Insect Pollinators and Pesticide Product Stewardship

PROTECTING INSECT POLLINATORS ON FARMS AND IN URBAN LANDSCAPES

INTRODUCTION

Insects, including the honey bee as well as wild bee species, butterflies, beetles, wasps and flies, are important pollinators. Honey bees and other insect pollinators provide important pollination service to millions of acres of fruit, nuts, vegetables and other flowers across North America. Insect pollinators are attracted to a variety of blooming flowers on crops, trees, shrubs, weeds and native vegetation and will visit multiple plant species for nectar and pollen throughout the growing season.

Pesticides such as insecticides, herbicides and fungicides play an important role in controlling insects, mites, weeds and diseases on farms and in urban landscapes.

The areas treated with pesticides may have blooming flowers that attract insect pollinators. Most pesticides can be used safely around honey bees and other insect pollinators, when label directions and stewardship practices are followed.

Proper pesticide use starts with reading and following the product label. The use of Integrated Pest Management (IPM) and good stewardship practices will help to reduce potential pesticide exposure or harm to insect pollinators.

Insect Pollinator Protection Checklist

1. Read and follow the pesticide label and use products wisely.
2. Determine if the pesticide may be harmful to insect pollinators.
3. Understand insect pollinator visitation habits.
4. Use Integrated Pest Management (IPM).
5. Follow pesticide product stewardship practices.
6. Cooperate and communicate in a timely manner with stakeholders in the area of a pesticide application.
7. Understand the signs of pesticide exposure to bees and other disorders that may cause similar effects.
8. Check state and local ordinances pertaining to insect pollinators.

1 Read and Follow the Pesticide Label and Use Products Wisely

READ THE LABEL carefully to understand the precautions for the specific pesticide. Pesticide label directions provide information intended to protect wildlife, including bees and other pollinating insects. If the pesticide is potentially harmful to honey bees, the product label will list precautions that need to be taken during application. For example, a label may prohibit applications to blooming crops or weeds when bees are foraging in or adjacent to the treatment area.

2 Determine If the Pesticide May Be Harmful to Insect Pollinators

ALWAYS CHECK THE LABEL FOR SPECIFIC PRODUCT INFORMATION. The pesticide label contains information on proper usage to minimize risks to insect pollinators. Label language for bees and other insect pollinators can be found in one or more of the following sections in the label: **Environmental Hazards, Directions for Use** and the **Protection of Pollinators** box. In addition, there may be a bee hazard icon alerting the user to pollinator precautions.

The label includes instructions for the control of pests, while minimizing risks to bees and other insect pollinators. If the pesticide is highly toxic to bees, the following language is on the label: "This product is **highly toxic to bees** and other pollinating insects exposed to direct treatment or residues on blooming crops or weeds. Do not apply this product or allow it to drift to blooming crops or weeds if bees or other pollinating insects are visiting the treatment area." Products that are **moderately toxic to bees** have similar language. If the product is **not toxic to bees**, there is no precautionary language on the label.

3 Understand Insect Pollinator Visitation Habits

Honey bees can fly several miles from their hives to find blooming flowers. Other insect pollinators, such as native bees, may stay closer to their nesting areas. The time and intensity of insect pollinator visitation to an area depends on the abundance and attractiveness of the available flowers and seasonal occurrence of pollinating insects. Bees and other insect pollinators are most at risk from pesticides applied to crops or other plants that are blooming. Before applying pesticides, be aware of the crop's bloom stage and pollinator attractiveness. To avoid exposing insect pollinators to pesticides, strictly observe the application **timing** on the label relative to the blooming stage of the crop and other plants in the area.

4 Use Integrated Pest Management (IPM)

An IPM program for insect pests includes the following components:

- **Identification** of the presence of the insect pest, its life cycle and damaging stages.

- **Monitoring** insect pest populations with light traps, sticky cards, pheromones and other tools, including digital tools.
- **Scouting** pest and beneficial population levels over time in a given area.
- **Using Economic Threshold Level** or **Action Threshold Level** to determine if the pest will cause economic damage and help determine when control measures need to take place.
- **Pest Control Measures**, including pest-resistant crop varieties, biological control such as predatory insects or pest pathogens, cultural control such as planting timing, mechanical control such as screens, and chemical control such as pesticides.

An effective IPM program employs a combination of practices that control pests and minimize risks to pollinators and other beneficial insects. Use the recommended pesticide at the appropriate labeled rate with the proper timing and placement. Using pesticides below the labeled rate is not recommended, because this could result in loss of efficacy and contribute to pest resistance.

5 Follow Pesticide Product Stewardship Practices

All pesticide users should take precautions that minimize risks to honey bees and other insect pollinators. Good stewardship practices for insect pollinators include minimizing off-site spray drift and minimizing off-site drift of seed treatment materials, as well as being mindful of the environment, including weather and landscape. These practices will provide benefits that extend beyond protecting insect pollinators and their habitat.

OTHER STEWARDSHIP PRACTICES

- When pesticide treatment is required, use products based on pest effectiveness and pollinator safety. Consider mode of action, formulation and method of application (e.g., foliar vs. soil vs. seed treatment).
- Adjust method and timing of pesticide application to maximize pest-control benefits and minimize risk to insect pollinators. For example, evening or nighttime applications minimize exposure to honey bees and other insect pollinators that typically are active during the daytime. In some cases, application restrictions may be indicated on the label for pesticides with extended residual toxicity.
- To minimize potential exposure of pollinators, birds and mammals, incorporate treated seeds into soil at proper depth, especially at field margins. Take care to cover or remove any treated seed spills.

