



In This Issue:

- Temperature, precipitation, and air quality impacts on vegetable production
- Disease forecasting updates for potato early blight and late blight
- Cucurbit downy mildew updates
- Cabbage maggot, seedcorn maggot, and Colorado potato beetle risks and management

Calendar of Events:

July 10, 2025 – UW Hancock Agricultural Research Station Field Day
July 17, 2025 – UW Langlade County Airport Station Field Day 1PM
December 2-4, 2025 – Midwest Food Producers Assoc. Processing Crops Conference, Kalahari Convention Center
January 12-13, 2026 – Wisconsin Agribusiness Classic, Kalahari Convention Center
February 3-5, 2026 – UW-Madison Div. of Extension & WPVGA Grower Education Conference & Industry Show, Stevens Point, WI

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According to the [UW-Madison Extension 2025 Weather Outlook](#), Most of the state has been at or below 70% of normal precipitation since May 4th. Cooler-than-normal temperatures were typical across the southern 2/3 of the state (2-6°F below normal), with closer-to-normal conditions in the north. The past 30 days have also been cooler-than-normal in the south, with a slight lag in GDD accumulation.

Looking forward:

- Precipitation chances are the highest in the central and northern areas over the next week, with multiple days of precipitation chances coming up.
- Mid-June climate probabilities are leaning strongly towards warmer-than-normal statewide conditions. This will add to the accumulated GDD since planting and help advance crop progress.

In addition, with the air quality index between 150-200 on June 3rd – 5th, there was a diligent watch on the surge in poor air quality across southern and south-central Wisconsin due to smoke from Canadian wildfires. Most recent estimates expect a decline of more than 25% in daily solar radiation due to smoke-induced haze. This reduction is due to the reflection of incoming sunlight caused by smoke and can impair plant photosynthesis. If such conditions are sustained for an extended period, it may result in lower tuber yields and poorer quality at harvest. As of June 7th, Wildfires in Canada continue to burn, leading to smoky skies and unhealthy air for sensitive groups in the U.S. Some reports stated that hazy and smoky weather might persist throughout the summer in Wisconsin this year.

Some recommendations for our growers:

- **Monitor Air Quality:** Regularly check local air quality indices to assess potential risks to crops.
- **Assess Crop Development Stages:** Pay close attention to tuber development, as negative environmental factors during tuber initiation and early tuber bulking could remarkably jeopardize final yield. The crop growth has already been on the slower side this year due to lower accumulation of GDD, hence keeping a check on tuber growth is critical.
- **Implement Adaptive Practices:** Consider agronomic practices that can mitigate stress, such as adjusting irrigation schedules or applying foliar nutrients to support plant health during periods of reduced photosynthesis.

Although with these weather conditions, plants are growing. The commercial 'Colomba' field that we are studying this summer has about 33% canopy closure on June 6th. The plants are about 16" tall, tuber initiation has started, and I am seeing dime-size tubers (Figures below).



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

The WI Special Local Needs registration for Bravo chlorothalonil products (registrant is ADAMA) is being voluntarily canceled. This change will cover Bravo ZN, Bravo 720, and Bravo 90DF. Please recall that the Echo chlorothalonil products (registrant is Sipcam Agro) had their SLN registration canceled back in April. Effectively, due to the change in allowable rates for chlorothalonil in vegetables, including potatoes, there are no longer long-season potato exceptions for extended chlorothalonil usage in Wisconsin. The new chlorothalonil labels will allow: 8 lb of active ingredient per acre/year when growing potato on non-vulnerable soils and 6.5 lb of active ingredient per acre/year when growing potato on vulnerable soils. For comparison, the old chlorothalonil labels allowed: 11.25 lb of active ingredient per acre/year when growing potato on any soil type and 16 lb of active ingredient per acre/year when growing potato on any soil type with Wisconsin's Special Local Needs (SLN) registration. The SLN registrations for Sipcam Agro Echo products were canceled on April 11, 2025. The SLNs for ADAMA's Bravo WeatherStik, Bravo Ultrex, and Bravo ZN products are also now in the process of being canceled. For more information and suggested plans for reduced chlorothalonil usage: <https://vegpath.plantpath.wisc.edu/2025/04/22/vegetable-crop-update-apr-22-2025/>

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) <i>through 6/7/2025</i>	Potato Physiological Days (P-Days) <i>through 6/7/2025</i>
Spring Green	Early	Apr 5	May 10	3	181
	Mid	Apr 18	May 14	3	153
	Late	May 12	May 26	0	96
Arlington	Early	Apr 5	May 10	3	178
	Mid	Apr 20	May 15	3	141
	Late	May 10	May 24	0	104
Grand Marsh	Early	Apr 7	May 11	0	162
	Mid	Apr 17	May 14	0	142
	Late	May 12	May 27	0	88
Hancock	Early	Apr 10	May 15	0	131
	Mid	Apr 22	May 21	0	105
	Late	May 14	June 2	0	50
Plover	Early	Apr 14	May 18	0	109
	Mid	Apr 24	May 22	0	102
	Late	May 19	June 7	0	9
Antigo	Early	May 1	May 24	0	87
	Mid	May 15	June 1	0	50
	Late	June 1	June 15	TBD	TBD
Rhineland	Early	May 7	May 25	0	78
	Mid	May 18	June 8	TBD	TBD
	Late	June 2	June 16	TBD	TBD

Late blight of potato/tomato. The usablight.org website (<https://usablight.org/map/>) indicates no new confirmed reports of late blight on tomato or potato in the US this past week. There was a US-23 late blight strain type confirmation in Collier County FL in 2025 (now several weeks old). The site is not comprehensive. This genotype/clonal lineage is generally still responsive to phenylamide fungicides meaning that Ridomil and Metastar fungicides (mefenoxam and metalaxyl) can still effectively control late blight caused by these strain types. We saw no accumulation of DSVs this past week across the state of Wisconsin.

Early blight of potato. We continue to steadily increase P-Days in potatoes. Accumulations were roughly 7/day over the past week. Values will continue to amass and develop conditions optimum for

early blight disease caused by *Alternaria solani*. Earliest inoculum typically comes from within a field 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 season.

