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APHIDS AND THEIR MANAGEMENT IN HOME GARDENS

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Aphids, or plant lice, are found on nearly every species of wild and cultivated plant. They are a common pest in Nevada gardens, and can be particularly troublesome during cool, moist conditions. Their feeding results in off-colored, distorted or curled leaves. Aphids obtain their food by sucking fluids from plant tissue. They feed on flowers, foliage, twigs, branches, trunks, or roots of herbaceous and woody plants. Most plants tolerate moderate numbers of aphids. Their excrement, honeydew, is sticky and often signals their presence. Aphids may live entirely on one type of plant, or they may spend part of their development on one host and then move to a different host. Many factors influence the extent of damage caused by aphids. Many species of aphids exist. Employ integrated pest management to reduce their damage—select plants that are unattractive to aphids, release their predators or grow plants that provide predator habitat nearby, use proper cultural practices, and lastly apply pesticides.

Appearance and Life History

Aphids are small, soft bodied insects, about one tenth of an inch long (Fig.1). The giant bark aphid, an exception, may reach one quarter inch or larger. Aphids are typically teardrop shaped and may be winged or wingless. Their long, slender mouthparts are used to pierce plant tissues to suck plant

sap. These ubiquitous insects range in color from pink, yellow, green, gray, deep blue, to black. Some aphids, including the woolly aphids, produce waxy threads to cover their bodies. The covering protects them from adverse conditions and predators.

Most aphids are easily distinguished from other insects by the presence of two tube like projections

called cornicles, or "tailpipes," that project up and out from the rear, upper side of the abdomen. Cornicles are variously shaped and help entomologists distinguish one species of aphid from another. Some aphids, including woolly aphid, lack obvious cornicles.

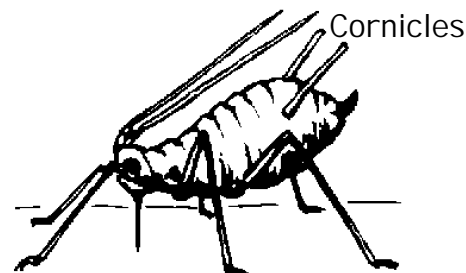


Figure 1. Aphids are sucking insects 1/10 inch long.

Most species of aphids found in Nevada overwinter as eggs. The eggs hatch with warming temperatures in early spring. The newly hatched aphids begin to feed, and complete their development in one to two weeks. These aphids give birth to live young, without mating, at the rate of one to twenty per day. The number of aphids born depends upon the species of aphid, environmental conditions, food availability and

the presence of natural enemies.

Aphids usually develop and feed in colonies. Unlike other insects that feed on plants, they do not disperse when disturbed. Aphid populations normally consist entirely of females, which continue to produce live young, or nymphs, without mating throughout the summer. As they grow, they molt and shed their skins, approximately four times, before they become adults. This may take only two or three weeks during warm weather. The first generations are wingless, but as populations increase and become crowded, winged aphids may develop (Fig. 2). Most of these winged individuals leave



Figure 2. Strawberry root aphid nymph and adult.

the colony. When temperatures begin to drop at summer's end, both male and female aphids are produced. These aphids mate and the female deposits eggs on plants where the eggs overwinter to hatch the next spring.

Damage

Aphids tend to congregate on leaves and shoots, particularly at the tips of new shoots. They prefer the undersides of leaves and fresh, succulent new growth for feeding and protection from the sun and drying conditions. Young, swelling leaf and flower buds are favorite targets. Small seedlings may be severely damaged or killed by aphids, but once plants have five to seven leaves they may "grow through" a

moderate infestation. When abundant, aphids can cause serious damage to larger plants. Some species of aphids have "saliva" that when injected into plant cells during feeding causes abnormal, often twisted, plant growth. This may be the first obvious sign of a heavy aphid infestation. Heavy feeding usually stunts growth, deforms leaves, flowers and fruit, or forms galls on leaves, stems or roots. Leaf distortion from heavy feeding by aphids is commonly seen on leafy vegetables, plum, cherry, honeysuckle and ash. The feeding of several aphid species stimulates the formation of galls on petioles and leaves of woody plants. Aphids may transmit plant diseases, such as viruses, from plant to plant as they feed. These viruses cause yellow, mottled or curled leaves and stunted growth (Fig. 3). Root feeding aphids also slow growth.

In addition, many aphids secrete a sticky, sweet substance called "honeydew".

Honeydew falls onto leaves, patios, vehicles and sidewalks creating a sticky nuisance. Some wasps and ants are attracted to and "harvest" the sweet honeydew for food. To safeguard their source of honeydew, these insects will protect



Figure 3. Aphid-curved leaves reduce plant growth and produce fewer, smaller fruits.

aphids from natural enemies. Often it is a line of ants ascending a tree trunk that first alerts a gardener to an aphid infestation in the top of a tree or shrub. In order to control an aphid population, the ants protecting the aphids may need to be controlled first, then natural predators may be able to reduce the

aphid population and eliminate any additional control measures.

