Apple & Crabapple Insects

Homeowners and small producers can produce useable apples in South Carolina with minimal insect damage if they are aware of the potential pest problems. Some insecticide applications may be necessary even under the best of conditions.

**Pests Attacking the Leaves**

There are several pests or groups of pests that feed on apple leaves. Most of these cause little real damage to the tree and are often best left alone. There are many natural enemies that feed on these pests.

**Aphids:** Aphids are a fairly common problem on apples. There are two major kinds that can build up to fairly high numbers during the summer. These are the green apple aphid (*Aphis pomi*) and the spirea aphid (*Aphis spiraecola*). Both of these aphids have green bodies. The adult aphids may have wings or be wingless. Aphids are common on the tender young leaves on branch tips and on watersprouts. While feeding, the aphids produce honeydew. This is a liquid, which is rich in sugars. Black sooty mold often grows on the honeydew. Aphids have many generations a season.

Aphids are attacked by lady beetles, syrphid fly larvae and other predators and parasites. In many cases, these beneficial insects may keep the aphids under control if insecticide treatments are avoided. Insecticidal soap or 1% horticultural oil sprays will help keep aphids under control with little impact on beneficial insects.

**Mites:** Two-spotted spider mites (*Tetranychus urticae*) and European red mites (*Panonychus ulmi*) can be serious pests of apples. If mite populations are high, the feeding activity can reduce the quality of the current crop and reduce flower bud set for the following year. While both mites produce the same type of damage, there are some significant differences.

Two-spotted spider mites on leaf. Whitney Cranshaw, Colorado State University, www.ipmimages.org

Two-spotted spider mites spend the winter as mature females hiding in protected places on the ground near the tree. In the spring, they begin feeding on the vegetation under the tree. Later, they move up into the tree and begin to feed on the apple leaves.
European red mites spend the winter in the egg stage. The eggs are laid on the tips of the twigs around the rough bud scars. When numbers are high, the twigs will have a reddish appearance. The mites remain in the tree throughout the season.

Both mites have several generations per season. This makes multiple spray applications necessary.

The most effective treatment for the European red mites (ERM) is a 2% horticultural oil spray (5 tablespoons oil per gallon of water) applied between the green tip stage and tight cluster (before the blooms open) for good early season mite control. This will smother both the eggs and the recently hatched mites. Since ERM can go from egg to an adult ready to lay more eggs in about a week, two applications of 1% horticultural oil at 10 to 14 days apart will help control the established populations during late spring and summer.

Similarly, the same early season 2% horticultural oil spray will kill the over-wintering two-spotted spider mite females, and later 1% sprays will greatly reduce summer populations. However, do not spray captan or sulfur within 10 days before or after a horticultural oil spray, as leaves or developing fruit may be burned.

**Japanese Beetle:** The Japanese beetle (*Popillia japonica*) adults feed on the leaves during June and July. The beetles feed on the soft leaf tissue and leave the leaf veins. This gives damaged leaves a lacy appearance. Occasionally, they may feed on damaged fruit. The insecticide carbaryl (such as in GardenTech Sevin Concentrate or a fruit tree spray containing carbaryl as one active ingredient) is very effective against the adult beetles. However, repeated use of Sevin will cause mite populations to explode. Because of this, it is best to leave the adult beetles alone in most cases. Do not apply carbaryl within 30 days after bloom.

Traps may be used to suppress Japanese beetles, but the traps must be placed at least 50 feet away from the plants to be protected. The traps will draw in adult beetles. If the trap is too close to the plant to be protected, the beetles may stop and feed for a while before entering the trap.

**Leafrollers:** There are a number of leafrollers (*Archips* species, *Choristoneura rosaceana* and *Sparganothis sulfureana*) that feed on apple leaves. The biggest problem with leafrollers is that sometimes they will tie the leaves to the fruit and feed on both the surface of the fruit and on the leaves. There are a number of predators and parasites that feed on the leafroller caterpillars. If an insecticide treatment is needed, one of the *Bacillus thuringiensis* (B.t.) materials, such as Thuricide, will not harm the natural enemies of the leafrollers and will kill the young caterpillars.

**Leafminers:** The spotted tentiform leafminer (*Phyllonorycter* species) is an occasional pest on apple trees. Usually, the worst damage is found on trees that have been heavily sprayed.
The young leafminer caterpillars feed inside the leaf. At first they feed on the sap present in the leaf. Later, they feed on the leaf tissue. This causes the leaf to pucker giving the upper leaf surface a tent-like appearance. Heavy mining damage can reduce the quality of the current year’s crop and reduce flower bud set for the following year. There are two very efficient parasites of this pest. Usually, the parasites keep the leafminers in check. However, if a treatment is necessary, spinosad is a less toxic alternative and has systemic laminar activity. This means it will penetrate the apple foliage to kill the leafminers inside. An example is Ferti-lome Borer, Bagworm & Leafminer Spray Concentrate.

Pests Attacking the Fruit

**Codling Moth:** The proverbial wormy apple probably has the immature of the codling moth (*Cydia pomonella*) in it. This is probably the number one apple pest in the world. The mature caterpillars (larvae) leave the apples in the fall and spin a silk shelter under loose bark. They spend the winter in this shelter. In the spring, they change to the adult moth. The moths emerge shortly after bloom and lay eggs on leaves near fruit clusters. The larvae enter the young fruit at the calyx end where the petals were attached. Another generation of moths occurs in July. These moths lay eggs directly on the surface of the fruit. Again, the larvae burrow to the core of the fruit and feed. A third generation occurs in August.

Insecticide treatments must be directed toward the adult moths or the newly hatched larvae. Once the larvae enter the apples they are totally protected. Parasites and predators feed on the eggs and larvae.

