More Information About Beneficial Species

The Integrated Plant Protection Center at Oregon State University houses the state-wide Integrated Pest Management program. The Center also runs the Farmscaping for Beneficials program, which undertakes participatory research and education programs with farmers. More information about increasing habitat for natural enemies of pests and weeds can be found at http://ipmnet.org/.

The Xerces Society is a non-profit organization that protects biological diversity through conservation of invertebrates. It works with farmers and scientists across the country to protect habitats that support native bees and natural enemies. More information is available at www.xerces.org.

The Xerces Society for Invertebrate Conservation
4828 SE Hawthorne Boulevard, Portland, OR 97215
503-232-6639 www.xerces.org

NRCS Programs

The USDA's Natural Resources Conservation Service (NRCS) provides financial and technical assistance to support conservation efforts for pollinators and other beneficial insects on farms. For information on NRCS conservation programs, contact your local NRCS or conservation district office. The office nearest you can be located at www.nrcs.usda.gov.

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Farming for Pest Management

Habitat for Beneficial Insects

Many invertebrates, as well as bats and birds, feed upon crop pests and weeds. Providing food and shelter for these useful animals can help suppress unwelcome pest species.

This brochure illustrates how farmers can attract and retain helpful predators and parasites by providing some of the key resources that they require. Many of these practices benefit pollinators and other wildlife as well, and are eligible for support by Farm Bill programs.

Inside, you will find more information and a guide to help you manage your farmland for a wide variety of the natural enemies of crop pests and weeds.

Principles of Farmscaping for Natural Enemies

1. ***Determine which species are most likely to be helpful.*** Find out which predators and parasites feed upon the pests that attack your crops, the time of year they are active, and the additional resources (food and shelter) that they need.

2. ***Know and map farm habitats.*** Identify fields and margins—and the times of year—where plant resources for these beneficial species are lacking.

3. ***Manage your farm to attract and retain natural enemies.*** Use the illustration in this brochure as a guide to protect and enhance valuable habitat and to add appropriate plants and other features.

> *Striking a balance between beneficial organisms and pests is the key to biological pest management on our farm. We don't want to kill off all the bad bugs. We want just enough out there to feed our good ones.*
>
> —John Eveland
> Gathering Together Farm
> Philomath, Oregon

Requirements of Predators and Parasites

Food. Many natural enemies of pests and weeds require plant nutrients for growth, development, and reproduction. They may feed on pollen, nectar, seeds, sap, or plant parts, or consume the honeydew produced by other insects. Many also may benefit greatly from feeding upon additional, non-pest prey on plants in and around the farm.

Shelter. Many natural enemies—both vertebrates and invertebrates—require specific plant habitats for nesting or for over-wintering, and to provide the particular conditions they need in the summer. If critical habitat requirements are missing at key stages in the life cycle of insects, birds, or bats, they will not stay on your farm.

Protection from pesticides and disturbance. Insecticides may be toxic to predatory and parasitic species; herbicides may remove critical plant resources; and intensive cultivation may reduce population densities of these beneficial organisms.

> *Producers who grow dill leaf, mustard greens, arugula, and Asian greens should consider letting them bloom after harvest. In many cases, it's a moot point—bloom just happens.*
>
> —Elanor O'Brien
> Persephone Farm
> Lebanon, Oregon

Getting Started

Here are two things you can do to improve the situation for natural enemies of pests and weeds:

Experiment with one tactic. Establish an insectary flower border or block, as illustrated in this brochure, in a readily accessible location. Observe this habitat regularly to determine whether beneficial species are present when they would be most helpful on your farm.

Avoid a harmful practice. Choose an alternative pesticide that is not toxic to beneficial species, or experiment with reducing intensive cultivations in an area of your farm. Watch to see whether predators and parasites are more active in these areas.

Going Further

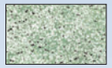
The practices listed in this brochure will generally reduce pests. Many pest species, however, also have specialized predators and parasites that are highly efficient, but these may require specific practices to attract and retain them on your farm. Consult with biological control experts such as university extension workers or other growers to determine what you might do for these species.

What to Expect

Many predators and parasite species have limited dispersal capacity and reproduction rates, and populations may therefore be slow to increase. Don't be surprised if it takes more than one growing season for your habitat improvements to yield results.

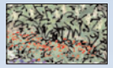
> Common natural enemies include hoverflies, lady beetles, parasitic wasps and flies, spiders, lacewings, predaceous mites, and pirate bugs.

Native Trees
Food and Shelter
Alone or in windbreaks, trees such as conifers, willows, or maples provide resources, travel routes, and safe haven for predators, parasites, and insect-feeding birds year-round.

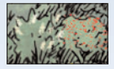


Cover Crops
Food and Shelter
Including cover crops such as buckwheat and clover in planting rotations helps to build soil and add nutrients while providing patches of flowers to support predator and parasite populations.

Sunflowers
Food and Shelter
Sunflowers support alternative prey and provide nectar and pollen for predators and parasites. They also offer escape cover for insect-feeding birds.



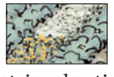
Insectary Blocks
Food and Shelter
Blocks planted with a variety of annuals and perennials such as rose, elderberry, or yarrow can provide resources throughout the year.



Perennial Shrubs
Food and Shelter
Native shrubs such as oceanspray, elderberry, or rose provide pollen, nectar, and home for non-pest prey—as well as undisturbed habitat—for predators and parasites.

Harmful Practices
Cultivation, field burning, and broad-spectrum pesticides disturb or kill natural enemies and their non-pest prey. Reducing disturbance and using selective pesticides and non-chemical controls will help minimize impacts.

Bat and Bird Nest Boxes
Shelter
Bats forage in the air above crops, where they feed upon the flying stages of insects, including pest species. Birds may eat insects and rodents. Providing nest boxes for these animals gives them a home on your farm.



Insectary Field Borders and Strips
Food and Shelter
A variety of strip plantings—blocks of calendula, alyssum, yarrow, or phacelia, for example—interspersed in and around crops are easily managed to provide resources for benefial insects at the times and places where they are most valuable.

Beetle Banks
Food and Shelter
Creating permanent raised banks near fields, and densely planting them with bunch grasses, will provide overwintering habitat for predatory beetles and spiders.

Bolting Crops
Food and Shelter
Retaining bolting or flowering crops for a time after harvest may provide an important nectar source when and where pests are active.

Weedy Patches
Food and Shelter
Patches of innocuous weeds or other annuals allowed to flower along field edges help to provide an unbroken sequence of nectar and pollen during the growing season.

Conservation Cover
Food and Shelter
Sowing crop alleys or field roads with a diverse plant cover can add soil nutrients while providing resources for predators and parasites throughout the year.