

VEGETABLE CROPS HOTLINE

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

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PLECTOSPORIUM BLIGHT - (Dan Egel, egel@purdue.edu, 812-886-0198) - I have observed this disease in several pumpkin fields this year. It is not clear to me why this disease seems to be more widespread compared to recent seasons. However, it makes sense to review Plectosporium blight here.

Plectosporium blight is usually not a serious disease. The occurrence of this disease is usually sporadic. However, when it occurs, it can cause yield loss if left uncontrolled. Older literature may list this disease as Microdochium blight. Plectosporium blight can be recognized from the light tan lesions on stems and leaf petioles (see Figure 1). Lesions may also occur on the fruit, although these symptoms are less common. Yield loss is most often caused by lesions on the stem adjacent to the fruit—the pumpkin handle (see Figure 2). Yellow squash and zucchini squash are also affected. Lesions are often individually spindle shaped. When these lesions occur in large numbers they can give a light gray or white appearance to the foliage. This disease may be managed through a combination of cultural and fungicide treatments. Crop rotations of 3-4 years and fall tillage will help keep the crop residue to a minimum. A regular contact fungicide program will also help to keep Plectosporium blight in check.

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Figure 1. Plectosporium blight may cause the stems and petioles of pumpkin plants to appear white or light brown when numerous spindle shaped lesions coalesce. (Photo by Dan Egel)



Figure 2. The handle of this pumpkin has lesions of Plectosporium blight which may ruin the marketability of the fruit. (Photo by Dan Egel)



NORTHERN CORN LEAF BLIGHT - (Dan Egel, egel@purdue.edu, 812-886-0198) - The relatively cool weather Indiana has experienced this summer may be responsible for more observations of northern corn leaf blight (NCLB) on sweet corn than normal. The primary symptom is the cigar shaped lesion that ranges from 1 to 7 inches in length (see Figure 3). 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 applications. 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. Effective fungicides for NCLB include Headline®, Headline AMP® and Quilt XCEL®. Fungicides may be less effective if applied after tasseling.

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Figure 3. Northern corn leaf blight causes a cigar shaped lesion on the leaves of sweet corn. (Photo by Dan Egel)



ROGUING AS A TOOL TO MANAGE PHYTOPHTHORA

BLIGHT OF PUMPKIN - (Dan Egel, egelpurdue.edu 812-886-0198) - When used as a verb, to rogue means to get rid of items that don't conform to a certain standard. In plant pathology, the word rogue is used to describe a technique whereby diseased plants are removed or rogued to slow the spread of disease (see Figure 4). I'd like to describe the practice as it might be used to manage Phytophthora blight of pumpkins.

The practice works like this: Under conducive conditions, Phytophthora blight spreads quickly from leaf to leaf and from plant to plant. From a single diseased pumpkin plant, an entire field can become infected. But what if one could rogue the few symptomatic plants at an early stage in the disease epidemic? Would this slow the spread of Phytophthora blight?

In theory, yes. If one were able to rogue all of the

diseased plants in a field, the disease could be slowed. It would be similar to sending sick children home from a classroom; the disease should progress at a slower rate with sick children removed than if they had stayed and infected more children. However, in practice there are a few complicating factors. Read below for more details.

Pumpkin plants may become infected with the organism that causes Phytophthora blight either by coming into direct contact with soil which harbors the causal organism or from spores that are spread from diseased plants. The practice of roguing is designed to slow secondary or plant to plant spread of the disease. Phytophthora blight that is caused by direct contact with the soil will remain unaffected by roguing. Therefore, roguing diseased plants will not stop new infections from soil borne fungi, however, this practice should slow the secondary or plant to plant-spread of Phytophthora blight.

Another complicating factor—it is almost impossible to completely eliminate all diseased plants. The reason is that pumpkin plants with Phytophthora blight do not show symptoms immediately. There is a period of 3 to 5 days between when the pumpkin plant is infected to when symptoms become visible (in plant pathology, this is known as the latent period). So, if one were to rogue all symptomatic plants, almost certainly some of the adjacent plants are infected but not showing symptoms yet. The best solution to this problem is to rogue some of the healthy plants along with the diseased ones. Or, as they taught us in graduate school, rogue till it hurts.

If one must remove apparently healthy as well as diseased plants when roguing, how many healthy plants must be rogued? Unfortunately, there is no mathematical formula for estimating how many healthy plants to rogue. However, let's assume that a rain storm accompanied by strong winds can blow splashed spores 10 to 15 feet. If most pumpkin plants are on 6 foot centers, then one should remove about two rows of apparently healthy plants in addition to the diseased plants. Each grower will have to estimate the amount of healthy plants to rogue based in his or her own circumstances.

