

# VEGETABLE CROPS HOTLINE

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

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[vegcropshotline.org](http://vegcropshotline.org)

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**DOWNY MILDEW NOT PRESENT IN INDIANA** - (Dan Egel, [egel@purdue.edu](mailto:egel@purdue.edu), 812-886-0198) - I have had several inquiries about downy mildew of cucurbits in Indiana. The fungus-like organism that causes downy mildew of cucurbits does not overwinter in Indiana; instead it has to be blown on wind currents from the Gulf States. The nearest locations where downy mildew of cucurbits has been found are central Michigan and southern Kentucky. One way to keep track of the downy mildew epidemic is to visit <http://cdm.ipmpipe.org>. The map of the Eastern US on this site shows where downy mildew has been found. In Indiana, we are watching for downy mildew at sentinel plots in Wanatah and Vincennes as well as in commercial fields across the state. Any outbreak of downy mildew we observe will be reported on the <http://cdm.ipmpipe.org> site as well as at [veggiediseaseblog.org](http://veggiediseaseblog.org) and in the *Vegetable Crops Hotline*.

For most growers, there is no need to apply specialized fungicides for downy mildew. I recommend that growers follow the epidemic (see above) and scout their fields. Growers who have high value cucurbits may want to apply specialized fungicides if the disease threatens. Fungicides listed in the *Midwest Vegetable Production Guide for Commercial Growers (ID-56)* for downy mildew includes Ranman<sup>®</sup>, Previcur Flex<sup>®</sup>, Gavel<sup>®</sup>, Zampro<sup>®</sup>, Presidio<sup>®</sup> and Tanos<sup>®</sup>. Most of these fungicides do not control the other diseases common to pumpkins. Therefore, applications of specialized downy mildew fungicides when downy mildew isn't present are likely to waste time and money. (Some of the fungicides effective against downy mildew are also effective against *Phytophthora* blight since these two causal organisms

are related to each other.) Please read the label carefully before any application.

There are several different types of cucurbit downy mildew, all of which can be differentiated by what hosts are affected. Cucumber and cantaloupe are susceptible to all the types of downy mildew. Pumpkin is susceptible to only one type of downy mildew. Therefore, cucumbers and cantaloupe are often the first to show symptoms.

Symptoms of downy mildew on cucumber often start as yellow, angular lesions (see Figure 1). On all hosts, the underside of lesions caused by downy mildew will have a dark fungal-like growth during moist conditions (see Figure 2).

Soybeans may also get symptoms of downy mildew; however, the fungus-like organism that causes soybean downy mildew will not infect cucurbits.

Powdery mildew of cucurbits is caused by a fungus unrelated to the organism that causes downy mildew. Control recommendations for these two diseases differ significantly.

Contact Dan Egel with any questions or concerns.



Figure 1. Lesions of cantaloupe often appear as angular yellow areas on the tops of leaves. (Photo by Dan Egel)



Figure 2. Under moist conditions, the underside of downy mildew lesions exhibits a dark, fungal like growth. (Photo by Liz Maynard)



**LATE BLIGHT IN LaGRANGE COUNTY-** (Dan Egel, [egel@purdue.edu](mailto:egel@purdue.edu), 821-886-0198) - Late blight has been reported on potatoes in LaGrange County. Potato and tomato growers in Northeast Indiana should follow the management recommendations listed below and in the *Midwest Vegetable Production Guide for Commercial Growers 2014 (ID-56)*.

Before going into the biology and management of late blight, a note on the late blight report mentioned above. The report is from the website <http://usablight.org/map>. There was no sample observed by any Purdue University specialist. However, growers in the area should start managing this disease.

Late blight thrives under cool, wet conditions. The disease can easily blow from plant to plant. Under ideal conditions, the disease can spread rapidly, causing symptoms on all above ground plant parts. The lesions may be green to brown and under moist conditions may be ringed with white fungal growth. Affected tomato fruit may have large brown lesions.

The fungus-like organism that causes late blight does not overwinter in Indiana. Therefore, the disease must be blown or brought into Indiana.

All strains of the fungus-like organism that affects tomato will cause disease on potato. However, not all potato strains will affect tomatoes. However, it is best for tomato growers in Northeast Indiana to take precautions against late blight.

Off-season recommendations for late blight include destroying cull piles and disking under affected crops. This time of year, however, the only option left to

growers is the application of specialized fungicides. The *Midwest Vegetable Production Guide for Commercial Growers 2014 (ID-56)* has specific products listed. One product not listed in the recommendations in the *ID-56* is Zampro®. Many of the products that are effective against late blight are not effective against more common diseases such as early blight or Septoria leaf blight. Organic growers should apply a copper product.

