Blossom-end Rot

If you have tomatoes with a sunken, brown leathery patch on the bottom of the fruit, you probably have blossom-end rot. Though most common on tomatoes, blossom-end rot can also affect squash, peppers and watermelons. Not a disease, this condition is caused by a lack of calcium in the developing fruit. It is often assumed that this means there is a corresponding lack of calcium in the soil. This is not necessarily the case, especially in Kansas. Most Kansas soils are derived from limestone, which is partially made up of calcium.

So what causes blossom-end rot? Actually, there are a number of possible causes, especially on tomatoes. Let's look at some of them.

- Tomato tops often outgrow the root system during cooler spring weather. As long as it is cool, the root system can keep up. When it turns hot and dry, the plant has a problem, and water — with the calcium it carries — goes to the leaves and the fruit is bypassed. The plant responds with new root growth and the condition corrects itself after a couple of weeks.

- Heavy fertilization, especially with ammonium forms of nitrogen, can encourage this condition. Heavy fertilization encourages more top than root growth and the ammonium form of nitrogen competes with calcium for uptake.

- Anything that disturbs roots such as hoeing too deep can encourage blossom-end rot. Mulching helps because it keeps the soil surface cooler and therefore a better environment for root growth.

- Inconsistent watering can be a factor. Keep soil moist but not waterlogged. Mulching can help by moderating moisture levels over time. You should also avoid damaging roots and watch fertilization. But there are some years you do everything right and the condition shows up due to the weather. In such cases, remember that blossom-end rot is a temporary condition, and plants should come out of it in a couple of weeks. You may want to pick off affected fruit to encourage new fruit formation.

Soils with adequate calcium will not benefit from adding additional calcium. If your soil is deficient in this nutrient, add 1 pound gypsum per 100 square feet. Gypsum is calcium sulfate.
and will not affect pH. Though calcium raises pH, sulfate lowers it and the two cancel each other out. Even if not needed, gypsum will not hurt anything.

We have also found that spraying plants with calcium doesn't work. The fruit's waxy surface doesn't allow absorption of the material and calcium does not move from the leaves to the fruit. (WU)

**ORNAMENTALS**

**Dutch Elm Disease (DED)**

People often assume that all of our American Elms have been killed by Dutch elm disease. Fortunately, such is not the case. Though many have survived thus far, the number diminishes each year, with some years being more severe than others. We are seeing numerous examples of Dutch elm disease on American elms this year. Though American elms are the species often associated with this disease, red and some hybrid elms are also susceptible. Siberian elm (sometimes referred to as Chinese elm) and the true Chinese elm (lacebark elm) are considered resistant but not immune to the disease.

Early diagnosis can help save recently infected trees. Look for branches with leaves that have wilted and suddenly turned yellow to brown. Remove a portion of the branch and peel back an area of the bark. If you notice brown streaking in the sapwood, you may have Dutch elm disease. Healthy bark is more cream-colored and the streaking is absent. Suspect wood should be submitted to the diagnostic lab and control measures started immediately.

Dutch elm disease can often be controlled through the use of systemic fungicide injections, judicious pruning of affected trees and removal of nearby diseased elms. However, trees infected through root grafts with nearby infected elms or those in which the disease has reached the main stem cannot be saved. Therefore, preventative measures have a better chance of success and are preferred. Fungicides labeled for Dutch elm disease include Arbotect and Alamo. The Arbotect fungicide is preferred because it is the most persistent with a three-year interval between injections. A trained arborist should administer injections. These treatments are quite expensive. Check with your local arborist for current prices. (WU)

**Leaf Scorch on Trees and Shrubs**
We have been seeing leaf scorch appearing on various trees and shrubs around the state. This is not a disease but rather a physiological problem associated with damaged roots, limited soil area, or hot, dry winds. Moisture is lost so quickly from the leaves that the roots can't absorb and transfer water quickly enough to replace what is lost. Though scorch is usually associated with droughty periods, it can appear even when the soil is moist.

