

UPDATE ON APHIDS AND THEIR MANAGEMENT

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Aphids are small, fragile insects which feed by inserting slender mouthparts into the phloem tissue of plants and sucking out sap.

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North Carolina greenhouse growers continue to report difficulty in controlling aphids this spring. Aphids, especially green peach aphids and melon aphids, have acquired resistance to an impressive array of synthetic pesticides which at one time were effective for aphid control. Aphids are small, fragile insects which feed by inserting slender mouthparts into the phloem tissue of plants and sucking out sap. Aphids excrete honeydew, and they also molt as they grow. Infested plants are often disfigured by the honeydew, by the molted skins which adhere to the honeydew and by sooty molds (dark fungi) that grow in the honeydew. Aphids are the only insects which have a pair of cornicles on the abdomen (Figure 1). Dennis Warkentin (1988) termed aphids "the most important pest of mums," by he says lots of problems can be prevented. It is important to monitor for aphids. In the greenhouse, aphids reproduce by giving birth to live young. Aphids are often wingless but when the population becomes dense or the host plant becomes unsuitable, young aphids often develop wings and migrate elsewhere.

The green peach aphid is a pale green to yellow green, smallish insect (2 to 2.4 mm long) with long, laid-back cornicles (which are slightly swollen) and tiny knobs on the inside of the base of the

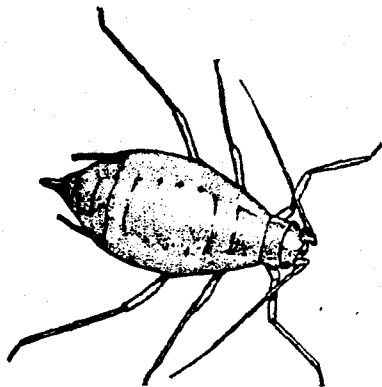


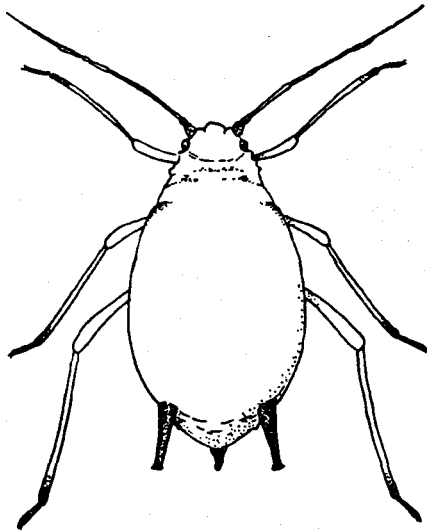
Figure 1. A wingless green peach aphid.

The melon aphid has relatively short, dark cornicles and no knobs on the insides of the bases of the antennae.

antennae which slant inward (Figure 1). The green peach aphid is shaped somewhat like a fat football. The winged forms have a black patch on the top of the abdomen. The green peach aphid is resistant to many insecticides and tends to persist on floral crops after repeated pesticide applications. It feeds on a wide variety of plants. In the southern United States, the green peach aphid apparently maintains parthenogenetic reproduction throughout the year. The green peach aphid is resistant to many insecticides and feeds on a wide variety of plants. Halbert and Mowry (1992) found green peach aphids infesting bedding plants in commercial outlets in Idaho in every community surveyed! Eighteen percent of cole crops, 36 percent of the forget-me-nots, 41 percent of the petunias, 42 percent of the peppers and 53 percent of the egg plants were infested. Although mums are not a favored host, this aphid infests it readily. In a mum crop, from weeks one to four the aphids reproduce rapidly. As the plants grow the aphids move down further into the foliage from the tips. As flower buds form, the aphids move to just below the buds. As the buds open, the green peach aphids move into the flowers. Because the resistance to some pyrethroids is almost complete, do not use pyrethroids for green peach aphids as that will merely scatter the population. One grower reported that Mavrik™ at 18 times the labeled rate did not control his aphids! ("Fattened them up.")

