# VEGETABLE CROPS HOTLINE

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

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*<http://www.entm.purdue.edu/entomology/ext/targets/newslett.htm>*

## IN THIS ISSUE



**MAGNESIUM AND MANGANESE IN MELON** - (*Chris Gunter*) - This time of year cantaloupe and watermelon vines may start 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 intervienal yellowing and death of tissues on older leaves (Figure 1). Manganese toxicity also first

**Figure 1:** Magnesium deficiency in cantaloupe. *(Photo by Rick Latin)*

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 (Figure 2). Leaves are best viewed when held up to the sun.

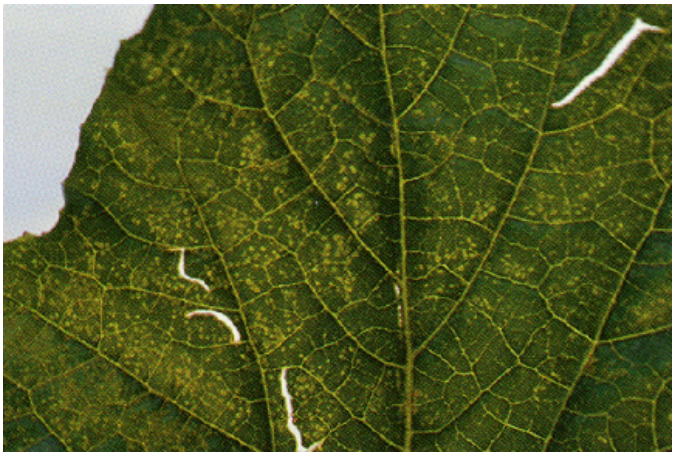

**Figure 2:** Manganese toxicity in cantaloupe. *(Photo by Rick Latin)*

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 likely received less lime. The remedy for these disorders is to raise the pH of the soils involved. This can be difficult to accomplish with crops growing under plastic mulch, because of the difficulty of getting the lime into the root zone.

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 non-existent disease.

**YELLOW CANTALOUPE LEAVES** - *(Chris Gunter)* - It's that time of year when older cantaloupe leaves begin to turn yellow (Figure 1). When this yellowing occurs at the leaf margin it is likely the result of guttation. This is a natural process by which plants lose water at the margin of the leaf. This water is rich in organic material and minerals and as the water evaporates the salts are concentrated at the leaf margin. Over time that high salt buildup shows up as the typical yellowing we commonly call salt burn. The yellow halo may expand to cover a great deal of the leaf surface. Guttation can occur at any time; however the warm days followed by cool nights that we have been experiencing seem to favor the condition.

**Figure 1:** Salt burn on the margin of a leaf. *(Photo by Chris Gunter)*

If the yellowing is not limited to the margin of the leaf, you may be observing symptoms of nutrient deficiency. At this time of year we are seeing symptoms associated with soil pH problems including magnesium and molybdenum deficiency and manganese toxicity. For more information on these deficiencies see "Muskmelon problems on acid sandy soils" (HO-191), <www.ces.purdue.edu/extmedia/HO/HO-191.html>. If you suspect you may be seeing nutrient deficiency or toxicity in your field, have your soil pH tested and corrected before additional nutrient applications are made.

**Molybdenum Deficiency in Melon** - *(Chris Gunter)* - Molybdenum deficiency has been suspected in some southwest Indiana fields. This disorder is most likely to occur on darker sandy soils with a pH of less than 6.0 and usually only occurs on cantaloupes. Mo deficiency can look like N deficiency due to the yellowing of the leaves, but the interveinal tissue is the most affected. The leaf develops a mottled appearance as the basal end of the leaf remains green and the interveinal tissue of the rest of the leaf is yellow (Figure 1). Marginal leaf tissues assume a burnt, brown appearance (Figure 2). A recommendation for managing low pH soils this time of year is to have a soil pH test taken to make sure the pH is 6.0 or higher for cantaloupes and pH 5.8 or higher for watermelons. A pH of 6.5 is optimal for all types of melons. Pelletized lime can be banded at the side of the plastic this time of year. The other recommendation is to choose calcium nitrate or preferably, potassium nitrate, as your N source, if you are still side-dressing N. These sources will slightly raise the pH of the soil. If you are using ammonium nitrate, the soil pH will further acidify/drop. Testing for pH and tissue testing for low Mo is critical in order to diagnose this problem correctly. Foliar sprays of Mo or any plant micronutrient are only justified after tissue testing identifies a deficiency. Correctly diagnosing the problem will help reduce unnecessary spraying.

