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. 20 – August 28, 2022

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Calendar of Events:

November 29-December 1, 2022 – Midwest Food Producers Assoc. Processing Crops Conference, Kalahari Convention Center
January 29-31, 2023 – Wisconsin Fresh Fruit and Vegetable Growers Conference, Kalahari Resort, Wisconsin Dells, WI
February 7-9, 2023 – UW-Madison Div. of Extension & WPVGA Grower Education Conference & Industry Show, Stevens Point, WI

Yi Wang, Assistant Professor & Extension Potato and Vegetable Production Specialist, UW-Madison, Dept. of Horticulture, 608-265-4781, Email: wang52@wisc.edu.

This week I am presenting our study results about effects of fertigation on growth of Colomba potatoes under different nitrate-N backgrounds in irrigation water. The table below shows our four N treatments (not including the N credits from irrigation).

We duplicated this study on two different sites at the UW Hancock Ag Research Station – the C field (study 1) and the K field (study 2). Nitrate-N in the C well is 9.9 ppm, and in the K well is 25.3 ppm. Total N credits we received from the irrigation water in the C field are 28 N lb/a, and in the K field are 72 N lb/a.

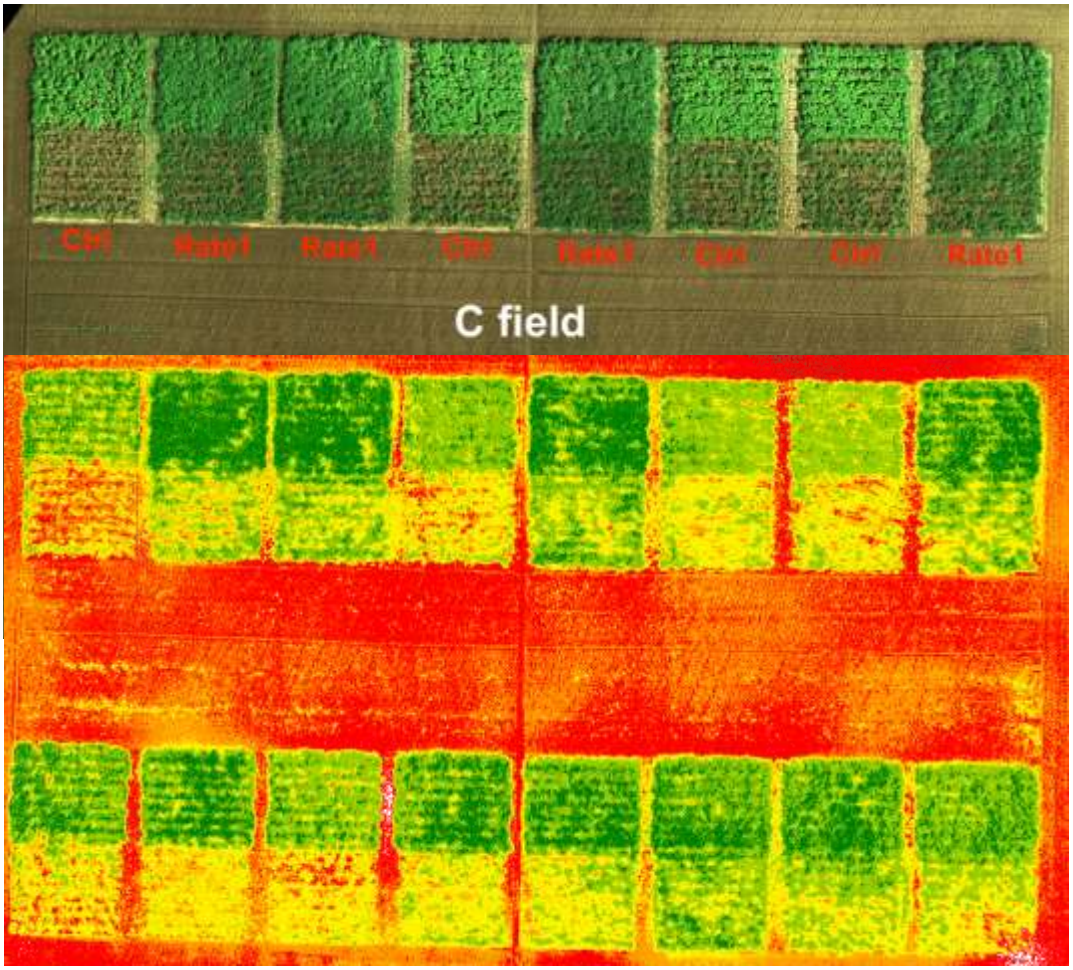
Treatment ID	Planting	Emergence (hilling)	Tuber Initiation	Fertigation				Seasonal Total	Notes
	4/28	5/17	6/8	6/30	7/10	7/20	7/30		
	------ lb N acre^{-1} ------								
Control	40	-	-	-	-	-	-	40	Only Starter
Rate 1	40	70	150	-	-	-	-	260	All N applied up until tuber initiation
Rate 2	40	70	30	30	30	30	30	260	With fertigation
Rate 3	40	70	120	30	30	30	30	350	High N program with fertigation

