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

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Calendar of Events:

July 11, 2024 – UW Agricultural Research Station Potato Field Day, Hancock, WI
July 18, 2024 – UW Langlade County Extension & WI Seed Potato Certification Program – Ag Research Station Field Day, Antigo, WI
July 31, 2024 – WI Seed Potato Certification Program & WI Potato Coalition Early Generation Seed Potato Field Day, Lelah Starks Seed Potato Farm, Rhinelander, WI
December 3-5, 2024 – Midwest Food Producers Assoc. Processing Crops Conference, Kalahari Convention Center
January 13-14, 2025 – Wisconsin Agribusiness Classic, Alliant Energy Center, Madison, WI
February 4-6, 2025 – UW-Madison Div. of Extension & WPVGA Grower Education Conference & Industry Show, Stevens Point, WI

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Please note that we have our **2024 Commercial Vegetable Production in Wisconsin Guide (A3422)** available at the link below as a free searchable, downloadable pdf. This provides information to help you select inputs to support healthy vegetable and specialty crop production in Wisconsin.
https://learningstore.extension.wisc.edu/products/commercial-vegetable-production-in-wisconsin

Current P-Day (Early Blight) and Disease Severity Value (Late Blight) Accumulations will be posted at our website and available in the weekly newsletters. Thanks to Ben Bradford, UW-Madison Entomology for supporting this effort and providing a summary reference table: https://agweather.cals.wisc.edu/thermal-models/potato. 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. Data from the modeling source: https://agweather.cals.wisc.edu/vdifn are used to generate these risk values in the table below. I've estimated early, mid-, and late planting dates by region based on communications with stakeholders. These are intended to help in determining optimum times for preventative fungicide applications to limit early and late blight in Wisconsin.

	Planting Date		50% Emergence Date	Disease Severity Values (DSVs) *through 5/25/2024*	Potato Physiological Days (P-Days) *through 5/25/2024*
Spring Green	**Early**	Apr 3	May 9	5	124
	Mid	Apr 17	May 12	5	107
	Late	May 10	May 25	0	5
Arlington	**Early**	Apr 5	May 10	2	116
	Mid	Apr 20	May 15	2	85
	Late	May 12	May 25	0	6
Grand Marsh	**Early**	Apr 5	May 10	7	107
	Mid	Apr 20	May 15	7	79
	Late	May 12	May 25	0	5
Hancock	**Early**	Apr 10	May 17	7	64
	Mid	Apr 22	May 21	5	35
	Late	May 14	TBD	TBD	TBD
Plover	**Early**	Apr 14	May 18	6	58
	Mid	Apr 24	May 22	2	26
	Late	May 19	TBD	TBD	TBD
Antigo	**Early**	May 1	May 24	0	10
	Mid	May 15	TBD	TBD	TBD
	Late	May 25	TBD	TBD	TBD
Rhinelander	**Early**	May 7	May 25	0	5
	Mid	May 18	TBD	TBD	TBD
	Late	TBD	TBD	TBD	TBD

Late blight of potato/tomato. The usablight.org website (https://usablight.org/map/) indicates no reports of late blight in potato or tomato from the US so far in 2024. The accumulated Blitecast Disease Severity Values for central Wisconsin (as high as 7) result from several days during the past week in which environmental conditions were favorable for spore production and infection of the late blight pathogen: moist and moderate temperatures (90-100% relative humidity and 46-75°F). The Blitecast tool operates under the assumption that inoculum is available.

