

Reducing Risks to Pollinators from Pest Control

Did you know?

In 2010, insect pollinators contributed to nearly \$29 billion of crops in the US. Over 75% of all flowering plants rely on animal pollinators.



Ruby-throated hummingbird collecting nectar. Bill Buchanan/USFWS

What is a pollinator?

Pollinators are animals that help flowering plants reproduce by moving pollen from the male part of the plant (anther) to the female part (stigma) of the same species. Pollinators include many bees and butterflies, some moths, beetles, flies, and birds and a few bats.

Why are pollinators important?

Many plants cannot reproduce without the help of pollinators. The plants they pollinate provide food for humans and wildlife, such as migratory birds. Successful pollination produces seeds and fruits, examples include sunflowers seeds, almonds, blueberries, pumpkins, and apples. Pollinators are an integral component of natural ecosystems and agriculture.

What is a pest?

A pest is any plant or animal that:

- interferes with site management goals, such as crop production yields or native habitat restoration,
- causes damage to a resource, such as gardens, houses, and wildlife habitats, or
- jeopardizes human health or safety.

What is Integrated Pest Management (IPM)?

IPM is a science-based, decision-making process that integrates pest biology, environmental information, consensus building, and technology to prevent unacceptable levels of pest damage. IPM considers site management goals and strives to minimize risk to people, property, and the environment, including pollinators.

How does IPM benefit people and pollinators? IPM can:

- 1) save time and money using a sustainable approach to manage pests. Do not wait for a pest outbreak or manage based on the calendar;
 - 2) reduce damage to people's health, the environment, and property;
 - 3) decrease pest resistance due to repetitive pesticide use; and
 - 4) decrease pesticide use and reduce risk to pollinators, the environment, and people.
- a) Take no action (expect and accept some pest damage)
 - b) Physical Control (example: hand remove pests, plants, or insects, using garden gloves)
 - c) Mechanical Control (example: machine tilling, cutting)
 - d) Cultural Control (plant pest resistant crops, use clean weed- and insect-free mulch, create beneficial insect habitat and water based on need)
 - e) Biological Control (encourage native predators with a diverse garden habitat)
 - f) Chemical Control (pesticides including insecticides, herbicides, fungicides and rodenticides)



Physical removal of an invasive plant. Andrea Pickart/USFWS

Physical removal of invasive European beachgrass (*Ammophila arenaria*) benefits the native seaside daisy (*Erigeron glaucus*), which can be pollinated by the native solitary bee (*Megachile wheeleri*). Physical removal of non-native plants may eliminate the potential for herbicide effects to non-target, native plants which then remain a source of nutrition for the bee.

Where can you use IPM?

Use IPM to manage pests in yards, gardens, golf courses, and natural and outdoor community areas as well as indoors (homes and businesses).

How do you implement IPM?

- 1) Describe your pest problem. What is the pest's effect on your site or resource?
- 2) Describe your site and its ecology.
- 3) Know your pests and their natural enemies. Understand the biological and physical conditions (water, food, shelter, temperature, and light) that support natural enemies, and how to make conditions more attractive to beneficial insects.
- 4) Monitor the pest: How many are there? What is the destruction? How are they getting to your resource?
- 5) Establish "action thresholds."
An action threshold is the level of damage or number of pests at which a management strategy will be implemented to reduce the pest population.
- 6) Decide what methods or tools you will use to control the pest.
- 7) Build consensus with neighbors, such as beekeepers, who may be affected by your pest management actions.
- 8) Implement the lowest risk, most effective methods and tools in accordance with applicable laws, regulations, and policies.
- 9) Keep records of your actions, the pest numbers, level of damage, and evaluate your results. Determine if objectives have been achieved and if not, modify the strategy.

If you choose to use pesticides, then what do you need to consider?

Pesticides can kill more than the target pest.

- Some pesticide residues can kill pollinators for several days after the pesticide is applied. This is especially true for butterfly caterpillars that eat leaves and leafcutter bees that use leaves to build nests.
- Pesticides can also kill natural predators, which can lead to greater pest problems.



Monitoring for pests. John Kucharski/USDA

- Some pesticides applied to the soil and mulch can travel through the plant and may be toxic in nectar and pollen.

If you use a pesticide, what do you need to do?

- 1) Read the product label, pay attention to the Environmental Hazards section, and chose a product that indicates low or no toxicity to bees. Consider if a soapy, dish-detergent and water solution or vegetable oil, water, and dish-detergent solution might be effective.
- 2) Use buffer zones between areas of pesticide application and sensitive species and habitats, water, and potential nectar sources to avoid contamination and help protect pollinators.
- 3) Use the lowest effective pesticide application rate to control the target pest.
- 4) Apply pesticides when pollinators are least likely to be present, such as before or after blooming, or in late afternoon and evenings. CAUTION: before using a pesticide scout for pollinators – some pollinators, such as *Normia* bees, rest in crop fields overnight and may be harmed by nighttime application of pesticides.
- 5) Reduce spray drift: use ground equipment (spot treat or use a hand applicator) instead of aerial spraying; spray under calm conditions.
- 6) Use liquid sprays or granules instead of dusts; avoid use of micro-

encapsulated pesticides that are similar in size to pollen and can be collected by bees and cause poisoning.

- 7) Rinse pesticide tanks thoroughly between applications to avoid cross-contamination. Dispose rinse water according to label instructions.
- 8) Notify beekeepers several days before applying any pesticide that is hazardous to honey bees.

Where can you find more information on IPM?

Contact agencies and organizations such as:

- U.S. Department of Agriculture;
- Department of Interior;
- Local community organizations, such as Master Gardener Programs and Garden Clubs;
- Municipal and county governments;
- Universities, especially those with county extension offices.



Cactus bee (*Lithurgus* spp.) on flowering prickly pear cactus (*Opuntia* spp.). Alicia King/USFWS

Integrated Pest Management

4401 N. Fairfax Drive
Arlington, VA 22203
703/358-1831

U.S. Fish and Wildlife Service
<http://www.fws.gov/Contaminants/>
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