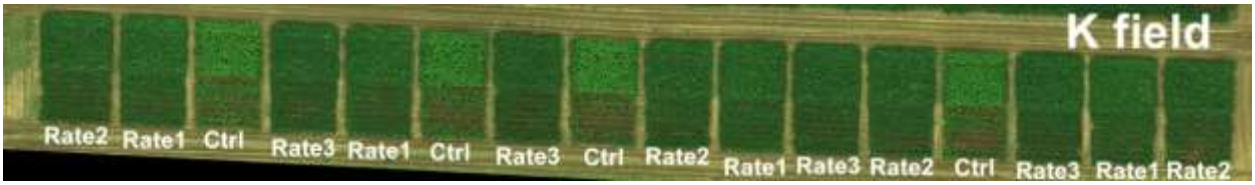
The table below shows the yield and size distribution of the two studies.

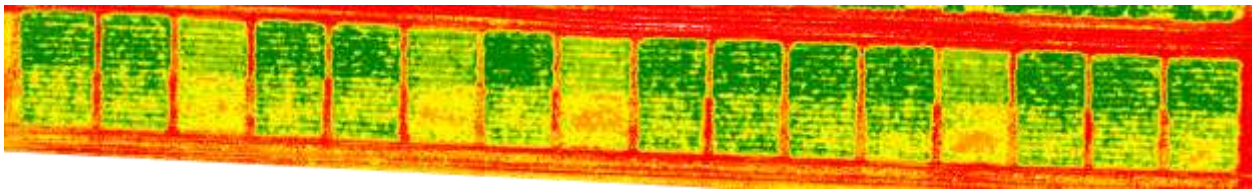
Treatment ID	Total Yield (cwt/a)				A size Yield (cwt/a)				B size Yield (cwt/a)			
	Study 1		Study 2		Study 1		Study 2		Study 1		Study 2	
Control	594	A	596	A	390	A	382	AB	195	A	204	AB
Rate 1	532	AB	629	A	373	AB	445	A	151	B	177	B
Rate 2	455	B	605	A	274	B	361	B	173	AB	233	A
Rate 3	590	A	620	A	414	A	406	AB	168	B	205	AB

It is shown that for both studies: 1) total yield under the control plots were not significantly different from that under Rate 1 and Rate 3; 2) Rate 2 produced the lowest amount of size A tubers; and 3) Rate 1 produced less size B tubers. Overall, study 2 (in the K field) produced higher yield than study 1 (in the C field). As both fields were planted on the same date, treated the same with the same varieties and the same N programs, we believe that higher nitrate-N credits in the irrigation water do have impact on tuber yield.

