

ATTRACTING BENEFICIALS

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Beneficials are insects, animals, mites, or worms that help make pest control easier by reducing pest species. There are populations of pests in landscapes, gardens, and lawns that generally should be controlled to limit damage. If gardens are attractive to these beneficials, they may hang around, reducing pest species and limiting the need for pesticides.

It is not enough to know that some beneficials can be purchased and released in the garden, that many are naturally occurring in the landscape or even which pests these beneficials will control. It is important to know how to keep them in the yard to reduce current and future pest outbreaks.

Predators eat insects. Parasites do not eat their host, but rather lay eggs in the host or in eggs. These insects need a food source that fit their needs.

ADVANTAGES OF RELYING ON BENEFICIALS

- Requires no (or little) work by the gardener.
- No pesticide resistance forms by the host.
- Causes no environmental pollution.
- Beneficials may keep pace with pest populations, in some cases.
- It's "Nature's Way" of keeping problem pests under control.

DISADVANTAGES OF RELYING ON BENEFICIALS

- May take years for beneficials to re-establish in a previously sprayed garden.
- Beneficials may not appear until large pest populations occur.
- Must leave some pest species to provide food. Beneficials may leave the property when available food is gone.
- May eat other beneficials.

- Use of beneficials limits safe spray times for any pesticides.
- Recognition may be a problem. Must know the "good guys" from the "bad guys."
- Should provide "attracting" plants (such as wildflowers) and a water source.
- Must be willing to accept some damage or less-than-perfect plants.
- Beneficials may be hard or nearly impossible to find, especially those that are very small, hide in debris, or feed at night.
- Patience is needed. On construction sites, there are usually few or no beneficials, so the new homeowner sprays to control pests in the newly planted landscape and continues to spray because there are no beneficials. Pesticides use may kill beneficials. A vicious cycle may start unless pesticides are not used at all or are used very carefully and beneficial emergence is considered.

REQUIREMENTS

- Determine which beneficials would be most useful in the garden and know their needs. Better yet, create conditions that will attract a wide variety, known and unknown.
- Learn to identify the beneficials so that they are not confused with pest species. It is easy to confuse lady beetles with Mexican bean beetles, aphid midges with fungus gnats, rove beetles with earwigs, or hover flies with yellowjackets.
- Accept low levels of certain pests so that there will be a food source or egg-laying site for the beneficials.

HABITAT

Shelter and protection

- Forego the manicured lot for less formal hedges and windrows that provide hiding places for birds, toads, and insects.
- Plant a windbreak or install a fence to reduce the hot sun and windblown dust that can desiccate insects.

- Provide permanent mulched beds as undisturbed homes for beneficial ground-dwellers.
- Leave crop residues in the garden and reduce tillage to provide a more stable environment.
- Provide sources of food and water.
- Provide birdhouses or standing dead tree trunks or grow plants that provide nesting areas for birds.
- Provide upside-down flowerpots as homes for toads. Cut a hole in the lip to provide an entrance.
- Avoid using sprays or dusts in the garden that will kill beneficial insects along with the pests. Avoid even botanical pesticides and insecticidal soaps.

Water

- Provide water both above and on the ground that is accessible to a variety of beneficials.
- Provide dry areas in water sources for insects to land by placing rocks or gravel in the birdbath or other shallow container. Birdbaths alone work fine for birds, but are too deep for insects.

Food

- Provide plants that will provide pollen and nectar as food sources for the adult stage of insects that are parasitic on pest insects or their eggs. (See plant list)
- Grow berry-producing trees and shrubs as food for birds. Be sure the plants you select to attract beneficials do not harbor large pest populations.
- Provide artificial food supplements containing whey, yeast, and sugar to supply nutrients for lacewings, lady beetles, and syrphid flies when prey is lacking. Wheast, Bug Pro, BugChow, and PredFeed are some available products.

BENEFICIAL SPECIES

ASSASSIN BUG (predator of flies, caterpillars, et. al.) Naturally present in most gardens

BIG-EYED BUG (predator of aphids, leafhoppers, caterpillars, plant bugs, mites.) Plant clover, soybeans, goldenrod.

BRACONID WASP (parasite of codling moth, elm bark beetle, cabbageworms, hornworm, corn borer, armyworm, aphids, et al.) Grow nectar plants with small flowers, such as dill, parsley, and yarrow.

DAMSEL BUG (predator of leafhoppers, aphids, plant bugs, small caterpillars, and thrips.) Provide unsprayed alfalfa.

GROUND BEETLE (predator of slugs, snails, cutworms, cabbage maggot, Colorado potato beetle larvae, and caterpillars.) Provide untilled permanent beds, perennial plantings, and clover refuges.

HONEYBEE (pollinator) Plant pollen and nectar flowers, provide water, avoid spraying fruit trees when in bloom. If insecticides are needed, apply in evening.

HOVER FLY/SYRPHID FLY (predator of aphids) Plant pollen and nectar flowers; allow flowering weeds to grow. Provide wind shelter.

ICHNEUMON WASP (egg parasite of caterpillars, sawfly and beetle larvae, and other insects. Female may feed on body fluids of host.) Plant pollen and nectar flowers in gardens. Grow flowering cover crops.

LACEWING (predator of corn earworm, aphids, thrips, mites and other small insects.) Plant pollen and nectar sources, provide water.

LADY BEETLE (predator of aphids and soft-bodied pests.) Plant pollen and nectar flowers. Leave weeds such as dandelions and wild carrot.

MINUTE PIRATE BUG (predator of thrips, spider mites, leafhopper nymphs, and other small insects and eggs) Plant pollen and nectar plants.

MITE, PREDATORY (predator of European red mites and other spider mites) Avoid pesticide use. Sprinkle pollen from dandelions on mite-susceptible plants.

