**D’s Notes 7-2-18**

**Fair**

 On Thursday, July 12, at 7:00 p.m., the 2018 Diamond Jubilee Hodgeman County Fair will kick off with the horse show and a youth ball game. Check online at <http://www.hodgeman.k-state.edu/> or in the newspaper for the fair schedule.

**Hornworms on Tomatoes**

     Hornworms are the largest larval insect commonly seen in the garden. Though usually seen on tomato, they can also attack eggplant, pepper, and potato.

     The larval stage of this insect is a 3 ½- to 4-inch long pale green caterpillar with five pair of prolegs and a horn on the last segment. The two most common hornworms are the tobacco hornworm (seven diagonal white stripes and, most commonly, a red horn) and the tomato hornworm (v-shaped markings with a horn that is often blue or black).

     The adult of the tobacco hornworm is the Carolina sphinx moth. The five-spotted hawk moth is the adult of the tomato hornworm. Both moths are stout-bodied, grayish-colored insects with a wing spread of 4 to 5 inches.  The larva is the damaging stage and feeds on the leaves and stems of the tomato plant, leaving behind dark green or black droppings.

     Though initially quite small with a body about the same size as its horn, these insects pass through four or five larval stages to reach full size in about a month. The coloration of this larva causes it to blend in with its surroundings and is often difficult to see despite its large size. It eventually will burrow into the soil to pupate. There are two generations a year.

     This insect is parasitized by a number of insects. One of the most common is a small braconid wasp. Larvae that hatch from wasp eggs laid on the hornworm feed on the inside of the hornworm until the wasp is ready to pupate. The cocoons appear as white projections protruding from the hornworm's body. If such projections are seen, leave the infected hornworms in the garden. The wasps will kill the hornworms when they emerge from the cocoons and will seek out other hornworms to parasitize.

     Handpicking is an effective control in small gardens.  Though large, these larvae are surprisingly difficult to see.  Missing foliage is often the first clue that you have an interloper.   Bt (Dipel, Thuricide), spinosad (Conserve; Colorado Potato Beetle Beater Conc; Captain Jack's Dead Bug Brew, Monterey Garden Insect Spray), cyfluthrin (Bayer Vegetable & Garden Insect Spray) and other insecticides may also be used to control hornworms. (Ward Upham)

**Squash Bugs**

     Squash bugs are the grey, shield-shaped bugs that feed on squash and pumpkin plants. If you have had problems with these insects in the past, you know that they are almost impossible to control when mature.

This is because the squash bugs have a hard body that an insecticide has difficulty penetrating. Thus, spraying when the insects are small is important. We are now seeing the nymphs of the first generation. These nymphs will eventually become adults, which will lay eggs that will become the second generation. The second generation is often huge and devastating. Therefore, it is important to control as many squash bugs now as possible.

     Because squash bugs feed by sucking juice from the plant, only insecticides that directly contact the insect will work. General use insecticides such as permethrin (Bug-B-Gon Multi-Purpose Garden Dust; Green Thumb Multipurpose Garden and Pet Dust; Bug-No-More Yard and Garden Insect Spray; Eight Vegetable, Fruit and Flower Concentrate; Garden, Pet and Livestock Insect Control; Lawn & Garden Insect Killer), malathion, and methoxychlor provide control if a direct application is made to young, soft-bodied squash bugs. This means that you MUST spray or dust the underside of the leaves because this is where the insects live. (Ward Upham)

**Do Not Over-Fertilize Tomatoes**
    Though tomatoes need to be fertilized to yield well, too much nitrogen can result in large plants with little to no fruit. Tomatoes should be fertilized before planting and side dressed with a nitrogen fertilizer three times during the season.
    The first side dressing should go down one to two weeks before the first tomato ripens. The second should be applied two weeks after the first tomato ripens and the third one month after the second. Common sources of nitrogen-only fertilizers include nitrate of soda, urea, and ammonium sulfate. Blood meal is an organic fertilizer that contains primarily, but not exclusively, nitrogen. Use only one of the listed fertilizers and apply at the rate given below.
    Nitrate of soda (16-0-0): Apply 2/3 pound (1.5 cups) fertilizer per 30 feet of row.
    Blood Meal (12-1.5-.6): Apply 14 ounces (1.75 cups) fertilizer per 30 feet of row.
    Urea (46-0-0): Apply 4 ounces (½ cup) fertilizer per 30 feet of row.
    Ammonium Sulfate (21-0-0): Apply 0.5 pounds (1 cup) fertilizer per 30 feet of row.
    If you cannot find the above materials, you can use a lawn fertilizer that is about 30 percent nitrogen (nitrogen is the first number in the set of three) and apply it at the rate of 1/3 pound (3/4 cup) per 30 feet of row. Do not use a fertilizer that contains a weed killer or weed preventer.  (Ward Upham)

