VEGETABLE CROPS HOTLINE

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

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IN THIS ISSUE

BACTERIAL LEAF AND FRUIT SPOT OF PUMPKIN - (*Dan Egel*) - This disease has occurred in several commercial fields in Indiana this year. Fruit lesions start as small (1/16-1/4 inch across), round, tan scabs that occur in clusters, often on the "face" of the jack-o-lantern. Secondary organisms may infect lesions on the fruit and may cause enlarged openings in addition to the lesions described above (Figure 1). Symptoms on leaves are not obvious and are unimportant except as a symptom of the disease. The spots are small (1/8-1/16 inch across), angular, necrotic lesions that coalesce to form larger, irregularly shaped necrotic areas that can be mistaken for non-infectious disorders (Figure 2). Lesions may have a white to light brown coloring.

Details regarding the bacterial spot disease cycle are still uncertain. The disease appears to be much worse in fields that have not been rotated from pumpkins adequately, 3 years or more between pumpkin crops is recommended. The bacteria that cause the disease may be transmitted in seed.

Figure 1: Bacterial spot on a pumpkin fruit. One of the lesions has a secondary infection and a brown rot can be seen developing inside the fruit. *(Photo by Dan Egel)*

Figure 2: Lesions of bacterial spot of pumpkin. *(Photo by Dan Egel)*

Bacterial spot of pumpkin and bacterial spot of tomato are caused by different bacteria. Therefore, a crop rotation in which pumpkins and tomatoes are planted in successive years does not place either of these crops in danger of the above diseases.

Like most bacterial diseases, the disease probably spreads by splash dispersal during rain or irrigation events. Long distance spread (one mile or more) is unlikely.

Fruit infection probably occurs during early fruit development. Symptoms develop on infected fruit in 7 to 14 days.

No host resistance has been identified. Therefore, growers must rely on a combination of cultural and chemical methods to reduce the disease threat. Since it is possible that the bacteria can be carried in seed, growers are advised not to save their own seed. If fields are transplanted, then transplant production facilities and transplant materials should be sanitized with commercial disinfectants.

Early season copper applications may also be used to reduce the amount of infection. Apply copper when fruit is about softball sized. When there is no longer any fruit of this stage that is likely to mature in time for harvest, copper applications may be discontinued. If symptoms are confirmed on the leaves before fruit are present, copper applications may be started at this time.

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Harvesting Tomatoes into the Fall - *(Liz Maynard)* - The wet spring and cool weather delayed tomato harvest. If plants have remained healthy there may be substantial amounts of fruit left at the time of first frost. For those with continuing markets there may be opportunity to harvest mature green fruit and sell it as it ripens.

This article reviews several key points for success. Harvest only tomatoes that have reached or passed the mature green stage (Figure 1). A tomato will not ripen if picked before this stage of development. A mature green tomato has reached its full size, and when cut open with a sharp knife, the jelly with seeds will be pushed aside so that no seed is cut in two. By cutting a few tomatoes as examples, it's possible to become familiar with the outside appearance and size of mature greens of a particular variety so they can be more easily identified by pickers. As always, harvest only healthy, sound, intact tomatoes.

Figure 1. Tomatoes at the mature green stage have reached their full size and when cut, seeds will slide out of the way. They should be kept above 55°F. *(Photo by Liz Maynard)*

Green tomatoes may feel hard, but don't let that be an excuse to bounce them around. They will bruise, reducing their shelf life and quality.

Green tomatoes should be stored at 55–60 °F and 90–95% RH. The best temperature for ripening is 68°F. This temperature will result in the best color and nutritional value. Ripening will occur more quickly at higher temperatures up to 77°F, but quality will not be as high. Once tomatoes have turned color on 60% of the surface, they may be stored at 50–55°F.

Good air circulation is important in the storage and ripening area to maintain uniform temperature and atmosphere. Like any harvested vegetable, tomato fruit respires, taking in oxygen and releasing carbon dioxide. Ripening tomatoes also produce ethylene gas, which in turns speeds the ripening process. If carbon dioxide builds up, it can slow ripening by interfering with the function of the ethylene.