Scorched leaves turn brown or, in some cases, turn black from the edges and between the major veins. If severe, the leaf may drop. Leaves may be affected over the entire tree or may be affected only on one side. White pines are also prone to this condition due to the delicacy of the needles. Though rare, we have also seen damage on Colorado blue spruce this year with about an inch of new growth turning brown. These tips will eventually fall off though some homeowners knock them off to improve the appearance of the trees.

Though scorch can be due solely to the weather, the condition of the roots of plants can make them much more susceptible to this condition. Shallow soils such as those over hardpan or rock lead to a limited root system that may not be able to absorb all the water needed. Trees may be more sensitive to scorch this year because of the heavy rains many areas received this spring. Though soils were recharged, in many cases so much rain was received that oxygen was driven from the soil resulting in root damage. That root damage is now making it more difficult for trees to provide all the water needed for the leaves. Also, root damage due to disease, insects, poor drainage or construction can cause poor water uptake.

To help alleviate damage due to dry soils or limited root systems, water once per week if there is no rainfall. Mulching small trees or shrubs will help conserve moisture. (WU)

**FRUIT**

**June Drop of Fruit**

Fruit trees have started their annual "June drop" with apples, peaches, and apricots losing excess fruit. Small, weak, or poorly pollinated fruit is usually the first to go, but dropped fruit may look as good as what's left on the tree.

June drop is a natural process to ensure that the fruit that remains matures. Often, remaining fruit must be thinned to maximize size and quality. Here are suggested spacings for commonly grown fruit. Note that these spacings are averages. Fruit may be closer together in places. Use these as a
 guideline when thinning fruit.

**Apples:** 4 inches.

**Apricots:** 2 inches.

**Peaches:** 6 to 8 inches. Start thinning after June drop six to eight weeks after full bloom.

**Pears:** Require little fruit thinning. 'Bartlett,' 'Hardy,' and 'Bosc' may set heavy crops of three to five fruits per spur and need hand thinning to 1 to 2 per spur. Thin 50 to 70 days after full bloom.

**Plums:** 1 to 3 inches. (WU)

### PESTS

#### Stalk Borer

If you have noticed vegetable or garden plants suddenly wilt for no apparent reason, look for stalk borers. Though there are other insects that bore into vegetable plants (squash vine borer, for example), this insect can feed on a wider variety of species (about 175). Though there are so many plants that can be attacked, we have been noticing damage primarily on peppers and tomatoes. Usually the whole plant wilts but sometimes only a branch is affected.

It is the larva of this moth that causes damage by tunneling inside stems. The larva is unique in appearance with a single white line running down the back and a white line on each side of the body that is visible near the head and the rear but is interrupted in the middle of the body with a purple band. The head capsule is a brownish-tan color.

If you look at affected plants closely, a small hole will be present in the side of the stem. Splitting the stem will reveal the larva. Some gardeners will slit the stem, remove the larva and wrap the stem back together. Our heat and wind often results in this operation being unsuccessful. Fortunately, damage is sporadic with usually only a plant here and there being affected. Also, there is one generation a year and so once the first attack is over, the problem doesn’t reoccur. Insecticides are ineffective against this insect. (WU)