**New Potatoes**
    Many gardeners look forward to harvesting new potatoes this time of year. New potatoes are immature and should be about the size of walnuts. Pull soil away from the base of the plants to see if the tubers are the desired size. If they are, dig entire plants and allow the skins of the exposed tubers to dry for several hours before gathering.
    These young potatoes are very tender and prone to the skin "slipping" unless they are given a few hours to dry. Even then these immature potatoes will not store well. Red-skinned varieties are often preferred as they are the earliest to produce. (Ward Upham)

**Tomato Leaf-Spot Diseases**
    Two common leaf-spot diseases will likely appear on tomato plants soon if they haven't already. Septoria leaf spot and early blight are both characterized by brown spots on the leaves.
    Septoria leaf spot usually appears earlier in the season than early blight and produces small dark spots. Spots made by early blight are much larger and often have a distorted "target" pattern of concentric circles. Heavily infected leaves eventually turn yellow and drop. Older leaves are more susceptible than younger ones, so these diseases often start at the bottom of the plant and work up. Mulching, caging, or staking keeps plants off the ground, making them less vulnerable. Better air circulation allows foliage to dry quicker than in plants allowed to sprawl.
    Mulching also helps prevent water from splashing and carrying disease spores to the plant. In situations where these diseases have been a problem in the past, rotation is a good strategy. It is too late for that now, but keep it in mind for next year. Actually, rotation is a good idea even if you have not had problems in the past. But many gardens are too small to make it practical. If you have room, rotate the location of the tomatoes each year to an area that has not had tomatoes or related crops (peppers, potatoes, eggplant) for several years.
    If rotation is not feasible, fungicides are often helpful. Be sure to cover both upper and lower leaf surfaces, and reapply fungicide if rainfall removes it. Plants usually become susceptible when the tomato fruit is about the size of a walnut. Chlorothalonil is a good choice for fruiting plants because it has a 0-day waiting period, meaning that fruit can be harvested once the spray is dry.
    Chlorothalonil can be found in numerous products including Fertilome Broad-Spectrum Landscape and Garden Fungicide, Ortho Garden Disease Control, GardenTech Daconil, Bonide Fungonil and others. Be sure to start protecting plants before these diseases are first seen if they have been a problem in the past. It is virtually impossible to control these diseases on heavily infected plants.
    If chlorothalonil doesn't seem to be effective, try mancozeb (Bonide Mancozeb Flowable). Note that there is a five-day waiting period between application and when the fruit can be harvested.
    You may wish to pick some tomatoes green just before you spray if you use Mancozeb as the tomato fruit will ripen inside. (Ward Upham)

**How Healthy is My Tree?**
    We have had a great deal of winter damage this year due to a lack of moisture and warm temperatures interspersed with sharp drops in temperature.  So how do you determine the health of your tree?
    One of the most important clues in determining the health of your trees is the amount of new growth that tree produces. A healthy tree should have a minimum of 4 to 6 inches of new growth each year. Check branches with the tips in the open and not shaded by the tree itself. Anything less than 4 inches on the majority of branches suggests the tree is under a great deal of stress.
    So, how do you tell where the new growth stops? Look for a color change in the stem. New growth is often greener than that from the previous year. There is also often an area of what looks like compressed growth where growth transitions from one year to the next.
    Lastly, look at leaf attachment. Leaves are only produced on current seasons' growth. Therefore, new growth stops where leaves are no longer attached directly to the twig but to side branches. However, pay attention as leaves may be appear to be attached directly to last year's growth but are actually borne on short spurs. If you look closely, you can tell the difference.
    All this clue tells you is whether a tree is under stress or not. It does not tell you what is causing poor growth. This year, the most common cause by far is environmental stress caused by the warm, dry winter.
    Stress is cumulative.  In other words, trees may not have completely recovered from stressful conditions that occurred several years ago.  The accumulating stress may have damaged root systems. In some cases, root systems were damaged enough that those trees may struggle as we enter summer. Though the roots were able to keep up with moisture demands during the cooler spring weather, they may not be able to as temperatures rise. Such trees may suddenly collapse and die or slough off branches they can no longer support. If possible, water to a depth of 12 inches every couple of weeks we do not receive rain in order to avoid further stress. (Ward Upham)