MINIMIZE OFF-SITE SPRAY DRIFT

SPECIFIC LABEL INFORMATION TAKES PRECEDENCE

- Establish appropriate buffers (no-spray zones) between treated areas and insect pollinator habitat or hives. Buffers may be a requirement for some pesticides.
- Check the weather forecast before application and be attentive to changing weather conditions during application.
- Follow all pesticide label requirements regarding application conditions, such as wind speed, wind direction, temperature and relative humidity.
- Monitor if the wind is blowing toward insect pollinator habitat or areas where beehives are located.
- Calibrate the sprayer often, checking individual nozzle output and pattern.
- Shut off the sprayer when making turns at the end of fields or gardens.
- Maximize spray deposition on the target site by minimizing sprayer speed, positioning spray booms as low as possible and shutting off sprayer or individual nozzles where it is not necessary to spray, such as in gaps in the crop. Choose low-pressure or low-drift nozzles that reduce drift.
- Shut off the sprayer near ponds, irrigation ditches and other sources of water that may be used by insect pollinators. Pesticide labels typically prohibit applications in close proximity to surface water.
- Consider sprayer technologies that reduce drift and consider the use of drift-retardant agents.

MINIMIZE OFF-SITE DRIFT OF SEED TREATMENT MATERIALS

SPECIFIC LABEL INFORMATION TAKES PRECEDENCE

American Seed Trade Association Seed Treatment Stewardship Guide (www.seed-treatment-guide.com)

- Eliminate flowering plants, including weeds, in and around the field prior to planting.
- Use advanced seed-flow lubricants that minimize dust.
- At planting, be aware of honey bees and hives located near the field.
- Always use high-quality treated seed free from excessive dust.
- Avoid releasing dust from seed treatments into the air. When opening seed containers and during filling, emptying or cleaning of the planting equipment, avoid dust movement that could cause exposure.
- Avoid off-site movement of dust from treated seeds during planting. Be aware of wind speed and direction.

6 Cooperate and Communicate in a Timely Manner with Stakeholders in the Area of a Pesticide Application.

Cooperation and communication among farmers, landowners, applicators, beekeepers, crop advisors and local officials greatly increase the likelihood of success in protecting insect pollinators, their hives and habitats from potentially harmful pesticides.

FARMER OR LANDOWNER

- Discuss pest-management plans involving pesticides with beekeepers before hives are placed on your land.
- Help beekeepers select the best hive locations on your land.
- Discuss bee issues with your renter or landowner, if applicable.
- Determine who will contact beekeepers—you or your pesticide applicator—prior to applications.
- Notify beekeepers 48 hours prior to a pesticide application and, if possible, have a communication plan in place.
- Discuss bee concerns with your agronomist or crop consultant.
- Eliminate flowering weeds before insecticide application.
- If possible, help the bees and other insect pollinators by providing forage in non-crop areas, in vegetative buffer strips and by using appropriate cover crops.

PESTICIDE APPLICATOR

- Work with your customers to identify and notify beekeepers in the area prior to pesticide applications.
- Be aware of local landscape, including locations of forage and water bodies that may be attractive to insect pollinators, prior to applications.
- Know and follow all state requirements (see section 8).

BEEKEEPER

- Work with landowners when choosing hive locations and make sure hives can easily be seen. Make sure the landowner has your contact information.
- Avoid placing hives in areas of increased risk to pesticides.
- Alert local Mosquito Control office of apiary location.
- Make sure your bees have sufficient resources throughout the year.
- Comply with all local and state beekeeping laws.
- Cooperate with pesticide applicators when you are notified of upcoming applications.
- Use only registered pesticides when treating your hives.
- Maintain good hive health.

7 Understand the Signs of Pesticide Exposure to Bees and Other Disorders that May Cause Similar Effects.

Common symptoms of honey bee exposure to pesticides include other disorders such as mite infestations, starvation and pathogens:

- Excessive numbers of dead bees in front of hives.
- Lack of the usual numbers of foraging bees. This can also be caused by poor weather conditions, honey bee queen issues and disruption of age-structure of worker bees.
- Bees in front of hives that appear disoriented and are unable to fly. This can also be a sign of honey bee tracheal mite infestation, *Nosema* spp. infection and other disorders.

8 Check State and Local Ordinances Pertaining to Insect Pollinators

State or county departments of agriculture can provide information about insect pollinator protection. Some states require that commercial honey bee operations register the apiary locations. States may also use GIS mapping programs or flags for apiary locations.

MANAGED POLLINATOR PROTECTION PLANS (MP3s)

Many of the practices outlined in this bulletin are discussed in greater detail in state-managed pollinator protection plans, also known as MP3s. MP3s are designed to mitigate risk to bees and other pollinators, while also allowing farmers to manage pests. Review the MP3 for your state or tribe, if available. All stakeholders must do their part and work together to successfully achieve the desired outcome of reducing risks to pollinators, while also effectively protecting crops.