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

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<http://www.btny.purdue.edu/pubs/vegcrop>

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Note from the Editor

This is the last *Vegetable Crops Hotline* for 2012. Please take a moment to renew your subscription by returning the form included in this issue, or by renewing your membership in the Indiana Vegetable Growers Association.

For most of us winter provides time to catch up on information that we didn't have time for during the season. Whether it is reading, watching webinars, talking to people, or attending trade shows and educational programs, I hope VCH readers will find time and opportunity to access new information that will help them meet their goals for next year. Please get in touch if there is information we might help you find.

SWEET CORN DISEASES - (*Dan Egel*) - Although the dry weather this year kept foliar diseases to a minimum, wet weather in the late summer and fall allowed a couple of sweet corn diseases to appear in southern Indiana.

Northern corn leaf blight (NCLB) can affect both field and sweet corn. The primary symptom is the cigar shaped lesion that ranges from 1 to 7 inches in length (see Figure 1). The lesions may range from tan to gray in color. Under conditions of high humidity, olive-green fungal spores may be produced on the lesion surface. Symptoms of NCLB are frequently observed late in the season when days become cooler.

Yield losses are possible if lesions reach the ear leaf or higher during the two weeks before or after tasseling.

NCLB can be managed by a combination of crop rotation, fall tillage, resistant hybrids and fungicide ap-

plications. Crop rotation and fall tillage help to minimize crop residue that might harbor the fungus that causes NCLB. Choose hybrids resistant to NCLB when possible. When it is necessary to use hybrids without resistance and weather conditions have been conducive to disease, fungicide may be used to help reduce symptoms of NCLB. See the *Midwest Vegetable Production Guide* for Commercial Growers for recommendations.

Common rust produces raised light brown lesions known as pustules on both surfaces of the corn leaf (see Figure 2). Each lesion produces copious spores that may cause additional lesions on leaves. Later in the season the lesions may turn brownish black as the overwintering spores are produced.

Infection is favored by moderate temperatures from 61° to 77° F. About 6 hours of leaf wetness are required for germination of spores. However, leaves may remain wet for long periods in the whorl in the absence of rain or dew.

Common rust is most easily managed by using host resistance. Look for hybrids that have resistance. If common rust appears to be affecting hybrids with resistance let me know. Fungicides are available to manage this disease. See the *Midwest Vegetable Production Guide* for fungicide recommendations.



Figure 1: Northern corn leaf blight causes cigar-shaped lesions on sweet corn leaves that may be 1 to 7 inches in length.



Figure 2: Common rust causes light brown pustules on the upper surface of sweet corn leaves.

VEGETABLE PATHOLOGY LESSONS FROM 2012 - (*Dan Egel*) - The 2012 season witnessed one of the worst droughts Indiana has ever seen. Most of us are glad to see 2012 disappear into the history books. But before we close the books, are there some lessons we can learn from the summer of 2012? Here are some thoughts about dry weather and vegetable disease management from a pathologist's point of view.

If there was a silver lining to the 2012 season, it was the relatively small amount of foliar disease. I had trouble getting disease in my own experimental vegetable plots. Why? Moisture on the surface of the leaf is necessary for many of the fungal propagules (e.g., spores, conidia) that cause plant diseases to enter into the plant. And rain or irrigation water in the form of droplets spreads propagules from leaf to leaf and from plant to plant.

Examples of vegetable diseases that need water to develop and spread are:

• Tomato: early blight, Septoria leaf blight, gray mold, leaf mold;

• Watermelon and cantaloupe: Alternaria leaf blight, anthracnose, gummy stem blight, downy mildew, Phytophthora blight;

• Pumpkin: black rot, Plectosporium blight, downy mildew, Phytophthora blight.

• Sweet corn: Northern blight, rust.

• Green beans: anthracnose, gray mold.

Management of the fungal diseases above includes use of crop rotation, fall tillage, resistant varieties and protectant fungicides. The fungicides may be contact or systemic. The fungicide label often lists application intervals such as "apply every 7 to 10 days."

Because water on the surface of leaves increases disease severity, when there is frequent rain, overhead irrigation, or heavy dews, the fungicide application intervals should become more frequent. Under dry conditions fungicides are just as effective when applied at less frequent intervals. Under very dry conditions such as we had this past summer it was possible to save money without compromising disease control by making fewer fungicide applications.

