VEGETABLE CROPS HOTLINE

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

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Alternaria leaf spot of Brassicas

(Dan Egel, egel@purdue.edu, (812) 886-0198)

Late last season, I observed Alternaria leaf spot on kale. I want to use this article to review this disease on all brassica crops. This disease also occurs on broccoli, cabbage and other leafy brassicas. Alternaria leafspot usually doesn't cause yield loss, but can cause unmarketable leaves.

The symptoms on leaves usually include round, dark lesions with target-like rings (Figure 1 and 2). Lesions can also occur on stems. In either case, the lesions may cause the leaf to become unmarketable. Lesions may grow together when the disease is severe.

Figure 1. Alternaria leafspot of broccoli

Figure 2. Alternaria leafspot on kale

Alternaria leaf spot is caused by a fungus that produces spores (known as conidia) that may spread with rain/wind. The fungus may survive in crop residue, such as infected leaves, and overwinter in that way. When the crop residue has completely rotted, the fungus will quickly die. To infect a leaf, Alternaria needs leaf moisture caused by rain or dew. The optimum temperature depends on what species of fungus is present. *A. brassicae* requires temperature from 64-75 °F; *A. brassicicola* requires 68-86 °F.

Tomato growers may recognize the name Alternaria and the target-like lesions. Early blight lesions are caused by a cousin of the fungi described here. However, the fungi described here will not affect tomato; nor will the early blight pathogen affect brassicas.

Black rot of cabbage, broccoli and other brassica crops has symptoms that are different including 'V' shaped lesions along the margin of the leaf. There is an article about black rot of brassica crops in this issue of the Hotline.

The fungus that causes Alternaria leaf spot of crucifer

crops may survive on seed; purchase seed tested for the disease and be careful saving seed. Hot water soaks of 122 °F for 20 min may help to eliminate the pathogen. Be sure to rotate crucifer crops and use fall tillage to disperse crop residue. A search of the *Midwest Vegetable Production Guide* reveals several fungicides that should be helpful in reducing the severity of this disease.

It is probably too early to be observing symptoms of Alternaria leaf spot of crucifer crops. However, it will be wise to familiarize yourself with the symptoms and the management options.

Black rot on Brassica Crops

(Dan Egel, egel@purdue.edu, (812) 886-0198)

Cabbage is the crop most often affected by black rot, however, other crucifers such as broccoli, cauliflower, mustard, kohlrabi or brussels sprouts may be affected. The first symptom one is likely to notice is a V-shaped lesion on the margin of the leaf (Figure 1). However, severe symptoms may become irregular and jagged (Figure 2). The differences may be due to differences in susceptibility of the crops/cultivars or the leaf in Figure 2 may have been infected at an earlier age than the one in Figure 1. You may want to compare these symptoms to those in the article about Alternaria leaf spot in this issue of the Hotline.

Figure 1. Black rot of cabbage with typical 'V' shaped lesions on leaf margin.

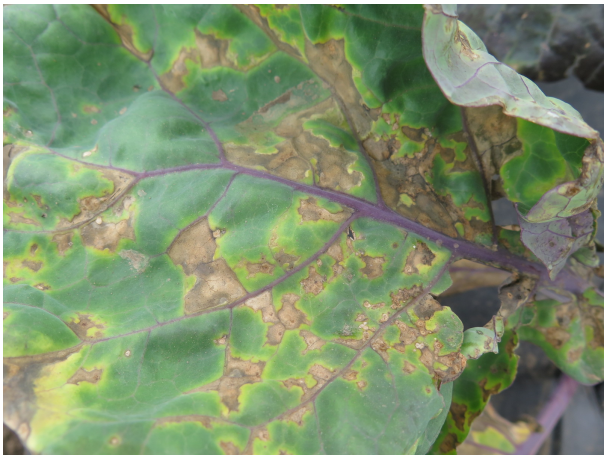


Figure 2. Irregular lesions of black rot on Brussel sprouts.

Black rot is most severe in wet, warm weather. The emergence of this disease during a rather cold spring may mean that the disease started in a greenhouse situation.