#### Bagworms Are Here So Beware!

Well, it is that time of year, which you have been nervously anticipating—dealing with that insect pest called the bagworm, Thyridopteryx ephemeraeformis. Yes, bagworms are out-and-about feeding on different trees and shrubs. So, what can you use to minimize the damage caused by bagworm caterpillars? Well, a number of insecticides labeled for control or
suppression of bagworms include acephate (Orthene), Bacillus thuringiensis subsp. kurstaki (Dipel, Thuricide), cyfluthrin (Tempo), trichlorfon (Dylox), indoxacarb (Provaunt), chlorantraniliprole (Acelepryn), and spinosad (Conserve). Some of these active ingredients are often available and sold under different trade names. Furthermore, several of these materials may not be available to homeowners. Insecticide applications are most effective on the young caterpillars. Older caterpillars in the bags may be 3/4 inch long and are more difficult to control or obtain sufficient mortality. Furthermore, females tend to feed less as they prepare for reproduction, which reduces their susceptibility to insecticide sprays and any residues. The bacterium Bacillus thuringiensis is highly active on young caterpillars; however, the material must be ingested to be effective, so thorough coverage of all plant parts is essential. Spinosad (Conserve) works by contact and ingestion, and is extremely effective in suppressing bagworm populations. Cyfluthrin (Tempo), trichlorfon (Dylox), and indoxacarb (Provaunt) are typically used against the larger caterpillars. Again, thorough coverage of all plant parts is essential, especially the tops of trees and shrubs, where bagworms commonly initiate feeding.  (RC)

Millipede Invasion

Millipedes are elongated wormlike arthropods. They can be differentiated from centipedes by virtue of the number of legs per body segment. Whereas centipedes have a single pair of body legs/segment, millipedes have 2 pairs.

The life cycle of millipedes extends over a period of years. Depending of conditions, development from egg to adult may require 2 - 4 years, with adults living additional years. Thus over time, millipede populations build up (especially) in heavily wooded areas which satisfy their preference for shaded and moist environments where they primarily feed on decaying organic matter, notably leaf litter.

For reasons unknown, whether under extremely dry or wet conditions, millipedes “march.” This is when people report “invasions of worms.” And although millipedes are harmless (they do not bite or sting), they may sometimes feed on tender garden crops. The most common complaint, however, is that their mere presence is disconcerting. They are mostly observed around daybreak when massing on sides of buildings, patios/decks, driveways and sidewalks and decorative rocks. Especially on hot sunny days, they rapidly disappear as they seek protective shelter/cover, only to re-emerge during the ensuing evening.

Frustrations arise when attempting to control millipedes. Millipedes seek “hiding places” ---- any available crack or crevice in the soil, under bark mulch, under landscape stonework/gravel/plastic ground cover, leaf litter in and around homes (especially in country/wooded settings), up and down the bark of trees, etc. Elimination of these protected sites is impractical and impossible. Insecticides registered for use as perimeter treatments will eliminate those millipedes in the target area. However repeated applications will be required for the duration of millipede movements. Another nuisance factor: the dead millipedes will have to be swept up and disposed of. The best news is that millipede activities stop as suddenly as they began!  (BB)
Twospotted Spider Mite

The warm weather that we are experiencing throughout the state of Kansas and will experience later on means it is time to be on the lookout for damage caused by the twospotted spider mite, *Tetranychus urticae*. Twospotted spider mite is considered a warm-weather mite because, in general, populations are primarily active from late spring through early fall. Summer temperatures allow twospotted spider mites to reproduce rapidly, so that they overwhelm natural enemy populations, which under “moderate” temperatures are able to regulate them.

Twospotted spider mite has a very broad host range, feeding on a diversity of ornamental trees and shrubs including ash, azalea, black locust, elm, euonymus, maple, oak, poplar, redbud, and rose. Twospotted spider mite will also feed on many herbaceous annuals and perennials such as marigold, pansy, aquilegia, buddleia, clematis, daylily, delphinium, phlox, rudbeckia, salvia, Shasta daisy, and verbena.

Twospotted spider mite adults are oval and approximately 1/16 inch long. They vary in color from green-yellow to red-orange. Adults possess two lateral dark spots that are visible when the spider mite is viewed from above (hence the common name). Both adults and nymphs may be present on plant parts; however, they are often more numerous on older leaves. Populations of twospotted spider mite produce fine silk, which may be seen between leaves, and the petiole and stem. Webbing produced by twospotted spider mites protects them from natural predators. Heavy rainfall may disrupt and remove the webbing.