Roguing for disease management is most likely to be successful if attempted early in the disease epidemic. Let's imagine that a few pumpkin plants are observed with Phytophthora blight in a low area of the field. The decision to rogue is made. The diseased plants are cultivated under as well as 2 or 3 rows of healthy plants beyond the plants with symptoms. The cultivation equipment is cleaned off to prevent soil from the diseased field from being carried to a different field. Such a situation is shown below in Figure 4. While success is not guaranteed, roguing has the potential to slow disease spread.

A situation where roguing is less likely to be successful is one where much secondary spread has already taken place. If a relatively large area of the pumpkin field already has symptoms of Phytophthora blight, the disease may have spread beyond where roguing may slow disease spread. If the field has a long history of Phytophthora blight over most of the field, roguing may

not help.

In deciding whether to conduct a roguing operation to manage Phytophthora blight of pumpkin, it may help to know whether secondary spread of this disease has occurred. Initial or primary spread of Phytophthora blight usually occurs in low areas of the field. Since initial outbreaks of Phytophthora blight are likely to come from fungi that have survived in the soil, the first plants to be affected often have lesions where the plant has the most contact with the soil, at the very base of the plant where the main stem meets the soil. (Mature fruit which comes into contact with the soil may also have symptoms of Phytophthora blight. By the time mature fruit are present and symptomatic, however, secondary spread is likely to have occurred.) Secondary spread, that is, disease that has occurred as a result of the splash of spores from a plant initially infected to the leaves and stem of healthy plants often occurs on the leaves, petioles or branches of the pumpkin plant.

There are other circumstances where roguing may be used as a disease management tool. Each circumstance, however, must be considered on its own merits. Please let me know if you have any thoughts or questions.

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Figure 4. In a field of pumpkins with Phytophthora blight, a portion of the field with symptomatic vines has been plowed down or rogued, to slow the spread of the disease. (Photo by Dan Egel)



DOWNY MILDEW OF CUCURBIT UPDATE - (Dan Egel, egel@purdue.edu, 812-886-0198) - Downy mildew has been confirmed on jack-o-lantern pumpkins in Daviess and Jasper Counties and on acorn squash in LaPorte County. These are the first confirmed reports of this disease on *Cucurbita pepo* in Indiana in the 2015 season. There are unconfirmed (but reliable) reports of downy mildew on pumpkins in Parke, Washington, and White Counties. This disease has also been observed on butternut squash (*Cucurbita moschata*) in Knox and LaPorte Counties and on giant pumpkins (*Cucurbita maxima*) in

LaPorte County. Read more about this disease at <https://ag.purdue.edu/arp/swpap/VeggieDiseasesBlog/Lists/Posts/Post.aspx?ID=48>.



DOWNY MILDEW OF BASIL - (Dan Egel, egel@purdue.edu, 812-886-0198) - This disease has been observed in northern Indiana on basil sold as a fresh herb. The fungus that causes downy mildew of basil does not overwinter in Indiana, but must blow in from the south. The fungus that causes downy mildew of basil is not the same fungus that causes downy mildew of cucurbits or soybeans. Leaves may turn a yellow color that is restricted by veins. Brown areas may develop in severe infections. Close examination of the underside of the leaf under moist conditions may reveal a gray 'fuzz' which is the spores of the causal fungus. Such leaves may not be marketable. Since the fungus that causes downy mildew of basil does not overwinter in Indiana, fall tillage and crop rotation, although a good idea, won't help manage this disease. Pruning plants so that leaves dry out sooner may help reduce the amount of infection (many growers may want to prune plants to avoid flowering anyway). Varieties of sweet basil tend to be more susceptible to downy mildew than more exotic varieties. Organic materials that may be used for downy mildew of basil include Actinovate®, Double Nickle®, Milstop® and Regalia®. Conventional products include: Ranman®, Revus®, Quadris®, Armicarb®, and phosphorus acid products.



LATE BLIGHT ON TOMATO UPDATE - (Dan Egel, egel@purdue.edu, 812-886-0198) - Late blight has been reported on processing tomatoes in Cass County Indiana. This is a late blight update from when this disease was reported on potatoes and tomatoes in LaGrange County Indiana. The latter outbreak and some disease management tips are reported in the Vegetable Crops Hotline Issue 603 at <https://ag.purdue.edu/hla/Extension/Veg-CropsHotline/Pages/Latest-Articles.aspx?article=117>

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CATION EXCHANGE CAPACITY (CEC): WHAT DOES IT MEAN - (Wenjing Guan, guan40@purdue.edu, 812-886-0198) - You might remember seeing cation exchange capacity in soil test reports. Recently, I have been asked about what it means. This is one of the important soil characteristics that we need to understand.

