# Vegetable Crop Update

***A newsletter for commercial potato and vegetable growers prepared by the University of Wisconsin-Madison vegetable research and extension specialists***

Extension
UNIVERSITY OF WISCONSIN-MADISON

**No. 22 – September 5, 2021**


***In This Issue:***



***Calendar of Events:***

**November 30-December 2, 2021** – Midwest Food Producers Assoc. Processing Crops Conference, Kalahari Convention Center
**January 11-13, 2022** – Wisconsin Agribusiness Classic Conference, Alliant Energy Center, Madison, WI
**February 8-10, 2022** – UW-Madison Div. of Extension & WPVGA Grower Education Conference, Holiday Inn, Stevens Point, WI


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- Reports on tuber yield and quality at Hancock:

This week we collected our last digging data for Russet Burbank and Soraya before vine kill on August 31st. The two varieties were under four different N fertilizer treatments shown below:

| Treatment ID | Planting | Emergence (hilling) | Tuber Initiation | Side-dressing | | Seasonal Total |
|---|---|---|---|---|---|---|
| | 4/22 | 5/17 | 6/8 | 7/3 | 7/17 | |
| | ------ lb N acre$^{-1}$ applied ------ | | | | | |
| **1** | 40 | - | - | - | - | 40 |
| **2** | 40 | 70 | 40 | 50 | - | 200 early |
| **3** | 40 | 70 | 40 | - | 50 | 200 late |
| **4** | 40 | 70 | 40 | 50 | 50 | 250 |

Digging data for Russet Burbank:

| Trt ID | N Rate (lb/acre) | Tuber Set Per Plant | Max Tuber Weight (oz) | Average Tuber Weight (oz) | Tuber Yield (cwt/ac) | Specific Gravity |
|---|---|---|---|---|---|---|
| 1 | 40 | 11 | 12 | 4 | 348 | 1.071 |
| 2 | 200 Early | 12 | 16 | 5 | 439 | 1.074 |
| 3 | 200 Late | 12 | 15 | 5 | 490 | 1.072 |
| 4 | 250 | 10 | 19 | 5 | 387 | 1.072 |

Digging data for Soraya:

| Trt ID | N Rate (lb/acre) | Tuber Set Per Plant | Max Tuber Weight (oz) | Average Tuber Weight (oz) | Tuber Yield (cwt/ac) | Specific Gravity |
|---|---|---|---|---|---|---|
| 1 | 40 | 13 | 9 | 4 | 402 | 1.049 |
| 2 | 200 Early | 13 | 12 | 5 | 547 | 1.052 |
| 3 | 200 Late | 14 | 17 | 5 | 542 | 1.053 |
| 4 | 250 | 13 | 16 | 5 | 455 | 1.051 |

On top of the nitrogen fertilizer application, we also have the nitrogen credits from irrigation water. As I reported in my previous newsletter, the well that irrigated this nitrogen trial has an average of 24 ppm of nitrate-N, and throughout the growing season we have applied a total of 14.25'' of irrigation water. There is 0.23 lb N / acre in 1'' of irrigation water with 1 ppm of nitrate-N, so the total nitrogen credits in the irrigation water we have received this summer are $0.23 \times 14.25 \times 24 \approx 79$ lb N / acre.

- Useful information about equipment and facility sanitization:

As the field season wraps up and the storage season is beginning, growers should consider adopting a good sanitary practice to thoroughly clean and disinfect all field equipment and storage facilities prior to operational use. We had an extension article on this topic on Page 22 – 25 in the January 2021 Badger Common'Tater. See link here: https://issuu.com/bctater/docs/0121_standard

- Summary report about the harvesting season in Wisconsin:

As the harvesting season is underway, there are more reports on tuber quality issues. The series of rainfall events in late August caused soil saturation issues and therefore soft rot, enlarged lenticels, poor harvesting conditions have been widely noted in the Central Sands region. For fresh market varieties, there is a high percentage of tuber breaking down once packed. In addition, some growers reported that the heat stress in June with more than a week of daily temperature higher than 90°C has led to load rejections due to hollow heart, misshaped tubers, scab issues, etc. Overall, yield is estimated to be close to average, but quality may be highly variable depending on varieties.

Lastly, the tuber quality issue is being noted in other potato production regions as well. Here I am sharing some fun photos of Russet Burbank from Manitoba (photos courtesy of Gaia Consulting Ltd.)