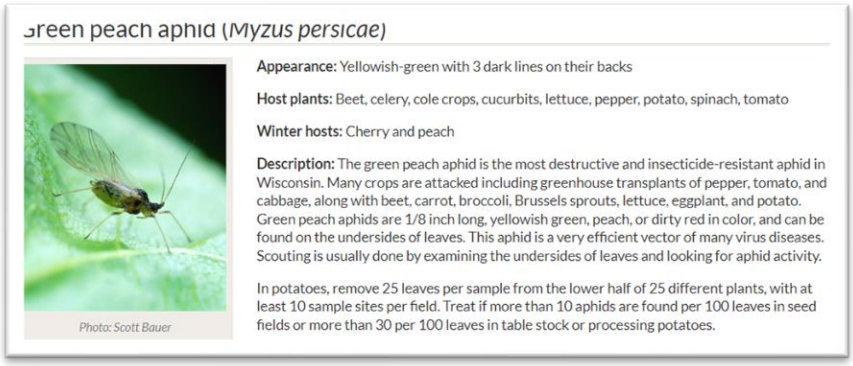
Early blight of potato. P-Day values will continue to amass (up to ~10 per day) and develop conditions optimum for early blight disease caused by *Alternaria solani*. Earliest inoculum comes from within field (small crop residue fragments can harbor the pathogen) and from nearby fields. Once established, early blight continues to create new infections due to its polycyclic nature – meaning spores create foliar infection and the resulting lesion on the plant can then produce new spores for ongoing new infections in the field and beyond. Early season management of early blight in potato can mitigate the disease for the rest of the growing season.

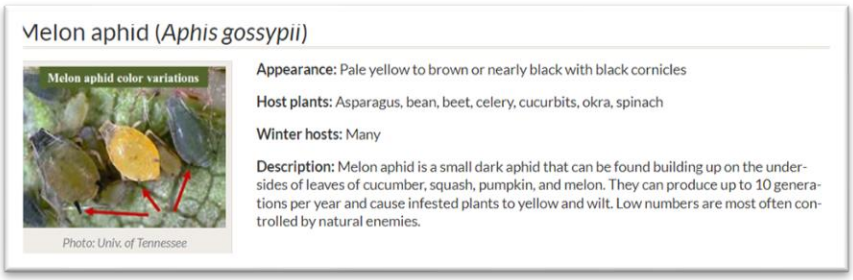
For custom values, please explore the UW Vegetable Disease and Insect Forecasting Network tool for P-Days and DSVs across the state (https://agweather.cals.wisc.edu/vdifn). This tool utilizes NOAA weather data. In using this tool, be sure to enter your model selections and parameters, then hit the blue submit button at the bottom of the parameter boxes. 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 2024 Commercial Veg. Production in WI Extension Document A3422: https://learningstore.extension.wisc.edu/products/commercial-vegetable-production-in-wisconsin

Vegetable Insect Update – Russell L. Groves, Professor and Department Chairperson, 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/

Aphids – (https://vegento.russell.wisc.edu/pests/aphids/). Aphids continue to be observed in several locations throughout southern and central Wisconsin infesting many, early-season crops with special emphasis on leafy greens and cole crops. Adults and nymphs feed on plant sap and excrete a sugary honeydew that creates the conditions for sooty mold. There are several aphid species that can attack many different types of crops. Aphids that pose the most serious problem to Wisconsin vegetable production include the green peach, melon, and potato aphids.





It is difficult to generalize the life cycle of all aphids because of the diversity of their life habits, which can range from single to multiple hosts. Female aphids can reproduce without mating and will hold the eggs in their bodies to give birth to live young. Look for "hot spots" of aphid activity scattered throughout the field. Because of the spotty nature of infestations, look for aphids on a number of plants in several areas. Examine the terminals of 15 consecutive plants and rate the plants as infested or uninfested. Given the huge reproductive potential of aphids, an infestation level of 5%-10% indicates a potentially damaging infestation. Repeat checks at weekly intervals to determine the need to treat as long as conditions prevail for their increase.

Flea beetles – (https://vegento.russell.wisc.edu/pests/flea-beetles/). Over the past 3-4 weeks, flea beetles have been consistent, early-season pests on many members of the cole crop group, as well as spinach, beets. Depending upon the species, many flea beetles overwinter as adults in the soil or beneath plant debris. They become active in early spring when temperatures reach 50°F and begin feeding on weeds or early-planted crops. The winter period of 2023-24 was not considered severe enough to cause significant overwintering mortality and the insect numbers can be anticipated to be numerous.

Following emergence, adults feed for 10-14 days before mating and then begin to lay eggs in the soil at the base of host plants throughout much of May. Eggs hatch in 7-14 days and larvae feed below- ground on various plant parts until fully grown. They pupate in earthen cells for 11-13 days before emerging as

adults. Larvae of flea beetles do not cause significant, direct damage to crops, and it is the feeding by adult flea beetles are particularly active on warm, calm, sunny days that cause the damage.

