

PARASITIC WASPS FOR APHID CONTROL IN A GREENHOUSE

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FACT SHEET

Growing in indoor environments, such as greenhouses, involves unique strategies for addressing pest issues. One method for controlling insect pests in an indoor environment is the use of a biological control, such as another insect that inhibits the growth of the pest population. This fact sheet addresses the use of parasitoid wasps to control aphids in greenhouses.

PEST

Aphids are insects that damage crops directly by transmitting plant viruses as they feed on tender leaves and buds. They also excrete a substance termed honeydew, that encourages the growth of grey mold. Uninterrupted, aphid populations grow exponentially, causing serious damage.



Cotton aphid (*Aphis gossypii*) leaf damage
Photo Credit: Queensland Government, Department of Agriculture and Fisheries

PARASITOID

A parasitoid is an insect with a parasitic larval stage. These insects lay their eggs inside a host organism, where the larval stage develops, feeds on the host, and kills it in the process. Aphids can sometimes be effectively controlled with parasitoid wasps. The first three life stages of the wasp (egg, larva, pupa) occur inside the aphid. Each female wasp can parasitize hundreds of aphids.



Aphidius colemani parasitizing *Aphis gossypii*
Photo Credit: BIOPLANET

CHOOSING THE RIGHT PARASITOID FOR THE JOB

Parasitoids are often host-specific. This means that one wasp species will not work for any and all aphid infestations. Identification of the aphid species in question is essential. Growers can predict which aphid species are likely to become an issue based on the crops being grown. Aphelinidae and Aphidiinae (Hymenoptera: Braconidae) are two important parasitoid wasp groups for aphid control.

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INDOOR GROWING TECHNIQUES

Parasitoid wasps can be a great first line of defense against aphid infestations in a greenhouse, but they will need to be purchased and maintained. Wasps are available commercially and arrive in aphid mummies. Maintaining banker plants with aphids to build a parasitic wasp population before an infestation starts and maintaining a strong parasitoid population is necessary for effective control of aphids. Growers should start their banker plants 6 weeks before their greenhouse plants. Growers should start with two banker plants per acre of greenhouse and add one banker plant per acre per week after that. Step-by-step information on how to schedule banker plant and parasitoid wasp integration into a greenhouse, as well as propagation techniques, can be found at tinyurl.com/AphidBankerPlantSystem.



Cereal banker plant for *Aphidius colemani*
Photo Credit: Plant Products

OTHER BIOLOGICAL CONTROL ORGANISMS FOR APHIDS

Other biological control methods can also be used to suppress aphid populations, including predators and fungi. Lady beetles are some of the most well-known and commercially available aphid predators. There are many others, including syrphid fly larva, soldier beetle adults, predacious midges, and minute pirate bugs. Although predators can compete with parasitoids and will consume parasitized aphids, killing the wasp inside, the overall effect of pairing these two biological control methods is generally still a net positive for aphid population control. Other biological control methods used to control aphids, such as entomopathic fungi, cannot be paired with parasitoid wasps because the wasps are susceptible to it as well.

ABIOTIC METHODS FOR APHID CONTROL

When using parasitoid wasps for aphid control, growers must be conscious of the abiotic methods used as well. Parasitic wasps are susceptible to many pesticides. Horticultural oil and insecticidal soap, however, are far more damaging to aphids than to parasitoids.

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