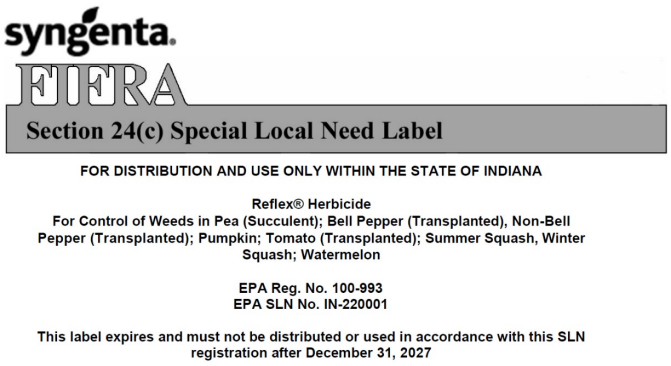
The bacterium that causes black rot, *Xanthomonas campestris*, survives in crop residue. Thus, crop rotations that avoid crucifers should lessen the severity of the disease. Sanitation in the greenhouse should help to lessen the amount of the bacterium that can cause more disease. The causal bacterium may also be transmitted through seeds, therefore, every effort should be made to plant seed that has been tested and found free of the bacterium. Inspect transplants for symptoms before planting. Avoid practices which add to free water on plant surfaces. Products which contain copper as an active ingredient may help to lessen the spread of the disease. However, copper products may also cause lesions on leaves under some circumstances. Although there may be varietal differences in susceptibility, complete levels of resistance are not available in commercial cultivars. More information about general pest management can be found in the *Midwest Vegetable Production Guide for Commercial Growers*, (mwveguide.org).

Reflex Herbicide Now Registered for Use in Select Indiana Vegetables

(Stephen Meyers, slmeyers@purdue.edu, (765) 496-6540) & *(Jeanine Arana, jcordone@purdue.edu, (765) 588-7787)*

As of March 29, 2022, Reflex herbicide is registered for use on select vegetables in the state of Indiana through an indemnified 24(c) special local needs label. Below we discuss what this means for Indiana vegetable producers

and how to access the new label.



syngenta.

FIFRA

Section 24(c) Special Local Need Label

FOR DISTRIBUTION AND USE ONLY WITHIN THE STATE OF INDIANA

Reflex® Herbicide
For Control of Weeds in Pea (Succulent); Bell Pepper (Transplanted), Non-Bell Pepper (Transplanted); Pumpkin; Tomato (Transplanted); Summer Squash, Winter Squash; Watermelon

EPA Reg. No. 100-993
EPA SLN No. IN-220001

This label expires and must not be distributed or used in accordance with this SLN registration after December 31, 2027

What crops are included?:

Pea (succulent)

Bell and non-bell pepper (transplanted)

Pumpkin

Tomato (transplanted)

Summer squash

Winter squash

Watermelon

Why it matters:

-The active ingredient in Reflex (fomesafen) is a Group 14 herbicide. For many of the crops on the 24(c) label, Reflex is the only Group 14 herbicide available. Rotating herbicides with different Group numbers is one way to slow the onset of herbicide-resistant weeds.

-Reflex offers control and/or suppression of some difficult-to-control and large-seeded broadleaf weed species often missed by other pre-emergence herbicides including common lambsquarters, giant ragweed, and morningglories. It also provides another option for pigweed control and can provide yellow nutsedge suppression.

Important notes:

-You **must** have a copy of the Indiana 24(c) Reflex label in order to use the product on these vegetable crops.

-Reflex is not intended to be used as a stand-alone weed control practice. It should be part of an overall weed management program that includes other control methods.

-As with any new pesticide or production practice, it is best to avoid whole-farm changes. If you choose to use Reflex herbicide, trial it on a portion of your production the first year to see how it fits with your current production practices.

-Labeled application methods vary by crop. Read the label carefully.

Where to find the Reflex 24(c) label:

1) Visit the Office of the Indiana State Chemist's Special Local Need Registrations Website at: https://oisc.purdue.edu/pesticide/special_state_registrations.html

2) In the table of products, clip on "Reflex Herbicide" to download a pdf of the label.

Watermelon Irrigation and Nitrogen Fertilization Methods Commonly Used in Indiana

(Wenjing Guan, guan40@purdue.edu, (812) 886-0198)

At the 2022 Southwest Indiana Melon and Vegetable Growers Annual Meeting, 17 watermelon farmers and 2 agricultural professionals shared their irrigation and fertilization management practices used for watermelon production in Indiana. These individuals grow or provide services for watermelon acres from less than 50 acres up to 2,000 acres over the past five years. We asked the percentages of watermelon acres using the different irrigation and nitrogen fertilization methods over the past five years. The figures below are the combined results from the respondents.