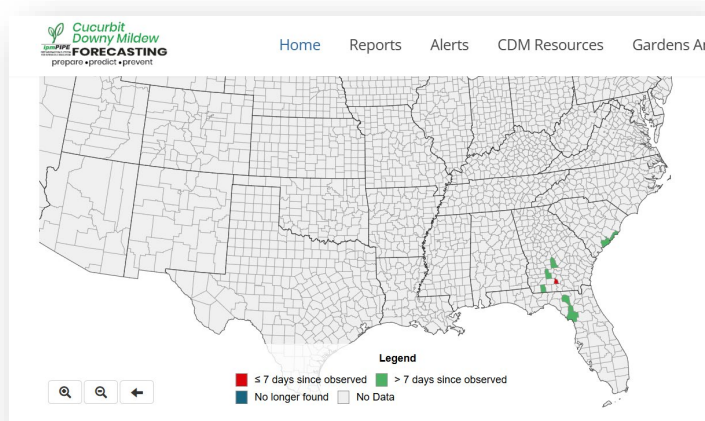
<https://vegpath.plantpath.wisc.edu/diseases/potato-early-blight/>

Fungicides can provide good control of early blight in vegetables when applied early on in infection. Multiple applications of fungicide are often necessary to sustain disease management to time of harvest due to the typically high abundance of inoculum and susceptibility of most common cultivars. For Wisconsin-specific fungicide information, refer to the Commercial Vegetable Production in Wisconsin (A3422), a guide available through the UW Extension Learning Store website which is annually updated.

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. 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 2025 Commercial Veg. Production in WI Extension Document A3422:

<https://cropsandsoils.extension.wisc.edu/articles/2025-commercial-vegetable-production-in-wisconsin-a3422/>

Cucurbit Downy Mildew: This national cucurbit downy mildew information helps us understand the potential timing of arrival of the pathogen, *Pseudoperonospora cubensis*, in our region, as well as the strain type which can give us information about likely cucurbit hosts in WI – as well as best management strategies. Clade 1 downy mildew strains infect watermelon and Clade 2 strains infect cucumber. I am hosting a cucurbit (and basil) downy mildew sentinel plot at the UW Hancock Agricultural Research Station this summer. This ‘sentinel plot’ is a non-fungicide-treated collection of cucurbit plants which are observed weekly for disease symptoms. I will report the presence/absence of downy mildew from this plot in this newsletter throughout the growing season. Additionally, I keep an eye on the downy mildew spore trapping work of Dr. Mary Hausbeck at Michigan State University and include this information as relevant to WI <https://veggies.msu.edu/downy-mildew-news/>. On May 27, Clade 2 downy mildew spores were confirmed in an Allegan County (SW Michigan) spore trap. Following, on **May 29, downy mildew symptoms were confirmed on cucumber plants in a commercial field in Allegan County.**



One new cucurbit downy mildew confirmation was made on watermelon in GA over this past week. This is Clade 1. Green counties indicate a former report of the disease greater than 7 days ago. From:

<https://cdm.ipmpipe.org/>

[Cucurbit Downy Mildew – UW Vegetable Pathology – UW–Madison](#)

Cucurbit downy mildew is a water mold or oomycete disease of cucurbit crops caused by *Pseudoperonospora cubensis*. Symptoms first appear on the upper leaf surface as angular, vein-bounded, yellow to pale-green spots, turning brown and coalescing to turn entire leaves brown with disease progression. In very humid conditions, the underside of leaves may appear fuzzy as the pathogen produces numerous spores which enable the pathogen to spread. This foliar disease can very rapidly destroy above ground plant parts reducing potential for yield and quality, and making fruit more susceptible to sunscald and secondary pathogen infection.

Primary Source: Living cucurbit plant tissue

Spread: Windborne spores, rain and irrigation splash, human spread on equipment and hands

Favorable Conditions: Very wet, humid conditions, moderate temperatures (59-68° F)

Infection & Disease Cycle. *Pseudoperonospora cubensis* does not overwinter on plant debris in Wisconsin, and can only survive on living plant tissue. No soilborne, long-term survival structures of the pathogen have been identified in our growing region. For this reason, the pathogen generally overwinters in warmer climates and in protected greenhouses. Spores spread northward on airborne spore-like structures called “sporangia”. The pathogen infects cucurbit leaves, producing lesions that create more spores when leaf wetness and humidity are high. These spores spread to nearby plants via water splash and human spread, and can travel longer distances via wind currents. The pathogen does not directly infect cucurbit fruits. Currently, two types of the cucurbit downy mildew pathogen are known. One type will infect cucumber and melon (“Clade 2”) and seems to be much more aggressive on these select cucurbit types. Clade 2 also has resistance to some currently used fungicides. The second type of downy mildew pathogen will infect pumpkin, watermelon, winter squash, bittermelon, and balsam apple (“Clade 1”). Clade 1 seems to arise a bit later in the production season than Clade 2.

Cultural Control. Scouting regularly allows early identification of disease before significant spread and damage. The following practices can also help prevent disease development: resistant varieties, avoid overhead irrigation, maintain proper spacing between plants, plant in areas with good airflow.

Chemical Control. Keep track of locations of known cucurbit downy mildew infection, and the cucurbit types infected, to best understand your risk and prescriptively manage this disease. For many years this disease was tracked and field reports were used to generate a disease forecast: <https://cdm.ipmpipe.org/forecasting/>. While this service is currently suspended, the website offer useful resources for management. For Wisconsin-specific fungicide information, refer to the [Commercial Vegetable Production in Wisconsin \(A3422\)](#), a guide available

through the [UW Extension Learning Store website](#). Or, for home garden fungicide recommendations, see [Home Vegetable Garden Fungicides \(D0062\)](#), a fact sheet available through the [UW Plant Disease Diagnostic Clinic](#) website. Always follow label directions carefully.



Fungicide Programs for Cucumber (Clade 2) DM

If program is initiated **before** disease onset: adhere to a **7-day** interval.
 If program is initiated **after** disease onset: adhere to a **5-day** interval.



