

## Least-Toxic Control of Aphids

Garden aphids are a common pest particularly in the spring and fall when they start reproducing. Although there are a number of beneficial predators and parasitoids that naturally control aphids, those beneficials rarely arrive until aphid populations have sprung up to begin seriously damaging plants. Given that their numbers can grow to infestation levels within a few days, or take as long as a few weeks if temperatures are cool, it is important to regularly check your plants for aphids to prevent populations from growing, and implement preventative practices before they strike.

Aphids are small-bodied insects that use their slender mouthparts to pierce the stems, leaves, and tender parts of the plant, sucking the fluids out for sugars. Aphids come in a variety of shapes, colors and sizes depending on the species; they can be green, pink, yellow, black or gray. However, they tend to have pear-shaped bodies, with long legs, antennae, and tube-like structures called cornicles that protrude from the back of their torso. These cornicles distinguish aphids from other insects.

### Prevention

- Protect natural predators such as lady bugs, brown and green lace wing beetles, and various flies such as syrphid flies, and aphid gall midges by providing a wide variety of plants, particularly flowering plants.
- Aphids are partial to plants fertilized with too much nitrogen; get a soil test to see your soil composition. If necessary, modify nutrient application favoring slow release fertilizers with a moderate portion of nitrogen such as organic compost, worm castings, fish emulsions, or liquid seaweed.
- Plant repellent companion plants such as any plant in the onion family, coriander, and anise, along with plants to attract beneficial insects (see box).

### Companion Plants to Attractive Beneficial Insects:

- Fern-Leaf Yarrow (*Achillea filipendulina*)
- Dill (*Anethum graveolens*)
- Feverfew (*Chrysanthemum parthenium*)
- Coriander (*Coriandrum sativum*)
- Queen Anne's Lace (*Daucus carota*)
- Fennel (*Foeniculum vulgare*)
- Lemon Balm (*Melissa officinalis*)
- Parsley (*Petroselinum crispum*)
- Marigold (*Tagetes tenuifolia*)

### Monitoring

Most plants can sustain a certain number of aphids without taking significant damage, by regularly examining the undersides of leaves. Early spring is when aphids start to show up, take note of how long it takes for natural predators to control them, and whether and when to take action against these aphids. One study of aphid infestation on roses found that rose buds could sustain as many as 10 aphids per bud before there was significant damage. Low levels of aphid populations will not necessarily damage gardens or trees. However, once plants exhibit wilting, stunting, yellowing and loss of leaves, it

may be time to take steps to control aphid populations. Other signs of aphid infestation include the secretion of honeydew on leaves, a sticky excretion of essentially concentrated sap which may turn black with the growth of fungus. Ants, may in fact be the first signs of aphids, which eat the aphid honeydew. Monitoring for early signs of aphids you may be able to control them before they cause much damage.

Beyond plant damage, aphids also transmit viruses and diseases between plants. Crops that are particularly prone to aphid-transmitted viruses include squash, cucumber, pumpkin, melon, bean, potato, lettuce, beet, chard and bok choy. Similar to flowering plants, aphids cause yellowing, stunting, and curling of leaves, but aphid-transmitted viruses may further damage crops causing eventual plant death.

### Control

- **Prune or pinch off** plant sections or leaves that are heavily infested or wash off and hose down plants. Use water sprays early morning in the morning allows to get rid of aphids, allowing plants to dry off slowly. These methods are effective for low levels of aphid infestation.
- **Two aphid predators are commercially available and effective at control:** The green lacewing, and the convergent ladybug. Before buying these predators take note of how many aphids are on each plant, identifying which plants are more infested for proper application of predators. Plan to make periodic releases throughout the year with the greatest number of predators released the first time.
- **Lacewings** are sold usually in the egg stage although they can also be sold as larvae which are more expensive but more effective at surpassing aphids. For egg application, roll a sheet of paper to form a cone with a small hole at one end and pour the eggs onto each infested plant evenly. For larvae, which are shipped in hex cell packages to isolate each larva, each larva must be tapped out with a pencil over the plant. One larva per plant should be sufficient.
- **Ladybugs** are also commercially available and have a voracious appetite for aphids. However, ladybugs also have the tendency to eat only some of the aphids before leaving in search of new food sources, so the control may be temporary. However, providing healthy and diverse habitats fosters all sorts of beneficial organisms, like ladybugs, that will provide protection year round. When releasing the ladybugs, be sure to do so at dusk to ensure that they remain throughout the night. Mist the ladybugs as well as the plants with water before releasing them. Place them at the base of infested plants or in the crevice of low branches.
- **Pathogens, such as the aphid killing fungi *Beauveria bassiana*** can be applied to soils to weaken the insect's immune system. Thoroughly spray the fungal spores and repeat applications 3 to 5 times to effectively control them.



- If all else fails, spot treatment with least-toxic chemicals can be used. **Insecticidal soaps** are available commercially for aphids which are non-toxic and leave no poisonous residues. Mix with water in a spray bottle and spray over plants.
- **Horticultural oil** in a 2% solution in water can be sprayed on leaves for aphid treatment.
- If insecticidal soap is ineffective, **spray neem oil** over plants.

## References

Olkowski, W., Daar, S., and Olkowski, H. 1991 Common-Sense Pest Control: Least-Toxic Solutions for Your Home, Garden, Pets and Community. Taunton Press: Newtown. Pp: 367-375.

Olkowski, H. 1986. Protecting Roses and Other Plants from Aphids. *Common Sense Pest Control* 11(2): 18-21.

Organic Gardening. 2013. Aphids: What to look for and how to control them. Available at:  
<http://www.organicgardening.com/learn-and-grow/aphids>

Oregon State University Extension Service. 2008. How to control aphids with less toxic methods. Available at:  
<http://www.organicgardening.com/learn-and-grow/aphids>

UC Davis IMP Online. 2013. Pests in Gardens and Landscapes: Aphids. Available at:  
<http://www.ipm.ucdavis.edu/PMG/PESTNOTES/pn7404.html>

University of Connecticut IPM. 2001. Greenhouse Insects: Managing Aphids in the Greenhouse. Available at:  
<http://hort.uconn.edu/ipm/greenhs/htms/ghsaphid.htm>