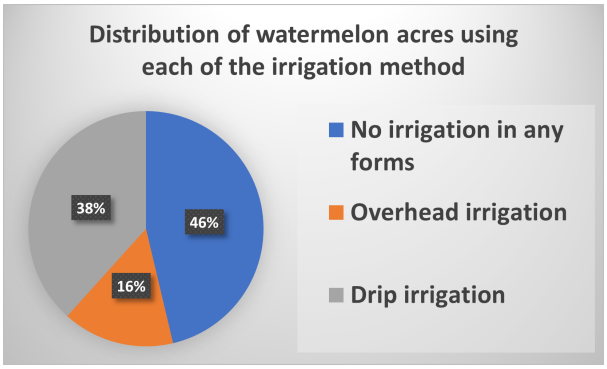


Figure 1. Distribution of watermelon acres using the three irrigation methods in Indiana: No irrigation in any forms, overhead irrigation, drip irrigation.

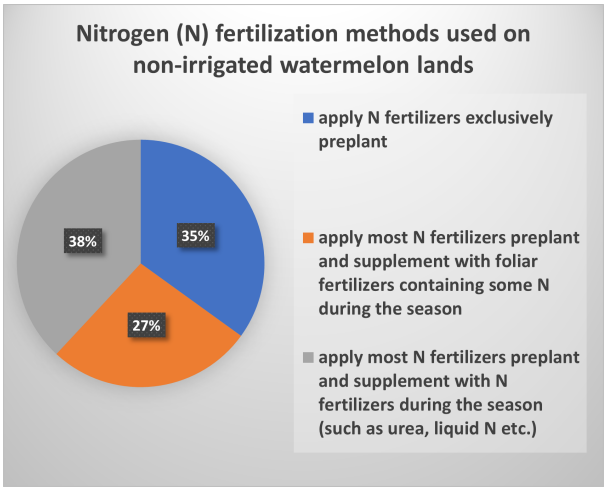


Figure 2. Nitrogen fertilization method used on non-irrigated watermelon lands over the past five years.

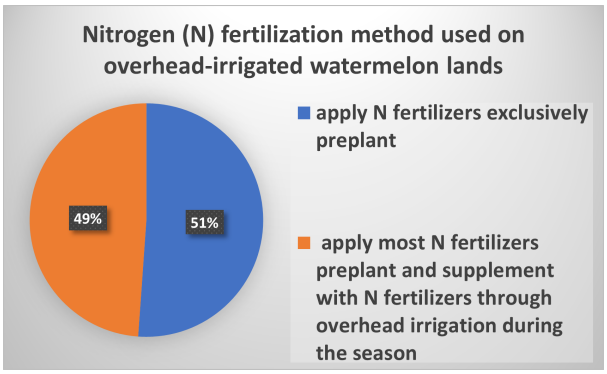


Figure 3. Nitrogen fertilization method used on overhead-irrigated watermelon lands over the past five years.

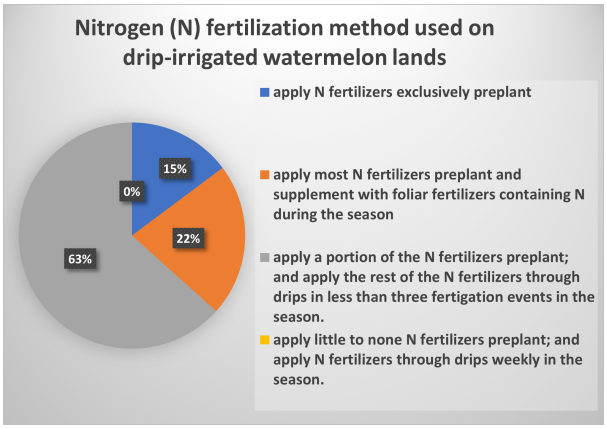


Figure 4. Nitrogen fertilization method used on drip-irrigated watermelon lands over the past five years.

A NEWA Deal for Indiana

(Janna Beckerman, jbeckerm@purdue.edu) & (Wenjing Guan, guan40@purdue.edu, (812) 886-0198)

Purdue recently joined and became one of twenty US states that are in the NEWA network. NEWA is a partnership of land grant universities and grower associations. If you live in one of the states listed, you can **buy a weather station** for your farm and connect to NEWA. For Indiana growers, this means your membership is covered in full. If you live in a different state, see the NEWA **Partners** page to check out the Ricky Bobby branding and find out more about your membership status.

What is NEWA?

The Network for Environment and Weather Applications (NEWA) delivers weather data from weather stations primarily located on farms through the Internet at newa.cornell.edu and automatically calculates and displays weather data summaries, crop production tools, and integrated pest management (IPM) forecasts.

How does NEWA and a weather station benefit me?

1. Promotes better and more precise IPM, reduced pesticide use, improved environmental protection.
2. Better crop management, improved crop quality, improved yield.
3. Enhanced decision support.

Okay, I'm interested. How does it work?