Those aerials images (collected on August 1st) below showed our field design of the two studies. The Colomba variety is on the south side of each strip in both fields. I included our RGB and NDVI images for both fields. It is very clear to identify the control plots from all images, as they showed smaller canopy sizes and yellower canopy colors.







Amanda Gevens, Chair, Professor & Extension Vegetable Pathologist, UW-Madison, Dept. of Plant Pathology, 608-575-3029, Email: gevens@wisc.edu, Lab Website: https://vegpath.plantpath.wisc.edu/

Current P-Day (Early Blight) and Disease Severity Value (Late Blight) Accumulations. 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 in 2022. 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 will come from weather stations that are placed in potato fields in each of the four locations, as available. Data from an alternative modeling source: https://agweather.cals.wisc.edu/vdifn will be used to supplement as needed. Data are available for each weather station at: https://vegpath.plantpath.wisc.edu/dsv/.

Location	Planting Date		50% Emergence Date	Disease Severity Values (DSVs) 8/28/2022	Potato Physiological Days (P-Days) 8/28/2022
Grand Marsh	**Early**	Apr 5	May 10	**72**	**814**
	Mid	Apr 20	May 15	**72**	**773**
	Late	May 12	May 25	**72**	**715**
Hancock	**Early**	Apr 7	May 12	**44**	**799**
	Mid	Apr 22	May 17	**44**	**779**
	Late	May 14	May 26	**44**	**720**
Plover	**Early**	Apr 7	May 15	**114**	**754**
	Mid	Apr 24	May 20	**114**	**720**
	Late	May 18	May 27	**113**	**685**
Antigo	**Early**	May 1	Jun 3	**49**	**637**
	Mid	May 15	June 15	**45**	**563**
	Late	June 10	June 24	**45**	**478**

In addition to the potato field weather stations, we have the UW Vegetable Disease and Insect Forecasting Network tool to explore P-Days and DSVs across the state (https://agweather.cals.wisc.edu/vdifn). This tool utilizes NOAA weather data (stations are not situated within potato fields). In using this tool, be sure to enter your model selections and parameters, then hit the blue submit button at the bottom of the parameter boxes.

Accumulations of P-Days were high (47-60) over the past week. Potatoes should continue to be on a preventative fungicide program with effective disease management selections to limit early blight in long-season potatoes.

There are no confirmed reports of late blight in Wisconsin, to the best of my knowledge, at this time. All monitored Wisconsin locations accumulated low to moderate DSVs this past week (7-10) indicating a low to moderate risk week for promoting late blight in potato plantings in Grand Marsh, Hancock, Plover, and Antigo. All plantings have now reached/exceeded the threshold for receiving a preventative application of fungicide for the management of late blight. A fungicide list for potato late blight in Wisconsin was provided in last week's newsletter and is available here: https://vegpath.plantpath.wisc.edu/2022/07/03/update-10-july-3-2022/

Once thresholds are met for risk of early blight and/or late blight, fungicides are recommended for optimum disease control. Fungicide details can be found in the 2022 Commercial Vegetable Production in Wisconsin Guide, Extension Document A3422, linked here: https://learningstore.extension.wisc.edu/products/commercial-vegetable-production-in-wisconsin

According to usablight.org there were no diagnoses of late blight in the US in the past week. The most recent previous diagnosis of late blight was on tomato in Haywood County North Carolina, the strain type is not yet known. For this year, there were just 2 reports entered back in March in southern Florida (US-23 clonal lineage/strain type) and 2 reports from eastern Ontario Canada on tomato in late July. Additional, reports from August have recently been posted to the usablight.org website from CA (tomato), and TN (tomato). This is a very unusual pattern of late blight confirmations in 2022.

