



UNIVERSITY OF CALIFORNIA
Agriculture and Natural Resources
UC Master Gardeners of Napa County

Healthy Garden Tips

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INCREASING BENEFICIAL ORGANISMS IN YOUR GARDEN

This handout explains steps to naturally control damaging insects in your garden with beneficial organisms. Beneficial organisms (also known as natural enemies, biocontrol agents, and 'good' bugs) control insects that damage your flowers and vegetables. Beneficial organisms can be parasites, predators, or microbes that eat or kill pest insects and mites. The best way to increase beneficial organisms in your garden is to *conserve and enhance* the ones that are already there. You can also try to *attract* additional beneficial insects by planting flowers, shrubs, etc. that attract them and meet other habitat needs. Finally, you can *supplement* or buy certain types of beneficial organisms.

Some examples of beneficial organisms that may already be in your garden are pathogens (fungi and bacteria that attack and kill insects), predators (insects that eat other insects; e.g. lace wing and hover fly larvae, lady beetles and their larvae, spiders, and predatory mites), and parasites (insects that parasitize other insects; e.g., tiny parasitic wasps, midges, and flies.)

CONSERVE AND ENHANCE: PROTECT AND ENCOURAGE THE BENEFICIAL ONES YOU HAVE

Avoid Pesticides Whenever Possible. The most important thing you can do to maintain a healthy population of beneficial organisms in your garden is to avoid using broad spectrum pesticides. Pesticides include insecticides, fungicides, and soil fumigants. Broad spectrum pesticides kill many types of insects and continue to kill for a while after being applied. Sometimes, by killing non-target natural enemies you can create a new problem different from the one you were trying solve. Pesticides should be your last resort!

1. First step is to identify the insects, determine if the insects you observe are pests causing a plant problem. Be sure you know the difference between good bugs and bad bugs; they can look very similar, and sometimes the good bugs can look pretty ugly (e.g. lady beetle larvae). If you need help identifying insects, catch some in a glass or plastic container and bring them to the UC Master Gardeners of Napa County or Agricultural Commissioner's office for correct identification. This way you will know if it is a pest and what if anything needs to be done.
2. Decide how much damage you and the plant can tolerate. When this critical level is reached, choose the least toxic solution that corrects the problem.
3. Choose your least toxic solution. Sometimes a management choice can correct the problem, e.g. move the plant to a more appropriate place in the garden or water appropriately. If possible use a non-toxic solution like a strong spray of water to control aphids on roses or a damp rolled up newspaper to collect earwigs for disposal. Some low toxic options might include soap sprays, oils, microbial agents, and botanical products.

- If you decided a stronger pesticide is needed, make sure it is appropriate for that plant and pest and follow the label instructions exactly. Only use the recommended amount and use it only where needed.

Provide Food, Water, and Shelter. Beneficial insects need food, either in the form of their prey, or in the form of pollen and nectar, or both. Beneficial insects often feed on insects only during their immature stage or adult stage. Many beneficial insects also feed on nectar and pollen in one life stage or supplement their high protein diet with nectar and pollen. You can attract and keep a wide variety of beneficial insects in your garden by planting a variety of plants with various heights, flower colors and shapes, blooming times, and long blooming periods. Providing a continuous variety of blooming flowers will help maintain a beneficial population. Plants with many small blossoms that produce pollen and nectar are especially useful (see table on next page). These types of plants can also be planted in open areas around your garden in what is sometimes called a hedgerow. Keeping your soil healthy by adding organic matter such as compost will keep your plants healthy and provide food for beneficial insects especially those that spend all or part of their cycle in soil.

Exclude Ants. While ants can sometimes be beneficial because they eat insects, insect eggs, aerate the soil and recycle dead animals and vegetable material, they can also be pests. Ants will “farm” aphids and scale by moving them around a plant and protecting them from predators and parasites. The ants do this because they feed on the sweet excretions called ‘honeydew.’ Ants can be excluded by using sticky traps or other non-toxic means at the plant base.

ATTRACT: LURING MORE BENEFICIAL ORGANISMS TO YOUR GARDEN

By providing year-round food, as well as water and shelter, you will make your garden more attractive to all beneficial insects. You can plant in your garden or surrounding unused areas around you garden, plants that specifically attract and support beneficial insects. These areas are sometimes called hedgerows. By doing this you will create an environment that will be attractive to beneficial insects. Some useful plants are listed in the table below.

BUY: PURCHASING BENEFICIAL ORGANISMS

You can purchase a variety of different biological control agents. Although this seems like the fastest way to increase numbers of beneficial organisms in your garden, unless your garden is hospitable to them, you may not see a lot of benefit. If they do not find food and shelter they will migrate out of your garden into your neighbor’s or the one down the street, or die. Also, certain kinds of biological control agents are very specific (e.g., certain types of parasitic wasps attack only one kind of prey.) Insect identification of your target pest is very important.

SMALL FLOWERING PLANTS

Common Name	Botanical Name
Carrot Family	
Caraway	Carum carvi
Coriander (cilantro)	Coriander sativum
Dill	Anethum graveolens
Fennel	Foeniculum vulgare
Bishop’s Flower	Ammi majus
Queen Anne’s Lace (wild carrot)	Daucus carota
Toothpick ammi	Ammi visnaga
Wild Parsnip	Pastinaca sativa
Sunflower Family	
Blanket Flower	Gaillardia
Coneflower	Echinacea spp.
Coreopsis	Coreopsis spp.
Cosmos	Cosmos spp.
Goldenrod	Solidago spp.

Sunflower	Helianthus spp.
Tansy	Tanacetum vulgare
Yarrow	Achillea spp.
Mustard Family	
Basket-of-Gold Alyssum	Aurinium saxatilis
Hoary Alyssum	Berteroa incana
Mustards	Brassica spp.
Sweet Alyssum	Lobularia maritime
Yellow Rocket	Barbarea vulgaris
Wild Mustard	Brassica kaber
Other Plant Families	
Buckwheat	Fagopyrum sagittatum
Cinquefoil	Potentilla spp.
Milkweeds	Asclepias spp.
Phacelia	Phacelia spp.

TREES, SHRUBS AND VINES

Botanical Name	
Butterfly Bush	Buddleia spp.
California Buckeye	Aesculus californica
California Lilac	Ceanothus spp.
Calif. Bay Laurel	Umbellularia californica
Coyote Bush	Baccharis pilularis
Dogwood	Cornus spp.
Elderberry	Sambucus spp.
Honey suckle	Lonicera spp.
Manzanita	Arctostaphylus spp.
Mulefat	Baccharis salicifolia or B. glutinosal
Oaks	Quercus spp.
Rosemary	Rosmarinus officialis
Sage	Salvia spp
Toyon, Calif. Holly	Heteromeles arbutifolia
Wild Rose	Rosa California
Willow	Salix spp.

For more information on beneficial insects please visit the UC IPM website at www.ipm.ucdavis.edu