Tomatoes are susceptible to chilling injury below 50°F. If chilled, they may not ripen or may not develop good color or flavor. They will be more susceptible to decay from fungi like *Alternaria*. The effects of chilling depend on temperature as well as the duration of the chilling period. The lower the temperature and the longer the time, the greater the negative effects. Unfortunately, chilling injury can occur even while tomatoes are in the field, and effects then carry over after harvest. At this point (Sept. 23), no more than 3.5 days of temperatures below 50 have accumulated at various locations around Indiana, and most areas have much less - probably not enough to cause significant problems (Table 1). As the season progresses, the cool periods will become more frequent and longer, and the likelihood of chilling-related problems will increase.

Tomatoes produced in high tunnels won't succumb to the first frost, but chilling temperatures may occur in tunnels as the season progresses. For the best fruit quality, minimize the exposure of fruit to cool temperatures.

Reference:
Suslow, T. V. and M. Cantwell. 2009. Tomato: Recommendations for Maintaining Postharvest Quality. Postharvest Technology Research Information Center, UC Davis. Retrieved 9/23/09 from <**http://postharvest.ucdavis.edu/Produce/ProduceFacts/Veg/tomato.shtml**>.

Table 1. Cumulative number of hours and days air temperature at or below 50°F was recorded at automated weather stations located at Purdue Ag Centers (PACs) from Aug. 1 to Sept. 23, 2009.

	Cumulative Time at or Below 50°F	
Location	Hours	Days
Northeast PAC, Columbia City	31	1.3
Pinney PAC, Wanatah	81	3.4
Southeast PAC, Butlerville	13	0.5
Southwest PAC, Vincennes	4	0.2
Throckmorton PAC, Lafayette	20	0.8

Source: Indiana State Climate Data Archive, Purdue University. Retrieved 9/23/09 from <**http://www.iclimate.org/data_archive_v3.asp**>.

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Here's what is coming up. Mark your calendar now and plan to attend.

We Need Your Suggestions for Winter Meetings - *(Announcement)* - Purdue staff and grower associations are beginning to plan the program for the Indiana Horticultural Congress (Jan. 19-21, 2010). Please help us with your suggestions for topics.

-What issues have come up this season that you'd like to hear more about?

-What new technologies, crops, or marketing strategies have you heard about that you'd like more information on?

-Have you heard an excellent speaker somewhere we should bring to Indiana?

-Is there a vegetable grower you'd like to hear talk about his/her operation?

Call, fax, or e-mail your suggestions to Liz Maynard. Thanks! Phone: (219) 785-5673 or (800) 872-1231 ext. 5673; Fax: (219) 785-5675; e-mail: **emaynard@purdue.edu**.

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USDA to Hold Ohio Hearing on Proposed Leafy Green Agreement - *(Announcement)* - Columbus is one of just seven cities across the nation to host a public hearing on proposed national marketing agreement covering the handling of leafy green vegetables.

The Columbus hearing is planned for 8:30 am to 5 pm on October 6, at the Greater Columbus Convention Center, Room D130, 400 North High Street. The U.S. Department of Agriculture is holding these hearings to provide the public an opportunity to learn more about the proposal and to offer comments supporting or opposing it.

According to the USDA, the agreement, as proposed, would authorize the development and implementation of production and handling regulations designed to support the U.S. Food and Drub Administration's Good Agricultural Practices, Good Handling Practices and Good Manufacturing Practices in the fresh leafy green vegetable industry. The agreement would be a voluntary program, so only those handlers who sign up with proposed agreement would be regulated.

"The goal is to reduce the risk of food safety problems related to leafy greens, such as the E. coli outbreak that occurred in fresh spinach in 2006," said Doug Doohan, Ohio State University Extension fruit and vegetable specialist and a leader of the Ohio Roundtable on Safe Production of Fresh Produce. "However, there are big concerns that such an agreement would put small growers at a disadvantage.

"Ohio has many small growers of leafy greens, and I've heard them express fears that even though this program is voluntary on a federal level, many retailers would likely not accept product from any grower that doesn't join the agreement. That could put some, or many, of our growers out of business, and would likely not increase the safety of the food they supply."

Doohan said he hopes many of Ohio's leafy greens growers and other interested parties will express their concerns -- or their support – of the proposal at the October 6 hearing.

Transcripts of other hearings held before October 6 will be available on USDA's Web site at <**www.ams.usda.gov/moab**>. In addition, the USDA will video-record hearings held in Monterey, California, September 22-24, and will make the video available for viewing at the same web site.