Twospotted spider mites feed on leaf undersides, removing chlorophyll (the green pigment) from individual plant cells with their stylet-like mouthparts. They feed near the leaf midrib and veins because this is where the highest concentrations of amino acids are located. Leaves are stippled in appearance, with silvery gray to yellow speckles. Heavily-infested leaves appear bronzed, turn brown, and eventually fall off. The warm and dry conditions of summer favor rapid development of twospotted spider mite populations, in addition to enhancing feeding and reproduction. The life cycle from egg to adult occurs within 5 days at temperatures >75°F. Twospotted spider mite females don’t have to mate to reproduce laying up to 300 eggs during their two to four-week lifespan.

Twospotted spider mite management involves maintaining plant health, implementing sanitation practices, and/or using pest control materials with miticidal activity (miticides). First of all, it is important to avoid exposing plants to any type of “stress” by maintaining proper watering, fertility, and mulching since this may reduce any potential problems associated with twospotted spider mite populations. For example, inadequate moisture or overfertilizing plants, particularly with nitrogen-based fertilizers, may enhance development and reproduction of twospotted spider mites. It is always best to monitor for twospotted spider mite populations by knocking the spider mites off plant parts such as branches or twigs onto a white sheet of paper. This allows you to easily observe the spider mites. Plant-feeding spider mites typically leave a green streak when
crushed whereas predatory mites leave a red streak. A very effective and rapid method to deal with twospotted spider mite populations are to apply a forceful water spray throughout the plant canopy. This will dislodge eggs and the motile life stages (larvae, nymphs, and adults), and also preserves any natural enemies. The removal of plant debris and weeds eliminates overwintering sites. In addition, many broadleaf and grassy weeds are hosts for twospotted spider mites.

Pest control materials with miticidal activity recommended for suppression of twospotted spider mite populations outdoors include abamectin (Avid), acequinocyl (Shuttle), bifenazate (Floramite), etoxazole (TetraSan), hexythiazox (Hexygon), potassium salts of fatty acids (Insecticidal Soap), and petroleum or paraffinic-based oil (horticultural or summer oil). Be sure to read the label and make applications before twospotted spider mite populations are extensive and causing aesthetic injury. Many pest control materials used to suppress other insects such as plant-feeding beetles and caterpillars may be harmful to the natural enemies of twospotted spider mite, which may lead to an inadvertent increase in twospotted spider mite populations. (RC)

What Happened to My Honeysuckle Bush?

Honeysuckle aphid (*Hyadaphis tataricae*) or honeysuckle witches-broom aphid is one of the most destructive insect pests of bush-type honeysuckles and damage is quite apparent in landscapes during this time of year. Aphids cause plant injury by injecting toxins or growth regulator-type substances with their saliva (spit) during the feeding process. The substances contained in the saliva stunt new growth causing twigs to branch into clusters called—“witches broom.” Affected plants appear red-streaked, curled, with dwarfed leaves. This makes plants less aesthetically pleasing (although I personally think this enhances their aesthetic quality) in the landscape and infected branches may die during the winter. In general, feeding by honeysuckle aphid will not kill plants.

Honeysuckle aphids overwinter as eggs, which are laid during the fall in buds and/or on the tips of branches. Eggs hatch in spring, into wingless females, when the leaves on honeysuckle plants are expanding. Aphids that develop from eggs can give birth to live offspring (young) without mating (this is referred to as parthenogenesis). These aphids initiate feeding when leaves have fully-expanded. Honeysuckle aphids are 1/16 inch long, cream-colored and feed on new shoots on leaf undersides and in leaf folds. Aphids tend to remain in the folded leaves, which protect them from natural enemies and weather. There may be multiple generations during the summer with only winged females being produced; however, in early to mid-fall winged males and females may be present. Mated females lay their eggs on honeysuckle shrubs.

