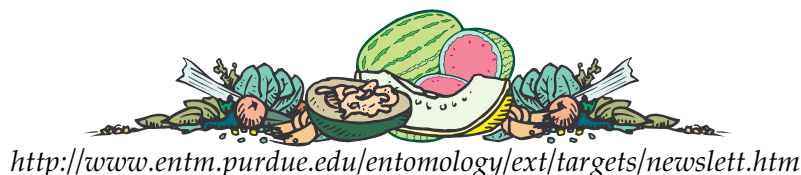


VEGETABLE CROPS HOTLINE

A newsletter for commercial vegetable growers prepared by the
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IN THIS ISSUE

- **WILTING PLANTS**
- **BACTERIAL WILT**
- **POWDERY MILDEW ON MUSKMELON**
- **PUMPKIN VIRUS DISEASES**
- **FUSARIUM CROWN ROT**
- **NITROGEN LEACHING**
- **SOUTHWEST INDIANA TWILIGHT MEETING**

WILTING PLANTS - (Dan Egel) - Imagine your favorite vegetable plant. The leaves and stem are able to maintain the form that we find so familiar due to a constant supply of water. Water is supplied from the soil, is transported up the stem and finally evaporates through tiny pores in the leaves. This process must be maintained if the plant is to be productive.

If for some reason the source of water is interrupted, the leaves and stem of the plant will soon begin to wilt. This article will examine some of the reasons why plants wilt.

First let's rule out drought. If plants are wilting, look for moisture in the soil. Does the pattern of wilting plants in the field follow the water? Are adjacent weeds wilting?

Plants may wilt as a result of too much water. Waterlogged roots will cease to function, thus causing the plant to lose water.

Roots must be healthy if plants are to function. Carefully dig up plants that show signs of wilt. Healthy roots should look white or light tan. The roots should feel firm to the touch. Along with large structural roots, smaller "feeder" roots should be present. Dark, discolored rotten roots are most likely a sign of fungal infection. This year I have observed fungal root rots brought on by cold, wet soil.

Examples of root rots caused by fungi include *Pythium*, *Phytophthora* and *Rhizoctonia* root rots.

The roots may be fine, but if the stem is not healthy, the water can not get to the rest of the plant. Cut open the stem of the plant near the base. The inside of the stem should be green and white. Brown or dark discoloration indicates a problem. *Fusarium* and *Verticilium* are ex-

amples of fungi that cause vascular wilt. These fungi cause the plant's plumbing in the stem to clog, discoloring the stem. Bacterial wilt is a vascular wilt but does not follow these rules (See article below).



BACTERIAL WILT - (Frankie Lam and Dan Egel) - Many muskmelon and cucumber growers are noticing

scattered plants that have wilted in the field. The leaves of such vines typically begin to wilt; the entire vine may die within a few days. To test for this disease, cut an affected vine with a stem about the size of a nickel. Press the two cut ends together for 10 seconds and draw them slowly apart. Small sticky strands of sap that hang between the cut pieces are diagnostic for bacterial or "bug" wilt. This disease rarely affects watermelon and pumpkin.

Diseased plants observed today are the results of the striped cucumber beetle feeding, which occurred three to four weeks ago. Therefore, it is unnecessary to spray for the beetles. There is no other pesticide or fertility spray that will "cure" the vines of bacterial wilt. In addition, if the vines are about three weeks from harvest, the transmission of bacterial wilt by the beetles will not cause yield loss significantly. Remember that bacteria by itself will not actively spread from plant to plant throughout your field, unless the plants have wounds caused by the beetles and free water in the field. So save your pesticides and worry about something else.



POWDERY MILDEW ON MUSKMELON - (Rick Latin and Dan Egel) - Growers who have planted muskmelon varieties that are susceptible to powdery mildew should be thinking about applying a systemic fungicide.

We recommend that growers with early melons apply systemic fungicides 10-14 days before harvest. Another spray is advisable in 14 to 21 days for fields with the potential for a 4 to 6 week harvest period. Powdery mildew is not a serious disease of watermelon.

Systemic fungicides labeled for use against powdery mildew on muskmelon include Benlate, Nova and Topsin as well as the newer chemicals, Flint and Quadris. With the exception of Quadris, we do not recommend any of these chemicals for use against *Alternaria* leaf blight, anthracnose, or gummy stem blight.

The fungi that cause powdery mildew may become resistant to the systemic fungicides listed here unless precautions are taken. It is important to always alternate between fungicides with different modes of action. Flint and Quadris have the same mode of action and must never be applied in back to back sequence. Similarly, Benlate and Topsin have the same mode of action. Nova has yet a different mode of action. Be certain to read the label carefully. More information is also listed in the Midwest Vegetable Production Guide for Commercial Growers 2001 <<http://www.entm.purdue.edu/entomology/ext/targets/ID/index.htm>>.