Honeydew often supports the growth of sooty mold that gives landscape plants, fruits, and vegetables a dull, dark cast and makes them undesirable looking. This is very common in southern Nevada. The honeydew and molds can usually be washed off both plant parts and fruits. Fruits are then safe for eating. It is difficult to remove honeydew, mold and aphids from leafy vegetables and crops like broccoli, cauliflower, cabbage and brussel sprouts.

Look for aphids on the windward side of gardens and landscapes. Turn leaves over to find colonies of aphids. Where aphid mummies or carcasses are present, look for and protect predators. They will increase in number and very rapidly control the aphids.

Managing Aphids

Removing debris, weeds and plants susceptible to aphid colonization should be first. Then select and plant species that are least susceptible to aphids. Inspect transplants of vegetables and ornamentals before bringing them into your yard and reject those with aphids. Keeping the numbers of aphids entering your property to a minimum is paramount. Protective covers, reme, plastic tunnels, cloches, screened green-houses and aluminum foil mulch that repels insects have reduced aphids in many crops.

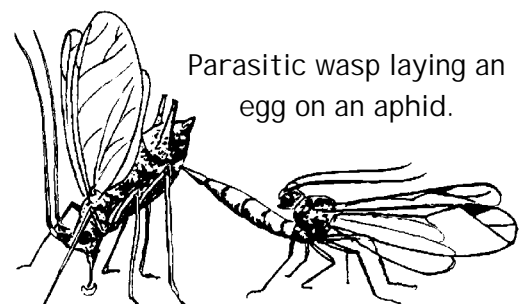
Natural enemies play a very important role in aphid control (Fig. 4). Species of ladybird beetles, lacewings, syrphid fly larvae, small parasitic or predaceous wasps and naturally occurring aphid diseases are common and effective natural enemies of aphids. Plant nectar producing flowers in your garden to encourage parasitic wasps and lacewings to occupy your yard and control aphids.

Reducing the numbers of ants through bating and decreasing the use of

pesticides in the landscape and garden will help to ensure a healthy population of these natural enemies. It is necessary to control the ants tending aphids in order for natural enemies to migrate in and control the aphids. Ants in trees and single-stemmed shrubs are prevented from reaching the aphids by the use of sticky barriers applied around the trunks and branches, or by using baits to kill the ants at their source. In dusty areas, the sticky barrier must be re-applied frequently, as often as it loses its stickiness from being coated with dust.

Good control is obtained by washing aphids from plants with a forceful stream of water. When repeated at regular intervals, this method knocks aphid populations down to acceptable levels. The water also helps to wash away dust and increase humidity, which also helps to control spider mites and powdery mildew on susceptible plants. Where only a few leaves or stems are infested, it is easy to rub and smash aphids by gently pressing the stems or leaves between your fingers. Moderate pruning or leaf picking also reduces aphid numbers.

Aphids are attracted to soft, succulent growth. Avoid over-fertilization with nitrogen fertilizer, especially in spring. This helps to prevent the rapid growth of soft, nitrogen-rich tissue, which is very attractive to aphids. Over-watering, which causes some plants to grow too rapidly, should also be avoided for the same reason. Severe or poorly timed pruning can result in the production of "water sprouts," or suckers, that are prone to aphid attack. Aphids can be particularly troublesome during cool, moist conditions, especially in spring and early summer.



Parasitic wasp laying an egg on an aphid.

Figure 4. Parasitized aphids die in a few days as the predator larvae feed internally on the aphids and grow.

Under most conditions, it is not necessary to use pesticides to control aphids. Natural enemies will do a good job of keeping aphid populations at bay, below an acceptable level. Should you choose to use a pesticide, keep in mind that most insecticides kill natural enemies as well. Select the least toxic chemical available to reduce the impact of the application on the natural enemies of aphids. Spray only the plant, or portion of the plant, that is infested.

Contact insecticides like insecticidal soap and horticultural oils do a good job of controlling aphids. They are less damaging to natural enemies compared to other kinds of insecticides. Because they are contact insecticides, horticultural oils and insecticidal soaps must contact the aphids to be effective. As well, aphids do not easily develop resistance to these products. This is not the case with other pesticides. Some varieties of trees and shrubs, ash, plumb, peach, and rose, are vulnerable to aphid attack year after year. In such cases, apply horticultural oil as a delayed dormant spray. Apply the oil after buds swell but before they

break and leaves begin to develop. Delayed dormant oil applications effectively kill aphid eggs that overwinter on buds, twigs, and the bark of branches and trunks. For a long term solution consider replacing vulnerable trees and shrubs with species that are not prone to aphid problems.

When aphids cause severe leaf curl, contact insecticides do not reach aphids hidden inside the distorted leaves. If there are only a few curled leaves, remove and destroy them or put them in a sealed bag in the trash. Always dispose of infested leaves; they are a source of aphids that could move to uninfested leaves. Alternatively, you may choose to use an insecticide that moves systemically through the plant. Systemic insecticides available to home gardeners *cannot be used on vegetables or fruit trees*, but can be used on most landscape trees and shrubs. Always, read and follow the labeled directions on the pesticide products that you purchase and use.

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