How can a grower know what fungicide application

intervals to use under various conditions? Unfortunately there aren't clear-cut answers for many crop and disease situations. Here are some general guidelines:

• When frequent rains have been the norm, one should apply fungicide about every 7 days. It isn't the amount of rain so much as the frequency of rain that is important. Remember, the longer leaves are wet, the greater the chance of disease.

• A rain or irrigation event that causes leaves to be wet well into the night when dews often occur is more likely to lead to increased disease severity than a rain or irrigation at mid-day when the leaf surfaces can dry before evening.

• In the absence of rainy periods, fungicide applications can be spread out to 10 or even 14 days. Dew periods can also lead to an increase in disease; however, dews don't normally spread vegetable disease like a good rain.

• If you are wondering about whether to apply that fungicide application before a possible rain, go ahead and make the application if it appears that the fungicide will have a chance to dry. (The label may have more specific instructions.) And most fungicides are formulated to stick on the surface of leaves pretty well: it isn't necessary to re-apply a fungicide after each rain.

• If the crops in question have not had a good crop rotation, there is likely to be more disease, and so more fungicide applications are warranted.

In the case of cucurbit crops, Purdue University has developed a program to take the guesswork out of fungicide applications. MELCAST (MELon disease foreCASTer) was developed by Rick Latin in the Botany and Plant Pathology Department to help growers schedule fungicide applications according to the weather. Growers that used MELCAST in 2012 saved lots of money on fungicide applications without compromising foliar disease health. Ask me for more information about MELCAST.

The disease severity of the tomato fungal diseases early blight and Septoria leaf spot can be forecast with a program known as TOMCAST. However, this program is not in service today. For more information about TOM-CAST contact me.

Bacterial diseases also need water to get into plants and to spread. However, it is my experience that less moisture is needed than for fungal diseases. Heavy dews won't spread bacterial diseases, but seem to be more than enough to get these diseases started. Even so, due to the drought, I observed fewer bacterial diseases this year. Examples of such diseases are: bacterial spot and speck of tomato, bacterial fruit blotch and angular leaf spot of all cucurbits, and bacterial leaf spot of pumpkins. Bacterial canker of tomato needs moisture to start and spread, but once in a plant, the disease moves systemically throughout the plant regardless of how much water is present.

Other diseases are soil borne and do not require leaf wetness to get the disease started. For example, the fungus that causes Fusarium wilt of watermelon lives and survives in the soil in the absence of the host. The conditions that lead to Fusarium wilt do not include leaf wetness. And there is no fungicide labeled for Fusarium wilt. Verticillium wilt of many crops including tomato and eggplant is similar in that no leaf wetness is required. Root knot nematode is also a soil borne problem that does not require leaf wetness.

Insects are necessary for the spread of other diseases. These diseases generally do not require any sort of leaf wetness to start or spread. Examples of such diseases are: bacterial wilt of cucumber and cantaloupe (spread by the cucumber beetle), Stewart's wilt of sweet corn (spread by the flea beetle), and several virus diseases of cucurbits (spread by aphids).

Some of you might be wondering where Phytophthora blight fits into these categories. Since Phytophthora blight causes lesions of leaves and fruit surfaces it is a foliar disease. However, Phytophthora blight survives in the soil for years in the absence of a host, so it is a soil borne disease. Phytophthora blight is both a foliar and soil borne disease: this is why it is such a serious problem for vegetable growers. Phytophthora blight thrives in the presence of frequent rains and flooded conditions.

This information should allow vegetable growers to better understand the conditions under which it should be possible to save money on fungicide applications for foliar diseases. A few soil borne and insect vectored diseases are also described. For more information on this subject, contact me or look for a PARP talk on this very topic at a location near you this winter.

POTENTIAL FOR HERBICIDE CARRYOVER GREATER AFTER DRY SUMMER – (*Liz Maynard*) – A recent article by Travis Legleiter and Bill Johnson in the *Purdue Pest and Crop Newsletter* warned of the potential for herbicide carryover and injury to agronomic crops planted this fall or next spring as a result of the drought. This is also a concern for vegetable growers. Dry conditions can lead to more herbicide carryover because less herbicide leaches out of the root zone. Also, in dry soil there is less microbial and chemical breakdown of herbicides. Although many areas of the state have received significant rain this fall, it is still likely that carryover will be greater than usual in some fields. This could lead to injury on rotational crops even if the rotational restriction on the herbicide label is followed.

