

# VEGETABLE CROPS HOTLINE

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

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**GOSS'S BACTERIAL WILT AND LEAF BLIGHT ON CORN -** (Kiersten Wise and Gail Ruhl) - Sweet corn growers may have heard the news about a new disease of field corn in Indiana and wondered how it will affect sweet corn. The new disease is Goss's wilt. This disease will probably not seriously impact sweet corn growers in Indiana, however, the following article should help answer questions about Goss's wilt.

Goss's wilt was confirmed at the Purdue Plant and Pest Diagnostic Laboratory in August on field corn and popcorn samples submitted from northern Indiana. Goss's wilt is a bacterial disease that infects susceptible varieties of sweet corn, popcorn, and field corn. This is the first confirmation of Goss's wilt in Indiana since the disease was discovered on corn in Nebraska in 1969. The disease is found sporadically throughout the Midwest in limited areas and years, and is currently only present in one county in Indiana.

Goss's wilt is caused by the Gram positive bacterium *Clavibacter michiganensis* subsp. *Nebraskensis* and is characterized by distinct light tan to gray lesions filled with dark specks. Lesions will often appear shiny due to bacteria oozing onto the leaf surface (Figure 1). Blighted areas are common in susceptible varieties, and can be confused with sunscald or drought stress. The dark flecking and shiny areas within lesions distinguish Goss's wilt from another bacterial disease, Stewart's wilt, which has elongated lesions that run parallel to the veins and taper off to a point. Goss's Wilt can also infect the vascular tissue of the plant causing a systemic infection. Infected vascular tissue appears orange to brown and can cause wilting and stalk degradation.



**Figure 1:** Lesions of Goss's wilt on corn often appear shiny due to bacteria oozing onto the leaf surface. (Photo by Kiersten Wise)

The bacteria overwinter in infected residue on the soil or in limited weed hosts. Reducing the amount of debris remaining on the field through conventional or limited tillage practices is of primary importance. Rotation to soybean, wheat, alfalfa or another non-host can also help encourage decomposition of infected corn debris. Replanting corn into infected corn stubble is strongly discouraged in areas where the infection has occurred.

Studies in Nebraska have shown that the bacteria is capable of being both seedborne and seed transmitted. The disease is not insect-transmitted, like Stewart's wilt, and relies on wounds for dispersal. Once seed to seedling transmission occurs, disease spreads in areas that have experienced hail-damage or wind-driven rain. Early hailstorms and recent heavy rains and windstorms likely contributed to the infection and dispersal of Goss's wilt in fields in Indiana.

Currently, the susceptibility level of most varieties of sweet corn to Goss's wilt in Indiana is unknown. Jerald Pataky of the University of Illinois will have resistance information available on some lines later this fall <[www.sweetcorn.uiuc.edu/](http://www.sweetcorn.uiuc.edu/)>. It is important to note that fungicides will NOT have an impact on Goss's wilt, since the disease is caused by a bacteria and not a fungus.

Other plant diseases or injuries can easily be mistaken for Goss's wilt. Suspect samples may be sent to the Purdue Plant and Pest Diagnostic Lab for diagnosis.

There is an \$11.00 sample handling fee and an additional \$25.00 testing fee for serological confirmation of the bacteria.

For more information on Goss's wilt, check out the University of Nebraska Extension Bulletin on the disease at the following location <[www.ianrpubs.unl.edu/epublic/live/g1675/build/g1675.pdf](http://www.ianrpubs.unl.edu/epublic/live/g1675/build/g1675.pdf)>.

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**PRISTINE® AND GUMMY STEM BLIGHT** - (*Dan Egel*) - An earlier issue (No. 496) of the *Vegetable Crops Hotline* had an article about managing gummy stem blight of muskmelon and watermelon and included information about the fungicide Pristine®. As an update to that article, I can now state that I have found several strains of the gummy stem blight fungus that are resistant to boscalid (boscalid has a MOA code of 7), one of the active ingredients in Pristine®. All the strains I have tested so far are from Southwest Indiana. I do not have any information yet about whether there is resistance in Indiana to the pyraclostrobin (group 7) part of Pristine®. Nevertheless, this new information casts doubt about the fungicide Pristine® for use on gummy stem blight in Southwest Indiana. More information about this topic will be presented in a later issue of the *Hotline* and possibly in winter meetings. And as always, interested parties can contact me anytime.