**Figure 1:** Interveinal chlorosis in cantaloupe with molybdenum deficiency. *(Photo by Rick Latin)*

**Figure 2:** Marginal necrosis in cantaloupe with molybdenum deficiency. *(Photo by Rick Latin)*

**Mites on Watermelons** - *(Rick Foster)* - I have received several calls already this week (I'm writing this Tuesday morning) about problems with mites on watermelons. Two-spotted spider mites sometimes will affect muskmelons or cucumbers, but are most commonly a problem on watermelons (Figure 1). Mites cause damage by sucking sap from the underside of leaves (Figure 2). In hot, dry weather (sound familiar?), mites can rapidly increase in numbers, as much as 70X in a week. In addition, hot, dry weather causes the mites to eat more and dry soil

**Figure 1:** Close up of two-spotted spider mite. *(Photo by John Obermeyer)*

**Figure 2:** Mite damage on watermelon leaf. *(Photo by Jerry Brust)*

conditions provide the mites with more concentrated food, resulting in more rapid reproduction. Watermelon plants that are not irrigated are particularly susceptible to mites, because the mites increase faster and eat more and the plants may already be drought stressed.

Mite feeding can cause plants to be defoliated within a couple of weeks or can cause fruit to be of such poor quality that they are unmarketable (Figure 3). In some cases, mites will also feed on the rind, giving it a sandpaper-like texture.

Most of you have reduced your insecticide sprays for control of striped cucumber beetles because numbers have been so low. This has helped to delay problems with mites because the predators were able to continue

**Figure 3:** Severe mite damage to watermelons. *(Photo by Jerry Brust)*

to eat the mites without being killed by the insecticides. However, the continued hot, dry weather created conditions in which the predators alone are not sufficient to keep mites under control in many cases.

To monitor for mites, you can either use a 10X hand lens and look for the mites on the underside of leaves or shake leaves over a white sheet of paper and watching the mites crawl on the paper. Look first on the edges of fields. If there is a gravel road next to the field that produces dust that lands on the plants, look there first since dust increases mite populations. Be aware that mite populations are frequently localized, so you may not need to treat the entire field. If you don't treat the whole field, be sure to spray at least 100 feet beyond the existing infestation to make sure that you contain the mites. We don't have a specific threshold for spraying mites on watermelons. Stressed plants on non-irrigated land will be able to tolerate far fewer mites than healthy plants on irrigated land.

There are several miticide choices listed in ID-56 <www.btny.purdue.edu/Pubs/ID/ID-56>. I believe that the best choice if you have a serious infestation is Agri-Mek. It has consistently given good to excellent control. I realize that Agri-Mek is rather expensive, possibly more expensive than most melon growers are used to. The high price may be alleviated somewhat by carefully scouting your fields and only treating those fields or even parts of fields where mites are present. Also, be sure to monitor your fields 5-7 days after treatment to make sure that you got the level of control you were looking for and to determine if a second treatment is needed.

**Sweet Corn Insects** - *(Rick Foster)* - European corn borer populations continue to be low in most areas. Growers should scout late whorl stage corn for the presence of feeding damage and worms (Figure 1). If more than 20% of the plants are showing corn borer feeding damage, a single application of a pyrethroid insecticide (Capture, Mustang Max, Warrior) just before tassels emerge should provide adequate control.

**Figure 1:** European corn borer whorl feeding. *(Photo by John Obermeyer)*

The second generation of corn earworm moths has just begun to fly (Figure 2). All sweet corn growers should have their pheromone traps in place now. If you are catching 10 or moths per trap per night, your sweet corn that has green silks present should be treated with an insecticide. The hot temperatures we have been having mean that earworm eggs will hatch in about two days. When moth catches are in the range of 10 per night, treatment should be made every 4 days. If moth catches are in the 25-50 range, treat every 3 days.

**Figure 2:** Corn earworm larva. *(Photo by Rick Foster)*

If moth catches exceed 100 per night, you should treat every 2 days. We are unlikely to see extremely high moth catches (more than 100 per night) unless we have the proper weather conditions to move the moths up from the Gulf Coast. So far, we have had very little migration of moths. Spraying can be terminated when silks turn brown because the moths are less attracted to brown silks. Although we are seeing some indications that earworms are developing resistance, the pyrethroid insecticides continue to be the best choice for earworm control.

Another insect that sweet corn growers need to watch out for right now is the western corn rootworm adult. This beetle will feed on silks and prevent pollination (Figure 3). If you are on a regular spray program with pyrethroid insecticides, the applications you make for corn

**Figure 3:** Western corn rootworm beetles feeding on corn silks. *(Photo by John Obermeyer)*

earworms will take care of the rootworm beetles. However, if you are growing Bt corn, which control corn borers and earworms, you need to be sure that you don't forget about rootworm beetles. The Bt toxin will not affect the beetles, so you may need a spray to protect pollination.

**Downy Mildew Update** - *(Dan Egel)* - As of this writing, downy mildew still has not been found in Indiana (Figure 1). Readers of the Vegetable Crops Hotline who have requested to receive the Hotline Bulletin by fax or email will be notified promptly if this disease is observed in Indiana.