**Happy Labor Day Farmers! We thank you for producing food for us!**

**Amanda Gevens, Chair, Professor & Extension Vegetable Pathologist, UW-Madison, Dept. of Plant Pathology, 608-575-3029, Email: gevens@wisc.edu.**

**Potato Disease Modelling and Management of Early Blight and Late Blight: Current P-Day (Early Blight) and Disease Severity Value (Late Blight) Accumulations.** Many thanks to Ben Bradford, UW-Madison Entomology; Stephen Jordan, UW-Madison Plant Pathology; and our grower collaborator weather station hosts for supporting this disease management effort. A Potato Physiological Day or P-Day value of ≥300 indicates the threshold for early blight risk and triggers preventative fungicide application. A Disease Severity Value or DSV of ≥18 indicates the threshold for late blight risk and triggers preventative fungicide application. Red text in table indicates threshold has been met or surpassed. Weather data used in these calculations comes from weather stations that are placed in potato fields in each of the four locations (substitute data from https://agweather.cals.wisc.edu/vdifn as needed). Data are available in graphical and raw formats for each weather station at: https://vegpath.plantpath.wisc.edu/dsv/

| Location | Planting Date | | 50% Emergence Date | Disease Severity Values (DSVs) 9/5 | Potato Physiological Days (P-Days) 9/5 |
|---|---|---|---|---|---|
| **Grand Marsh** | **Early** | April 2 | May 10 | **120** | **854** |
| | **Mid** | April 10 | May 15 | **120** | **840** |
| | **Late** | May 1 | May 23 | **114** | **774** |
| **Hancock** | **Early** | April 5 | May 12 | **65** | **858** |
| | **Mid** | April 15 | May 15 | **65** | **849** |
| | **Late** | May 5 | May 23 | **61** | **787** |
| **Plover** | **Early** | April 7 | May 12 | **101** | **819** |
| | **Mid** | April 20 | May 20 | **98** | **774** |
| | **Late** | May 7 | May 30 | **93** | **712** |
| **Antigo** | **Early** | April 26 | May 28 | **60** | **797** |
| | **Mid** | May 10 | June 5 | **60** | **759** |
| | **Late** | May 20 | June 13 | **60** | **690** |

All potato fields of Wisconsin have reached/surpasesed the threshold for Disease Severity Values (18) and should continue to be preventatively treated for late blight management. Accumulations over the past week were ranging

from 5-9 DSVs, indicating low to moderate risk from disease-promoting weather. To date, potato late blight (US-23) was confirmed from commercial potato fields in Portage County on Jul 28, Aug9 and Aug 25. No new reports during this past week.

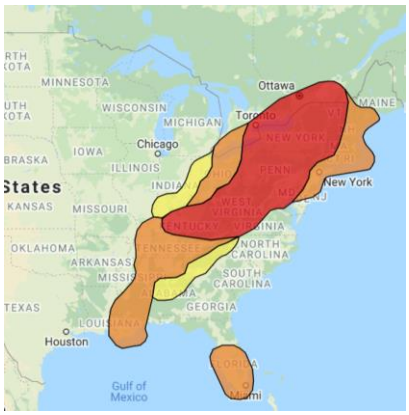
Outside of Wisconsin, tomato late blight was confirmed in Cocke County Tennessee on Aug 19 on tomato (US-23), North Carolina on Aug 16 on tomato (strain typing in process); on tomato in Ontario (Haldimand-Norfolk) Canada (no sample submitted for strain determination on Aug 10); on potato in Aroostook County Maine (US-23 on Aug 9); and on tomato in northeastern Georgia (US-23 on Jul 28) (usablight.org). US-23 is typically sensitive to the fungicides in the phenylamide group (including mefenoxam and metalaxyl). The map below, from usablight.org shows the counties in which late blight has been confirmed in 2021. For more information on this disease: https://vegpath.plantpath.wisc.edu/resources/potato-late-blight/.

The **early blight** P-Day threshold of 300 has been exceeded in all potato plantings of Wisconsin. A listing of details of currently registered fungicides for early blight management can be found in our 2021 Wisconsin Vegetable Production guide: https://cdn.shopify.com/s/files/1/0145/8808/4272/files/A3422-2021.pdf

**Cucurbit Downy Mildew Update:** Over the past week, cucurbit downy mildew was confirmed in the following locations: NJ (pumpkin), WV (cucumber), OH (pumpkin), MS (cucumber, cantaloupe), and TN (ornamental gourds). There have been no samples of cucurbit downy mildew through our UW Plant Disease Diagnostic Clinic, or my Vegetable Pathology Lab so far this season. No downy mildew has been observed in our sentinel plots in WI. This season, so far, the disease has been documented in AL, CT, DE, FL, GA, IN, KY, LA, MA, MD, MI, MS, NC, NH, NJ, NY, OH, Ontario Canada, PA, RI, SC, TN, VA, and WV. There is no predicted movement of the pathogen into Wisconsin at this time– as reflected in the recent forecast (for Sunday September 5, 2021) depicted below from https:// cdm.ipmpipe.org/

