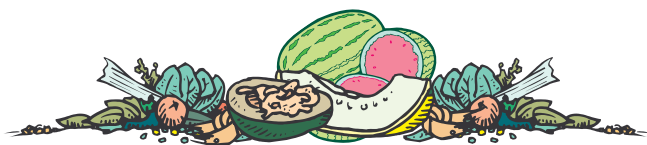


VEGETABLE CROPS HOTLINE

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

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SPRAY DRIFT SYMPTOMS - (Dan Egel)
- This is the time of year when spray symptoms may begin to show up in vegetables. It has been a windy spring, so herbicide damage is possible. As one examines new transplants, the question may arise: are the symptoms on my plants due to a herbicide drift problem? I would like to break down the symptoms one observes on vegetables into 3 categories: herbicide damage, disease and environmental problems.

A field that has been drifted with a herbicide will almost surely show some sign of a gradient: the plants one side of field will show a high degree of damage. The damage lessens as one walks away from the point of application. An exception would be herbicide carry over. In such a case, all or most of the plants in a field could be affected. In this case, the damage may be related with a previous year's application. Look for signs that the damage varies with the application; the damage may be greater where the application started or where the applications overlapped.

There are many different herbicides whose modes of actions differ. Some cause distortions of leaf tissue (aphid damage may cause similar damage). Some may cause marginal browning or yellowing of leaf tissue. Often, interveinal yellowing or browning may be apparent. New leaf tissue may be bleached out or pale looking. Plants may be stunted with the space between leaf attachments (internodes) shortened. Finally, some herbicides cause spots. Such spots are usually smooth. That is, the inside of the spots will have few rings or ridges in them. Herbicide spots often have no yellowing around them. Depending on the mode of action of the herbicide, the

newer growth will not have any damage on it.

The distribution of disease symptoms across a field is usually clustered. (An exception would be fusarium wilt that is usually scattered fairly randomly.) Disease usually starts in one or two locations in the field, such as a low spot. Sometimes a disease starts with the introduction of a specific plant. Plants located

around that plant would become diseased first. Leaf spots resulting from disease are irregular in shape and may be surrounded with yellowing. Since disease spots have been growing over time, they often have small rings or ridges and may vary in color. Disease symptoms almost never affect just the leaf tissue between the veins. Disease symptoms seldom cause the margins of a leaf to brown or yellow. Disease symptoms will often spread with time across a field or up a plant.

Environmentally induced problems include weather and nutrient related problems (at least in this discussion). Wind may cause leaves to have brown or gray areas. Rough or discolored stems may be due to the wind causing a transplant to rub against the plastic. Nutrient deficiencies may cause leaves to have yellowing or browning in interveinal areas. While some nutrient problems cause younger leaves to have symptoms, other nutrient problems may cause old leaves to have symptoms. (Deficiencies of nitrogen, phosphorus or potassium, calcium, and iron will cause symptoms in younger leaves. Magnesium is an example of a nutrient that is present in older leaves.)

Look carefully at the symptoms in your field. You may want to send



MAGNESIUM AND MANGANESE PROBLEMS ON MELONS - (Rick Latin and Dan Egel) - This is the time of year when samples of cantaloupe and watermelon vines arrive showing symptoms of magnesium deficiency or manganese toxicity. Both disorders are related to acid soils and usually occur in clusters in

a field. Magnesium deficiency appears on sandy ridges and can be recognized by interveinal yellowing and death of tissues on older leaves. Manganese toxicity also first occurs on older leaves but appears in heavier or darker sands, often in swales. The diagnostic feature of manganese toxicity are the tiny pin hole type lesions with yellow halos clustered between the veins. Leaves are best viewed when held up to the sun.

These disorders can easily be confused with an infectious disease. Symptoms may seem to "spread" from areas of the lowest pH to areas of somewhat higher pH. Individual rows seem to be worse than adjacent rows. Such rows may have received less lime. The remedy for these disorders is to raise the pH of the soils involved. However, once crops are within a week or so of harvest, there is no remedial treatment.

Although growers may have soil tested and spread lime before the season, there may still be pH problems in some areas of the field. Learn the symptoms of these disorders so you won't be wasting fungicides on a nonexistent disease.