More information on the proposal is available at <**www.ams.usda.gov/AMSv1.0/moab**> (click on "Proposed - Leafy Greens Marketing Agreement").

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Specialty Food Workshop Puts Entrepreneurs on the Right Path - *(Announcement)* - Hoosiers who have a hunger to start a specialty food business can attend an introductory workshop about how to be a successful business owner and operator.

The workshop will be from 8 a.m. to 4:30 p.m. October 8 at Purdue Extension's Allen County office. Workshop sessions will include information about organics, processing and packaging, food safety and regulation.

"We want participants to understand the steps they need to go through to start a successful business," said Maria Marshall, Purdue Extension small business development specialist.

Sharon Farrell of the Indiana State Department of Health will talk about the importance of food regulation. Rules vary depending on the product. Attendees will learn about the different regulatory agencies and how they work.

The food safety session will focus on bacteria that cause food-borne illnesses and what ingredients could be potentially hazardous if handled incorrectly.

The marketing session will provide valuable information as well, Marshall said.

"The food industry is very competitive, and participants need to understand what their target market is and how to position their product for that market," she explained. "We want to help each participant start a viable business, and to do that they have to understand the importance of marketing."

Registration, due Oct. 1, is $100 per participant, which includes a resource binder, lunch and refreshments. For more information and a registration form, visit <**www.agecon.purdue.edu/newventures/Pubs/EntrepBroch10.09.pdf**>, or contact Marshall at (765) 494-4268, **mimarsha@purdue.edu**.

The Extension office in Allen County is located at 4001 Crescent Ave. in Fort Wayne.

Meeting sponsors include Purdue University's departments of Agricultural Economics and Food Science, Purdue Extension in Allen County, the Indiana State Department

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Fulton County Vegetable Crops Meeting, November 25, 2009, 1:00PM (EST) at the Fulton County 4-H Fairgrounds, Rochester, IN. Contact Mark Kepler at **mkepler@purdue.edu**, or (574) 223-3397.

Times, featured speakers and topics are:

1:00 pm - Liz Maynard, Purdue Regional Vegetable Specialist - Utilizing Nutrient Meters in your Enterprise

1:30 pm - Dan Egel, Purdue Plant Pathologist - A Review of 2009 Diseases with an Emphasis on Late Blight of Tomato

2:30 pm - Rick Foster, Purdue Entomologist - Western Bean Cutworm, Insects of High Tunnels

Break

3:10 pm - Fred Whitford, Purdue Pesticide Programs - Chains and Webs: Hot to Tie Your Loads Down for the Road

4:00 pm - Mark Kepler, Extension Education, Fulton County - Private Pesticide Applicator Direct Supervision.

Cost is $20 per person (includes materials and handouts).

Make checks payable to: Purdue CES Education Fund

Mail to: Purdue Extension Service - Fulton County, 1009 W. Third Street, Rochester, IN 46875.

Credit towards recertification of a private pesticide license is an additional $10 per person.

Registration Deadline is Wednesday, November 18, 2009.

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Cucurbit Downy Mildew ipmPIPE Survey - *(Wendy Britton, North Carolina State University)* - This is a reminder to everyone about the site survey for the Cucurbit Downy Mildew ipmPIPE. The survey can be found at the following website, <**www.ces.ncsu.edu/depts/pp/cucurbit**>, by clicking on the "Please help us improve our Website" link on the top of the main page as well as on the top of the interactive map page.

We currently have 20 results from the survey and it would be extremely beneficial to have more. There will also be an "end of season" survey posted soon.

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2009 SARE Farmer/Rancher Grants - *(Announcement)* - The 2009 call for farmer/rancher grant proposals is now available at <**http://sare.org/ncrsare/documents/FRG_CFP_2009.doc**>. The deadline is 4:30pm CDT, Thursday, December 3, 2009.

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Illiana Vegetable Growers School, Tuesday, January 5, 2010, Teibel's Restaurant, Schererville, Indiana. Program available early December at <**www.hort.purdue.edu/fruitveg/events/events.shtml**>**.** For more information contact Liz Maynard at (219) 785-5673 or **emaynard@purdue.edu**.

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Indiana Horticultural Congress, January 19-21, 2010, Windham Hotel, Indianapolis, Indiana, <**www.inhortcongress.org**>. For more information, contact Tammy Goodale at **tgoodale@purdue.edu**.

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