Depending upon the species, there may be 1-3 generations per year. There are several different species of flea beetle that pose problems early in the season when they are considered occasional pests. Host plants of many of the flea beetles are easily identified by their common names. For example, the crucifer flea beetle attacks cole crops and mustards while the eggplant flea beetle is commonly associated with eggplant.

Table 2. Established control thresholds for various crops

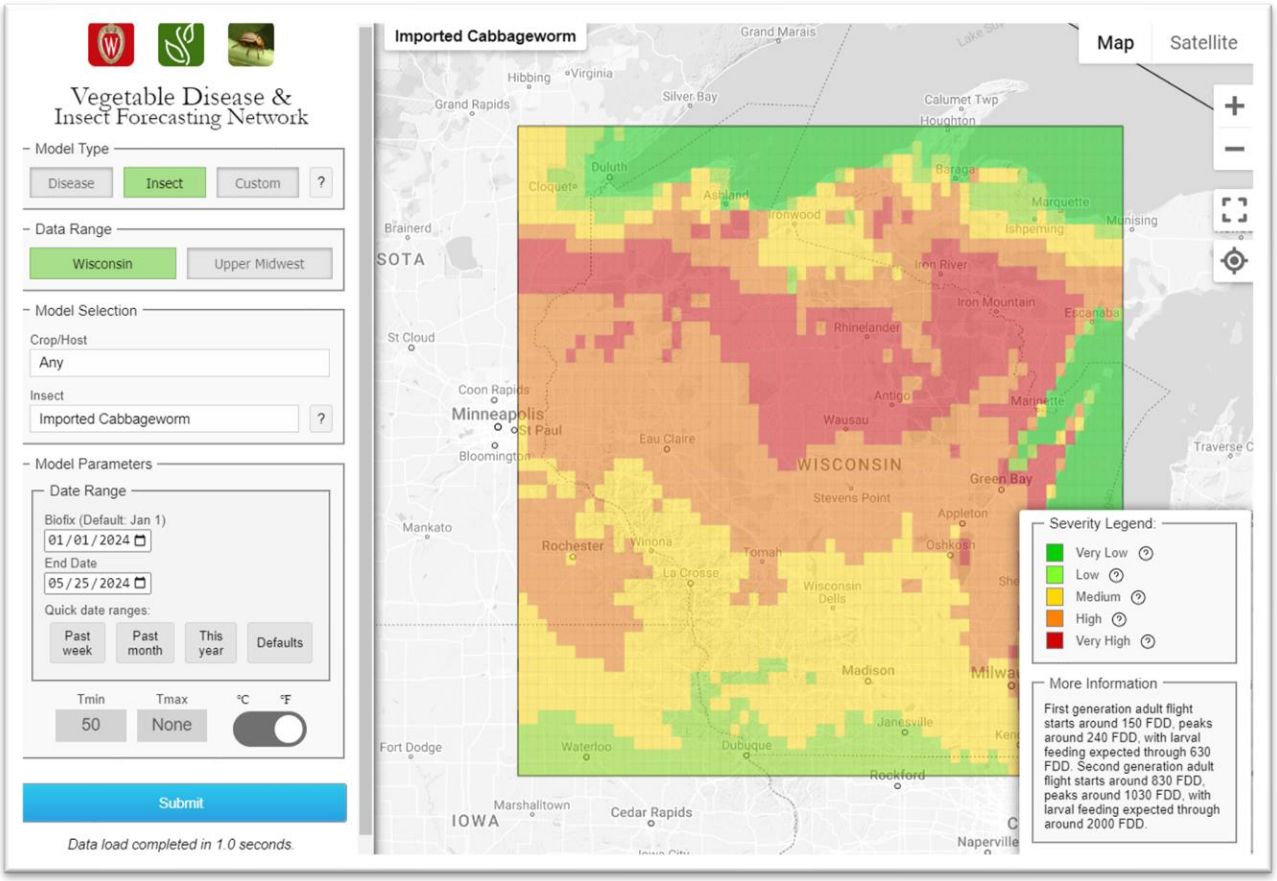
Crop	Threshold
Beets	Treat when beetles cause stand reduction on small plants
Cole crops	Undetermined
Eggplant	<3" = 2 beetles/plant 3-6" = 4 beetles/plant >6" = 8 beetles/plant
Horseradish	Treat only if beetles are found in high numbers early in the season
Potato	>2 beetles/sweep
Tomato	>2 beetles/plant

