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. 13 – July 4, 2021

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Calendar of Events:

July 21, 2021 – UW-Hancock Ag Research Station Field Day (1-4:30PM)
July 22, 2021 – UW-Extension Langlade Co. Airport Ag Research Station Field Day
November 30-December 2, 2021 – Midwest Food Producers Assoc. Processing Crops Conference, Kalahari Convention Center
February 8-10, 2022 – UW-Madison Div. of Extension & WPVGA Grower Education Conference, Holiday Inn, Stevens Point, WI

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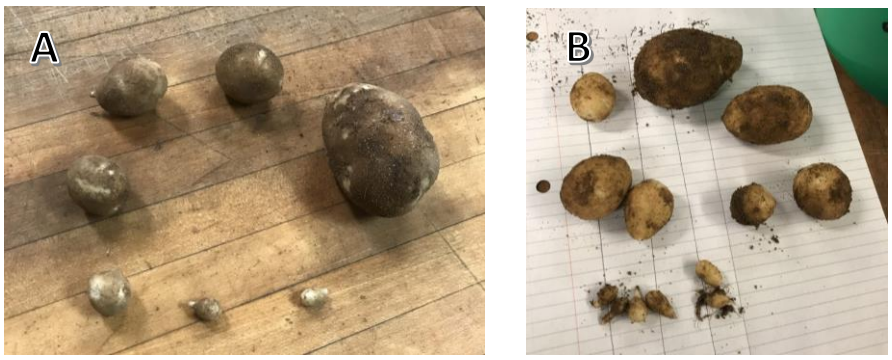
Firstly, some updates on my knee surgery: after six weeks of recovery, I can gradually get back to normal field trips. Hope you see people out in the field in the near future.As of June 28th, all varieties (Russet Burbank, Snowden, Soraya, Colomba, Silverton, Plover Russet, Dark Red Norland, Red Prairie) that we planted at HARS has achieved flowering and full canopy closure (Figure 1). My group dug tubers from Russet Burbank and Soraya, and found that all plants had tubers, and most tubers were smaller than 1oz (Figure 2).

Figure 1. (Left) Russet Burbank and Soraya planted on April 19th at HARS have both achieved full canopy cover as of June 28th.

Figure 2. (Right) Most tubers from Russet Burbank (A) and Soraya (B) were smaller than 1oz as of June 28.



For kidney beans that we planted on May 24th, most plants are at V7-V8, and some plants have showed flower buds as of July 1st (Figure 3 below).

Figure 3. Kidney beans showing flower buds as of July 1. Planted date was May 24 and most plants are at V7-V8 stages.

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) 7/3	Potato Physiological Days (P-Days) 7/3
Grand Marsh	**Early**	April 2	May 10	**32**	**368**
	Mid	April 10	May 15	**32**	**358**
	Late	May 1	May 23	**26**	297
Hancock	**Early**	April 5	May 12	**22**	**365**
	Mid	April 15	May 15	**22**	**357**
	Late	May 5	May 23	16	294
Plover	**Early**	April 7	May 12	**30**	**355**
	Mid	April 20	May 20	**27**	**311**
	Late	May 7	May 30	**22**	249
Antigo	**Early**	April 26	May 28	12	271
	Mid	May 10	June 5	12	233
	Late	May 20	June 13	12	164

All potato fields of the Grand Marsh and Plover areas have reached/surpasesed the threshold for Disease Severity Values (18) and should be preventatively treated for late blight management. The latest plantings in Hancock will likely meet threshold early this week; likely by next week in the Antigo area. **Late blight** continues to emerge sporadically in Wisconsin with annual occurrence. The disease hasn't yet appeared in the US this season (usablight.org), however, when environmental conditions are favorable the pathogen can become active and quickly cause crop destruction. For more information on this disease: https://vegpath.plantpath.wisc.edu/resources/potato-late-blight/

