

GROWERTALKS

Features

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Steps to Avoiding Aphids

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Aphids are destructive and economically important insect pests of many greenhouse-grown ornamental and vegetable crops, including chrysanthemum, calibrachoa, geranium, transvaal daisy, tomato and pepper.

Pictured: Aphids on the underside of a calibrachoa leaf.

Aphids feed within the vascular tissues of plants (phloem sieve tubes) using their piercing-sucking mouthparts. They primarily feed on terminal growth, leaf undersides and commonly aggregate in large numbers. Damage associated with aphid feeding includes leaf distortion, plant stunting and wilting.

Moreover, aphids exude honeydew while feeding. Honeydew is a clear, sticky liquid that serves as a growing substrate for black sooty mold. In addition, ants feed on honeydew and protect aphids from natural enemies, such as parasitoids and predators.

The four common above-ground feeding aphid species that may be encountered in greenhouses are: 1) Green peach aphid (*Myzus persicae*); 2) melon/cotton aphid (*Aphis gossypii*); 3) potato aphid (*Macrosiphum euphorbiae*); and 4) foxglove aphid (*Aulacorthum solani*). In addition to above-ground feeding aphids, there are aphid species (*Pemphigus spp.*) that feed on plant roots.

Aphids feed on many different host plants, vector a number of plant viruses and have a high reproductive capacity. Aphids don't have to mate to produce young (parthenogenesis) and many aphids can be produced in a short period of time. For example, it's been reported that in five generations, a single green peach aphid may give rise to 13,552,028 individual aphids.

Plant protection against aphids involves scouting, cultural, insecticidal and biological practices. Scouting crops regularly by visually inspecting plants highly-susceptible to aphids will help to detect aphid populations early during crop production, which will help to time insecticide applications or the release of biological control agents (natural enemies).

Here are the cultural strategies that must be implemented in order to avoid or alleviate problems with aphids:

- 1) Don't over-fertilize plants (especially with water-soluble nitrogen-based fertilizers), as this increases plant susceptibility to aphids. In addition, aphids may produce more young than normal.
- 2) Remove weeds from within and outside the greenhouse, as many weeds serve as a refuge for aphids. Furthermore, certain weeds serve as an inoculum source for the viruses transmitted by aphids.

Using insecticides & biocontrols

There are two types of insecticides used against aphids: contact and systemic. Contact insecticides will kill aphids by direct contact; systemic insecticides can be applied as a granule or drench to the growing medium where the active ingredient is taken up by the root system and translocated or distributed throughout the plant. As aphids feed within the phloem sieve tubes, they ingest a lethal concentration of the active ingredient and are subsequently killed.

When using insecticides, be sure to rotate different modes of action in order to mitigate aphid populations developing insecticide resistance.

Here are three ways to effectively use insecticides against aphids:

- 1) Timing:** Apply insecticides early in the production cycle before aphid populations build-up to damaging levels.
- 2) Coverage:** When spraying an insecticide, be sure to obtain thorough coverage of all plant parts, including leaves, stems, flowers and fruits.
- 3) Frequency:** Apply insecticides within timely intervals, which is dependent on the residual activity of a given insecticide. Always read the label for information affiliated with frequency of application.

Factors that result in insufficient suppression of aphid populations when using insecticides include:

- 1) Failure to implement a scouting program.
- 2) Using inappropriate insecticides.
- 3) Poor coverage of plant parts with insecticide spray application.
- 4) Improper timing of insecticide application.
- 5) Extended insecticide application intervals (not frequent enough).
- 6) Not rotating insecticides with different modes of action.
- 7) Watering heavily immediately after applying a systemic insecticide to the growing medium as a granule or

drench.

The use of biological control or releasing natural enemies is an option for regulating aphid populations. However, natural enemies must be released early in the production cycle in order to maximize the effectiveness of biological control.

In addition, when implementing a biological control program, be sure to control ants, which protect aphids from their natural enemies and move aphids among plants.

Natural enemies (parasitoids and predators) commercially available for use against aphids are:

Parasitoids:

- * *Aphidius colemani* (green peach and melon/cotton aphids)
- * *Aphidius ervi* (potato and foxglove aphids)
- * *Aphidius matricariae* (tobacco aphid)
- * *Aphelinus abdominalis* (wide range of aphid species)

Predators:

- * *Aphidoletes aphidimyza* (predatory midge)
- * *Chrysoperla* spp. (green lacewing)
- * *Adalia bipunctata* (predatory ladybird beetle)

In conclusion, in order to avoid problems with aphids:

1) Immediately dispose of plants heavily infested with aphids; 2) avoid over-fertilizing plants with water-soluble nitrogen-based fertilizers; 3) scout crops regularly to detect the presence of aphids early in the crop production cycle; 4) when applying insecticides, make frequent enough applications and thoroughly cover all plant parts; and 5) when implementing a biological control program, be sure to control ants and release natural enemies (parasitoids and predators) early in the crop production cycle. **GT**

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