Adjusting planting dates to avoid damage caused by flea beetles may be useful. Floating row covers can prevent adults from feeding on leaves and laying eggs on the crop. If used, row covers should be set up just before the crop emerges. Water deters adult flea beetles, and any watering should be done in mid-day. Since flea beetles overwinter near fields, planting after adults have emerged or rotating crops can help minimize flea beetle damage. Commercially available nematodes that feed on flea beetle eggs, larvae, and pupae are available, but applications at this time of the year will only affect 2nd generation numbers.

Cole crops and Imported cabbageworms – (https://vegento.russell.wisc.edu/pests/caterpillar-pests-of-cole-crops/). Imported cabbageworm adults, commonly referred to as the white cabbage butterfly, are white butterflies with black markings on the wing tips. Female butterflies have 2 black dots on each fore wing; males, which are smaller, have 1 dot per wing. An adult butterfly can lay 300 to 400 eggs in their lifetime. Larvae appear as velvety green worms up to 1 inch long with a faint yellow stripe running down the back. The caterpillar is commonly found along the veins of leaves and easily blends into the foliage.

Imported cabbageworms overwinter as pupae on plant debris and usually produce 3-6 generations in a season. Butterflies emerge in early May and begin laying single, small, yellow-orange eggs on any plant part that is above ground. The eggs hatch in about 5 days. The larva develop on cole crops that are early planted. The caterpillar feeds and develops for approximately 11 to 20 days before forming a pupa from which the adult butterfly emerges after 6 to 11 days. Second generation butterflies emerge mid-July and larvae develop almost entirely on cultivated cole crops. This generation

causes the most damage.



Scout fields weekly throughout the season for damage. Check plants carefully, even if no feeding damage is apparent, to look for eggs that will hatch into small caterpillars several days to a week later. Examine the lower leaves of the plant for the larvae of each pest. Although feeding damage and fecal material are signs of activity, it is better to rely on larvae counts to determine the level of infestation. Caterpillars cause varying amounts of damage depending on the plant's maturity, so the need for treatment changes as the crop grows. Keep a record of which insect is present, its life stage and the percentage of plants infested. This information will be useful for monitoring whether the population is increasing or decreasing.

Treatment thresholds are well established and based on the percent of infestation by any lepidopteran species. Economic thresholds (ETs) vary based on the stage of crop development. Cabbage, broccoli and cauliflower in the seedbed are particularly susceptible to damage. Therefore, control measures are warranted when 10% of the plants are affected. Between transplant and cupping, the ET is raised to 30%, from the time plants begin to cup until early heading, if more than 20% of plants are infested, treatment is warranted. From early heading until harvest, the threshold again drops to 10% to protect market quality of the produce.

Colorado potato beetle (CPB) – (https://vegento.russell.wisc.edu/pests/colorado-potato-beetle/). The current and forecast weather remains very conducive for continued emergence of adult CPB in southern and central Wisconsin. Egg masses are starting to be prevalent on outside field edges and producers

thinking about initial perimeter spray applications should be prepared to spray in the coming two weeks. The insect growth regulator, novaluron (Rimon® 0.83EC), together with a tank mix of indoxacarb (Avaunt® eVo 30DG) are typical tank mix partners for perimeter applications.

Week 1: Spray field edges ***Week 2-3: Spray entire field*** ***Week 4: Spray field interior***

In the illustration above, Week 1 represents the initial perimeter application which should contain a tank mix of Rimon® 0.83EC (8.0 fl oz/acre) together with Avaunt® eVo 30DG (6.0 oz/acre). This tank mix should also contain a 6.0 fl oz/acre addition of piperonyl butoxide (e.g., Exponent) to synergize the indoxacarb component. Additional applications of Rimon, or another appropriate 1st generation CPB material, can follow in subsequent weeks.