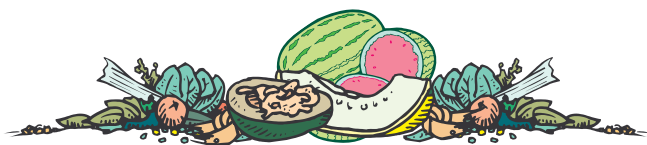


VEGETABLE CROPS HOTLINE

A newsletter for commercial vegetable growers prepared by the
Purdue University Cooperative Extension Service

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TOMATO DISEASE PRIMER - (Dan Egel) - Following is a brief description of the tomato diseases that are most common to Indiana. I have listed the diseases in approximate order of the most common to the least common. Since the management of these diseases varies, it makes sense to be certain which disease is present before treating.

Early blight - The leaf spots caused by this disease are roughly circular and up to 1/2 inch in diameter. The spots contain dark concentric rings in a target-like pattern. The spots first occur on the older leaves and progress upwards. Fruit spots (less common) may occur at the stem end. Such spots are usually brown-black and up to 1 inch in diameter.

Early blight can be managed by rotating away from tomatoes or potatoes for 3 to 4 years. Fall tillage can help get rid of crop residue which might harbor the disease. Most growers find that protective fungicides are critical to managing early blight. Check the **Midwest Vegetable Production Guide for Commercial Growers 2000** (ID-56) <<http://www.entm.purdue.edu/entomology/ext/targets/ID/index.htm>>.

Septoria leaf spot - Spots on leaves are circular with chocolate brown margins and gray centers. As the spots enlarge (up to 1/8 inch in diameter), small dark spots may be observed within each lesion. These are the reproductive structures of the causal fungus. As in early blight, the spots start on the older leaves first.

Manage Septoria leaf spot in the same fashion as early blight.

Bacterial spot - Leaf spots are usually 1/16 inch in diameter, black and angular. Spots are more often found on younger plant tissue rather than old plant tissue. Spots are

usually surrounded by yellow plant tissue. Spots on fruit are black, raised and up to 1/3 inch in diameter. The disease prefers warm wet weather.

Bacterial spot may be seed borne; greenhouse grown transplants should be carefully monitored.

Tomatoes should be rotated 2 to 3 years away from peppers or tomatoes. Treatment with copper hydroxide may reduce spread in the field. However, copper products will have little effect on tomato disease such as early blight and septoria leaf spot. Make sure to consult the **Midwest Vegetable Production Guide for Commercial Growers** (ID-56) <<http://www.entm.purdue.edu/entomology/ext/targets/ID/index.htm>>.

Bacterial canker - Older leaves are often affected first. Leaves may turn downwards and eventually curl. The most characteristic symptom on leaves is the brown necrotic area along the margin of the leaves. Inside the brown area, the leaves are frequently yellow, giving the leaves a scorched appearance. However, other environmental factors can give the leaves a similar scorched appearance. Spots on fruit are usually less than 1/4 inch in diameter and have a characteristic "birdseye" appearance; that is, they are light colored with a dark center.

Bacterial canker is another disease that may be seed borne. Rotations of 2 to 3 years and fall tillage are important in managing this disease. The use of copper products to control the disease in the field has had mixed results. Remember to use good sanitation. For example, use only clean stakes. Reduce the spread of bacterial canker by working the field when the plants are dry.

Many other diseases and disorders may occur. This list is just a start. Find someone who knows tomato disorders and diseases to know for sure.



FALL ARMYWORMS - (Rick Foster) - Fall armyworm larvae have been found feeding on corn in southern Indiana. The larvae found were nearly full grown. Fall armyworms do not overwinter in Indiana and must migrate from southern states each year. Their arrival this year is approximately one month earlier than usual for this pest. This means that we are likely to have one additional generation of fall armyworms compared to normal. The numbers generally increase with each generation, so by late summer populations could be quite high. Sweet corn growers should look for fall armyworm feeding regularly for the remainder of the season. The potential exists for serious damage to sweet corn crops.

Sweet corn is vulnerable to attack from fall armyworms at any stage of development. Although it takes a considerable amount of damage to whorl stage sweet corn to affect yield, fall armyworms, like European corn borers, should be controlled before tasseling. The best time to treat is just before the tassels emerge, the stage we call pre-row tassel. Treating at pre-row tassel and every 5 days thereafter until 10 days before harvest will provide good control. The insecticide recommendations for fall armyworms are the same as for corn earworms. Capture and Warrior are the best products, with the other pyrethroids providing good control. Spin-Tor will also control fall armyworms.