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**FOLICUR 3.6F® REGISTERED** - (*Dan Egel*) - This fungicide has a section 3 (full) registration. This fungicide has a group 3 mode of action (DMI fungicide). Fungicides in the same group include Nova®/Rally®, Procure® and Tilt®. The crops and diseases for which Folicur 3.6F® is labeled include:

- Asparagus (rust)
- Beans, fresh and dry (rust)
- Sweet corn (rust, gray leaf spot, southern and northern leaf blight)
- Cucurbits (powdery mildew and gummy stem blight-suppression).
- Onion (purple blotch and rust)
- Leafy greens (*Cercospora* and *Alternaria* leaf spot)

Cucurbit growers may be able to use Folicur 3.6F® for managing gummy stem blight on muskmelon and watermelon (see accompanying article on Pristine and gummy stem blight). However, note that Folicur 3.6F® is labeled for suppression, a term which indicates this fungicide will help slow the disease but no more. In addition, note that there is a 7-day PHI for Folicur 3.6F® on cucurbits.

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**DOWNY MILDEW OF CUCURBITS UPDATE** - (*Dan Egel*) - Downy mildew was observed on one leaf of one plant of the cultivar 'Big Max', *Cucurbita maxima*. The outbreak was observed in a sentinel plot in Wanatah in LaPorte County. (Downy mildew was observed on cucumber in Hancock County in August.) The plot is part of a USDA grant Purdue University has obtained to help track downy mildew across the US to determine more about the races of the downy mildew fungus. For most growers, this outbreak will not influence yield or quality of cucurbits. It is too late in the season to require any additional fungicide applications for downy mildew.

Growers may follow the downy mildew epidemic at the North Carolina State University Cucurbit downy mildew webpage <[www.ces.ncsu.edu/depts/pp/cucurbit](http://www.ces.ncsu.edu/depts/pp/cucurbit)>, which is updated twice a week.

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**FALL PLANTED COVER CROPS** - (*Liz Maynard*) - Many reading this will already have planned for cover crops on vegetable fields this winter. For those who haven't, it is not too late to consider the benefits and plant a cover crop where appropriate. Protecting soil from erosion, adding fresh organic matter, and taking up nitrogen to reduce leaching during winter and early spring are some of the ways winter cover crops can benefit vegetable producers. Rye is probably the most widely used cover crop in the region, but wheat and oats are also used. Rye can germinate at 34°F and grow if it is above 38°F, so it is the best choice if cover crop planting is delayed until late fall. Oats should winter kill, while wheat and rye will need to be killed in the spring. Table 1 provides suggested seeding rates.

The nitrogen-fixing hairy vetch may be a good fit for fields that will be planted in late spring or early summer. This is a different species than the perennial crown vetch; hairy vetch is a winter annual and will naturally die after it sets seed in the spring. It will not grow much in the fall and so does not provide the benefits of winter soil protection or nitrogen scavenging. It will grow rapidly in the spring and by mid to late May can fix large amounts of nitrogen that will be available to a following vegetable crop. It is often combined with winter rye to provide better cover and nutrient scavenging over the winter. Hairy vetch should be seeded 4 to 6 weeks before a killing frost. Include an inoculant of rhizobia bacteria suitable for vetch at planting.

Cover crops do present some risk for vegetable growers. If spring weather prevents timely management of the cover crop, vegetable crop planting may be delayed. This risk is greatest in fields planned for early spring plantings. The risk can be reduced by choosing a cover crop that winter kills, like oats. Fields to be planted in late spring and summer are good candidates for cover crops because the longer period before cash crop planting permits greater leeway in management.