The usual pattern of downy mildew survival and spread has been for the pathogen to survive in Florida during the winter and spread north with the planting of cucurbit crops. This pattern often leads to the observation of downy mildew in Indiana in late August or September if the disease is observed in Indiana at all.

In 2006 and again in 2007, downy mildew was reported in Canada in June. It appears to be this source of the disease, which is responsible for the earlier observations of downy mildew in the last two seasons. Thus, cucurbit growers must now watch for downy mildew spread from either the north or the south.

Downy mildew has now been reported in Texas, North Carolina, South Carolina, Ohio, New York, Michigan and Ontario, Canada. Follow the epidemic at the North American Plant Disease Forecast Center <www.ces.ncsu.edu/depts/pp/cucurbit/>. Previous articles in the Vegetable Crops Hotline have addressed downy mildew management issues. Please address any questions or concerns to Dan Egel at (812) 886-0198.

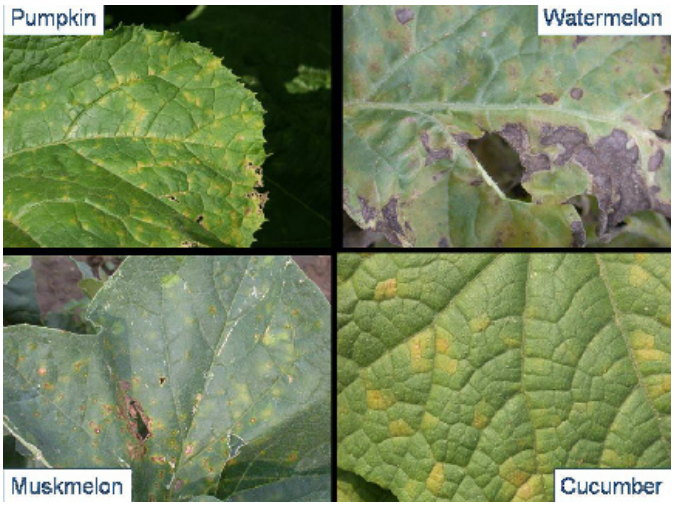


**Figure 1:** Downy mildew on various cucurbits. (Photos by Dan Egel)

**2007 Rural Entrepreneur Network (REN) Workshops** - *(Announcement)* - "Start Your Own Business" workshop series in Central and Southern Indiana now through October 4, 2007.

**Content:** How REN Helps Rural Business Start Ups; Characteristics of Successful Rural Entrepreneurs; Self Assessment Exercise; Available Rural Businesses; Steps in Successful Revenue and Profit Planning; Support Services for Rural Start Ups; Steps to Get Started; and more.

**Instructor and Leader:** James (Jim) R. Roudebush is an entrepreneur from Central Indiana with a rural background. He has an MBA in Marketing. Jim is the owner of two successful Indiana small businesses. He currently serves as adjunct professor and lecturer.

**Who Should Attend:** Rural individuals or family members who are interested in starting a business or are in the early stages of a business.

**Cost:** $10 for Early Bird Registrations - must register by seven days prior to the workshop. If you register with a family member or a friend, the workshop will cost $5 for each additional person. Registrations at the door are $15 per attendee.

**Workshop Dates, Locations, and Time: (**Each workshop will be held from 6:00-8:30 p.m.):

**July 10** - Monroe County - Hoosier Energy, 7398 North State Road 37, Bloomington, In 47404

**July 12** - Putnam County Public Library (Kiwinas Room) 103 East Poplar Street, Greencastle, IN 46135

**July 19** - Lawrence County Economic Growth Council 1116 16th Street, Bedford, IN 47421

**July 24** - Owen County Purdue Extension Service 180 S. Washington St., Spencer, IN 47460

**July 31** - Parke County Purdue Extension Service Parke Co. Fairgrounds, U.S. 41 N. Rockville, IN 47872

**Aug. 2** - Jennings County Southeast Purdue Agricultural Center 4425 E. Co. Rd. 350 N., Butlerville, IN 47223

**Aug. 16** - Orange County - To be determined.

**Aug. 21** - Decatur County Purdue Extension Office, 545 S. Co. Rd. 200 W., Greensburg, IN 47240

**Aug. 23** - Madison County Farm Bureau 4-H Building, 512 E. 4th St., Alexandria, IN 46001

**Sept. 11** - Montgomery County Crawfordsville District Public Library 205 S. Washington St., Crawfordsville, IN 48933

**Oct. 4** - Greene County Community Learning Center Hwy. 54, Switz City, IN 47465

**Registration:** Contact Hoosier Heartland RC&D Council, 6041 Lakeside Blvd., Indianapolis, IN 46278; Phone: (317) 290-3250; Fax: (317) 290-3150; email: hhrcd@hhrcd.org; website: <www.hhrcd.org>.

