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Disease Forecasting Updates
Colorado Potato Beetle Management

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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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. TBD indicates that data are To Be Determined as time progresses. Weather data used in these calculations comes from weather stations that are placed in potato fields in each of the four locations. 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)	Potato Physiological Days (P-Days)
				5/29	5/29
Grand Marsh	Early	April 2	May 10	6	112
	Mid	April 10	May 15	6	102
	Late	May 1	May 23	3	42
Hancock	Early	April 5	May 12	7	110
	Mid	April 15	May 15	7	101
	Late	May 5	May 23	1	39
Plover	Early	April 7	May 12	8	106
	Mid	April 20	May 20	5	62
	Late	May 7	May 30	TBD	TBD
Antigo	Early	April 26	May 28	0	3
	Mid	May 10	TBD	TBD	TBD
	Late	May 20	TBD	TBD	TBD

Accumulations of DSV and PDays were limited over this past week. While the start of week had typical, if not warm temperatures for the season, the dip in temperatures overnight into May 27 resulted in drastically reducing risk accumulation for both early blight and late blight diseases. 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 2021 Commercial Vegetable Production in Wisconsin Guide, Extension Document A3422: <https://cdn.shopify.com/s/files/1/0145/8808/4272/files/A3422-2021.pdf>

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/>

Colorado potato beetle – (<https://vegento.russell.wisc.edu/pests/colorado-potato-beetle/>). Continue checking for CPB adults now (in mid-May) after potato plants have emerged and during hilling operations. Emerging adults continue to colonize field edges and mating is well underway. Initial egg masses have been observed in early planted fields throughout southern Wisconsin and will become more prevalent in central Wisconsin in the coming weeks.

Our reduced-risk chemical management options are often linked to the stage of population development (often early larvae). Recall that insect development is directly related to temperature: cool weather slows growth, warm weather accelerates it. So, unless the weather of a given year is that of the “normal” year, recommended treatment dates can vary from year to year, and the most vulnerable life stages of CPB can be delayed or accelerated by temperatures. Recent cool weather will likely slow the development of the population by emergence, mating and egg laying.

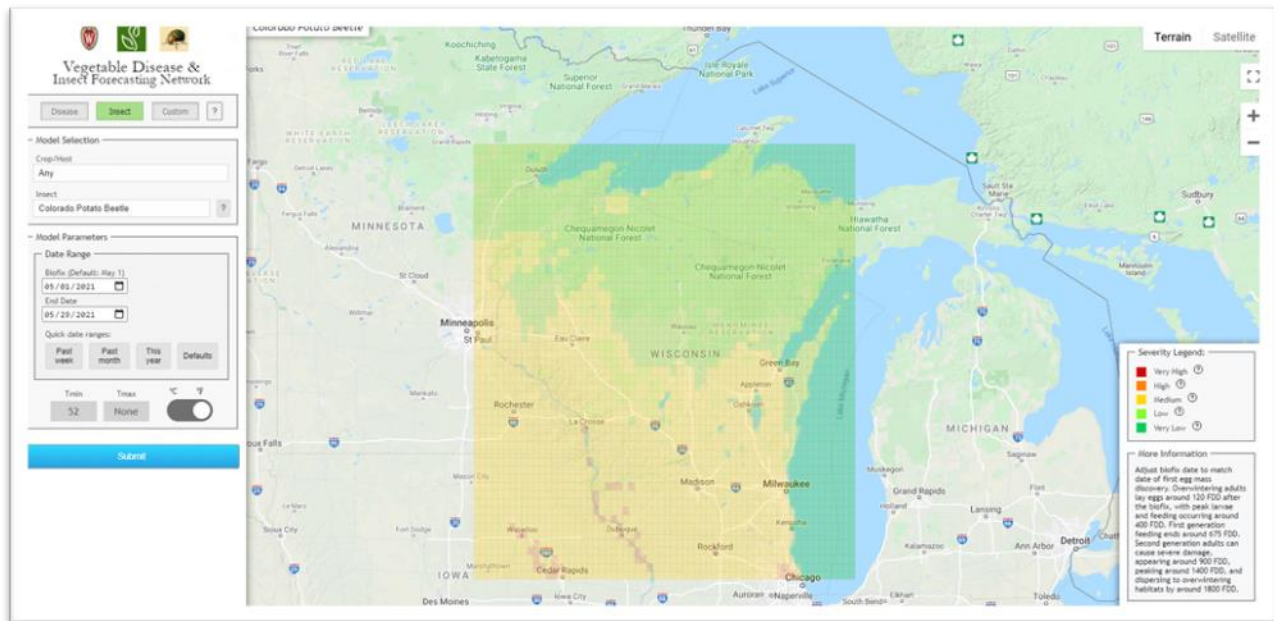
Using a system based on the daily high and low temperatures instead of calendar dates will help you better anticipate pest outbreaks. The Vegetable Disease and Insect Forecasting Network (VDIFN) website converts daily average temperatures into cumulative degree days. A degree day is a unit of measure for each degree above a base temperature (52°F for CPB). To use this approach, begin keeping track of the temperature when you find the first egg mass (or use the VDIFN degree-day calculator and associated map for CPB). Click any cell on the map to see a running total of the numbers of degree days to chart insect development (Table 1). The included table identifies the number of degree days needed for each stage of CPB development.