More information about late blight is included in this bulletin <https://www.extension.purdue.edu/extmedia/BP/BP-80-W.pdf>. For a hard copy of this bulletin or for questions or comments, contact Dan Egel.



### **YELLOW SHOULDER AND INTERNAL WHITE TISSUE IN**

**TOMATOES** - (Liz Maynard, [emaynard@purdue.edu](mailto:emaynard@purdue.edu), 219-531-4200) - Yellow shoulder disorder describes well the yellow hard areas near the stem end of tomato fruit that fail to ripen properly (see Figure 3). Even on fruit that doesn't show the distinct yellow on the shoulder, cutting across the top of the fruit will reveal internal white tissue that is also associated with the disorder. A variety of factors make this problem more likely to occur.

**Genetics:** Varieties that have green shoulders in immature fruit are more likely to show the disorder. If you aren't sure whether a variety has the gene for green shoulders, check with the seed supplier, or review the tomato cultivar descriptions available from the North Carolina State University site at <http://cuke.hort.ncsu.edu/cucurbit/wehner/vegcult/vgclintro.html>.

**High Temperatures/Sun:** Yellow shoulders are often found on tomato fruit exposed directly to the sun. On plants pruned to a single stem there may be many fruit in this situation. Loss of foliage due to disease can also expose fruit to the sun. If tomato fruit gets extremely hot it may exhibit sunscald, with the skin and flesh turning white and sunken on the exposed area of the fruit. Covering a high tunnel with shade cloth can reduce temperature in the tunnel.

**Nutrition:** Inadequate potassium is linked to this disorder. Research in processing tomatoes has shown that adequate potassium early in tomato plant development is necessary. Soil conditions that influence potassium availability, such as levels of magnesium and calcium are also a factor. The 'Hartz Ratio' calculator at Ohio State University <http://www.oardc.ohio-state.edu/tomato/HartzRatioCalculator.htm> provides a way to assess risk of the disorder in processing tomatoes based on soil properties.

With increased production in high tunnels I have been hearing more about this disorder from growers. Researchers in several states are studying the problem in high tunnel production systems. Watch for more specific production recommendations as we learn more.



Figure 3. Yellow shoulder disorder on a ripening tomato fruit. (Photo by Liz Maynard)



**FALL PLANTED COVER CROPS** - (Liz Maynard, [emaynard@purdue.edu](mailto:emaynard@purdue.edu), 219-531-4200) - As summer crops reach the end of production and are tilled under the planting season for fall cover crops begins. Cover crops offer many benefits, including protecting soil from erosion, adding fresh organic matter to build the soil, and taking up nitrogen to reduce leaching during winter and early spring are some of the ways winter cover crops can benefit vegetable producers. Some producers have developed systems that combine cover crops with reduced tillage the following the spring, leaving cover crop residue on the surface to suppress weeds and provide a mulch during the growing season.

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. These winter annual grains can be killed by close mowing or rolling/crimping after they reach the reproductive stage in the spring, or by tillage and/or herbicides earlier in the season.

The nitrogen-fixing hairy vetch may be a good fit for fields that will be planted to vegetables in late spring or early summer. Hairy vetch is a winter annual and will naturally die after it sets seed in the spring. It can be killed by close mowing or rolling/crimping after it reaches the reproductive stage, or by tillage and/or herbicides earlier in the season. 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.

Forage and oilseed radishes as well as other members of the cabbage family are also used as cover crops. Trademark names like 'Tillage Radish' or 'Groundhog Radish' emphasize the large taproots of radishes used as cover crops. Radishes planted in the fall will develop roots over an inch across that can reach a foot or more into the soil. The rosette of broad green leaves may reach 2 to 3 feet in height. Temperatures in the low 20s will kill the plants. As roots decompose after plants die, the holes they leaves in the soil increase soil aeration and improve drainage, providing better soil conditions for future crops. Early fall is the best time to plant radishes so they will have at least 60 days to grow. Radishes cover the ground quickly to reduce weed growth in the fall, and suppress early weed growth in the spring. They are excellent scavengers of nitrogen in the fall, but as temperatures warm in the spring and dead plants decay, that nitrogen will be released and may be lost from the soil. Be aware that as radishes decay, they emit an unpleasant sulfur odor that can be a problem during warm spells in the winter. Cover crops in this family are susceptible to the diseases that attack related cash crops like broccoli and cabbage, and so would probably not be recommended in close rotation with those crops.

In the short period before frost, there may be time for a planting of buckwheat. This quick-growing broadleaf will be killed by frost. If frost is late, be prepared to terminate the crop before it goes to seed so that volunteer buckwheat doesn't become a weed next spring.

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. Choosing a cover crop that dies off in the winter, like oats or radishes, can reduce that risk. 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.

Here are some common sense suggestions for developing a successful cover crop system on your farm.