NEMATODE, BENEFICIAL (entomopathogen of larval stage of soil insects.) Keep soil moist.

PRAYING MANTIS (predator of all insects, including beneficials.) Avoid pesticides. Provide permanent shrub plantings for egg laying sites

ROVE BEETLE (predator of aphids, mites, springtails, flies, cabbage maggot) Maintain permanent plantings. Mulch planting beds

SOLDIER BEETLE (predator of cucumber beetle, corn rootworm, caterpillars, aphids, grasshopper eggs, and beetle larvae.) Plant goldenrod, milkweed, hydrangea. Maintain permanent beds.

SPINED SOLDIER BUG (predator of caterpillars and sawfly larvae) Maintain permanent beds.

TACHINID FLY (predator of caterpillars, et. al)

TIGER BEETLE (predator of many insects.) Do not use insect light traps. Maintain permanent plantings

YELLOWJACKET (pollinator; predator of flies, caterpillars, et al.) Not necessary to attract. May be serious pest near people.

Also **toads, earthworms, snakes, birds, et. al.**

POLLEN AND NECTAR PLANTS

The adult stage of many beneficial insects eats pollen and/or nectar. When selecting appropriate plants, pick a variety of species that provide constant bloom from spring through fall. Choose small-flowered species that are attractive to the tiny parasitic wasps. Especially attractive to beneficials are:

- **Carrot family plants** (*Umbelliferae*) including **parsley** (*Petroselinium* spp.), **dill** (*Anethum graveolens*), **fennel** (*Foeniculum vulgare*)
- **Mint family plants** (*Labiatae*) including **peppermint** (*Mentha piperata*), **lemon balm** (*Melissa officinalis*), **catnip** (*Nepeta cataria*), **spearmint** (*Mentha spicata*), and **thyme** (*Thymus* spp.)
- **Daisy family plants** (*Compositae*) including **coneflowers** (*Echinacea* and *Rudbeckia* spp.), **yarrow** (*Achillea* spp.), **daisies** (many), **goldenrod** (*Solidago*)

Ageratum (*A. houstonianum*)

Angelica (*A. archangelica*)

Anise (*Pimpinella anisum*)

Aster (*Aster* spp.)

Baby blue eyes (*Nemophila* spp.)

Beebalm (*Monarda* spp.)

Black-eyed-Susan (*Rudbeckia* spp.)

Blanketflower (*Gaillardia* spp.)

Blue mist caryopteris (*C. clandonensis*)

Borage (*Borago officinalis*)

Buckwheat (*Fagopyrum esculentum*)

Butterfly bush (*Buddleia davidii*)

Butterfly weed (*Asclepias tuberosa*)

Calliopsis (*Coreopsis tinctoria*)

Caraway, coriander (*Carum carvi*)

Clovers (*Trifolium* spp., *Melilotis* spp.)

Cosmos (*Cosmos* spp.)

Euonymus (*Euonymus* spp.)

Gayfeather (*Liatris* spp.)

Golden marguerite (*Anthemis tinctoria*)

Ivy (*Hedera* spp.)

Joe-Pye-weed (*Eupatorium maculatum*)

Lavender (*Lavandula* spp.)

Marigold (*Tagetes* spp.)

Onions, garlic chive, etc. (*Allium* spp.)

Raspberries, other brambles (*Rubus* spp.)

Rosemary (*Rosemarinus* spp.)

Russian sage (*Perovskia atriplicifolia*)

Sage (*Salvia* spp.)

Sedum (*Sedum* spp.)

Spike speedwell (*Veronica spicata*)

Sunflowers (*Helianthus* spp.)

Sweet marjoram (*Origanum vulgare*)

Tansy (*Tanacetum vulgare*)

Tithonia (*T. rotundifolia*)

Beneficial insects also visit the flowers of many weeds and wildflowers such as **lamb's quarter, pigweed, dandelion, wild mustards, knotweed, and Queen Anne's lace**. Leave these plants in small numbers in a little corner of the garden. Remove before they set seed.

RELATED READING ON BENEFICIALS

Bradley, F. M. (Ed), *Rodale's Chemical-Free Yard and Garden*, Rodale Press 1991.

Cox, Jeff, *Landscaping with Nature*, Rodale Press, 1991.

Ellis, B.W. and F.M. Bradley (Eds), *The Organic Gardener's Handbook of Natural Insect and Disease Control*, Rodale Press, 1992.

Leslie, Anne R. (Ed.) *Handbook of Integrated Pest Management for Turf and Ornamentals*, Lewis Publishers, 1994.

Rodale's Successful Organic Gardening™ *Companion Planting*, Rodale Press, 1994

Xerces Society Guide: *Attracting Native Pollinators*. Storey Publishing, 2011.

ATTRACTING BIRDS

BEST TREES FOR BIRDS

Alder (*Alnus* spp.)

Ash (*Fraxinus* spp.)

Beech (*Fagus* spp.)

Cherry (*Prunus* spp.)

Crabapple (*Malus* spp.)

Hawthorn (*Crataegus* spp.)

Holly (*Ilex* spp.)
Larch (*Larix* spp.)
Mulberry (*Morus* spp.)
Pine (*Pinus* spp.)
Russian and autumn olive (*Eleagnus* spp.)
Serviceberry (*Amelanchier* spp.)

BEST SHRUBS FOR BIRDS

Barberry (*Berberis* spp.)
Cotoneaster (*Cotoneaster* spp.)
Elderberry (*Sambucus* spp.)
Firethorn (*Pyracantha coccinea*)
Hazelnut or filbert (*Corylus* spp.)
Honeysuckle (*Lonicera* spp.)
Quince (*Chaenomeles* or *Cydonia* spp.)
Viburnum (*Viburnum* spp.)