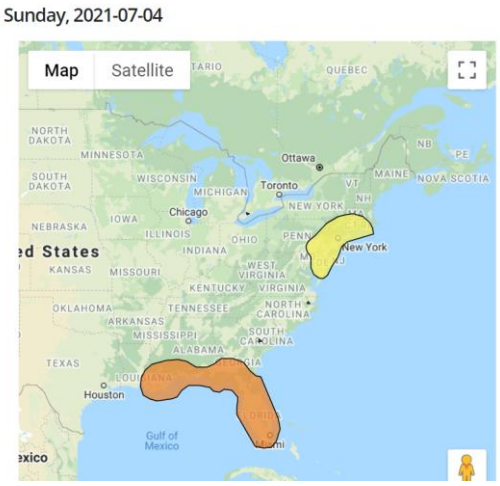
The **early blight** P-Day threshold of 300 has been met/exceeded in early and mid- potato plantings for Grand Marsh, Hancock, and Plover areas. Early blight is active in central Wisconsin in the lower canopies. A listing of details of currently registered fungicides for early blight management can be found in our 2021 Wisconsin Vegetable Production guide: https://cdn.shopify.com/s/files/1/0145/8808/4272/files/A3422-2021.pdf

Performance of newer fungicides in our Hancock trials from recent years is provided at our website: https://vegpath.plantpath.wisc.edu/field-trials/

Cucurbit Downy Mildew Update: Cucurbit downy mildew was reported in DE (cucumber), PA (cucumber), SC (watermelon), LA (cucumber), MS (cucumber), and NC (squash and cantaloupe) this past week. This season, so far, the disease has been documented in AL, DE, FL, GA, LA, MD, MS, NC, NJ, Ontario Canada, PA, SC.

No additional reports in our growing region of MI, OH, or Ontario Canada at this time – as reflected in today's forecast depicted below from https://cdm.ipmpipe.org/

Management recommendations: https://vegpath.plantpath.wisc.edu/2021/06/20/update-11-june-20-2021/



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

Vegetable Entomology Webpage: https://vegento.russell.wisc.edu/

Striped cucumber beetle – (https://vegento.russell.wisc.edu/pests/cucumber-beetles/). Striped and spotted cucumber beetles continue to cause significant damage in vine crops, but the striped beetle is more prevalent in Wisconsin. Feeding from larvae and adults causes direct damage to roots, leaves, flowers, and fruits. Adults can also vector fusarium wilt and the bacteria, *Erwinia tracheiphila*. Cucumbers and melons are particularly susceptible to bacterial wilt, and damage from this can be severe**.**

Striped cucumber beetle (Acalymma vittatum)
Photo: Ralph C. Baslow

Only the striped cucumber beetle overwinters in Wisconsin. Significant numbers emerged in mid- to late May and began infesting cucurbits. The beetles are attracted to the chemical cucurbitactin produced by the plants. The small white larvae feed on plant roots for 2-3 weeks before pupating in the soil. Spotted beetles migrate to northern locations in early to mid-July. This late arrival generally seldom makes them a serious problem. There is one generation of striped and spotted beetles per year.

Spotted cucumber beetle (Diabrotica undecim-punctata)
Photo: 'Pollinator' on Wikipedia

Cucumber varieties differ in their attractiveness to beetles. The varieties "Liberty" and "Wisconsin SMR58" are tolerant of cucumber beetle damage. In cantaloupe, "Makdimon" and "Rocky Sweet" are less attractive to beetles. Less bitter cultivars are less attractive to cucumber beetles

Several chemical insecticides are available when beetles exceed thresholds. However, chemical control will be limited if beetle populations are already high. Systemic neonicotinoid insecticides should be used with caution. Contact insecticides (including botanicals) should be applied to seedlings before transplanting and continued on a regular basis to keep numbers low. Cucumber leaves are sensitive and can be burned by chemical sprays. Spraying in the afternoon or evening is preferable to avoid killing beneficial insects and pollinators.

Squash bugs – (https://vegento.russell.wisc.edu/pests/squash-bug/). Squash bugs are an emerging problem at this point in the summer in parts of southern and central Wisconsin. In recent years, these insects have become more prevalent, causing damage to vine crops in commercial fields and home gardens alike. The key to management is early detection. Squash bugs feed on all vine crops, but pumpkins and squash are the preferred hosts with gourds and melons favored next.

Squash bugs are a major pest of squash and pumpkins. Nymphs and adults feed on plant juices and release toxins into leaves. Feeding causes wilting, and leaves become dry and brown or black along the edges. This wilting may appear like bacterial wilt, but bacterial wilt is spread by the cucumber beetle. Early symptoms of infestation include yellow spotting on the leaves. Later in the season, adults will also feed on fruit, which can cease development and begin to rot. Young plants are more susceptible to severe damage.