Common sense precautions will help producers avoid fields where carryover injury is likely. Identify what herbicides have been used in the past four years on any field where vegetables will be planted. Four years may seem like a long time, but the rotational restriction for some vegetables can be 40 months or more for some herbicides (e.g. Pursuit[®], Optill[®], and Lightning[®]). Check the rotational restrictions for the vegetable crop to be planted for those herbicides. Table 20 in the *Midwest Vegetable Production Guide* for 2012 lists restrictions for rotating to vegetables for many agronomic herbicides. If that table doesn't include the herbicide or crop you need to know about, find a label for the herbicide and look under rotational restrictions. (Many labels are available online at http://www.cdms.net under the 'Services' tab.)

Planting sooner than the rotation restriction on the label is off label and not permitted. If the planned planting date for a vegetable crop will be close to the minimum required time since the herbicide was applied, assess the situation carefully. How much rain did that field actually receive since the herbicide was applied? Does the soil pH in the field increase carryover of the herbicide in question? For example, atrazine and sulfonylureas such as Accent[®] have longer carryover at higher soil pH. If the conditions suggest that carryover is likely, it may be best to find another field for the vegetable crop. If more information is needed, consider conducting a field bioassay.

A field bioassay can help to assess whether harmful levels of herbicide residue remain. The field bioassay compares growth of the crop of interest (or an indicator crop) in soil from the field in question and similar soil from another location known not to have herbicide residues. It's best to conduct the test in the spring if that is when the crop will be planted. Because fields rarely have uniform soil it is important to test soil from different areas of the field. For detailed instructions on conducting a field bioassay, see "Herbicide Persistence and How to Test for Residues in Soils" in the *Illinois Agricultural Pest Management Handbook*, available at http://www.ipm.uiuc.edu/pubs/iapmh/13chapter.pdf. Contact me if you have questions about the process.

RESEARCH UPDATE: COVER CROPS AND WEED SEED PREDA-TION SERVICES - (*Carmen Blubaugh, Ph.D. student, Purdue Dept. of Entomology*) I'm finally wrapping up field work at Meigs Research Farm, where I had three experiments on the ground this year, all investigating different aspects of weed seed predation services by beneficial ground beetles. We'll spend most of the winter processing our field data from this year, but I have a few preliminary results to share.

It's very well documented that ground beetles aggregate in areas on the farm with protective vegetative cover. Since many common beetle species are ferocious hunters of weed seeds, weed scientists assume that seed consumption services (along with plant competition from the cover crops) may substantially reduce weed growth in cover crops. Still, a single common lambsquarters plant can produce up to 170,000 seeds, so it would require a LOT of hungry beetles to reduce the seedbank to a point that would be meaningful for weed control. To put the seed predators to the test, I decided to exclude them from cover cropped areas and actually measure the differences in weed communities. Last fall, I set up impenetrable beetle fortresses (see Figure 3) in plots where we were already comparing weed growth following cover crop plantings of cereal rye, oriental mustard, hairy vetch, a rye/vetch mix, and fallow control plots. To make sure the seedbanks were

similar between my plots, I sowed in about 15,000 seeds of common lambsquarters, pigweed and crabgrass per plot (with apologies to the Meigs farm crew for planting weeds). After excluding beetles during the fall and spring, I counted seedlings in May and July, to try to get an idea of what kind of impact seed predation had on the weed communities in the different cover crop plots.

This summer, I counted fewer lambsquarters and pigweed seedlings in the fenced plots (where beetles were not allowed) than I did in the open plots (where beetles could visit freely) (see Figure 4), suggesting that indeed seed predators might consume enough seeds to reduce weed pressure in cover crop environments! Unfortunately, when I harvested the vegetation in my plots, there was no difference in weed mass between the fenced and open plots, even though there were more individual plants in the fenced plots. Because weed seed production is strongly related to weed biomass (more than to the actual numbers of germinated plants), I'm waiting for more data before I strongly declare the positive weed-suppressive effects that seed predators may have in cover crop systems. Next year, I will replicate the experiment without harvesting biomass until the end of the season, at weed senescence. This will give me the opportunity to examine the effects of seed predator access on germination rates as well as seedbank flux. If you're interested in learning more about my work, please send me an email at blubaugh@ purdue.edu. I would love to share more about this project and my other work at Purdue.



Figure 3: Fence constructed to exclude weed seed predators from cover crop plots. (Photo by *Carmen Blubaugh*)



Figure 4: More germinated individuals were counted in the fenced plots than in the open plots for both pigweed and common lambsquarters.

