Vegetable Crop Update

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

Division of Extension
University of Wisconsin-Madison

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In This Issue

Calendar of Events

December 3-5, 2019 – Midwest Food Producers Association Annual Convention/Processing Crops Conference, Wisconsin Dells, WI
January 26-28, 2020 – WI Fresh Fruit & Vegetable Growers Conference, Wisconsin Dells, WI
February 4-6, 2020 – UW-Madison Div. of Extension & WPVGA Grower Education Conference, Stevens Point, WI

Vegetable Insect Update – Russell L. Groves, Professor and Extension Specialist, UW-Madison, Department of Entomology, 608-262-3229 (office), (608) 698-2434 (cell), or e-mail: groves@entomology.wisc.edu.

New and Anticipated Arrivals. Unfortunately, Wisconsin agriculture remains as vulnerable to invasion of new and exotic insect pests due to several factors. Biological invasions are sub-divided into distinct processes: arrival, establishment and spread; and the Wisconsin landscape, in many ways, is very enabling of these processes. Arrival is the process by which individuals are transported to new areas, and our proximity to major air traffic centers, interstate highways that bisect the state, rising levels of domestic and international trade, together with an incredibly diverse set of agricultural industries, increase our chances for arrival. Although most arrivals are initially considered unsuccessful, the next process, 'establishment' results from populations that grow, often unnoticed, to levels where eradication is highly unlikely. Subsequent 'spread' of these unwanted, non-natives species is the final process by which a new arrival expands its presence, until it finally reaches levels of abundance that negatively influences the ecology of a native system, or economically impacts crop productivity.

The Wisconsin Department of Agriculture, Trade and Consumer Protection (WI DATCP) conducts, summarizes and reports upon their efforts to protect the agricultural resources in the State through the Bureau of Plant Industry's, Cooperative Agricultural Pest Surveys (https://datcp.wi.gov/Pages/Publications/PlantIndustry.aspx). The Department works directly with officials of the USDA Animal Plant Health Inspection Service (APHIS), and the Wisconsin Department of Natural Resources (WI-DNR), to identify, maintain and prioritize a list of exotic and invasive species prohibited or restricted in Wisconsin under the Chapter NR 40 Invasive Species Rule (https://dnr.wi.gov/topic/Invasives/classification.html).

Last week we reported on the newly arrived swede midge; a fly (midge) species that was suspected for arrival over the past few years, since neighboring states (Michigan, Minnesota) have reported established infestations since 2015 and 2016, respectively. And based upon the challenges of accurate and initial identification, the broad spectrum of hosts plants (crop and non-crop) this midge can infest, and the life stages present in the field(s) during the initial detections, this pest is likely entering into the process of 'spread' throughout the State. Examples of recent insect arrivals in the state over the past 5-7 years are unfortunately numerous, and include the Brown Marmorated Sting Bug, the Purple Carrot Seed moth and the Spotted-Wing Drosophila fruit fly, which can infest fruits and vegetables. The Department also reports on several wood boring species infesting ornamental and forest systems, together with numerous plant pathogens regarded as new or anticipated 'arrivals'. Insect pests that we anticipate for arrival (or detection) in Wisconsin include the Allium leafminer (https://wiki.bugwood.org/Phytomyza_gymnostoma/NJ, aka. Leek moth), the Spotted Lanternfly

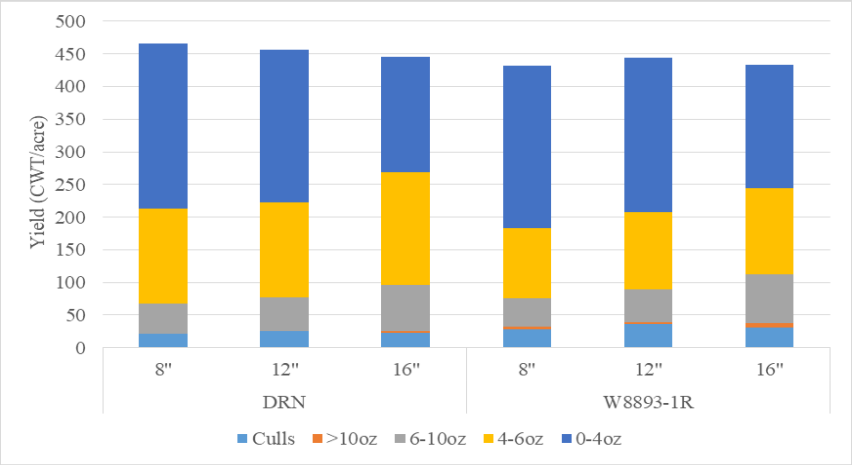
(https://wiki.bugwood.org/Lycorma_delicatula/NJ), and the Soybean Gall midge (https://cropwatch.unl.edu/2019/SGM-stem-feeding), to mention a few.
The WI DATCP, the USDA APHIS and the WI-DNR collectively work with other state agencies (to include the University of Wisconsin) to coordinate surveys and responses to these arrivals. Early reports of new species/populations allow these agencies to respond rapidly and potentially control invasives before they become 'established' and 'spread' into new areas. Detailed instructions on reporting potential invasive species can be found at: https://dnr.wi.gov/topic/Invasives/report.html#pests.
Vegetable Entomology Webpage: http://www.entomology.wisc.edu/vegento/index.html