More information about cover crops is available from The Midwest Cover Crop Council (MCCC) web site at <[www.mccc.msui.edu/index.htm](http://www.mccc.msui.edu/index.htm)>. The MCCC is currently collecting information from people who have used cover crops in this region so that they can develop a Cover Crops Selector Tool. To contribute your experience, complete the survey on their website.

Table 1. Suggested Cover Crop Seeding Rates

Crop	Depth in.	Drilled		Broadcast		
		lb./A	bu./A	lb./A	bu./A	oz./100 ft2
Rye	¾ - 2	60 - 120	1 - 2	90 - 160	1.5 - 3.0	4 - 6
Wheat	½ - 1.5	60 - 120	1 - 2	60 - 150	1 - 2.5	3 - 6
Oats	½ - 1.5	80 - 110	2.5 - 3.5	110 - 140	3.5 - 4.5	4 - 6
Hairy Vetch	½ - 1.5	15 - 20		25 - 40		2

Source: Clark, A. (ed.) 2007. Managing Cover Crops Profitably, 3<sup>rd</sup> Ed. Sustainable Agriculture Network, Beltsville, MD. p. 70. Available online at <[www.sare.org/publications/covercrops.htm](http://www.sare.org/publications/covercrops.htm)>

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**FALL WEED MANAGEMENT ACTIVITIES** - (*Liz Maynard*)

- Actions taken now are an important part of an integrated weed management plan. Which of these might be appropriate for your operation?

1. Remove seed-producing weeds before seed is shed; especially important for weeds with long-lived seeds like common lambsquarters and velvetleaf.
2. Treat perennial weeds with herbicide.
3. Check next year's fields for weed species and distribution; make a weed map. Note areas where floodwaters may have brought in new weed seed.
4. Check fields for weeds new to the farm; identify them. New weeds are more likely to be found at field edges, under power lines or other structures where birds sit, in flooded areas, where off-farm materials containing weed seed (i.e. insufficiently composted manure or weedy straw) have been spread.
5. Plant a cover crop.
6. Moldboard plow to bury small, short-lived weed seeds (e.g. giant foxtail, large crabgrass).
7. Provide habitat for seed predators like mice, birds, beetles, crickets and earthworms.

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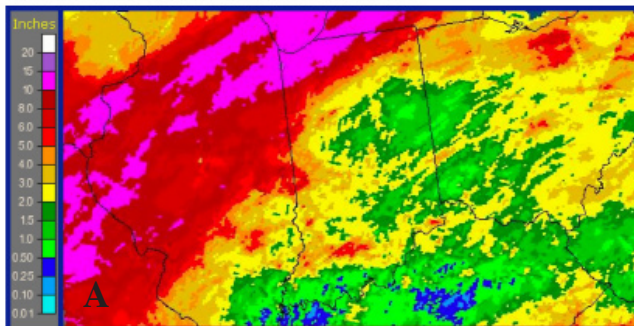
**NORTHWEST INDIANA WEATHER** - (*Liz Maynard*) - NW Indiana finally got its share of rainfall, or more, during the first two weeks of September. Pinney-Purdue Ag Center logged 8.6 in. over 3 days ending the morning of Sept. 15, and that was in addition to 3.5 in. the previous week. Other areas reported even more. Figure 1 illustrates rainfall in the region over the last month, and departure from normal for the last 6 months.

As a result of flooding following the rain, Lake, Porter, and LaPorte Counties have been declared federal disaster areas. Contact the local office of the Farm Service Agency for information about disaster assistance available to farmers.