Please contact me or the UW Plant Pathology Diagnostic Clinic for confirmed diagnoses of cucurbit downy mildew. https://pddc.wisc.edu/

Due to the presence of unique pathogen types (Clade 1 and 2 types with unique host ranges among cucurbits), our improved understanding of the cucurbit downy mildew type that may be in our region can aid in recommending the most appropriate prevention of crop disease and resulting loss.




**HIGH Risk for cucurbits in upper southern ON, southern QC, VT, western MA, northwest CT, NY, PA, central and western MD, northern DE, northern / western / southwest VA, WV, southeast OH, and eastern and central KY. Moderate Risk in southwest ME, NH, central and eastern MA, RI, CT except the northwest, Long Island, NJ, central DE, far southern ON, northeast into southwest OH, western KY, TN and nearby NC mountains, northern AL, northeast / central / southern MS, southeast LA, and central and southern FL. Low Risk to cucurbits in central AL, northern GA, western NC, southern and eastern IN, and northwest OH.** Minimal risk otherwise.

**Basil Downy Mildew Confirmed in Dane County:** https://www.vegetables.cornell.edu/pest-management/disease-factsheets/basil-downy-mildew/

Basil downy mildew caused by the fungus-like pathogen *Peronospora belbahrii* has become more prevalent in the Great Lakes region and throughout the U.S. Since about 2007, basil downy mildew has made headlines as a new North American culinary herb disease – with confirmed reports in FL, NC, PA, NJ, NY, MA, NC, KS, MO, and WI (for the first time in 2010). European and South American nations are also dealing with this destructive plant pathogen. In 2014, nearly 40 states reported basil downy mildew from within the continental U.S. The basil downy mildew pathogen can be transmitted on seed, infected plant parts, and on the wind. This particular downy mildew can affect both ornamental and basil varieties grown as herbs. It is suspected that basil downy mildew has moved geographically on contaminated seed or leaves. The spores of basil downy mildew are produced on leaf underside prolifically and can be aerially dispersed long distances. Symptoms begin as non-descript pale yellow leaves which mimic nitrogen deficiency, but typically progress to well defined yellow, angular lesions on leaf surfaces (Figure below). As disease develops, the pathogen's gray to black spores can be seen on leaf undersides.

**Basil Downy Mildew** Symptoms include yellow, angular lesions apparent on leaf surface. On leaf underside, pathogen signs can be seen in yellowed areas as brown-black (or purplish) masses of pathogen sporulation. Photo courtesy: Dr. Meg McGrath of Cornell University.

The **management** of basil downy mildew includes planting uninfested or 'clean' basil seed, selecting resistant or tolerant varieties (see more info here: https://www.vegetables.cornell.edu/pest-management/disease-factsheets/basil-downy-mildew/), using adequate plant spacing to promote dry plant canopies, and applying fungicides when environmental conditions favor disease. Currently there are no effective seed treatments and hot water seed treatments negatively impact seed quality. Minimizing leaf wetness and humidity will aid in management as the pathogen is favored by moist conditions. There are a limited number of fungicides with registration for use on basil downy mildew, and few with meaningful efficacy in either organic or conventional systems. While not a preferred approach, applying fungicides frequently and starting before first symptoms may be necessary to control downy mildew effectively. Fungicides were effective in experiments with applications started before or after initial symptoms were found. To determine when to initiate a fungicide program, or when to harvest early to avoid losses, growers should routinely scout their fields and gardens for symptoms of disease, and should stay informed of disease reports within the region or state to determine when downy mildew is occurring nearby. Summer is not a time to forget about this disease: unlike most other downy mildew pathogens, e.g. the ones affecting lettuce and cruciferous crops, which stop developing in summer, the basil downy mildew pathogen seems to develop best under moderate to warm temperatures while also tolerating cool temperatures. Basil crops should be disked under or otherwise destroyed as soon as possible after last harvest, or when abandoned because of disease, to eliminate this source of inoculum. Research is ongoing in the U.S. and worldwide to better understand the pathogenicity, host resistance, spread, and control of basil downy mildew. Advances in resistance breeding and seed treatment technologies will greatly aid in improved disease control and sustainability of basil production in Wisconsin and worldwide.