Recommendations based on multiple years of field research by Hausbeck, Michigan State Univ. & Quesada-Ocampo at NCSU



G. Holmes

SE U.S. and MI (2014) have noted resistance in the downy mildew pathogen to several fungicides

Bold indicates best in MI

Use of highest labeled rate of products is recommended	
Previcur Flex 6SC (2 day PHI), GH	propamocarb hydrochloride 28
Elumin SC (2 day PHI)	ethaboxam 22
Ranman 3.6SC (0 day PHI)	cyazofamid 21
Gavel 75WG (5 day PHI), GH	mancozeb M3 + zoxamide 22
Orondis Opti (0 day PHI)	oxathiapiprolin 49/ chlorothalonil M5
Orondis Ultra (0 day PHI)	oxathiapiprolin 49/ mandipropamid 40
Omega 500F (7 day PHI)	fluazinam 29
Zampro 4.4SC (day PHI)	ametoctradin 45/ dimethomorph 40
Zing! SC (0 day PHI)	zoxamide 22 + chlorothalonil M05

Alternate products and mix each with either:
[Dithane \(mancozeb\)](#) 3 lb 5 day PHI, M3, GH; or [Bravo \(chlorothalonil\)](#) 2 pt 0 day PHI, M5

Resources

- [Cucurbit Downy Mildew Forecast](#) from ipmPIPE. View latest reports of CDM from across the country, report new infestations, and sign up for text or email alerts.
- [Commercial Vegetable Production in Wisconsin \(A3422\)](#) from the UW Extension Learning Store. This guide offers the latest recommendations for disease, insect, and weed management in Wisconsin's most common commercial vegetable crops. Also included are lime and fertilizer recommendations as well as insect identification information and keys.
- [UW Plant Disease Diagnostics Clinic](#). The University of Wisconsin-Madison/Extension Plant Disease Diagnostics Clinic (PDDC) provides assistance in identifying plant diseases and provides educational information on plant diseases and their control.

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

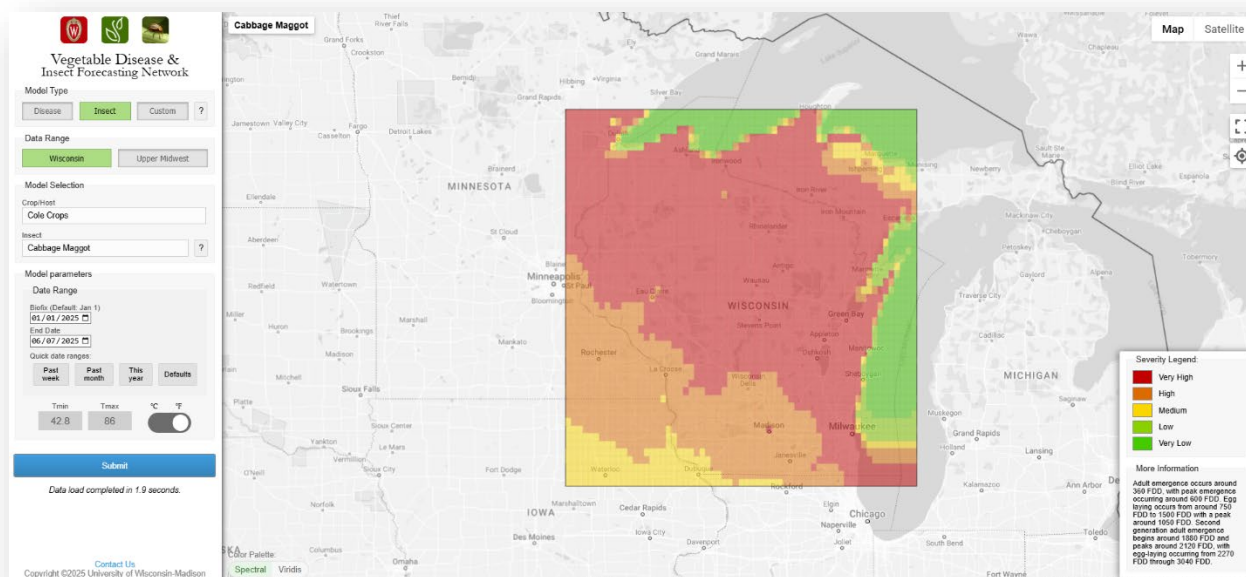
Vegetable Entomology Webpage: <https://vegento.russell.wisc.edu/>

Cabbage maggot (<https://vegento.russell.wisc.edu/pests/cabbage-maggot/>) – Damaging populations of cabbage maggots are at a high risk across portions of central Wisconsin. Regarded as an early season pest, the larval stages (maggots) feed on the roots and lower stems of all cruciferous crops and weeds. Wounds produced by this feeding can create entry points for several cole crop diseases. Early season transplants and spring roots crops are damaged most severely when recently transplanted and during the times when adults are laying eggs (oviposition).

Cabbage maggots overwinter as pupae in the upper few inches of the soil. Overwintering adults emerge in mid-May, about the same time as yellow rocket and forsythia are in bloom. Adults are attracted to freshly-tilled fields with decaying organic matter. Eggs are laid on the soil near the base of cole crops. Eggs hatch in 2-7 days, and the larvae immediately begin feeding on the roots of the plant. Feeding continues for 3-4 weeks before the larvae pupate in the soil. The second generation of adults emerges in mid- to late June (temperature dependent) and lays eggs, which will develop into overwintering pupae by fall.



Fly emergence can be forecasted with degree day models, which can be counted after the ground has thawed. At a base temperature of 43°F, the first generation appears after 300 degree days have accumulated. The second and third generations will appear after 1476 and 2652 degree days have accumulated. Fly populations can also be monitored with yellow plastic bowls filled with soapy water. Bowls can be placed at 100-foot intervals along field edges and inspected every 4-6 days to determine if fly populations are building or dropping off. Visit the Vegetable Disease and Insect Forecasting Network (VDIFN) website for a convenient map-based interface for viewing degree day insect models including the cabbage maggot.