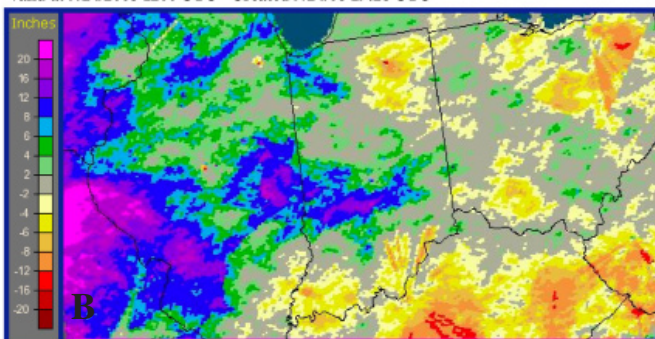
As has been explained in articles published in this newsletter earlier this year (see Issue #494), vegetables that have come in contact with floodwaters should not be sold.

**Figure 1:** A) Total precipitation for 30 days, and B) departure from normal in Indiana and neighboring regions for 180 days, ending Sept. 24, 2008.

Indiana: Current 30-Day Observed Precipitation  
Valid at 9/24/2008 1200 UTC - Created 9/24/08 19:13 UTC



Indiana: Current 180-Day Departure from Normal Precipitation  
Valid at 9/24/2008 1200 UTC - Created 9/24/08 19:28 UTC



Source: National Weather Service, Advanced Hydrologic Prediction Service. 2008. Indiana: Current 30-Day Observed Precipitation and Indiana: Current 180-Day Departure from Normal Precipitation. Retrieved 9/24/08, from <<http://water.weather.gov/>>.

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### Announcements and Upcoming Events

The Departments of Agricultural Economics and Food Science are co-sponsoring the bi-annual workshop titled, "**Introduction to Starting a Specialty Food Business in Indiana**", Thursday, October 9<sup>th</sup> at the Apple Hill Orchard, Bruceville, IN. Topics discussed in the workshop range from marketing food products to packaging, regulation, and food safety. If you would like a brochure, it can be downloaded from <[www.agecon.purdue.edu/newventures](http://www.agecon.purdue.edu/newventures)>, or by contacting Maria Marshall at [mimarsha@purdue.edu](mailto:mimarsha@purdue.edu) or (765) 494-4268; Marsha Prichard at [mpritcha@purdue.edu](mailto:mpritcha@purdue.edu) or (765) 494-0889; Kevin Keener at [kkeener@purdue.edu](mailto:kkeener@purdue.edu) or (765) 494-6648.

**Fulton County Vegetable Crops Meeting**, November 24, 2008, 1:00 PM – PARP credit available. Contact Mark Kepler, at [mkepler@purdue.edu](mailto:mkepler@purdue.edu), or (574) 223-3397.

**2008 Winter Technical Meeting and Variety Showcase**, December 4, 2008 at the Southwest Purdue Agricultural Center, Pinney Purdue Agricultural Center and remote locations to be named. Contact Dan Egel at [egel@purdue.edu](mailto:egel@purdue.edu) or (812) 886-0198.

**January 6, 2009. Illiana Vegetable Growers' School**, Teibel's Restaurant, Schererville, Indiana. Program available in early December. Contact: Liz Maynard, [emaynard@purdue.edu](mailto:emaynard@purdue.edu), (219) 785-5673.

**January 19-21, 2009. Indiana Horticultural Congress and Trade Show**, Adam's Mark Hotel, Indianapolis, Indiana. Program available in early December. Contact: Tammy Goodale, [tgoodale@purdue.edu](mailto:tgoodale@purdue.edu), (765) 494-1296. <[www.inhortcongress.org](http://www.inhortcongress.org)>.

**January 21-22, 2009. Midwest Organic Production and Marketing Conference and Trade Show**, Adam's Mark Hotel, Indianapolis, Indiana. <<http://orgconf.sustainability.uiuc.edu>>. Contact: Jim True, [jtrue@purdue.edu](mailto:jtrue@purdue.edu).

**LOOKING FOR PRODUCE TO BUY?** Growers who need to supplement their own production may find suppliers on the Indiana Market Maker web site <<http://in.marketmaker.uiuc.edu>>, or in the Indiana Vegetable Growers Association Directory of Wholesale Vegetable Producers available at <<http://ivga.org/directories.htm>>. Hard copies of the IVGA Directory may be requested by calling (219) 785-5673.

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