**Farm Sustainability Tour to Focus on Organic Production and Marketing** - (*Announcement)* - The 2007 Indiana Farm Sustainability Tour Series continues in July with visits to 3 locations in Monroe County. The tour to be held on Thursday, July 19, will visit Stranger's Hill Organic Farm, the Bloomington Farmer's Market and the Bloomingfoods Co-operative new downtown grocery story.

This tour is provides educators, farmers, and other rural residents the opportunity to investigate ways to diversify farming operations and to learn from other successful Hoosier farmers. The stop in Bloomington will highlight three locations with proven track records of success in production and marketing of organic products.

Registration begins at 9:30 a.m. EDT, with drinks and donuts at **Fairview Elementary School, located at 627 W. 8th St. in Bloomington**. From there, tour participants will travel to Stranger's Hill Organic Farm, a farm certified by Ohio Ecologic and Farm Association. The owners, Lee and Dale Jones, have run a successful farm and greenhouse operation for over 15 years. Stranger's Hill produces bedding plants and vegetables. They sell retail through the local Farmers' Market and wholesale both locally and regionally.

The tour will then return to downtown Bloomington and visit the site of the Bloomington Community Farmers' Market. During lunch, Marcia Veldman, Market Coordinator for the Bloomington Community Farmers Market, will provide some insight into the largest and one of the most successful Farmer's Markets in the State. This market, in its' 32nd, year has enriched the lives of the members of the community and local producers by providing a place for residents and visitors to come together in a festive atmosphere and buy local produce from those who produce it. Marcia will discuss what makes the Bloomington Market so successful and its impact on the community.

Bloomingfoods a highly successful member-owned cooperative grocery has a long history in the community. The first Bloomingfoods, opened in 1976, was a two-story space in a renovated limestone carriage house just off Bloomington's main street. In 1991, when annual sales crested $1.5 million, a second, much larger store on the east side of town was opened. 2007 brings the creation of a new near-Westside grocery store. A tour of the new store and conversation with the store Manager Jason Hill will be the final stop on the Monroe County tour. Jason will discuss Bloomingfoods work with local producers and the retailing of organic produce in South Central Indiana.

Anyone can join the tour. For more information and to register, visit <www.conf.purdue.edu/farmtours>. Each tour is $15 per person, which includes lunch, refreshments and related materials. Registration is due seven days prior to a tour.

The 2007 Indiana Farm Sustainability Tours are sponsored by the Purdue Small Farms Team, the Purdue New Ventures Team, Indiana State Department of Agriculture (ISDA) and North Central Region Sustainable Agriculture Research and Education (NCRSARE).

For questions and more information about this or upcoming tours contact Jerry Nelson, Purdue New Ventures Extension Educator, at (812) 886-9582 or jnelson@purdue.edu, or Roy Ballard at (317) 462-1113 or rballard@purdue.edu or Amy Thompson at (812) 349-2575, afthompson@purdue.edu.

**Resolution from Congress** - *(Announcement)* - July 2007 and July 2008 designated as "National Watermelon Month".

Whereas watermelon production constitutes an important sector of the agricultural industry of the United States;

Whereas, according to the January 2006 statistics compiled by the National Agricultural Statistics Services of the United States Department of Agriculture, the United States produces 4,200,000,000 pounds of watermelon annually;

Whereas watermelon is grown in 49 States, is purchased and consumed in all 50 States, and is exported to Canada;

Whereas evidence indicates that eating 2 ½ to 5 cups of fruits and vegetables daily as part of a healthy diet will improve health and protect against diseases such as cancer, high blood pressure, stroke, and heart disease;

Whereas proper diet and nutrition are important factors in preventing diseases such as childhood obesity and diabetes;

Whereas watermelon has no fat or cholesterol and is an excellent source of the vitamins A, B6, and C, fiber, and potassium, which are vital to good health and disease prevention;

Whereas watermelon is also an excellent source of lycopene;

Whereas lycopene, an antioxidant found only in a few red plant foods, has been shown to reduce the risk of certain cancers;

Whereas watermelon is a heart-healthy food that has qualified for the heart-check mark from the American Heart Association;

Whereas watermelon has been a nutritious summer favorite from generation to generation; and

Whereas it is important to educate citizens of the United States regarding the health benefits of watermelon and other fruits and vegetables: Now, therefore, be it *Resolved,* That the Senate –

(1) supports the goals and ideals of "National Watermelon Month";
(2) calls on the Federal Government, States, localities, schools, nonprofit organizations, businesses, other entities, and the people of the United States to observe the month with appropriate programs and activities; and
(3) designates July 2007 and July 2008 as "National Watermelon Month".



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