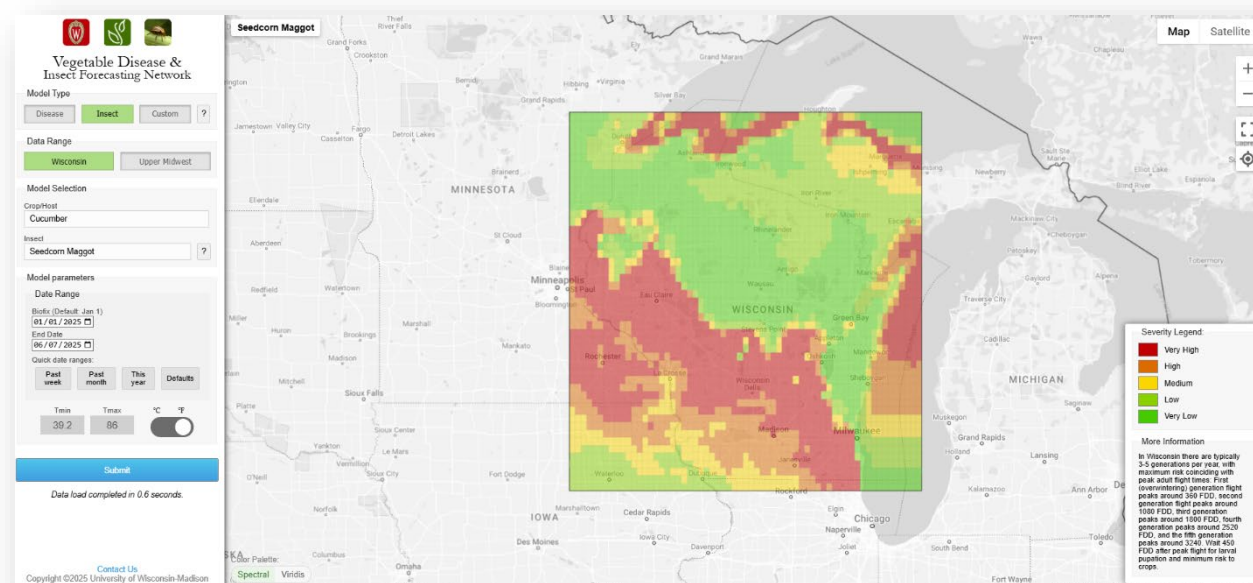


Cabbage maggot treatment is primarily preventative. Plants that already have eggs on them are likely to have damage from infestations. If possible, time planting dates to avoid peak fly emergence. Plantings in early June generally suffer greater damage than later early plantings. To avoid damage from this pest, till in cover crops 2-3

weeks before seeding or transplanting, and plant when soil temperatures are adequate (e.g. > 50 F) for quick emergence. Transplants should be planted one week before peak fly emergence. Floating row covers are also effective in protecting plants during flight periods. Do not plant cole crops in fields where animal manure has been freshly applied. Crop residues should be worked into the soil immediately after harvest to reduce sites where maggots can overwinter. Insecticides at planting time are recommended in areas that have historically had problems with cabbage maggots. Brigade (bifenthrin) banded applications can be used at planting. These directed applications at the base of the plants can avoid disrupting soil-inhabiting beneficial insects. No insecticides are effective after the onset of a cabbage maggot outbreak.

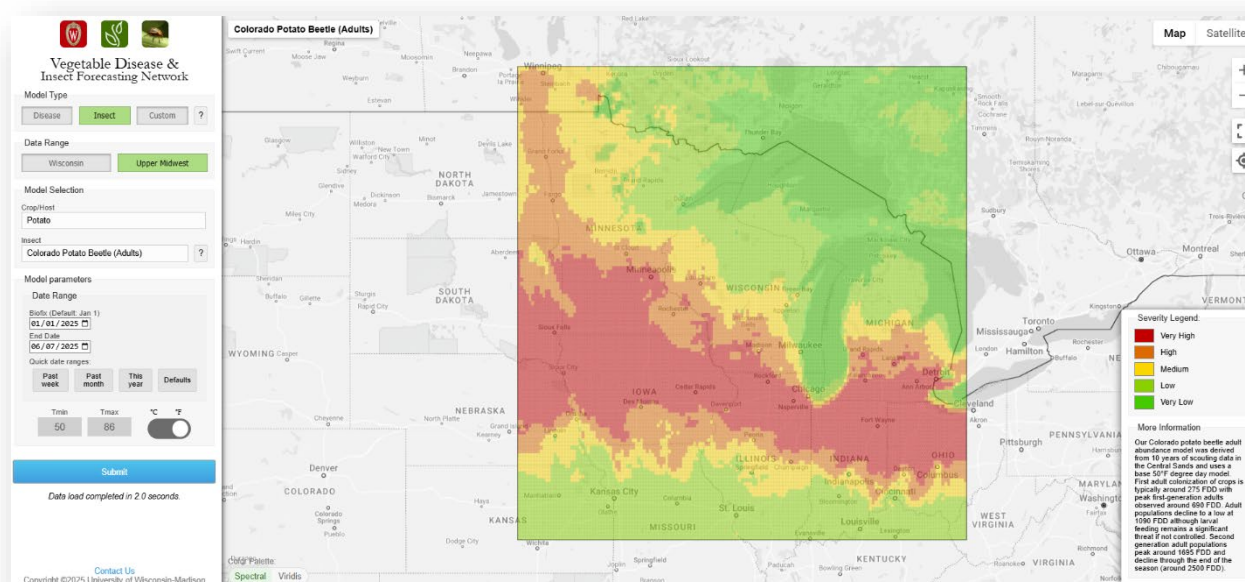
Seed corn maggot - (<https://vegento.russell.wisc.edu/pests/ssedcorn-maggot/>) – Another maggot species also present across central Wisconsin is the seedcorn maggot (SCM). Reported previously, the 1st generation of seedcorn maggot already moved across Wisconsin in mid-May, but few susceptible plants were up at this time. Now, the 2nd generation of the SCM is now developing across much of the state and far more susceptible crops are in the field.

Adult SCM often swarm over recently tilled fields or gardens. Preferred egg deposition sites are locations with germinating or decaying seeds, plant residue, incorporated green manures or where organic fertilizers have been recently applied. Similar to the adult cabbage maggots, flies often mate and lay eggs within 2-3 days of emergence. Eggs hatch 2-4 days later depending on soil temperature. The larval portion of the SCM life cycle occurs below ground over the course of a few weeks. Once hatched larvae burrow into the soil 6-8 cm to locate food resources. A complete life cycle for SCM often results in 14-22 days in late spring and early summer conditions. Important to



note, each maggot species has their own developmental minimum temperatures, seedcorn maggot (39°F) and cabbage maggot (43°F), and thus the risk for infestation differs over the state.