Sprays with *B.t.* (Thuricide), spinosad (Bonide Captain Jack’s Dead Bug Brew Concentrate or Monterey Garden Insect Spray Concentrate), or carbaryl (GardenTech Sevin Concentrate) will control the codling moth caterpillars if applied before they enter the fruit. Do not apply carbaryl within 30 days after bloom.

**Tarnished Plant Bugs & Stink Bugs:** Tarnished plant bugs (*Lygus lineolaris*) and stink bugs (*Acrosternum* species and *Euschistus* species) will both feed on the young fruit. As the bugs penetrate the fruit with their needle-like mouthparts they inject saliva that kills the plant cells around the puncture. They then suck the juices from the fruit. As the fruit continues to grow, depressed areas appear around the feeding sites. Homeowners do not have good insecticides available for controlling these pests. Keeping early blooming weeds cut in the area where the apple trees are growing reduces the number of plant bugs.

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Plum Curculio: The plum curculio (*Conotrachelus nenuphar*) is a native weevil that may attack apple fruit. The adult weevils spend the winter in protected areas near the apple trees. They return to the trees in the spring after three or four days when the temperature is above 70 °F. After petal fall, the female weevil will make a crescent-shaped cut through the fruit skin and insert an egg under the flap. Usually, the larva will be killed by the rapidly growing fruit. The scar will show up at harvest. If the fruit becomes infested it will be misshapen and often will drop to the ground. Insecticide sprays applied immediately after bloom may reduce plum curculio damage. Do not apply carbaryl spray to apple trees within 30 days after bloom. Removal of wild plum in the area and practicing sanitation around the apple trees will reduce the problem. Pick up prematurely fallen fruit and dispose of them.

Pests Attacking the Branches, Trunk & Roots

San Jose Scale: One of the most important pests of the branches is the San Jose scale (*Quadraspidiotus perniciosus*). The adult scale insect is about 0.1 inch in diameter. It has a grey cover that hides the insects. Scale insects have thread-like mouthparts that are inserted into the bark. They feed on the sap. There are four generations a year in South Carolina.

A single female scale can produce about 400 young over a six-week period. The young are called crawlers and move to a new area. They then settle down, insert their mouthparts, begin to feed and secrete the covering over their body. When populations are high, the crawlers may settle on the fruit. This produces a red measles-like spot on the ripe fruit.

Heavy scale infestations can kill individual branches. The best control for scale insects is a thorough spray application of 2% horticultural oil on the trunk and limbs in the late winter or early spring. This should be applied before the leaf buds begin to open. During the growing season, either insecticide sprays or 1% horticultural oil sprays will kill the crawlers. Insecticide sprays will not kill the scales once the cover is secreted.

Aphids: Usually aphids are considered a pest of the leaves. The woolly apple aphid (*Eriosoma lanigerum*) feeds on the bark of small twigs, around pruning cuts, and also on the roots of apple trees. The feeding causes the tree to form knobby galls. This can occur on twigs and on the roots. Heavy damage can reduce the vigor of the tree.
Woolly aphids are covered with a mass of long wax filaments. This gives them their common name.

The above-ground forms can be controlled with insecticide sprays (such as with malathion or a fruit tree spray containing malathion) or horticultural oil sprays. These should be applied whenever colonies of the aphids are present. Root feeding colonies cannot be controlled.

Woolly apple aphids on twig.
Whitney Cranshaw, Colorado State University, Bugwood.org

**Borers:** Apple trees that are under stress from planting, drought or other causes may be attacked by the flatheaded appletree borer (*Chrysobothris femorata*). This borer is found primarily on young trees. The adult beetles are about ½ inch long, somewhat flattened, and vary from dark metallic brown to dull gray. The larvae are legless, yellow to yellowish-white and have a broad, flattened area immediately behind the head. Mature larvae are 1½ inches long.

The larvae damage the trees by boring in the trunk and main branches. The galleries will be filled with sawdust-like frass or excrement. Infested trees will often have cracks in the bark that ooze sap. Initial attacks are usually on the sunny side of the tree. Eventually the galleries can girdle the tree and cause death of the tree.

Adult beetles are present from late spring to November. There is one generation a year. Vigorous trees will often produce enough sap to drown the larvae in the galleries. The only good control is to keep the trees healthy and vigorous. Water trees weekly during periods of heat and drought.

Occasionally, apple trees will go into a slow decline. Close examination of the roots will show the damage from Prionus root borers (*Prionus* species). These borers may attack weak trees, and they may also attack young trees that are planted in an area that was recently cleared of hardwood trees. The larvae of this borer can survive for several years feeding on dead roots. Since the life cycle of this pest is at least five years, the larvae grow to a very large size. Mature larvae may be as large as a man’s finger. There is no control for this pest.

Fruit Bagging
Though products are available at gardening stores for homeowners, many gardeners are not inclined to use pesticide applications for home fruit production. Instead, hobbyist gardeners may use bags to protect fruit from pests and diseases. Clemson University has tested and is promoting the use of specialty bags that, if used properly, allow for production of high
quality fruit with very little pesticide input. The bags are recommended for use in a three step fashion: (i) properly take care of your trees to minimize tree stress; (ii) protect your fruit from pests and insects between bloom and the day of bagging; and (iii) enclose ½ to ¾ inch, green fruit (typically 3 weeks after bloom) with a specialty bag to be removed at harvest. If the apple fruit are bagged, the bags should be removed approximately 3 weeks prior to harvest to allow the fruits to color properly. For purchase information and use instructions please see: Clemson Fruit Bags or simply google this page using the key words “Clemson Fruit Bags”.

Clemson Fruit Bag developed for the home orchard and hobbyist fruit gardener will work on apples and peaches. Guido Schnabel, ©2015, Clemson University.