DROUGHT STRESSES PEOPLE AS WELL AS PLANTS – (*Paul Jones*) - Agricultural production is stressful under the best circumstances. Competition, consumer expectations, adverse weather conditions, and the price of inputs are just a few factors that can raise your blood pressure or lead to some sleepless nights. However, when you add the devastating circumstances that many farmers faced in 2012, such as the worst drought in decades and a salmonella outbreak that affected producers and consumers in several states, farm stress levels can quickly go off the charts

Another challenge farmers face when dealing with stress is often considered one of their greatest strengths: independence. The self-sufficiency and individualism that keep many farmers going in the face of turmoil can fall short when emotional resources are stretched too far. During those times, farmers need "community," and they need to see that accepting help from others is a sign of wisdom, not weakness.

Some early signs of "stress overload" include increases in physical illness, a decline in the care of livestock and the farmstead, headaches, eating irregularities, and sleep disturbances. Prolonged, chronic stress can lead to such adverse outcomes as depression, bitterness, anger, alcoholism, and even violence against self and others.

It's much better to address stress-related issues sooner than later. Some good places to start are with a pastor or family doctor. Also, check your phone book for local counselors or locate one of Indiana's community mental health centers at www.iccmhc.org. The U.S. Department of Health and Human Services also maintains an online treatment locator at www.store.samhsa.gov/ mhlocator. Rural-oriented help-lines like Farm Aid's 800-FARMAID (800-327-6243) can help with a variety of issues ranging from stress to financial struggles. If you or someone you know has considered or talked about suicide, get help immediately. Call the National Suicide Prevention Lifeline: 800-273-TALK (8255), dial 2-1-1 in many communities for referral to social service agencies, or call 9-1-1 if the threat seems imminent. Hope is available, but you can't do it alone. Don't let your fear of losing independence keep you from getting the help you need – help that can benefit not only you but also those closest to you.

WORKSHOPS TO HELP FARMERS/OTHERS "SCALE UP" PRODUCTION FOR NEW MARKETS - (*Roy Ballard*) - Farmers and small-business owners interested in selling their food products can learn ways to make their businesses safe and profitable at workshops to be given across the state.

MarketReady Indiana will be offered at 11 locations

and feature sessions on each stage of food marketing, including quality assurance, pricing, insurance, and relationship building.

Target audiences include traditional farmers seeking to diversify their crop and livestock markets, small and beginning farmers, owners of small businesses such as bakeries or dairies, and producers of value added products such as flour, jellies, jams or salsa seeking to expand their marketing options.

This workshop is all about the five Ps - people, product, place, promotion and plan. It will make farmers and small-business owners better able to compete in food markets by familiarizing themselves with business practices, quality and similar issues that are expectations of the modern marketplace. We want to allow vendors to successfully access institutional, restaurant and wholesale markets.

Sessions will include panel discussions with representatives from restaurants and wholesale buying institutions, as well as presentations by county Extension educators.

Registration costs \$60 per person, and \$30 per person for each additional member of a family or farm group. Registration forms can be downloaded from http://www3.ag.purdue.edu/ counties/hancock/Documents/AgFiles/Programs/ MarketReady2012brochure.pdf and mailed to the Monroe County Extension Office, 3400 S. Walnut St., Bloomington, IN 47401, or participants can call their county Extension office to register.

For more information, contact Roy Ballard at 317-462-1113 or **rballard@purdue.edu**.

SMALL, SUSTAINABLE FARMERS - SAVE THE DATE! Purdue Extension announces the first Indiana Small Farm Conference, which will be held on March 1st and 2nd 2013 at Hendricks County Fairgrounds in Danville, Indiana. We hope you can join us to share experiences and interact with other farmers, producers, extension educators, researchers, and students.

There will be sessions on crop production including hoop houses, livestock production, processing and marketing your produce or goods, energy and small farm management. This will be a dynamic conference where participants will be able to interact with each other as well as hear from other successful small farm enterprises.

Please watch for updates and registration information on the Purdue Small Farm and Sustainable Ag website http://www3.ag.purdue.edu/smallfarms/

UPCOMING EVENTS

MarketReady Indiana. Various dates and locations, Nov. 5 through Jan. 26. See article elsewhere in this issue. Registration forms can be downloaded from http://www3.ag.purdue.edu/ counties/hancock/Documents/AgFiles/Programs/ MarketReady2012brochure.pdf. Contact: Roy Ballard at 317-462-1113 or rballard@purdue.edu.

