

Aphid Pests of Cole Crops in Missouri

Aphids are a serious pest. Aphid colonies create a sugary secretion that leads to fungus on plants. Produce with fungus is not marketable, and the plants will wilt or even die.

Introduction

Aphids (Hemiptera: Aphididae) are small, soft-bodied insects that remove plant sap through their piercing-sucking mouthparts. The leaves affected by aphids can curl and crinkle or form cups completely lined with aphids. If the infestation is severe, the plants wilt and die. Aphid colonies and the sugary secretion (honeydew) they produce can lead plants to develop a fungus (sooty mold). This makes the produce less marketable or unmarketable.

Several aphid species can be serious pests of cole crops, which include broccoli, Brussels sprouts, cabbage, cauliflower, etc. The cabbage aphid (Photo 1), *Brevicoryne brassicae*, is the most common aphid species in cole crops. The mustard aphid (Photo 2), *Lipaphis erysimi*, and the green peach aphid (Photo 3), *Myzus persicae*, also attack cole crops.

Identification and Life Cycle

The cabbage aphid is grayish-green. Its body is covered with a waxy material. Mustard and green peach aphids have no waxy covering on their bodies. The cabbage aphid possesses a pair of tube-like structures on the posterior end called cornicles. These are relatively shorter than in the mustard and green peach aphids. In addition, cabbage aphids occur in clusters. They can infest plants at all growing stages. The other two species occur singly and infest younger plants.

All aphid species have similar life cycles. In warmer climates, a female has two ways to reproduce. Without mating, called asexual reproduction, she gives birth to nymphs (immature stage). At this point, all aphids in a colony are female. In temperate climates, when the temperature decreases and the



Photo 1. Cabbage aphids (covering entire stem)



Photo 2. Mustard aphid



Photo 3. Green peach aphid



Dr. Roshan Manandhar

Postdoctoral Fellow
Sustainable Pest Management Systems
Integrated Pest Management (IPM)
program and

Dr. Jaime Piñero

State Extension Specialist –IPM

900 Chestnut Street, Allen Hall
Jefferson City, MO 65101
(573) 681-5543

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days shorten in the fall, males are produced and mate with the females. The mated females lay eggs. These eggs will last during the winter season and is called the overwintering stage. As soon as the temperature rises in the spring, the eggs hatch. The cycle then resumes with asexual reproduction. Winged aphids are produced due to overcrowding and/or when the host plant is of a lower quality. As a result, aphids scatter and infest new host plants.

Management Options

Biological control: Parasitic wasps (called parasitoids) and predators (insects and other arthropods such as spiders that eat other organisms) can naturally reduce cabbage aphid numbers in the field. In general, after aphids infest crops, there are increases in the populations of beneficial insects. *Diaeretiella rapae* is a common parasitoid of cabbage aphids. The female parasitoid lays an egg inside aphid nymphs. Each egg hatches into a larva that feeds on the inside of the aphid. This stage of the aphid is killed internally by the parasitic wasp; it is called a mummy (Photo 4). When it is fully developed, an adult parasitoid emerges from the mummified aphid by making an exit hole. Ladybugs, syrphid fly larvae and lacewing fly larvae are common aphid predators. To help these beneficial insects, it is necessary to protect their habitats and reduce insecticide use. It is also helpful to plant insectary plants, such as buckwheat and sweet alyssum, to support beneficials. They can then aid in reducing aphid numbers in the field.

Cabbage aphid outbreaks can be caused by the use of broad-spectrum insecticides that disrupt the activity of beneficial insects. Protected production sites (e.g., greenhouses, hoop houses, row covers) might help aphids reproduce. Such sites exclude beneficial insects and favor pest outbreaks. Most insecticides that are sprayed to control pest caterpillars should also kill aphids; however, the microbial biopesticide *Bacillus thuringiensis* var. *kurstaki* is specific to caterpillars.

Cultural control: Field sanitation can reduce aphid populations. To do so, remove alternate hosts, such as weeds in the mustard family. Plow and destroy plant debris in and near the field. This usually kills the overwintering eggs of aphids. This makes for less infestation in the next planting season. If there are aphid outbreaks, use crop rotation: plant a series of non-host crops for cabbage aphids. This can suppress aphids in the next cole crop planting. Row covers that keep out aphids are also useful. However, any aphid that is overlooked can quickly reproduce inside the row covers. And, under the row covers, beneficial insects cannot access the aphids.

Chemical control: Insecticides are one way to suppress aphid populations. There are a number of reasons to use insecticidal soaps and oils to control aphids. For example, soaps and oils have little negative impact on beneficial insects. Insecticidal options, including reduced-risk insecticides and biopesticides, are listed in the *Midwest Vegetable Production Guide for Commercial Growers* (available at <http://www.btny.purdue.edu/pubs/ID/ID-56>). It is always best to limit the use of insecticides. This conserves helpful predators and parasites.

References:

Blackman, R. L., and Eastop, V. F., 1984. *Aphids on the World's Crops: An Identification and Information Guide*. John Wiley & Sons, Ltd.: Chichester, UK.

Capinera, J. L., 2001. *Handbook of Vegetables Pests*. Academic: New York.

Midwest vegetable production guide for commercial growers 2015. <http://www.btny.purdue.edu/pubs/ID/ID-56>

Gill, H. K., Garg, H., and Gillett-Kaufman. 2013, J. L., *Cabbage Aphids*. EENY-577. Entomology and Nematology Department, University of Florida: Gainesville, FL.

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Photos 1, 3, 4: Whitney Cranshaw, Colorado State University, Bugwood.org

Photo 2: Alton N. Sparks, Jr., University of Georgia, Bugwood.org



Photo 4. Aphid mummy parasitized by *D. rapae*