Firstly, we need to know what cations are. Cations are positively charged ions. There are several. The ones that are very important for plant growth are calcium (Ca²⁺), magnesium (Mg²⁺) and potassium (K⁺). Soil

particles are negatively charged. They can hold positive charged cations. When plants absorb nutrients from the soil solution, these bound nutrient cations are exchangeable with other cations in the soil solution and become plant available. Therefore, CEC describes the soil's capacity to supply nutrient cations to the soil solution for plant uptake.

Sands do not have the quantity of negative charges that clays and organic matter do. Thus sandy soils generally have the lowest CEC. Soils with lower CEC have less ability to retain cation nutrients, and have higher risk for nutrient leaching. As a result, vegetables grown on sandy soils are more likely to show potassium and magnesium deficiencies. Applying fertilizers a little at a time, and multiple times can reduce the problem.

CEC is expressed as meq/100 g (milli-equivalents per 100 grams of soil) or cmol/kg (centimol positive charge per kg of soil). The two expressions are numerically the same. It is not surprising to see CEC less than 5 for sandy soils and approaching 100 for organic soils. To improve CEC, the most effective way is to enhance soil organic matter, which can be done by growing cover crops or adding compost.

Another important point is that soil pH decrease due to crop production is faster with lower CEC soils. So sandy soils need to be limed more frequently than clay soils. Remember, it takes 6 to 12 months for the lime to dissolve completely, so fall is a good time to consider adding lime. I will explain liming in another article.



INDIANA GROWN SEEKS PRODUCERS FOR PMA FRESH SUMMIT - (Bianca Gogel, ISDA, bigogel@isda.in.gov, 317-800-1700) - The Indiana State Department of Agriculture's (ISDA) Indiana Grown Program is an all-inclusive collaborative initiative to promote Indiana produced agricultural products to Indiana residents, restaurants, grocery stores, farmer's markets, wholesalers, processors and other retail businesses. In addition, through the Indiana Grown program, the ISDA is establishing a marketing strategy to promote Indiana agriculture nationally as well as internationally.

The Indiana Grown program is seeking Indiana producers to attend the Produce Marketing Association (PMA) Fresh Summit Conference located in Atlanta, Georgia from October 22-25. The PMA Fresh Summit conference is a great opportunity for producers to market their product to potential buyers. The Summit is where produce and floral industry leaders from around the world converge to share ideas, breakthroughs and inspiration. No other single conference in the produce

industry helps one create global connections, cultivate industry talent, find practical solutions to complex science and technology issues. PMA's connections reach across the supply chain and around the world, attracting the best of today's decision-makers, and tomorrow's game changers. With more than 18,000 people participating, Fresh Summit can help us anticipate change, identify emerging trends, and for producers, profit from new opportunities. Please visit the following website for more information <http://www.pma.com/events/fresh-summit>.

Indiana Grown will be providing booth space, marketing collateral and advertising for the event. If you are interested in participating in the PMA Fresh Summit please contact Bianca Gogel at 317- 800-1700 or bigogel@isda.in.gov. For more information about the Indiana Grown program or to become a member please visit www.indianagrown.org.



UPCOMING EVENTS

Beginning Farmer Tours. Free farm tours and networking events sponsored by Purdue Extension and Local Growers Guild. For more information and to register contact the Purdue Extension Education Store at www.edustore.purdue.edu or 888-EXT-INFO.

- September 8: Growing Places Indy, Indianapolis, IN. Lunch, networking session, tour. Urban produce farm with raised beds, u-pick, and greenhouses.
- September 14: Morning Harvest, Palmyra and Hardinsburg, IN. Breakfast, networking session, lunch and tour. Developing local markets for produce, including marketing to institutions such as hospitals and schools, hydroponic lettuce, herbs, strawberries, and more.
- October 11: Simpson Family Farm, Martinsville, IN. Lunch, networking session, tour. Grassfed beef, pastured pork, and poultry.
- November 7: Perkins Good Earth Farm, DeMotte, IN. Breakfast, networking session, lunch, tour. Soil health, cover crops, vegetable and high tunnel production.

Arthritis and Agriculture. Thursday, September 24, 2015. 12:00 P.M. - 1:00 P.M. EDT. Presenter: Amber D. Wolfe, M.S., from the National AgrAbility project. To participate, register at <https://goo.gl/R8Eq11>. You will then receive a confirmation email with the link to participate in the webinar. You will also receive a reminder 24 hours before the webinar begins.

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