High Tunnel Field Day: Winter Crops. Saturday, Dec. 1, 2012. Pinney Purdue Ag Center, 11402 S. County Line Rd., Wanatah, IN. Flyer will be posted at https://www2. ag.purdue.edu/hla/fruitveg/Pages/Events.aspx. Contact: Liz Maynard at 219-531-4200 ext. 4206 or emaynard@ purdue.edu

Southwest Indiana Melon and Vegetable Growers Association Meeting. Thursday, December 6, 2012, 6:00 p.m. Southwest Purdue Agricultural Center, 4369 N. Purdue Rd., Vincennes, IN. The meeting will start with dinner, which is free with your paid SWIMVGA membership. Nonmembers may join at the door. Members will receive a postcard in the mail in November reminding them to RSVP. Contact: Dan Egel at 812-886-0198 or egel@purdue.edu.

Good Agricultural Practices A to Z. Various dates and locations, Dec. 11 through March 9. Registration form will be posted at https://www2.ag.purdue.edu/hla/ fruitveg/Pages/Events.aspx. Contact: Liz Maynard at 219-531-4200 ext. 4206 or emaynard@purdue.edu

Illiana Vegetable Growers Symposium. Thursday, January 3, 2013. Teibel's Restaurant, Schererville, IN. Program will be available in early December and posted at https://www2.ag.purdue.edu/hla/fruitveg/Pages/ Events.aspx. Contact: Liz Maynard at 219-531-4200 ext. 4206 or emaynard@purdue.edu.

Indiana Horticultural Congress. January 22 – 24, 2013. Wyndham Indianapolis West, Indianapolis, IN. www.inhortgress.org. Register online at http://www.regonline.com/Register/Checkin. aspx?EventID=1127338. Contact: Tammy Goodale at 765-494-1296 or tgoodale@purdue.edu.

Indiana Small Farm Conference. March 1 – 2, 2013. Hendricks County Fairgrounds, Danville, IN. http:// www3.ag.purdue.edu/smallfarms/

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2013 Vegetable Crops Hotline Subscription Form

The *Vegetable Crops Hotline* newsletter provides the commercial vegetable grower with timely information about disease, insect and weed pests, fertility practices, post-harvest problems, pesticide label changes, meetings and much more. Each year, the Hotline is published 12 times during the growing season (April - September) with off-season issues in February, March and November.

Again this year, in addition to receiving the regularly scheduled *Hotline* issues, subscribers may also receive the <u>Vegetable Crops Hotline</u> - <u>Bulletin</u> either by e-mail or FAX. This will require that subscribers to the 2013 *Hotline* indicate how they want to receive the bulletins. The *Bulletin* articles will also appear in the next regularly scheduled *Hotline* issue along with other pertinent articles written by the Purdue staff.

To subscribe, please fill in your name and address below, and send this form and a check for \$15.00 made payable to **<u>Purdue University</u>** to:

Vegetable Crops Hotline Subscription Southwest Purdue Agricultural Program 4369 N. Purdue Road Vincennes, IN 47591

Indiana Vegetable Growers Association members are automatically signed up for the *Vegetable Crops Hotline* at no additional charge.

Yes, I would a \$15 check mad <u>Mail to</u> : *****(Please con	l like to subscribe to the 2013 <i>Vegetable Crops Hotline</i> . Enclosed is e payable to Purdue University . Vegetable Crops Hotline Subscrition, SWPAP, 4369 North Purdue Road Vinennes, IN 47591. nplete the following)*****
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Indiana Vegetable Growers Association

Membership Renewal/Application

Benefits of IVGA Membership

- Midwest Vegetable Production Guide for Commercial Growers, (ID-56) (new edition usually available in Jan.)
- Vegetable Crops Hotline subscription
- Listing in IVGA Directory of Wholesale Vegetable Producers (optional)
- Your web site linked on www.ivga.org
- Corporate members only: free ad on www.ivga.org
- Networking with other vegetable growers

To renew or join, correct or fill out the form below and send in with your check payable to IVGA. If you have already renewed for the current year, but haven't provided the information requested below, please check here _____, complete this form, and return to the address below.

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How would you like to receive the Vegetable Crops Hotling?	chrysanthemums	radishes	
	cauliflower	pumpkin	
magazines that may be offered to IVGA members?	cantaloupe_muskmelon	potatoes	
Would you like to receive free subscriptions to trade	cabbage	peppers_hot	
□IHC □IVGS □SW □MAIL □OTHER	broccoli	peppers_bell	
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The information below will be printed in the membership			