Cucurbit Downy Mildew: During this past week, cucurbit downy mildew was confirmed on cucumber in NY, PA, VA, and NC. Previously this growing season, the disease was confirmed in AL, CT, DE, FL, GA, KY, MA, MD, ME, MI, NC, NH, NJ, NY, OH, PA, SC, VA, and WI. There was an additional commercial field in Waushara County with cucumber downy mildew this past week. The first report in WI had also come from Waushara County (UW Hancock ARS) on Aug 15. Red counties, on the figure below, indicate recent reports (less than 1 week old) of cucurbit downy mildew.

https://cdm.ipmpipe.org/

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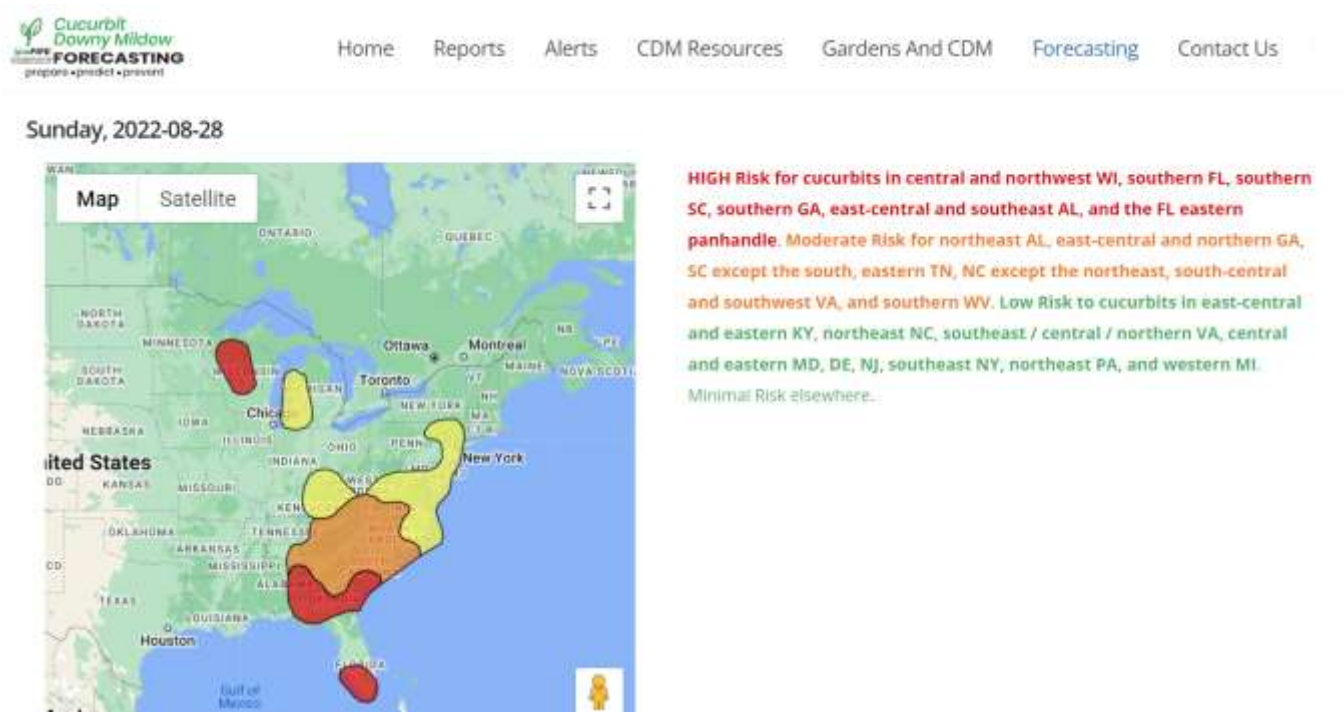

As a reminder, the pathogen is now known to have two 'strains' for clade types. The type (Clade 2) which infects cucumber, can also infect melon. Due to fungicide resistance within the downy mildew pathogen population, especially in Clade 2, selection of fungicides is important. Management of cucurbit downy mildew requires preventative fungicide applications as commercial cultivars are generally susceptible to current strains (Clades) of the pathogen. Management information can be sourced here: https://vegpath.plantpath.wisc.edu/2022/07/03/update-10-july-3-2022/