The melon aphid has relatively short, dark cornicles and no knobs on the insides of the bases of the antennae (Figure 2). The wingless form of the melon aphid is somewhat pear shaped and 1.0 to 1.5 mm long. This is a yellow to dark green aphid. The winged melon aphid has a black head and thorax, and the antennae and cornicles are slightly longer than those of the wingless adults (Figure 3). Melon aphids feed on plants in 25 families including many ornamentals and vegetables. This aphid apparently overwinters as wingless adults in plant debris in the southeastern United States from

Figure 2. An adult wingless melon aphid.



which they emerge periodically to feed on perennial weeds. In the spring, a new generation of winged adults flies to other hosts. Each female produces an average of 84 nymphs. Most nymphs develop into wingless adults unless the host becomes crowded in which case most nymphs develop into winged forms. Ladybird beetles and their larvae and syrphid maggots feed upon melon aphids. These aphids are often parasitized by braconid wasps in greenhouses in spite of relatively heavy applications of pesticides. Of the pesticides tested for toxicity to aphid parasites in the greenhouse, Dursban™ is the most toxic to aphid parasites and Orthene™ was the least toxic. Grafton-Cardwell (1991) found that the resistance to pesticides of various populations of melon aphids on cotton varied significantly within California. She also found that the nymphs of melon aphids which were developing wings are 2 to 3.7 times more resistant to Dursban™ than wingless adults (!) perhaps due to higher levels of enzymes called esterases which detoxify pesticides.

Control

Winged forms of aphids readily disperse by air. Aphids start flying at light intensities of 100 to 1,000 fc and by midday, tremendous numbers of aphids may be flying. Dickson (1959) found that 75 miles of desert was not a sufficient barrier to prevent a massive migration of aphids into melon patches. Based on the numbers of aphids he caught in the air, he estimated the

number of aphids which would visit each plant to be 2,000 aphids per hour, but actual counts showed that about 3,000 aphids per hour alighted on each plant! Once aphids become airborne, their color preference changes from bright blue to yellow (Kennedy et al., 1961). This is one reason that yellow, sticky traps are effective in luring aphids. It is also a good reason to forbid greenhouse workers from wearing yellow or yellow-green clothing because aphids may be inadvertently carried into the greenhouse on such clothes. Consider screening the intake vents and doorways of greenhouses to prevent aphids from flying or being blown in. Typar™ screening (spun polypropylene fabric) is effective at screening out aphids and is relatively resistant to weathering. Screening with Typar™ requires at least twice as much screening area as evaporative cooling pad area.

Soaps, oils and Orthene™ seem to be the most effective pesticides currently labeled for resistant green peach aphids. Butler et al. (1991) found that plant-derived oils and detergents were effective at reducing melon aphids populations 87 to 95% on cotton. Growers in North Carolina report that Talstar™, Avid™ and Orthene™ do not always give 100% control. The inconsistency of performance by these chemicals is not surprising as the aphids in greenhouse situations undoubtedly have had different backgrounds of exposure to pesticides.

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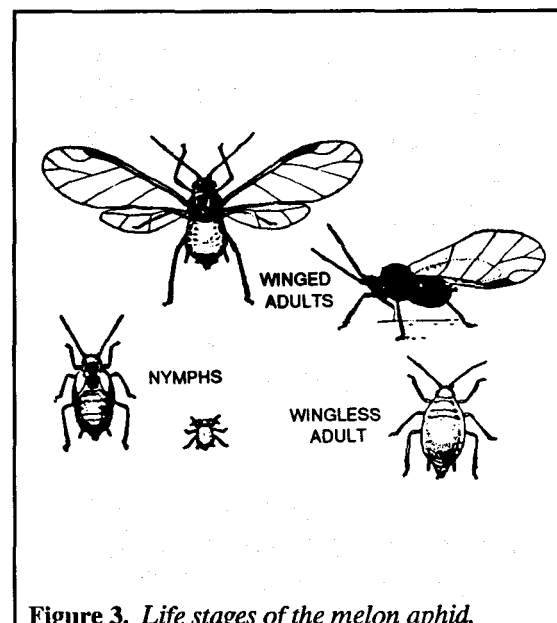


Figure 3. Life stages of the melon aphid.

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