Honeysuckle aphid management includes the use of resistant varieties of honeysuckle, proper cultural practices, and use of insecticides. Honeysuckle varieties that have demonstrated to be tolerant of honeysuckle aphid are Arnold Red, Clavey’s Dwarf, and Emerald Mound. There may also be newer varieties that exhibit tolerance to honeysuckle aphid. Appropriate watering and fertilization practices can also alleviate problems with this insect pest. For example, avoid over-watering and over-fertilizing plants, especially with nitrogen-based fertilizers, as this may prolong infestations by stimulating succulent shoot growth. It is important to prune out, at least
6.0 inches below the initial damage, any witches-broom growth before buds break so as to remove overwintering eggs. In addition to removing the unsightly witches-broom growth, pruning may reduce the severity of future outbreaks by eliminating a majority of the honeysuckle aphid population early in the season. However, any pruning that occurs after eggs hatch may lead to the production of new leaf growth that is highly susceptible to honeysuckle aphids thus resulting in extensive damage.

Systemic insecticides recommended to manage or suppress honeysuckle aphid populations include acephate (Orthene), imidacloprid (Merit and many generics), and dinotefuran (Safari). These insecticides should be applied in the spring when new leaves are expanding and before newly-hatched aphids initiate feeding. In addition, these insecticides may provide suppression of aphids within the leaf folds. Repeat applications may be warranted depending on the timing of application and extent of the infestation. Acephate may provide suppression for a month whereas imidacloprid and dinotefuran should give season long suppression. The benefit of using systemic insecticides is the long residual activity and preservation of natural enemies such as ladybird beetles that will prey upon the aphids in the leaf folds. Be sure to always read the label for instructions on how to properly apply systemic insecticides. (RC)

Squash Vine Borers

In last week’s Kansas Insect Newsletter, I reported that Jake Weber reported that he captured his first squash vine borer in a pheromone trap in his garden in Columbus.

A couple of days later, Rebecca McMahon reported that she had captured her first squash vine borer (May 28) in a pheromone trap the Sedgwick County’s Master Gardener’s Vegetable Demonstration Garden. And here in Manhattan, I trapped my first squash vine borer on June 4. By knowing when moths are active, gardeners can be on the alert and inspect plants for the eggs of squash vine borers. And that is what Rebecca did.

While I have “read-the-books” regarding squash vine borers (not a new insect by any means ---- I have early literature dating back nearly 100 years ago), I have seen squash vine borer moths and squash vine borer larvae. I have never seen their eggs. But Rebecca did, and she took an excellent photograph of the eggs which look as described in the literature: small (1 mm) flattened brownish eggs glued on plant stems and leaf stalks, especially near the base of the plant.

One recommended tactic against various insect pests is to use row covers to exclude the pest from the plant. In her communication, Rebecca made the point that the eggs were found on a plant which was not under a protective row cover ---- giving credence to the “exclusion tactic”. If eggs are located, they can be removed ---- Rebecca said that they easily flaked off. Of course, care must be taken to “catch them” ---- if left on the ground, the eggs will continue their development, and larvae will seek out the adjacent plant into which they will borer.

As plants grow, it may be very difficult to easily inspect plants for eggs as squash vine borer
moth activities continue. And row covers will eventually have to be removed in order to allow bees access to flowers for pollination and the development of squashes. Thus it may be that a series of protective insecticide sprays be applied to kill newly emerged larvae before they are able to borer into plants. As far as making a specific insecticide recommendation: there currently are 377 products registered for use against squash vine borers. People need to go to retail outlets to see what products are being marketed in their respective locales. (BB)

Contributors:
Ward Upham, Extension Associate; Ray Cloyd, Entomologist; Bob Bauernfeind, Entomologist

To view Upcoming Events: http://tinyurl.com/fswqe

Horticulture 2010  E-mail Subscription

For questions or further information contact: Hort WebMeister.

Brand names appearing in this publication are for product identification purposes only. No endorsement is intended, nor is criticism implied of similar products not mentioned.

“Knowledge for Life”
Kansas State University Agricultural Experiment Station and Cooperative Extension Service