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 reporting research results from our 2019 spacing trials with two early season russets and two reds. The trial was conducted at the Hancock Ag Research Station. Seeds were planted on May 1st, emergence on May 25th, vine kill on August 12th, and final harvest on 27th.

- Reds (DRN vs. W8893-1R):

Total yield and size profile of the two cultivars under the three seed spacing treatments are shown in figure below.



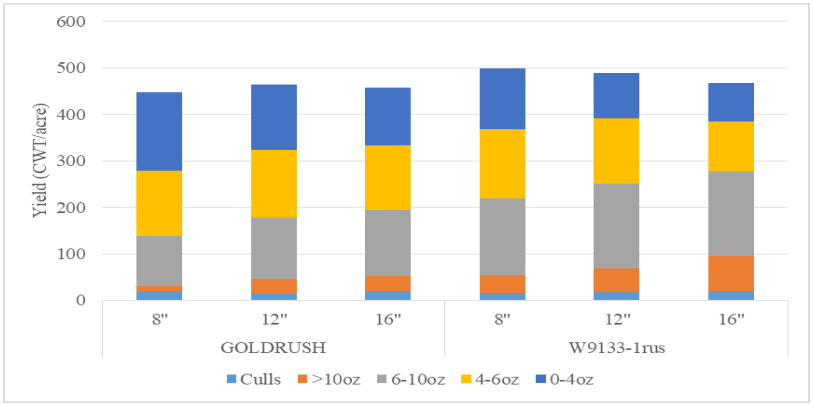
There is no difference between the total yield of different spacing treatments for both cultivars, however, spacing at 16'' resulted in higher percentage of tubers >4oz (55% for DRN and 49% for W8893-1R). For tuber set per plant (shown in table below), it is quite obvious that seed spacing at 8'' and 12'' led to more tuber set per plant than spacing at 16'' for both cultivars. There is not any difference of specific gravity and hollow heart incidence between different spacing treatments and cultivars.

Cultivar	Seed spacing	Tuber set per plant
DRN	8''	15
	12''	14
	16''	12
W8893-1R	8''	15
	12''	15
	16''	12

This picture was taken at final harvest from the 12'' treatment. We can see that across tubers W8893-1R has more uniform and redder color on the skin compared to Dark Red Norland.

- Early season russets (GoldRush vs. W9133-1rus):

Total yield and size profile of the two cultivars under the three seed spacing treatments are shown in figure below.



Larger seed spacing was associated with higher percentage of tubers >6oz (38% for GoldRush and 55% for W9133-1rus). For GoldRush, there is not any difference of total yield between the three spacing treatments, however for W9133-1rus, total yield is 31 CWT/acre less under 16'' spacing compared to that under 8''.

For tuber set per plant, again larger spacing at 16'' resulted in less tuber set.

Cultivar	Seed spacing	Tuber set per plant
GoldRush	8''	12
	12''	11
	16''	10
W9133-1rus	8''	11
	12''	10
	16''	9

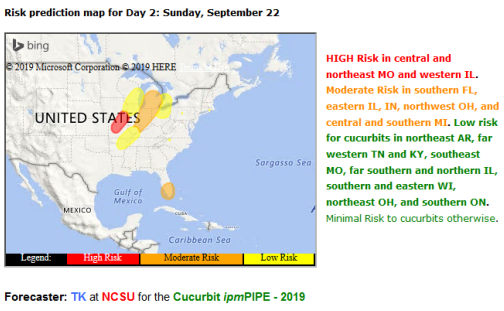
Our conclusion from the spacing trials so far is that larger seed spacing at 16'' can be associated with:

1) Production of tubers that are larger than 6oz;
2) Less tuber set per plant;
3) Sometimes less total yield for specific cultivar.

This is the 1st year of the study, we will repeat the trial next summer.