WHY ARE LEAVES YELLOW? - (Liz Maynard) - Reports of yellow leaves on melon plants have come in from Southern Indiana. A careful look at the plants shows it is the older, crown leaves that are yellowing, or chlorotic. It is normal for the older leaves to die back, or senesce, but sometimes senescence will occur earlier than expected due to stress. Plants, which have been in the ground for several weeks, may have experienced drought stress during new growth. Inadequate uptake of nitrogen could occur if the soil has been too wet. Roots can't effectively take up nutrients from saturated soils. In some cases there may not be enough nitrogen in the soil. If nitrogen applied prior to planting was primarily in the nitrate form (such as calcium nitrate or potassium nitrate), rains or over-irrigation may have moved it out of the root zone. Nitrate is very soluble and will move with water down the soil profile. A tissue test for nitrogen or a quick test of petiole sap nitrate



concentration can aid in diagnosing nitrogen-deficiency. The solution to nitrogen-deficiency depends on the cause of the problem. If saturated soil has prevented uptake; the problem should correct itself when soil dries. If wet conditions persist, foliar nitrogen application is an option. For foliar applications, no more than 10 lb. nitrogen per acre is recommended at one time. If nitrogen has leached from the soil, additional applications through irrigation, side-dressing, or foliar sprays may be warranted.

Magnesium deficiency also leads to yellowing of older leaves, but usually the veins remain green. This deficiency is common in soils with low magnesium content. It can be corrected by a foliar application of 1 - 2 lb. magnesium per acre, equivalent to 10 - 20 lb. magnesium sulfate per acre.



BLOSSOM END ROT PREVENTION - (*Liz Maynard*) - As early fruits develop on pepper and tomato plants, it is time to take steps to reduce incidence of blossom end rot (BER), a disorder caused by localized deficiency of calcium in the developing fruit. • Maintain an even supply of water. Calcium is transported with the mass flow of water in the plant and an uneven water supply leads to uneven calcium uptake. • Avoid excess nitrogen fertilizer - it promotes vegetative growth that will compete with the fruit for water (and calcium). • If soil level of calcium is low (most likely on low pH), consider applying additional calcium. • Spray applications of calcium to developing fruit are sometimes recommended, although it is not clear how effective they are. Calcium chloride (5 - 10 lb. per acre) or calcium nitrate (5-15 lb. per acre) can be used. If these practices don't reduce BER this year, consider the following for next year: maintain proper soil pH; promote healthy root growth by providing good drainage and eliminating hard pans; provide balanced mineral nutrition; and choose a variety that is less susceptible.



FOOD QUALITY PROTECTION ACT - (*Rick Foster*) - The Environmental Protection Agency has announced the latest decision resulting from its reevaluation of organophosphate insecticides as required by the Food Quality Protection Act. Chlorpyrifos, the active ingredient in **Lorsban and Dursban**, is the latest victim. Virtually all uses for homeowners will be eliminated, and the products will become Restricted Use Products. While most agricultural uses have survived, Lorsban can only be used on apples pre-bloom beginning next year. Tolerances for residues on apples, grapes, and tomatoes are being lowered. The grape and tomato tolerances will primarily affect foreign producers who

ship these crops to the US. Lorsban can continue to be used on corn. This ruling should have minimal impact on vegetable growers. More decisions are yet to come. Stay tuned.



SQUASH VINE BORERS - (*Rick Foster*) - Adults of the squash vine borer are active in most areas of the state now. The adults will lay eggs on the stems and the newly hatched larvae will bore into the stems. Once inside the plant, the larvae are very hard to kill with insecticides, so it is important to kill them before they get inside. Weekly sprays with pyrethroid insecticides for 4-6 weeks should provide good control. Winter squash such as Blue Hubbard tend to be more susceptible to vine borers, but all types of squash and pumpkins will be attacked.



SQUASH BUGS - (*Rick Foster*) - Larger than normal populations of adult squash bugs have been observed in several locations. Since they overwinter as adults, we might guess that the large populations are the result of better than normal survival during the mild winter. Growers should watch for the coppery brown egg masses that the females lay on the leaves. When most of the eggs have hatched, apply one of the pyrethroid insecticides to kill the young nymphs. Squash bugs are very difficult to kill in the adult stage or when the nymphs are large. Timing sprays toward the young nymphs will greatly improve the level of control you will achieve. You can use the same insecticides for squash bugs as for squash vine borers.



MITES ON MELONS - (*Rick Foster*) - The hot weather we have been experiencing has helped twospotted spider mite populations increase to damaging levels in some fields. If you see areas in your melon fields that appear to have mite injury, inspect the plants for the presence of the tiny mites on the underside of the leaves. You will probably also see some webbing on the underside of the leaves. There are some nutrient deficiencies that resemble mite injury, so make sure to confirm that mites are the culprits. If you have mites, mark the infested area and come back in 3-5 days to see if the area is spreading. If not, continue to check it, but don't spray for now. If it is spreading, then you probably need to spray. Some of the materials available include the old standbys Kelthane and Dimethoate. Two newer products, Capture and Agri-Mek should provide good to excellent control.

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