Colorado potato beetle – (<https://vegento.russell.wisc.edu/pests/colorado-potato-beetle/>) – Overwintered, adult Colorado potato beetle (CPB) are becoming very abundant across much of central Wisconsin this past week and first egg masses have become prevalent in this region. Egg masses are bright yellow to orange in color and are typically found in clusters of ten to thirty eggs on the undersides of leaves. In southern WI, egg hatch is underway whereas in northern WI only the first few adults are just beginning to emerge. Recall that larvae hatch from the eggs in 4-9 days depending upon ambient air temperature. In central WI we will be in the first 10-25% of egg hatch this coming week (June 8-15). The Vegetable Entomology program has refined the VDIFN site to give more precise predictions of the damaging stages for defoliation. From the website, the appearance of overwintered adults has swept across much of southern and central WI and they will continue to emerge from the soil over the next week (see below). Early perimeter treatments for adults and egg masses should be implemented at this time and with a special focus on areas of the field where initial colonization is underway. Compounds used for perimeter treatments should include the active ingredients indoxacarb (Avaunt Insecticide, Avaunt eVo, Steward EC, synergized with



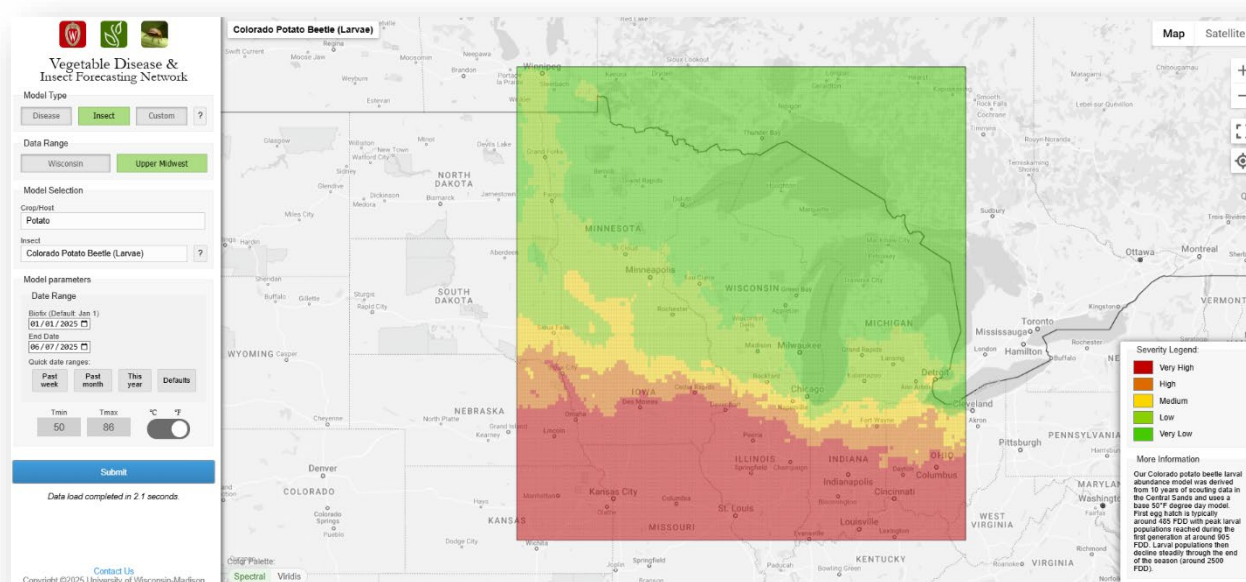
with piperonyl butoxide (Exponent). Perimeter applications can also include the active ingredient novaluron (Rimon) which will have effects upon egg masses and early hatching larvae. Please consult the attached CPB pest management listing for more details on control options.

Populations of the damaging larvae will hatch from these eggs and will begin feeding in approximately one week after the appearance of first eggs. The larvae will molt three successive times before pupating. Each immature life stage (stadia) between molts is called an instar, totaling 4 instars. First instar larvae are blackish-brown in color and very small, approximately the size of a pinhead. Once hatched first instar larvae prefer to feed upon newly expanded foliage at the crown of the plant, but these stages do not cause significant defoliation. Second instar larvae assume a deep crimson coloring, leaf consumption increases two-fold from first instars. Early larval populations are now present in the very south western portions of Wisconsin, but will become more evident later in the week in central Wisconsin. Initial applications of the novel compound containing ledprona (Calantha) should be initiated this coming week throughout much of central Wisconsin as early eggs are hatching and 1st instar larvae are beginning to feed.

Producers should be planning to implement applications of larvicides by the end of the coming week and into early portions of the following week. Active ingredients that successfully target these 1st and 2nd instars that are actively

feeding include abamectin, chlorantraniliprole, cyantraniliprole, cyclaniliprole, spinosad, spinetoram and tolfenpyrad.

The last two larval instars consume increasingly more foliage and result in the majority of economic damage to solanaceous crops. After passing through four instars over 2-3 weeks, larvae return to the soil to pupate. Within 10-14 days the second generation of adult beetles emerge. At an optimal temperature of 83°F CPB can transition from egg to adult in 21 days. Second-generation adults normally appear in mid-July and may cause severe defoliation of the crop. Generally, second-generation adults will produce another generation of larvae. Under normal conditions, these adults may produce only a partial second generation and then seek overwintering sites as the crop begins to senesce. Typically, there are two discrete generations of beetles per year in South-Central Wisconsin and only a single generation in Northern Wisconsin.



Insecticide options for controlling Colorado potato beetle in Wisconsin

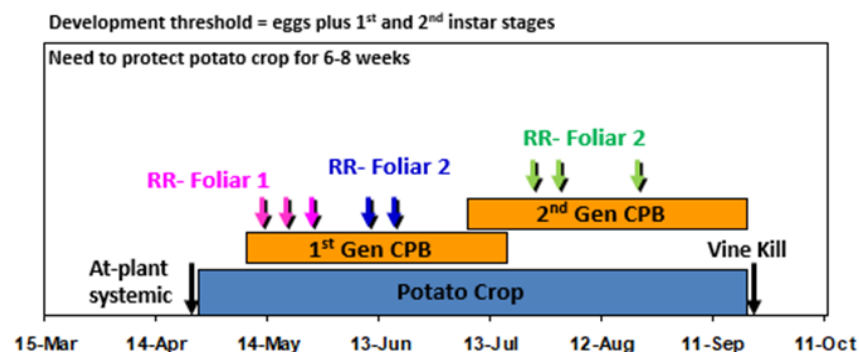
For most CPB chemical management tools, timing application occurs with the appearance of first instar larvae in the field. Early instar larvae are the most susceptible life stage for chemical management, and applications should be timed with the midpoint of egg hatch. The first application should be followed up in 7-10 days later with a second application of the same compound depending on the formulation and label restrictions. Refer to the UW-Extension publication [Commercial Vegetable Production in Wisconsin \(A3422\)](#) for a list of registered insecticides and management recommendations.

