

the need for pesticide application, and provide many more different native plant, insect and animal species than monocultures. They also provide year-round cover and food for pollinators and other wildlife.

Forestland

Forests provide habitat for a wide range of wildlife, supplies timber, and can be a place for recreation. Over harvesting of forest lands and increasing human encroachment reduces forest acreage which in turn decreases habitat for wild pollinators. Forest management programs that apply toxic pesticides to control weeds or insects can also target forest birds and beneficial insects. It is therefore important that forestry management include organic techniques that do not rely on toxic pesticides, but uses biological and mechanical controls.

What to do...

- Support forest restoration efforts when possible.
- Plant seedlings native to your region.
- Maintain biologically important areas such as virgin and old-growth forests and wetlands.
- Encourage natural succession after harvesting when possible, but active replanting of forest land is also encouraged.

Agriculture

About 20 percent of U.S. land area is cropland. Most of these crops undergo heavy chemical-intensive production. Corn and soybeans, which account for the majority of cropland, are treated with systemic pesticides and/or are genetically engineered (GE) to tolerate pesticide applications. Systemic pesticides and GE cropland not only destroy natural pollinator habitat, but also exposes pollinators and other wildlife to toxic pesticides.

Organic Farming Supports Pollinators

Organic agriculture effects good land stewardship and reduces hazardous chemical exposures in the environment and for workers on the farm. The use of soil building practices, least-toxic chemical inputs and sustainable management methods, which embrace crop rotation and crop diversity help support populations of wild and domestic bees, birds and other wildlife. Find out more about organic agriculture.

What to do...

- Plant an organic vegetable garden or support your local organic co-op.
- Use Beyond Pesticides' Eating with a Conscience database to educate yourself and others about the impacts of chemical use on the food we eat. See www.EatingWithAConscience.org.
- Buy organic whenever possible to support sustainable and environmentally sound practices. See www.beyondpesticides.org/organicfood for resources.



BEE Protective **Managing Landscapes** **with Pollinators-in-Mind**



**BEYOND
PESTICIDES**

For more information, go to:
www.BEEprotective.org

Pollinators are important members of various land ecosystems. How we manage these ecosystems and landscapes therefore plays a critical role in long-term pollinator health. The expansion of urban, suburban, and agricultural areas reduces pollinator habitat and access to food. Intensive chemical use in these areas harms these beneficial organisms. Pesticide applications to manage weeds and insects along roadsides, in forestland, parks, and rights-of-ways expose bees, birds, butterflies and other beneficial organisms to acute and sublethal levels of pesticides,



which can result in reproductive abnormalities, impaired foraging, and even death. Eliminating hazardous pesticide use along with the planting of pollinator forage and habitat areas with native vegetation are the best options for conserving pollinators.

Home and Garden

Backyard trees, gardens and beekeeping are great ways to support biodiversity and pollinators. Intentionally providing water, food and forage to pollinators will encourage and boost pollinator populations in your community.

What to do...

- Plant colorful, flowering plants that are attractive to bees. Don't have a garden? Balcony and window plants are also great ways to support pollinators.
- Encourage birds with bird baths and seed.

Use Least-Toxic Pesticides

Even least-toxic pesticides may impact bees, so proper timing and location of application is important. Particularly, they should not be applied while plants are blooming or during mid-day when pollinators are foraging. The following list includes pesticides that are considered least-toxic by Beyond Pesticides and acceptable for use against pests as a last resort. Be sure not to spray when bees are present:

1. **Fatty acid soaps/ insecticidal soaps**—Effective in controlling many soft-bodied insects such as aphids, caterpillars, crickets, fleas, flies, and mites.
2. **Horticultural and essential oils**—Horticulture oils are effective in controlling a variety of insect pests and some plant diseases like rusts and mildews. Some effective essentials oils include citrus oil, garlic, neem, and tree oils.
3. **Microbe-based pesticides**—Microbial pesticides contain living microorganisms or the toxins they produce as active ingredients. Examples include beneficial nematodes and milky spore.

- Eliminate the use of toxic pesticides. Pesticides kill beneficial organisms, like bees, that provide important ecosystem services.
- Go organic- use organic soil management, pest prevention, and least toxic practices for your lawn and garden. Take the pollinator-friendly *Pesticide Free Zone* at bit.ly/LawnDeclaration.
- Increase biodiversity, which supports pollinators. See bit.ly/DIYbiodiversity.
- See our *BEE Protective Habitat Guide* for more information on bee-attractive flowers, and how to create a pollinator-friendly garden. Available at www.BEE-protective.org.

Roadsides and Rights-of-Way

Millions of miles of roads, utility lines, railroad corridors and other types of rights-of-way (ROWs) are treated with pesticides to control unwanted plants and insects. Some states have addressed the risk of using pesticides along ROWs by developing integrated pest management (IPM) programs, restricting when and where pesticides can be applied on ROWs and/or providing no-spray agreements. Planting native vegetation, using mechanical, biological, and least-toxic vegetation control methods are effective in reducing and eliminating toxic pesticide applications.



What to do...

- Encourage your community to develop an integrated roadside vegetation management program for roadside management.
- Establish a roadside wildflower program that plants native flower and grass species, especially those that are attractive to bees and other pollinators.
- Cut, girdle, mow or use grazing animals when possible as mechanical means to eradicate unwanted vegetation.

Prairies, Meadows, and Other Grasslands

Many species of wildlife depend on prairie and grassland habitat. Unfortunately, these habitats are being replaced by human development, and many grassland birds have declined in recent years due to the lack of grassland habitat. Grass and flower species that are native to your region must therefore be encouraged. Meadows and prairies require minimal disturbance to the landscape, are low maintenance, reduce