**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.  If blossom-end rot has been a perpetual problem, try using calcium nitrate (15-0-0) as your fertilizer.
    - 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 usually 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. In Hodgeman no calcium needs to be added.  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. (Ward Upham)

**Pulling Onions**
    Onions are ready to harvest when about half the plants have tops that have fallen over. This is a sign that the onions are mature and need to be pulled out of the ground. Bulbs may sunburn without the foliage to protect them. The secret to onions keeping well is to allow the tops to dry completely before storage. Move onions to a shaded, well-ventilated area after harvest.
    After tops are completely dry, store in a cool, dry location. Large-necked onions take more time to dry than small-necked onions such as Bermuda types. Avoid storage in plastic bags because the lack of air circulation will shorten storage life. Use an open, mesh bag instead. (Ward Upham)

**Vegetables Produce Flowers But No Fruit**
    If you have vegetables that are blooming but not setting fruit, you may have a problem with flower pollination. There are several possible reasons for this that usually vary by species. One condition that can affect several species at the same time is over fertilization. Too much nitrogen causes the plant to emphasize vegetative growth, often to the detriment of fruit production.  Over fertilization can lead to a delay in flower production and a decrease in fruit set among the flowers produced.
    Squash, cucumbers, watermelon, and muskmelon can have a couple of other problems. First, the early flowers on these plants are usually all male. The production of both male and female flowers becomes more balanced as time passes. You can easily tell the difference between the two because only the female flower has a tiny fruit behind the blossom. If you have both, have not over-fertilized, and still have a problem, make sure you have pollinators.
    Look for the presence of bees visiting the plants. If you don't see any, try hand-pollinating several flowers.  Use a painter's brush to transfer pollen from the anther of the male flower to the stigma of the female flower. If you get fruit on only those flowers you pollinated, you need more pollinators.  Make sure you aren't killing them with overuse of insecticides.  If you must use an insecticide, spray near dusk when the flowers have closed.
    Tomatoes are wind pollinated and therefore not dependent on pollinators. But they have another possible problem which is temperature. Tomatoes normally won't set if the night temperature is below 50 due to sparse pollen production. They also won't set when nighttime temperatures are above 75 degrees F and daytime temperatures are above 95 degrees F with dry, hot winds.  Under such conditions, fertilization is not completed and no fruit develops.  (Ward Upham)

**Bagworms: They Have Arrived…and Not From Outer Space!**

Bagworms, Thyridopteryx ephemeraeformis, are emerging from eggs, and the young caterpillars are out-and-about feeding on plants. Eventually bagworms will be present throughout the rest of Kansas feeding on both broadleaf and evergreen trees and shrubs. Therefore, now is the time to initiate action against this insect pest. Bagworms are primarily a pest of conifers but have expanded their host range to include a number of broadleaf plants, such as; rose, honeylocust, and flowering plum. Hand-picking small caterpillars (along with their accompanying bag) and placing them into a container of soapy water will kill them directly. This practice, if feasible, will quickly remove populations before they can cause substantial plant damage.