Applications of ledprona (Calantha), novaluron (Rimon), tolfenpyrad (Torac), spinetoram (Radiant, Delegate), or abamectin (Agri-Mek) should be applied when nearly 50-75% of egg masses have hatched, and a few 2nd instar larvae are present from the earliest hatched egg masses. These 1st generation larvicides often require 2-3 subsequent re-applications spaced on a 7-10 day interval to achieve sufficient control.

Recommended products for the 2024 season are listed below:

At-plant systemic options

Trade name	Active ingredient	IRAC MoA Code	Spray pH<	Adjuvant	PHI	Rate	Adult	Egg Mass	Early Larvae (1st-2nd instar)	Late Larvae (3rd-4th instar)
Belay	clothianadin	4A	pH < 7	none (see notes)	0	12 fl oz	+	-	+++	++
<i>Consider soil surfactant to increase uniform movement in soil profile. Season total maximum is only 0.2 lb a.i./ac for both soil-applied and foliar. Do not apply any Group 4A insecticides over the top of an at-plant application of Belay. Considerable resistance with CPB, very effective for potato leafhopper and colonizing aphids.</i>										
Platinum 75SG	thiamethoxam	4A	pH < 7	none (see notes)	0	2.67 oz	+	-	+++	++
<i>Consider soil surfactant to increase uniform movement in soil profile. Season total maximum varies by use pattern (soil-applied vs foliar). Can apply additional foliar applications of a Group 4A on an at-plant application. Considerable resistance with CPB, very effective for potato leafhopper and colonizing aphids.</i>										
Admire Pro (generics)	imidacloprid	4A	pH < 7	none (see notes)	0	8.7 fl oz	+	-	+++	++
<i>Consider soil surfactant to increase uniform movement in soil profile. Season total maximum varies by use pattern (soil-applied vs foliar). Can apply additional foliar applications of a Group 28 on an at-plant application. Considerable resistance with CPB, very effective for potato leafhopper and colonizing aphids.</i>										
Verimark SC	cyantraniliprole	28	pH < 6.5	none (see notes)	0	13.5 fl oz	+	-	+++	++
<i>Consider soil surfactant to increase uniform movement in soil profile. Season total maximum varies by use pattern (soil-applied vs foliar). Can apply additional foliar applications of a Group 28 on an at-plant application (not advisable!). Will provide only 45-60 days of control of CPB. Ineffective for potato leafhopper and mildly effective for aphids.</i>										
Regent 4SC	fipronil	2B		none (see notes)	90	3.2 fl oz	-	-	-	-
<i>For use as an at-plant, distributed in-furrow application for the control of Asiatic garden beetle, other white grubs and wireworms.</i>										



1st generation Colorado potato beetle materials

Trade name	Active ingredient	IRAC MoA Code	Spray pH<	Adjuvant	PH I	Rate	Adult	Egg Mass	Early Larvae (1st-2nd instar)	Late Larvae (3rd-4th instar)
Rimon 0.83EC	novaluron	15	pH < 6.5	NIS (0.25-0.5% V:V)	14	9,8,7 fl oz 10,8,8 fl oz	-	+++	++	++
Initiate applications when egg deposition first appears in outer rows (0-48 rows) of the field. Initial foliar application (9.0 fl oz/ac) can be applied as a 'ring' application, treating only the outer-most rows of the field. Subsequently, apply 2nd foliar application (8.0 fl oz/ac) over entire field one week later. Continue to scout field and consider a 3rd foliar application (7.0 fl oz/ac) 7 days after prior application. Continue to scout the field, if an additional application is necessary, apply a final application (8.0 fl oz) to the interior of the field, not initially treated during the ring application. Must be applied with an adjuvant (NIS), and consider application outside of mid-day hours (10:00 - 16:00 h). Slightly acidify tank mix prior to application (pH < 6.5). Caution when tank-mixing this product with fungicides containing proprietary stickers (e.g., WeatherStik). Both ground and aerial application are appropriate.										
Agri-Mek SC	abamectin	6	pH < 6.5	NIS (0.5% V:V)	14	3.0-3.25 fl oz	+	-	+++	++
Initiate applications when 50-75% egg hatch has occurred, and 1st instar larvae are present on outer-most field rows. Initial foliar application (3.25 fl oz/ac) can be applied to the entire field. Subsequently, apply 2nd foliar application (3.0 fl oz/ac) over entire field one week later. Continue to scout field and consider a 3rd foliar application 7 days after previous application with another larvicide that is effective on later stage larvae (e.g., Radiant @ 8 fl oz/ac). Must be applied with an adjuvant (NIS), and consider application outside of mid-day hours (10:00 - 16:00 h). Slightly acidify tank mix prior to application (pH < 6.5). Caution when tank-mixing this product with fungicides containing proprietary stickers (e.g., WeatherStik). Both ground and aerial application are appropriate. Only two successive applications of Agri-Mek SC allowed per crop season.										
Torac	tolfenpyrad	21A	pH = 6.5	NIS (0.5% V: V)	14	14-21 fl oz	++	++	+++	++
Initiate applications when 50-75% egg hatch has occurred, and 1st instar larvae are present on outer-most field rows. Initial foliar application (21.0 fl oz/ac) can be applied to the entire field. Subsequently, apply 2nd foliar application (21.0 fl oz/ac) over entire field two weeks later. Continue to scout field and consider a 3rd foliar application with another larvicide that is effective on later stage larvae as needed. Must be applied with an adjuvant (NIS), and consider application outside of mid-day hours (10:00 - 16:00 h). Slightly acidify tank mix prior to application (pH < 6.5). Both ground and aerial application are appropriate. Only two successive applications of Torac allowed per crop season.										
Blackhawk 36WDG	spinosad	5	pH = 7	NIS (0.125 - 0.25% V:V)	7	3.0-3.3 oz	+	-	+++	+++
Initiate applications when 50-75% egg hatch has occurred, and 1st instar larvae are present on outer-most field rows. Initial foliar application (3.3 oz/ac) can be applied to the entire field. Subsequently, apply 2nd foliar application (3.0 oz/ac) over entire field one week later. Continue to scout field and consider a 3rd foliar application 7 days after previous application with another larvicide that is effective on later stage larvae (e.g., Agri-Mek SC @ 3.25 fl oz/ac). Can be applied with an adjuvant (NIS), and consider application outside of mid-day hours (10:00 - 16:00 h). Neutral tank pH is appropriate for this application (pH = 7.0). Both ground and aerial application are appropriate. Only two successive applications of Blackhawk allowed in succession per crop season.										
Radiant SC / Delegate WG	spinetoram	5	pH = 7	NIS (0.125 - 0.25% V:V)	7	Radiant 6.5-8.0 fl oz/A, Delegate 2.5 - 4.0 oz/A	++	-	+++	+++
Initiate applications when 50-75% egg hatch has occurred, and 1st instar larvae are present on outer-most field rows. Initial foliar application (8.0 oz/ac) can be applied to the entire field. Subsequently, apply 2nd foliar application (6.5 oz/ac) over entire field one week later. Continue to scout field and consider a 3rd foliar application 7 days after previous application with another larvicide that is effective on later stage larvae (e.g., Agri-Mek SC @ 3.25 fl oz/ac). Can be applied with an adjuvant (NIS) and consider application outside of mid-day hours (10:00 - 16:00 h). Neutral tank pH is appropriate for this application (pH = 7.0). Both ground and aerial application are appropriate. Only two successive applications of Radiant or Delegate allowed in succession per crop season.										
Calantha	ledprona	35	pH < 6.5	NIS (0.125 - 0.25% V:V)	0	16.0 fl oz	++	-	+++	++
Initiate applications when 50-75% egg hatch has occurred, and 1st instar larvae are present on outer-most field rows. Initial foliar application (16.0 fl oz/ac) can be applied to the field perimeter and all subsequent applications (16.0 fl oz/ac) can occur over the entire field one week later. Continue to scout field and consider a 3 rd or 4 th foliar application 7 days after previous application as needed through only the 1 st generation of CPB. Do not use Calantha on 2 nd generation if used earlier in the same year. Can be applied with an adjuvant (NIS). Both ground and aerial application are appropriate. No more than four successive applications of Calantha are allowed in succession per crop season.										