Amanda Gevens, Associate Professor & Extension Specialist, UW-Madison Plant Pathology, gevens@wisc.edu, 608-575-3029. https://wivegdis.plantpath.wisc.edu/

Cucurbit downy mildew: No new cucurbit downy mildew reports from this past week, but, to date, we've had a few in WI including Buffalo (watermelon; 9/5); Vernon (cucumber; 8/20) and Dane County (butternut squash and pumpkin, 8/20). While downy mildew doesn't directly infect fruit, cucurbits that require several more weeks in the field could lose foliage, creating little/no sun protection for fruit resulting in sun scald. Protection of cucurbits with use of effective fungicides is recommended at this time. **Visit our 2019 WI Commercial Vegetable Production Guide** for further information pertaining to the fungicides listed in this newsletter. https://learningstore.uwex.edu/Assets/pdfs/A3422.pdf The cucurbit downy mildew reporting and forecasting site http://cdm.ipmpipe.org/ indicated new confirmations of downy mildew in KY, MD, NC, NY, PA, SC, and VA during this past week. In 2019 so far, the site has documented confirmations in AL, AR, CT, DE, FL, GA, IN, KY, MA, MD, MI, MO, MS, NC, NH, NJ, NY, OH, PA, RI, SC, TN, VA, and WI on various cucurbits.



The disease forecast indicates no risk of downy mildew movement within WI.

Potato & Tomato Late Blight Updates: Two new reports of late blight from tomato in St. Croix and Sauk Counties from this past week.

Date	County	Host Crop	Clonal Lineage
7/17/2019	Wood	Potato	US-23
8/2/2019	La Crosse	Tomato	US-23
8/6/2019 **8/15/2019** **8/22/2019** **9/3/2019**	Portage	Potato Potato Potato Potato & Tomato	US-23 US-23 US-23 US-23
8/13/2019	Monroe	Tomato	US-23
8/14/2019 **8/27/2019**	Adams	Potato Potato	US-23 US-23
8/14/2019 **8/15/2019** **8/19/2019**	Waushara	Potato Potato Tomato	US-23 US-23 US-23
8/14/2019	Vernon	Tomato	US-23
8/19/2019 **9/13/2019**	Crawford	Potato Potato & Tomato	US-23 US-23
8/24/2019 **9/16/2019**	Sauk	Potato Tomato	US-23 US-23
8/29/2019	Juneau	Tomato	US-23
9/12/2019	Shawano	Potato	US-23
9/13/2019	Green Lake	Tomato	US-23
9/18/2019	St. Croix	Tomato	TBD

Most isolates of US-23 can be managed with phenylamide fungicides such as mefenoxam and metalaxyl. It is critical that susceptible potatoes and tomatoes in and around the counties of reports be treated with a combination of antisporulant and protectant fungicides to limit reproduction of the pathogen and new infections. **Antisporulants include: Orondis, Forum, Curzate, Tanos, Ariston, Previcur, Revus, and Ridomil.** Outside of WI, late blight was confirmed in NY (tomato) this past week. In 2019, late blight had been confirmed in FL, NC, NY, PA, TN, WA, and WI. Late blight fungicides registered for use in Wisconsin are available at the UW-Potato & Vegetable Pathology website or at link: https://wivegdis.wiscweb.wisc.edu/wp-content/uploads/sites/210/2019/06/2019-Potato-Late-Blight-Fungicides.pdf

Current P-Day (Early Blight) and Disease Severity Value (Late Blight) Accumulations - As potato fields are vine killed and harvested, our stations will be shut down for this season. Many thanks to Ben Bradford, UW-Madison Entomology; Stephen Jordan, John Hammel, & Samuel Meyer, UW-Madison Plant Pathology for maintaining stations and advancing data collection and processing in 2019. A P-Day value of ≥300 indicates the threshold for early blight risk and triggers preventative fungicide application. A DSV of ≥18 indicates the threshold for late blight risk and triggers preventative fungicide application. Red text in table indicates threshold has been met/surpassed. Weather data used in these calculations comes from stations that are in potato fields. Data are available in graphical and raw data formats for each weather station at: https://wivegdis.plantpath.wisc.edu/dsv/

Location	***Planting Date***		**Emergence Date (50%)**	**Disease Severity Values (DSVs) 9/21/19**	**Potato Physiological Days (P-Days) 9/21/19**
Grand Marsh	Early	Apr 10	May 20	**159**	**959.11**
	Mid	May 1	June 1	**157**	**881.91**
	Late	May 20	June 9	**155**	**823.42**
Hancock	Early	Apr 10	May 22	**107**	**951.35**
	Mid	Apr 25	May 27	**106**	**915.45**
	Late	May 15	June 8	**104**	**825.93**
Plover	Early	Apr 22	May 27	**150**	**925.79**
	Mid	May 1	June 1	**150**	**891.39**
	Late	May 29	June 13	**148**	**801.17**
Antigo	Early	May 14	May 29	**88**	**803.33**
	Mid	May 24	June 8	**88**	**796.42**
	Late	Jun 1	June 20	**85**	**714.28**