Table 1. Rate of beetle development using degree days
See **VDIFN** (base: 52°F; max: none; biofix: 1st eggs)

Life stage	Degree days	Accumulated degree days	Treatment
Egg	120	120	Not susceptible - do not treat
First instar	65	185	Most effective time to apply Btt
Second instar	55	240	Most effective time to apply conventional insecticides
Third instar	60	300	Most effective time to apply conventional insecticides
Fourth instar	100	400	Most effective time to apply conventional insecticides
Pupae	275	675	Not susceptible - do not treat

Visit the Vegetable Disease and Insect Forecasting Network (VDIFN) website (<https://agweather.cals.wisc.edu/vdifn>), which features a convenient map-based interface, to view the Colorado potato beetle model and many other insect degree day models. The current map (**Fig. 1** below) illustrates risk for egg laying and maturation (yellow shaded area) is now very prevalent throughout much of central Wisconsin.

Figure 1. Vegetable Disease and Insect Forecasting Network distribution of Colorado potato beetle lifestages (May 29, 2021). Yellow shaded areas illustrate risk for egg mass deposition and hatching. Orange shaded areas (very SW portions of the state) illustrate where egg hatching may be underway.



We are beginning to see the first egg masses around field perimeters at the Hancock Agricultural Research Station, and likely the very first egg masses will begin hatching this coming week. These colonizing adults, their initial egg masses and newly hatched early larvae are just within the first 20-40 rows of fields currently. Perimeter spray applications of the insect growth regulator, novaluron (IRAC Group 15, Rimon® 0.83EC), should begin this week. Recall, these initial applications of Rimon can be successful by making recently laid eggs non-viable after adult females ingest the product, and by limiting egg maturation and hatch if egg masses are contacted by the application (requires good coverage). The initial perimeter applications can be applied at 8.0 fl oz/A, with plans for the remainder of field to be treated over the next 3 successive weeks (**Fig. 2**).

Care should be taken to avoid initial applications of other reduced-risk insecticides at this time, unless these are directed just at field perimeters and only if actively feeding early larvae have been observed at this time. For products containing the IRAC Group 5 spinosyns or spinetoram (e.g., Radiant, Delegate, Blackhawk), the IRAC Group 6 avermectins (e.g., Agri-Mek), or the IRAC Group 28 diamides (e.g., Coragen, Elevest, Vantacor, Exirel), we have far greater success when the majority of lifestages are actively feeding larvae. Do not go too early with these compounds.

One potential option for use along field perimeters could include the use of the IRAC Group 22A indoxacarb (e.g., Avaunt EvO, tank-mixed with piperonyl butoxide) or the IRAC Group 21A tolfenpyrad insecticide (Torac EC, also tank-mixed with piperonyl butoxide), both of which act as contact insecticides and will control actively feeding adults plus any eggs that are directly contacted by the spray application.

Figure 2. Hypothetical field where the initial spray application of Rimon 0.83EC is directed to the field perimeter (e.g., first 50 rows) in Week 1, and then successive foliar applications are directed over the entire field in Weeks 2 and 3 (also applied at 8.0 fl oz/A). A final 8.0 fl oz/A application is then applied in Week 4 to the field interior not treated in Week1. This schematic provides 4 weeks of control over a field and takes advantage of our understanding of how Colorado potato colonizes a field.