1. Gather information from people in your area who are knowledgeable about the crops. Natural Resource and Conservation Service staff, representatives of local cover crop seed companies, or Extension staff may have the practical local knowledge that is needed. Cost-share programs may be available from NRCS.
2. Start small with new cover crops.
3. Choose cover crops and varieties that match the situation on your farm.
4. Obtain seed from a reliable, preferably local or

regional source.

5. Check rotation restrictions for herbicides used during the growing season and discuss with experienced people to determine the potential for injury to a fall-planted cover crop.

6. Plan in advance for how the crop will be managed in the spring.

7. Keep notes and records, and review them to guide improvements in future years.

More information about cover crops is available from The Midwest Cover Crop Council (MCCC) web site at <http://www.mccc.msu.edu/index.htm>. Included on the site is a Cover Crops Selector Tool. This tool will make recommendations on cover crops for Indiana based on the type of cash crop to be planted, the soil drainage class, and the cover crop attributes (e.g. nitrogen scavenger, nitrogen source, soil builder, etc.) desired.



**FIELDWATCH/DRIFTWATCH: NEVER TOO LATE TO LIST FIELDS** - (*Liz Maynard, [emaynard@purdue.edu](mailto:emaynard@purdue.edu), 219-531-4200*) - The DriftWatch website offers a platform where producers can list their fields of vegetables and other high-value crops that are sensitive to pesticide drift. The information is then available to commercial pesticide applicators, as well as others, in order to aid in communication to minimize pesticide drift onto the sensitive crops. While spring is often the time people think about listing fields, it is never too late to add a field or greenhouse to the site.

Started in 2008 by Purdue University, the website is now operated by the non-profit FieldWatch, Inc., created in 2012 to support expansion of Driftwatch. There is no charge to list fields on the site. For more information and to access the Driftwatch site, visit [www.fieldwatch.com](http://www.fieldwatch.com).



**WETZSTEIN APPOINTED NEW HEAD OF PURDUE HLA DEPARTMENT** - (*Keith Robinson, [robins89@purdue.edu](mailto:robins89@purdue.edu), 765-494-2722*) - Hazel Wetzstein, professor of horticulture at the University of Georgia, has been appointed professor and head of Purdue University's Department of Horticulture and Landscape Architecture.

The appointment, effective Aug. 1, was announced Monday (May 5) by Jay Akridge, Glenn W. Sample Dean of the College of Agriculture.

Wetzstein succeeds Robert Joly, who is returning to the faculty after serving eight years as department head. "Dr. Wetzstein is a respected scholar and thought-

ful leader," Akridge said. "She made a deep and positive impression on the Department of Horticulture and Landscape Architecture and the college during her visits here, and I could not be more excited about the future of the department under her leadership."

Wetzstein received her bachelor's degree in biology from California State University in 1975 and doctorate in botany from the University of California-Davis in 1978. She first joined the biological sciences faculty at the University of Nevada before moving in 1980 to the University of Georgia, where she was promoted to professor in 1995. In addition to her work in the Department of Horticulture there, she also was on the faculty in the School of Forest Resources.

Wetzstein's research emphasis has been in plant growth and development, reproductive biology, conservation and tissue culture, and medicinal plants.

Akridge thanked Joly for his service as head of the Department of Horticulture and Landscape Architecture.

Editor's note: We extend a warm welcome to Dr. Wetzstein, and echo the Dean's thank you to Dr. Joly for his leadership and support for vegetable Extension and research.



## UPCOMING EVENTS

**HIGH TUNNEL TOMATO TWILIGHT MEETING AT PINNEY PURDUE.** Tuesday, August 12, 2014, 6:00 P.M. to 8:00 P.M. Central Time. 11402 South County Line Rd., Wanatah, IN. See three varieties of tomatoes grown with different support methods in organic and conventionally-managed high tunnels, and help us evaluate tomato eating quality. Learn about disease management from Dan Egel. Free, but pre-registration is encouraged. Register online at: [https://purdue.qualtrics.com/SE/?SID=SV\\_bfs1KmQ4iY4aeBn](https://purdue.qualtrics.com/SE/?SID=SV_bfs1KmQ4iY4aeBn), or send an email to [vegacrops@purdue.edu](mailto:vegacrops@purdue.edu) with names of those attending, or leave message for Cassandra at 219-531-4200 ext. 4201.

**VEGETABLE GROWERS TWILIGHT MEETING.** Thursday, August 14, 2014, 6:00 P.M. Hackman Family Farm Market, 6077 South State Road 135 Vallonia, IN. Guest Speaker Dr. Dan Egel, Plant Pathologist with Southwest Purdue Ag Program. Come with your vegetable production questions and samples of problems. PARP Credit has been applied for and may be available. PARP credit is \$10. For more information contact Purdue Extension Jackson County Office at 812-358-6101.

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