For those not really interested in enjoying the nice hot weather and hand-picking, a number of insecticides are labeled for use against bagworms including those with the following active ingredients (trade name in parentheses): acephate (Orthene), Bacillus thuringiensis subsp. kurstaki (Dipel), cyfluthrin (Tempo), lambda-cyhalothrin (Scimitar), trichlorfon (Dylox), indoxacarb (Provaunt), chlorantraniliprole (Acelepryn), and spinosad (Conserve). Most of these active ingredients are commercially available and sold under various trade names or as generic products. Several insecticides, however, may not be directly available to homeowners. The key to managing bagworms with insecticides is to apply early and frequently enough to kill the highly susceptible young caterpillars that are feeding aggressively on plant foliage. Older caterpillars that develop later in the season are typically more difficult to kill with insecticides. Furthermore, females feed less as they prepare for reproduction, which reduces their susceptibility to spray applications and any residues. The bacterium Bacillus thuringiensis subsp. kurstaki is active on young caterpillars but the active ingredient must be consumed or ingested to be effective.

Therefore, thorough coverage of all plant parts and frequent applications are required. The insecticide is sensitive to ultra-violet light degradation and rainfall, which reduces residual activity. Spinosad is the active ingredient in a number of homeowner products, including: Captain Jack's DeadBug Brew and Monterey Garden Insect Spray. The insecticide works by contact and ingestion (stomach poison); however, activity is greatest when ingested. Products containing spinosad can be used against older or larger bagworm caterpillars later on in the season. Acephate (Bonide Systemic Insect Control), cyfluthrin (Bayer Vegetable & Garden Insect Spray), gamma-cyhalothrin (Spectracide Triazicide), trichlorfon, chlorantraniliprole, and indoxacarb can be used against both the young and the older caterpillars. However, thorough coverage of all plant parts, especially the tops of trees and shrubs, where bagworms commonly start feeding, and frequent applications are essential in achieving sufficient suppression of bagworm populations. The reason multiple applications are needed is that bagworm eggs do not hatch simultaneously but hatch over a certain period of time depending on temperature, and young bagworms can 'blow in' (called 'ballooning') from neighboring plants on silken threads. If left unchecked, bagworms can cause significant damage and ruin the aesthetic quality of plants. In addition, bagworms can actually kill plants, especially newly transplanted small evergreens, since evergreens do not usually produce another flush of growth.  (Raymond Cloyd)

**“How Much Water Does a Cow Need?”**

 Most cattle producers fully understand the importance of water. After all, providing an adequate supply of clean, fresh water is the cornerstone of animal husbandry and there are very few things that compare to the feeling of finding thirsty cows grouped around a dry tank on a hot day. Water is important, and in situations where the water supply is limited or we are forced to haul water, one of the first questions we find ourselves asking is, “How much water do those cows need?” The old rule of thumb is that cattle should consume 1-2 gallons of water per 100 lbs of bodyweight. Accurately determining the amount of water cows will voluntarily consume is difficult and is influenced by several factors (ambient temperature, moisture and salt content of the diet, body weight, lactation, etc.). Water consumption increases linearly as ambient temperature increases above 40° Fahrenheit such that cows require an additional gallon of water for every 10 degree increase in temperature. Additionally, lactation also directly increases the amount of water required by beef cows. The table below summarizes the daily water requirements of beef cows of several different body weights, milk production levels and ambient temperatures.

|  |  |  |
| --- | --- | --- |
|  |  | **Average Daily Temperature, °F** |
|  |  | **40** | **65** | **90** |
| **Cow weight** | **lb Milk Production** | **Gallons of Water/day** |
| 1100 | 0 | 8.2 | 10.8 | 13.4 |
|  | 10 | 10.5 | 13.1 | 15.7 |
|  | 25 | 12.8 | 15.4 | 17.9 |
| 1300 | 0 | 9.2 | 11.8 | 14.3 |
|  | 10 | 12.2 | 14.8 | 17.4 |
|  | 25 | 14.5 | 17.1 | 19.7 |
| 1500 | 0 | 10.2 | 12.7 | 15.3 |
|  | 10 | 14.0 | 16.5 | 19.1 |
|  | 25 | 16.3 | 18.8 | 21.4 |

 The daily water requirements of beef cows represented are estimates and water consumption varies greatly during the summer months when temperatures exceed 90° Fahrenheit. Therefore, these recommendations should be regarded as minimum guidelines. (Justin Waggoner)