

Reducing Risks to Pollinators from Insect and Plant Pest Control:

Using Integrated Pest Management on Farmlands

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.



Rusty patched bumble bee on leadplant. Photo: Sarah Warner/USFWS

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 such as sunflowers, almonds, blueberries, pumpkins, and apples. Pollinators are a key component of natural ecosystems and agriculture.

What do pollinators need?

Pollinators need habitat with a diversity of native flowering plants and a sequence of flowers that bloom from early spring through fall. Pollinators such as bumble bees and butterflies need nectar and/or pollen from a variety of flowering plants including native flowers, shrubs, trees, garden plants, even some weeds and crops.

What is a pest?

A pest is any plant or animal that:

- Interferes with site management goals such as crop production yields and healthy soils.
- Causes damage to agriculture crops.
- Jeopardizes human health or safety.

What can be done about pests?

- Pests are best controlled by an Integrated Pest Management approach.

What is Integrated Pest Management (IPM)?

IPM is a decision-making process that coordinates pest biology, site management goals, environmental conditions, consensus building, tools, technology and methods to prevent unacceptable levels of pest damage while minimizing risk to people, property, and the environment, including pollinators.

How does IPM benefit people and pollinators? IPM can:

- Decrease pesticide use and reduce risk to pollinators, the environment, and people.
- Save time and money using a sustainable approach to manage pests.
- Decrease pest resistance from repetitive pesticide use.

When implementing IPM, it's helpful to:

- Describe the pest problem: how is the pest impacting the site?
- Monitor the pest: How many are there? What is the destruction? How are they getting to the crop or other resource?
- Scout for pollinators. Determine where pollinators are and what plants they are using in your farmland.
- Know your site and its ecology: for example, soil and habitat type.
- Know your pests and their natural enemies (predators and competitors). Understand the biological and physical conditions (water, food, shelter, temperature, and light) that support natural enemies, and how to make your site more attractive to beneficial insects.
- Determine if crop damage is at an unacceptable level. Establish "Action Threshold": 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.
- Identify methods to control the pest. Implement the lowest risk, most effective methods and tools.



Milkweed in a farm field buffer. Photo: USFWS

- Build consensus with neighbors, such as beekeepers and natural resource managers, who may be affected by the pest and/or the management actions.
- 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.
- Use the services of certified crop advisors or your local extension office to help implement an IPM program.

What IPM methods can you use?

- Take no action (expect and accept some pest damage).
- Mechanical Control
Example: machine tilling, aerating, cutting, digging.
- Cultural Control
Example: plant trap crops and/or pest-resistant crops, implement crop rotation, use cover crops, water crops based on need, use clean weed- and insect-free mulch and other soil amendments, create beneficial insect habitat.



Monitoring for pests.
Photo: John Kucharski/USDA

- Biological Control (Example: consider use of predatory insects for pest control).
 - Pesticide Control Example: treat with pesticides such as insecticides, herbicides, fungicides, nematicides, and rodenticides.
- If pesticide treatment is needed:*
- Consult the label information on safe usage, application rate and methods, and hazards to pollinators.
 - Minimize the use of pesticides in and around nesting and forage sites. Nesting sites can be pithy stems, twigs, leaf duff, trees, shrubs, forbs, well-drained bare ground and crevices. Insecticides and fungicides can directly harm some pollinators if they are exposed. Herbicides can harm the plants that pollinators need for food and shelter.
 - Avoid off-site movement of pesticides into pollinator habitat.
 - Use the lowest possible boom height and a coarse versus fine droplets. Apply pesticides when wind speeds are between 3-9 mph to reduce drift and temperatures are < 85°F to reduce volatilization.
 - If possible, use precision application technology to focus the pesticide application directly on the target pest.
 - Use the lowest effective pesticide application rate to control the target pest.
 - Avoid scheduled or “calendar” sprays.

- Apply pesticides when pollinators are least likely to be present, such as before or after blooming, or in late afternoon and evenings. For example, pollinators such as *Normia* bees rest in crop fields overnight and may be harmed by nighttime application of pesticides.

- Use liquid sprays and granules instead of dusts. Clean up spilled granules. Avoid use of micro-encapsulated pesticides that are similar in size to pollen and can be collected by pollinators and mistaken as food.

- Use vegetative buffer zones (grass or hedgerow of shrubs) between areas of pesticide application and pollinator habitats to reduce pesticide drift.

If you are considering using treated seeds:

- Before planting, determine if non-treated seed is adequate for use.
- Reduce drift at planting by use of a seed lubricant and incorporate the seeds immediately.



Farmer spreading prairie seeds.
Photo: Mike Engel/USFWS

Where can you find more information?

U.S. Department of Agriculture IPM Guidance: <https://directives.sc.egov.usda.gov/OpenNonWebContent.aspx?content=34828.wba>

<https://nac.unl.edu/documents/agroforestrynotes/an35g09.pdf>

U.S. Fish and Wildlife Pollinators: www.fws.gov/initiative/pollinators

Local community organizations, such as Master Gardener Programs and Garden Clubs.

Extension offices, universities, and the Regional IPM Centers <http://www.ipmcenters.org/>.

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U.S. Fish and Wildlife Service

www.fws.gov/initiative/pollinators *Monarch butterfly on a New England aster.*

July 2022 Photo: USFWS