2nd generation Colorado potato beetle materials

Trade name	Active ingredient	IRAC MoA Code	Spray pH<	Adjuvant	PHI	Rate	Adult	Egg Mass	Early Larvae (1st-2nd instar)	Late Larvae (3rd-4th instar)
Coragen 1.67SC / Vantacor 5SC	chlorantraniliprole	28	pH < 6.5	MSO (0.25-0.5 % V:V)	14	variable and formulation dependent (fl oz/A)	++	++	+++	+++
<i>Initiate applications after the emergence of the 2nd generation of CPB, and when defoliation estimates have reached or exceeded 5-10%. Initial foliar application (7.5 fl oz/ac, Coragen) can be applied to the entire field. Subsequently, apply 2nd foliar application (5.5 fl oz/ac, Coragen) over entire field one week later. Continue to scout field and consider a 3rd foliar application 7-10 days later only if populations continue to defoliate. Should be applied with an adjuvant (MSO) and acidify tank pH (pH < 6.5). Ground-application advised. Up to 4 successive applications of Coragen allowed in succession per crop season for control of the Colorado potato beetle. Do not apply a Group 28 material if a Group 28 material was applied in 1st generation, or as an at-plant systemic (e.g., Verimark).</i>										
Exirel 0.83SC	cyantraniliprole	28	pH < 6.5	MSO (0.25-0.5 % V:V)	7	5.0-13.5 fl oz	++	++	+++	+++
<i>Initiate applications after the emergence of the 2nd generation of CPB, and when defoliation estimates have reached or exceeded 5-10%. Initial foliar application (13.5 fl oz/ac) can be applied to the entire field. Subsequently, apply 2nd foliar application (10 fl oz/ac) over entire field one week later. Continue to scout field and consider a 3rd foliar application 7-10 days later only if populations continue to defoliate. Should be applied with an adjuvant (MSO) and acidify tank pH (pH < 6.5). Ground-application advised. Only two successive applications of Exirel allowed in succession per crop season for control of the Colorado potato beetle. Do not apply a Group 28 material if a Group 28 material was applied in 1st generation, or as an at-plant systemic (e.g., Verimark).</i>										
Minecto Pro	abamectin + cyantraniliprole	6 + 28	pH < 6.5	MSO (0.25-0.5 % V:V)	14	5.5-10 fl oz	++	++	+++	+++
<i>Initiate applications after the emergence of the 2nd generation of CPB, and when defoliation estimates have reached or exceeded 5-10%. Initial foliar application (10 fl oz/ac) can be applied to the entire field. Subsequently, apply 2nd foliar application (7.5 fl oz/ac) over entire field one week later. Continue to scout field and consider a 3rd foliar application 7-10 days later only if populations continue to defoliate. Should be applied with an adjuvant (MSO) and acidify tank pH (pH < 6.5). Ground-application advised. Only two successive applications of Minecto Pro allowed in succession per crop season for control of the Colorado potato beetle. Do not apply a Group 28 material if a Group 28 material was applied in 1st generation, or as an at-plant systemic (e.g., Verimark).</i>										
Besiege	chlorantraniliprole + lambda-cyhalothrin	28 + 3	pH < 6.5	MSO (0.25-0.5 % V:V)	14	6.0-9.0 fl oz	++	++	+++	+++
<i>Initiate applications after the emergence of the 2nd generation of CPB, and when defoliation estimates have reached or exceeded 5-10%. Initial foliar application (9.0 fl oz/ac) can be applied to the entire field. Subsequently, apply 2nd foliar application (7.0 fl oz/ac) over entire field one week later. Continue to scout field and consider a 3rd foliar application 7-10 days later only if populations continue to defoliate. Should be applied with an adjuvant (MSO) and acidify tank pH (pH < 6.5). Ground-application advised. Three successive applications of Besiege are allowed in succession per crop season for control of the Colorado potato beetle. Do not apply a Group 28 material if a Group 28 material was applied in 1st generation, or as an at-plant systemic (e.g., Verimark).</i>										
Harvanta	cyclaniliprole	28	pH < 6.5	MSO (0.25-0.5% V:V)	7	10.9-16.4 fl oz	++	++	+++	+++
<i>Initiate applications after the emergence of the 2nd generation of CPB, and when defoliation estimates have reached or exceeded 5-10%. Initial foliar application (16.4 fl oz/ac) can be applied to the entire field. Subsequently, apply 2nd foliar application (14.0 fl oz/ac) over entire field one week later. Continue to scout field and consider a 3rd foliar application 7-14 days later only if populations continue to defoliate. Should be applied with an adjuvant (MSO) and acidify tank pH (pH < 6.5). Three successive applications of Harvanta are allowed in succession per crop season for control of the Colorado potato beetle. Do not apply a Group 28 material if a Group 28 material was applied in 1st generation, or as an at-plant systemic (e.g., Verimark).</i>										
Elevest	chlorantraniliprole + bifenthrin	28 + 3	pH < 6.5	MSO (0.125 – 0.25% V:V)	21	5.6-9.6 fl oz/A	++	++	+++	+++