NEWA works with **Onset Data Loggers** and **KestrelMet** (weather stations) which are configured for NEWA's agricultural production tools. These stations provide the data to the NEWA system, and look like this:

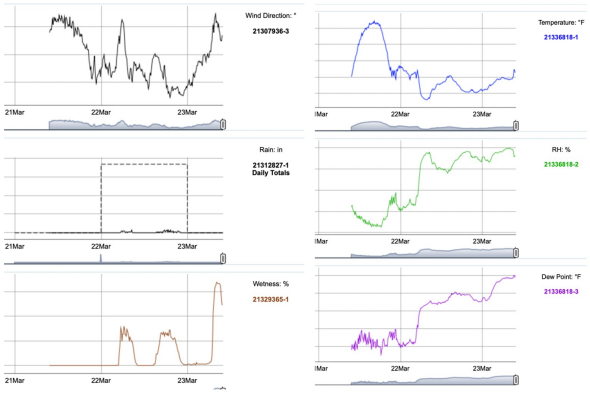


Figure 1. HOBOLINK data summaries from the weather station.

In this format, the data isn't super helpful for most people, but I know I piqued your interest if you've read this far. Keep reading…

How does NEWA help in crop management decision making?

As a nerd, the data above is really exciting, but it doesn't help me to make decisions. To do that, the data needs to be entered into appropriate mathematical models correctly to make it useful. Most people don't want to sit down and calculate degree days (DD) and

growing degree days (GDD) with base temperatures for different crops, and then use that data for additional models to forecast insect hatch dates and plant disease infection periods. I sure don't (it's super tedious and easy to make mistakes). So, NEWA does this calculation for you and displays the data:

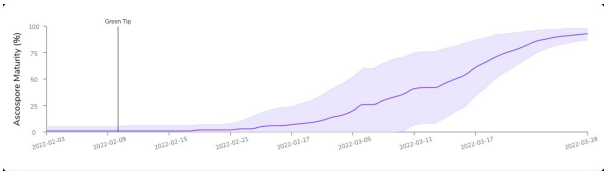


Figure 2a.

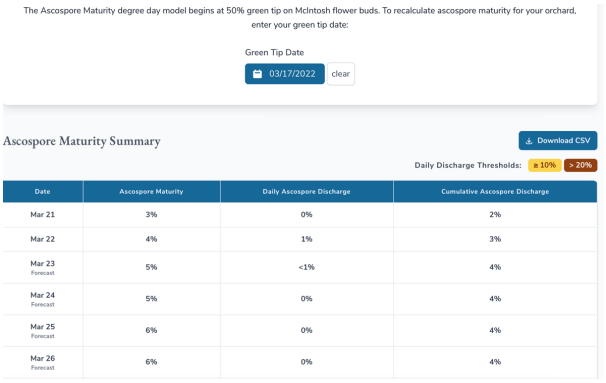


Figure 2b.

Figure 2c. Figure 2a-c. Tools are provided in graphical form (top) and table form (middle and bottom). These data are from an orchard in Hendersonville, NC, taken 3/22/22).

There are over 20 weather-based IPM forecast tools in NEWA. Many tools in NEWA address apple and grape decision support. However, vegetable growers can also benefit from the system. Currently, it provides forecast tools for insect pest management include cabbage maggot and onion maggot; disease management include cercospora leaf spot of table beets, onion disease model, potato disease model and tomato disease model. Users can also access all weather data and growing degree days calculation.

For more information:

Visit the NEWA online Knowledge Base to quickly get started with NEWA 3.0

Vegetable management resources

Additional user support

Contact the NEWA Help Desk if you have any problems, have questions or (especially) if you find a bug or glitch. Do this by sending an email to support@newa.zendesk.com with details, screenshots, and other information that might be helpful for a quick resolution.

For additional information:

https://newa.cornell.edu/crop-and-pest-management/

https://nyshs.org/wp-content/uploads/2017/05/Carroll-Pages-19-24-from-NYFQ-spring-book-2017-4.pdf

Severe Weather Season Yet to Get Started

(Beth Hall, hall556@purdue.edu)