PUMPKIN VIRUS DISEASES - (Frankie Lam and Dan Egel) - Each year, we observe pumpkins with virus diseases. Virus diseases cause pumpkin leaves to become a mottled yellow and have a distorted appearance. In severe infections, both fruit size and shape can be affected. Regardless of planting date, virus diseases will likely show up in all pumpkin patches. However, if the plants are infected before fruit set, a severe reduction in yield may occur. Commonly, the younger the plant is infected, the greater the yield is reduced. Virus diseases are much more a problem in southern Indiana than northern Indiana. In southern Indiana, growers can avoid virus damage by planting seed on or before June 20. Growers in other parts of the state should vary their planting dates accordingly.



Aphids can transmit viruses within a matter of seconds. The insect can complete the life cycle in five to seven days depending on temperatures. Because of their small size, feeding on the underside of leaves, and fast reproductive rate, application of insecticide is not cost effective for the reduction of aphid infection and control of the viruses (See Hotline Issue #385). Moreover, limiting the number of insecticide applications will help to conserve natural enemies, including lacewing larvae; lady beetle larvae and adults, syrphid fly larvae, and parasitic wasps, that eat aphids. The best tactic to manage virus diseases on late season cucurbits, such as pumpkins, is to avoid planting late in southern Indiana.



FUSARIUM CROWN ROT - (*Karen Rane*) - We have received two samples of transplanted processing tomato plants in the Plant and Pest Diagnostic Lab in the past week. These samples are from east central Indiana. The plants had wilted in the field, and close examination of the lower stems revealed the presence of sunken cankers that caused a constriction of the stem/taproot area. The affected tissue was medium brown in color, and on some plants the cankers extended about 2 inches above the soil line. On other plants, only the lower taproot was brown and rotted. We have recovered *Fusarium oxysporum* from the symptomatic lower stem tissue.

There are two members of this fungus species that attack tomatoes, and both look identical on culture media. *Fusarium oxysporum* f. sp. *lycopersici* colonizes the water-conducting tissue of tomatoes, causing *Fusarium* wilt. The symptoms of *Fusarium* wilt include wilting and an internal discoloration of the vascular system that extends several inches above the soil line. The second fungus, *F. oxysporum* f. sp. *radicis-lycopersici*, invades the roots and lower stem and causes the disease known as *Fusarium* crown and root rot. It is this second fungus that we believe is responsible for the symptoms on these recent clinic samples.

The *Fusarium* crown and root rot fungus produces thick-walled spores that survive in the soil for years. The disease is favored by cool soil temperatures, conditions that have occurred throughout Indiana in recent weeks.

Although there are no remedial management options, growers trying to avoid the problem in future years should choose well-drained fields that do not have a history of the disease. *Fusarium* crown and root rot will not spread in the field from plant to plant; thus there is no need to apply fungicides in an attempt to stop the disease.



NITROGEN LEACHING - (*Chris Gunter*) - Nitrogen applications early in the season may be in jeopardy of being lost following locally heavy rainfall events. Primarily this is a loss of the nitrate form of nitrogen. Nitrate molecules have a negative charge, which prevents them from being bound to the soil surface. They move freely with water as it moves through the soil. If rainfall is heavy, nitrate can be washed down through the soil profile and out of the root zone of the plant.

Testing plant tissue for its nutrient content is an easy way to determine the nutrient status of the crop. These samples should be taken at least two times during crop development, 1) during the period between initial flowering and the first small fruit developing and, 2) between fruit set and harvest. Traditional tissue testing, in which the sample is sent to a lab to be dried and total mineral content examined, is the most accurate way to know the nutrient status of the plant. However, this can be costly and the time required to get the results of these tests can be significant. An on farm alternative may be a hand held meter which tests for a specific ion (nitrate or potassium). However, these meters require an initial investment of \$300-\$400. Testing the plants before symptoms appear on the foliage is the best way to minimize losses due to a lack of nutrients.

Correcting for nitrate loss after plant growth has filled the furrows presents a problem. Fertilizer additions to correct the deficiency may be difficult, without damaging the developing plant canopy. Injection of soluble nitrogen through overhead irrigation or through drip tape is an easy way to correct the deficiency. If you have to apply a solid fertilizer over the top of the crop, be sure that the plant canopy is dry or wash the applied fertilizer down off the canopy with overhead irrigation following application. This will prevent the concentrated fertilizer from damaging the leaves.



SW INDIANA TWILIGHT MEETING - (*Dan Egel*) - There will be a twilight meeting 7 p.m. on Tuesday June 26 at the Joe and Mike Mouzin Farm at 3707 South Main Street Road, Vincennes, IN. Vegetable growers are encouraged to attend and bring questions or samples to discuss. Present will be Dan Egel Plant Pathologist, Frankie Lam, Entomologist, Chris Gunter, Horticulturist, and Hari Ramasubramaniam, Vine Decline Specialist. In addition, Dr. Ray Martyn, Department Chair for Botany and Plant Pathology Purdue University West Lafayette will be present. Dr. Martyn is an expert on *Fusarium* wilt as well as other watermelon diseases. Light refreshments will be served. Please call if you need directions or further information.



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