Squash bug (Anasa tristis)
Photo: Jeffrey Hahn, Univ. of Minnesota

Adults are about ½ -3/4-inch long, brownish-black, flat, shield-shaped bugs. They are sometimes mistaken for stink bugs. Adults congregate and emit a strong odor when crushed. Immature squash bugs initially have red heads and legs with whitish-green bodies, but later have black heads and legs with gray bodies. Eggs are 1/16-inch, reddish orange to brown-colored and are laid in clusters on the undersides of leaves along the center vein

Squash bug nymphs
Photo: 'Pollinator' on Wikipedia

Unmated adults overwinter in Wisconsin in protected areas. Eggs are laid in late June and early July when cucurbit vines begin to develop. Eggs hatch in about 10 days. The nymphal stage lasts 4-6 weeks. Nymphs undergo 5 molts before reaching maturity. Adults appear in late July and early August. There is one generation per year. The female lays eggs over an extended period, and all life stages may appear at once on the plant.

Squash bug eggs
Photo: 'Pollinator' on Wikipedia

Destroy crop residues in the fall to reduce the number of overwintering adults. Crop rotation will also reduce the incidence of infestation. Trellised plants are less susceptible to squash bug infestations. Young nymphs are the most susceptible to control practices, while adults are more difficult to control. In smaller plantings, adults can be congregated by placing boards on the ground near the plants as a hiding place. The squash bugs will aggregate at night under the boards, which can then be destroyed each morning.

Squash vine borer – Potato leafhopper – Onion thrips
(**https://vegento.russell.wisc.edu/pests/**).

All three of these pests continue to be prevalent across the range of crops they infest. Numbers of immature **onion thrips** slowed in their development over the past 7-9 days with needed rainfall, but numbers have the potential to rebound quickly. Pay very close attention to developing populations and continue to scout onion, cabbage and garlic/leek crops for this pest. Onion thrips overwinter in legume and grain fields and along weedy field edges. Females can reproduce without mating and lay eggs beneath the leaf's surface. Eggs hatch after 5-10 days, and nymphs are full grown within 15-30 days. Development of the last two nymphal stages occurs in the soil, without feeding. After the fourth molt, adult female thrips return to the plant. Thrips produce 5-8 generations per year, and outbreaks are most likely to occur in hot, dry weather.

Potato leafhopper (PLH) numbers continue to develop in green bean, hops, alfalfa and potatoes. Chemical insecticides provide the most effective control of PLH. Seed treatments and at-plant systemic treatments applied to control other insect pests have been shown to give excellent control of PLH. Many foliar insecticides also provide excellent control for PLH. The selection of foliar insecticides should consider control of multiple pests.

Adult **Squash vine borer** adults continue to be prevalent in central and southern Wisconsin. Squash vine borer is very difficult to manage with chemical insecticides since older larvae are protected within the plant stem. The target life-stage for conventional chemical management is newly hatched larvae that have not yet entered the stem. Effective control requires insecticide residue to be in place before and during the egg laying period (1,000 DD_{50}). Two to three successive applications of insecticide 5-7 days apart will adequately control most of the larval borers before entering the vines. Consult the Vegetable Disease and Insect Forecasting Network (VDIFN - https://agweather.cals.wisc.edu/vdifn?panel=insect&model=squash-vine-borer) site to see where adult numbers are being initiated (e.g., northern Wisconsin).

Newly emerged female moths quickly seek suitable hosts and begin laying small, brown eggs singly at the base of susceptible plants. Each female is capable of laying between 150-200 eggs. Depending upon temperature, eggs will hatch within 10-15 days of being laid. Newly hatched larvae quickly bore into the vine stems to feed for four to six weeks. As the larvae feed, they leave behind characteristic light brown frass (insect feces) that resembles sawdust. Larvae typically feed at the center of host plant stems this internal feeding greatly restricts the plant's ability to move water and nutrients. Fully-grown borers exit the stems and burrow into the soil to pupate. Squash vine borers produce one generation per year in Wisconsin.

Squash vine borer adult emergence (3 July 2021)