Indiana's been seeing a lot of rain lately, while avoiding severe weather such as hail, tornadoes, and strong winds. Will this mild pattern continue, or could things shift soon? The southern states along the Gulf coast have been experience what has seemed like non-stop severe weather with tornado watches (if not warnings) becoming almost a daily occurrence. What has happened? Typically, tornadoes are most common from Texas northward into the high plains states as well as the Midwestern states of Indiana and Illinois (Figure 1). This area has been traditionally referred to as "Tornado Alley". There are climatological hot spots in Florida and southern Mississippi, but those are often attributed to landfalling hurricanes that spawn tornadoes. This year has been slightly different so far, but we cannot get a false sense of security too soon. April, May, and June tend to be the most active months for tornadoes in Indiana, so there's still time. Tornadoes are energized by a strong contrast between cold, polar air from the north pushing up against the warm, tropical air from the south. Temperatures have not warmed up enough in Indiana to be the battleground location for these two extreme air masses. Another thought to ponder is the differences in tornadic activity in Indiana between El Niño springs and La Niña springs. Figure 2 shows the difference in both tornadic and hail frequency between these two global atmospheric-oceanic phases. Based upon climatology, southern Indiana has experienced more tornadoes and hail event during La Niñas than El

Niños. Will this happen this year? For now, we need to just wait and see as the La Niña pattern lingers on. In the meantime, stay cognizant of the risks and have a safety plan in place, particularly for tornadoes.

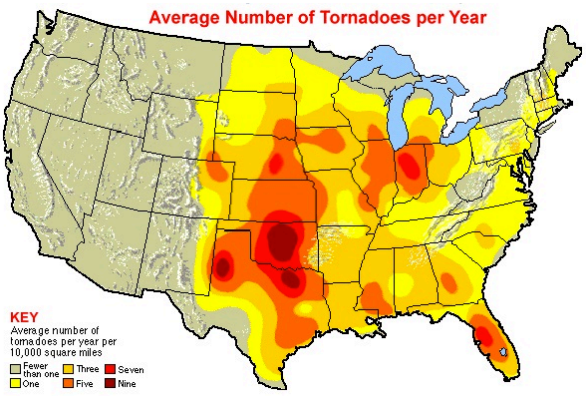


Figure 1. Average number of tornadoes per year. Source: University Corporation for Atmospheric Research.

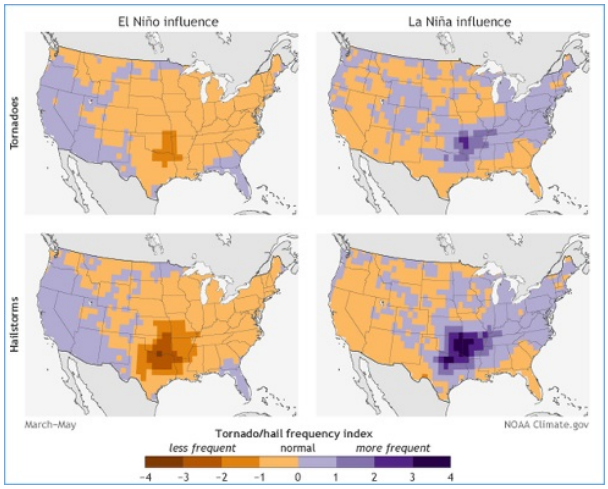


Figure 2. Relatively frequency of tornadoes and hail events based upon climatology during El Niño versus La Niña events. Source: NOAA Climate.gov

Weather forecasts are continuing to support above-normal precipitation for the next several weeks and months. Since the beginning of 2022, Indiana has been receiving near-normal to above-normal precipitation with the greatest excesses is the southwestern counties (Figure 3). Global circulation patterns seem to be sticking in place cause one rain event to quickly follow the previous one. Soil moisture has been showing no signs of concerning stress and groundwater supplies are replenishing nicely. With temperatures staying on the mild side, it has been challenging to get things dried out enough before the next rain event. Hopefully, temperatures will warm up soon to get vegetation thriving to help soak in some of that ground moisture and transpire it back into the atmosphere!

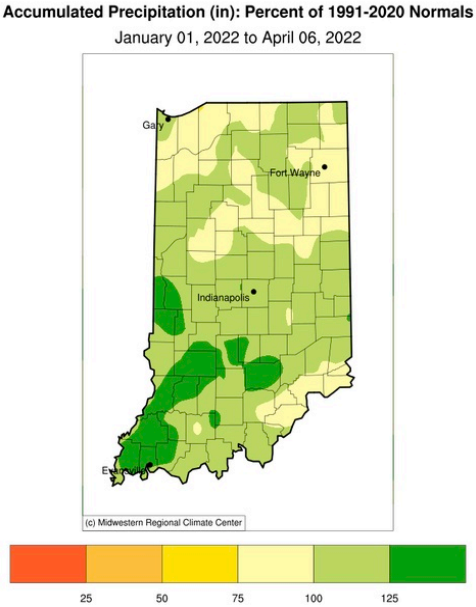


Figure 3. Precipitation amount represented in comparison to the average observed from 1991-2020 for the period 1 January 2022 through 6 April 2022.

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