food sources and for protecting the hives.
- Place hives away from areas that may be exposed to PTPs during the pollination period.
- Protect water sources from contamination by pesticides.
- Inform neighboring growers and custom applicators operating in the area where hives are located so precautions can be taken when treating nearby fields.
- Remove hives if PTPs will be applied in the immediate vicinity.
- If PTP applications near beehives are unavoidable, shield beehives with wet burlap to confine and protect the bees, but ensure that bees are kept cool at all times.
- Post the beekeeper's name and contact information near the hives.

## Grower and Aerial Applicator Cooperation

Growers and the aerial applicators they hire must cooperate when aerial applications are made in areas where beehives are located. Specifically, growers and applicators should work together to:

- Accurately identify the proper site for application. Use GPS coordinates if the applicator has this capability. Review a sketch of the field and surrounding areas.
- Accurately identify and confirm the location of beehives near the treatment site or on neighboring fields.
- Check to ensure weather conditions are appropriate for aerial applications by reviewing the 1 to 6-hour forecast prior to initiating treatments.
- Never make treatments when conditions are marginal. Doing so can be illegal and can jeopardize the applicator's licenses as well as the industry standard for stewardship.
- Make sure aerial applications are done properly, avoiding direct overspray of beehives or off-site movement toward beehives and other sensitive sites.
- Mount the spray boom on the aircraft so as to minimize drift caused by wing tip vortices. The minimum practical boom length should be used and must not exceed 75% of the wing span or rotor diameter.
- Release spray at the lowest possible height consistent with pest control and flight safety. Applications more than 10 feet above the crop canopy should be avoided.
- Consider Chemical Drift Insurance Coverage as an addition to a Comprehensive General Liability Insurance Policy.



## Recognize Bee Behavior From Accidental Exposure to PTPs

Common symptoms of bee poisoning are:

- Excessive numbers of dead bees in front of hives.
- Lack of foraging bees (if not weather-related).

Normal bee die-off ranges from 0-100 dead bees per day per hive. Higher numbers are excessive and could be a sign of a bee poisoning.

## Check for Specific County and Local Ordinances Pertaining to Pollinators

In many farming areas of the U.S., state or county departments of agriculture can provide information about pollinator protection. Some states require that commercial beehive operations register the location where hives are being kept. See your county guidelines for product-specific restrictions and recommendations for pollinator-toxic pesticides.

## Sources

Pollinator experts, pesticide product labels and other sources including:

*Protecting Honey Bees From Pesticides*; Alabama Cooperative Extension  
<http://www.aces.edu/pubs/docs/A/ANR-1088/#>

*Protecting Honey Bees From Pesticides*; Ohio State University Fact Sheet #HYG-2161-97  
<http://ohioline.osu.edu/hyg-fact/2000/2161.html>

*Protecting Honey Bees From Pesticides*  
<http://edis.ifas.ufl.edu/AA145>

This publication is available online at  
[www.curesworks.org/publications/pollinators.asp](http://www.curesworks.org/publications/pollinators.asp)

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Coalition for Urban/Rural Environmental Stewardship  
[www.curesworks.org](http://www.curesworks.org)

# Pollinator Protection Checklist

Most pesticides are not toxic to honey bees and other insect pollinators. As a general rule, insecticides are more toxic to pollinators than fungicides and herbicides, but not all insecticides are toxic to pollinators. Any pesticide that is toxic to insect pollinators is referred to in this brochure as a "pollinator-toxic pesticide" or a "PTP". Please follow these guidelines before treating an area with pesticides when pollinators are present:

- 1 Read and follow all pesticide label directions and precautions.
- 2 Determine if the pesticide may be toxic to pollinators.
- 3 Understand local pollinator visitation habits.
- 4 Use an Integrated Pest Management (IPM) approach.
- 5 Follow good pesticide stewardship practices at all times.
- 6 Cooperate and communicate with others.
- 7 Recognize Bee Behavior from Accidental Exposure to PTPs.
- 8 Check for specific county and local ordinances pertaining to pollinators, especially commercial beehive locations or designated preserves.