Insecticide options for controlling Colorado potato beetle in Wisconsin, 2024

Trade name	Active ingredient	IRAC MoA Code	Spray pH<	Adjuvant	PHI	Rate	Adult	Egg Mass	Early Larvae (1st-2nd instar)	Late Larvae (3rd-4th instar)
<i>Initiate applications after the emergence of the 2nd generation of CPB, and when defoliation estimates have reached or exceeded 5-10%. Initial foliar application (9.6 fl oz/ac) can be applied to the entire field. Subsequently, apply 2nd foliar application (7.5 fl oz/ac) over entire field one week later. Should be applied with an adjuvant (MSO) and acidify tank pH (pH < 6.5). Ground-application advised. Two successive applications of Elevest are allowed in succession per crop season for control of the Colorado potato beetle. Do not apply a Group 28 material if a Group 28 material was applied in 1st generation, or as an at-plant systemic (e.g., Verimark).</i>										
Voliam Flexi	chlorantraniliprole + thiamethoxam	28+4A	pH < 6.5	MSO (0.25-0.5 % V:V)	14	4.0 fl oz	++	++	+++	+++
<i>Initiate applications after the emergence of the 2nd generation of CPB, and when defoliation estimates have reached or exceeded 5-10%. Initial foliar application (4.0 fl oz/ac) can be applied to the entire field. Subsequently, apply 2nd foliar application (3.5 fl oz/ac) over entire field one week later. Continue to scout field and consider a 3rd foliar application 7-10 days later only if populations continue to defoliate. Should be applied with an adjuvant (MSO) and acidify tank pH (pH < 6.5). Ground-application advised. Only two successive applications of Voliam Flexi are allowed in succession per crop season for control of the Colorado potato beetle. Do not apply a Group 28 material if a Group 28 material was applied in 1st generation, or as an at-plant systemic (e.g., Verimark).</i>										

Other options

Trade name	Active ingredient	IRAC MoA Code	Spray pH<	Adjuvant	PHI	Rate	Adult	Egg Mass	Early Larvae (1st-2nd instar)	Late Larvae (3rd-4th instar)
Admire Pro (foliar)	imidacloprid	4A	pH < 7	none (see notes)	7	1.3 fl oz	+	-	++	+
<i>Apply Admire Pro as a foliar insecticide for control of late-season potato leafhopper and aphids where no Group 4A insecticide was used as an at-plant insecticide starter.</i>										
Actara 25WG (foliar)	thiamethoxam	4A	pH < 7	none (see notes)	14	1.5-3.0 oz	+	-	++	+
<i>Apply Actara 25WG as a foliar insecticide for control of late-season potato leafhopper and aphids where no Group 4A insecticide was used as an at-plant insecticide starter.</i>										
Assail 30SG (foliar)	acetamiprid	4A	pH < 7	NIS (0.25-0.5 % V:V)	7	1.5-4.0 oz	+	-	++	+
<i>Apply Assail 30SG as a foliar insecticide for control of late-season potato leafhopper and aphids where no Group 4A insecticide was used as an at-plant insecticide starter.</i>										
Venom	dinotefuran	4A	pH < 7	none (see notes)	7	1.0-1.5 oz	+	-	++	+
<i>Apply Venom as a foliar insecticide for control of late-season potato leafhopper and aphids where no Group 4A insecticide was used as an at-plant insecticide starter.</i>										
Avaunt eVo	indoxacarb	22	pH < 7	NIS (0.25% V:V)	7	3.5-6.0 fl oz	+++	-	-	-
<i>Apply Avaunt insecticide targeting only adult Colorado potato beetle. Applications can be tank mixed with Rimon 0.83EC during early season applications to kill adults, alternatively a tank mix application can be applied during later 2nd generations to target adults only. The addition of piperonyl butoxide (PBO) is necessary to increase the efficiency of adult control. Use a formulation of PBO that contains > 90% active ingredient. Apply only two successive applications, spaced 5-7 days apart.</i>										
Brigade 2EC	bifenthrin	3A	N/A	N/A	21	2.1-6.4 fl oz	+	-	-	-
<i>Apply Brigade insecticide targeting only adult Colorado potato beetle. Applications can be applied during later 2nd generations to target adults only. The addition of piperonyl butoxide may increase the efficiency of adult control. Apply only two successive applications, spaced 5-7 days apart.</i>										
Imidan 70W	phosmet	1B	pH < 6.5	N/A	7	1.33	+	-	+	-
<i>DO NOT Re-enter fields within 5 days (5-day REI)! Apply Imidan insecticide targeting only adult Colorado potato beetle. Applications can be applied during later 2nd generations to target adults only. Apply successive applications spaced no less than 10 days apart.</i>										

Definitions:

- PHI: Post-harvest interval (time that must elapse after last application and before any harvesting of the crop, given in hours)
- Activity icons: (-) no activity, (+) very little activity, (++) moderate activity, (+++) excellent activity