CORN EARWORMS - (Rick Foster) - First generation corn earworm moths have been flying for at least a week in southern Indiana. This is earlier than usual, so don't be caught unprepared. Sweet corn growers should have their corn earworm pheromone traps in place now.

We should probably review management of corn earworms on sweet corn. Female earworm moths lay eggs, primarily on fresh green



silks. At times they will lay them on leaves or on brown silks, but the vast majority are laid on the green silks.

Therefore, your sweet corn crop is in jeopardy if moths are flying and laying eggs and your corn is in a stage that is attractive for egg laying, that is, has green silks. Obviously, there is no danger if moths are not flying and there is little risk if silks are not green. The way that we tell if moths are flying is by monitoring their activity with pheromone traps. Experience has shown that if you catch 10 or more moths per night in your pheromone trap, then there will be enough egg laying to justify using an insecticide.

The timing of applications of insecticides is critical. When the eggs on the silks hatch, the tiny larvae will move down the silks and into the tip of the ear. The larvae do not feed until they enter the ear, which takes from 1 hour to 1 day. That period of time between egg hatch and when the larva enters the ear is the only opportunity you have to kill it. Once a larva enters the ear, you cannot kill it with insecticides. As a result, you must have a toxic dose of insecticide present on the silks between the egg and the ear tip before the egg hatches. The first application should be made when at least 70% of the silks have appeared. If you treat when 20% of the plants have silked, you are only protecting 20% of the ears, so you are better off to wait a day or two until more plants have silked.

Eggs hatch in 2-5 days, depending on temperature. Therefore, the interval between sprays should be 2 to 5 days. Use a shorter interval if you are catching large numbers of moths in the pheromone trap, such as 100 to 200 per night and use a longer interval if moth catches are just over the threshold of 10 per night. Use a shorter interval if temperatures are high, above 85°F. Use a longer interval if temperatures are cool. You can stop treating about 10 days before you expect to harvest.

Years of testing have shown that Warrior and Capture are the premier insecticides available for corn earworm control. Other pyrethroids, such as Baythroid, Pounce and Ambush, will also provide very good control. Sevin will provide only mediocre control. The Bt insecticides such as Dipel, Javelin, MVP, etc. will not provide control of corn earworms on sweet corn because these products must be eaten to be effective and earworms don't eat until they are inside the ear.



STRIPED CUCUMBER BEETLES - (*Rick Foster*) - The overwintering generation of striped cucumber beetles are starting to die out in southern Indiana but are just starting to get going in the northern part of the state. That means that growers in southern areas should make sure that there are still enough beetles present in their fields before applying insecticides. The threshold for cantaloupes and cucumbers is 1 beetle per plant and for watermelons, squash, and pumpkins is 5 beetles per plant. Growers in northern areas should be inspecting their vine crops regularly now and treating when the thresholds are exceeded. See ID-56 <<http://www.entm.purdue.edu/entomology/ext/targets/ID/index.htm>> for details of recommended insecticides.



WHAT ABOUT DROUGHT? - (*Liz Maynard*) - It seems odd to be using the "D" word when most areas of Indiana received over an inch of rain the week prior to Memorial Day (and some areas more than two inches), according to the Ag Weather Information Service. How has the soil moisture situation changed since 6 weeks ago when drought was discussed in this newsletter? As of May 26, topsoil moisture was adequate in more than 3/4 of Indiana, and surplus in another 1/8 of the State, while subsoil moisture was short or very short in 43% of Indiana fields, according to Ralph Gann, State Statistician. This is a big improvement over the 50% of topsoil and 70% of subsoil which was short or very short in mid-April. According to the long term Palmer Drought Severity Index, northwest Indiana is still in a severe drought, and north central, central, and west central Indiana are in a moderate drought. The Crop Moisture Index, which takes into account weather over a shorter period of several weeks, indicates that northeast and central Indiana are a little wetter than normal, while the remainder of the state is about normal. The outlook from June through August predicts slightly lower rainfall and higher temperatures than normal. To summarize, recent rains have improved soil moisture but the subsoil is still dry in some areas. With the likelihood of a warmer, drier summer than normal, it's still much too early in the season to banish the "D" word from our vocabulary.

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