Vegetable Crop Updates

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

Extension
UNIVERSITY OF WISCONSIN–MADISON

June 7, 2026

In This Issue:

- Potato productivity and weather updates
- Potato early and late blight disease risk model updates
- Cucurbit downy mildew spores found in MI
- Onion thrips updates and management
- Colorado potato beetle updates and management

Calendar of Events:

July 9, 2026 – UW Hancock Agricultural Research Station Field Day, Hancock, WI
July 16, 2026 – UW Langlade County Airport Research Station Field Day, Antigo, WI
December 1-3, 2026 – Midwest Food Products Association Annual Convention & Expo, Processing Crops Conference, Wisconsin Dells, WI
February 9-11, 2027 – WPVGA/UWEX Grower Education Conference, Stevens Point, WI

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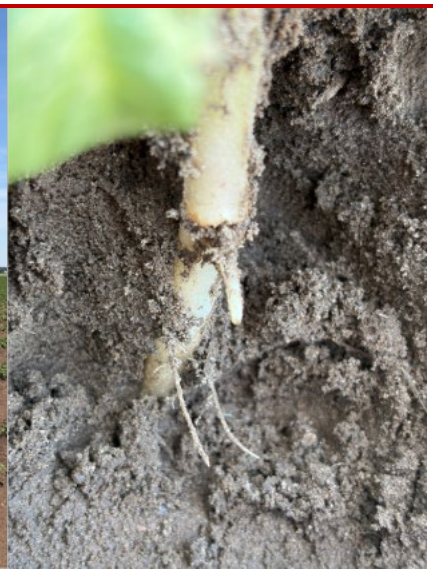
According to the UW-Madison Extension 2026 Weather Outlook, temperatures were unseasonably warm last week, with many locations showing 4-8°F above normal for late May. Portions of central Wisconsin received up to 1.5'' of rainfall last week, but most parts of the state received 0.25'' or less. Over the past month, most of the state has received 50% or less of normal precipitation. Therefore, drought has returned to Wisconsin, with southeastern and west-central counties in moderate drought conditions. Soil moisture content at 4'' depth across the Wisconet research farm stations decreased from last week's levels, in some cases down to zero inches of plant available water.

Looking forward:

- Rain chances over next week are highest in the southern and southwestern parts of the state;
- Most of Wisconsin will likely see above normal temperatures (50-70% chance);
- The June outlook indicates a lean towards above-normal temps (40-50% chance) and below-normal precip (about 40% chance);
- The warm temps will boost growing degree days;
- Efficient irrigation management in those drought-stressed fields, especially sandy grounds with lack of recent precip.

I checked on the growth status of some full-season potato varieties on Wednesday. The plants are about 4'' tall, and some plants started to hook (pictures below).



This year, we will work on two commercial fields to continue our petiole nitrate-N prediction research using multispectral and hyperspectral imagery. We selected a 23-acre field that grows Reveille and a 90-acre field that grows Caribou (half of a pivot). We used a DJI Phantom 4 Pro V2.0 drone for the flight. It took us about one hour to finish the Reveille field, but more than 3 hours to finish the Caribou field. We flew at 200 feet high and at 25 mph. The biggest problem we ran into when flying the big Caribou field was that the drone's batteries and sensors overheated during the long flight (air temperature was 82°F). The software controlling the drone then crashed, so we had to repeatedly restart the whole system. A good thing about a small drone like the one we used is that it is lightweight, and the battery has a relatively long life. The long flight time could be due to the low altitude at which we flew and the high resolution required for research. Commercially used drones could fly higher and cover larger fields without long-flight-time issues.

23-acre Reveille field

90-acre Caribou field

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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 in potato 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 in potato. 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.

Location	**Planting Date** *Dates in future are anticipated or not yet listed (To Be Determined or TBD)*		**50% Emergence Date**	**Disease Severity Values (DSVs)** ***through 6/6/26***	**Potato Physiological Days (P-Days)** ***through 6/6/26***
Spring Green	Early	Apr 10	May 7	3	209
	Mid	May 5	May 20	1	137
	Late	May 16	June 2	1	41
Arlington	Early	Apr 12	May 8	0	199
	Mid	May 6	May 23	0	124
	Late	May 20	June 4	0	27
Grand Marsh	Early	Apr 13	May 9	1	183
	Mid	May 6	May 22	1	123
	Late	May 21	June 5	1	18
Hancock	Early	Apr 14	May 11	2	177
	Mid	May 10	May 30	1	62
	Late	May 23	June 6	0	9
Plover	Early	Apr 15	May 12	3	177
	Mid	May 10	May 30	3	63
	Late	May 25	June 6	0	9
Antigo	Early	May 12	May 29	2	63
	Mid	May 25	June 5	2	18
	Late	TBD	TBD	TBD	TBD
Rhinelander	Early	May 15	June 6	0	9
	Mid	May 28	TBD	TBD	TBD
	Late	TBD	TBD	TBD	TBD

Late blight of potato/tomato. The southern locations of early-planted potatoes have accumulated up to just 3 Disease Severity Values or DSVs as of 6/6. This indicates that late blight favorable weather has occurred, since ~50% crop emergence. However, we have not yet accumulated enough late blight-favorable weather to warrant a preventative fungicide application to target this disease.

Early blight of potato. Once we see potato crops at 50% emergence, P-Days accumulate. P-Day values will continue to amass and indicate optimum conditions for early blight disease caused by *Alternaria solani*. Fungicides can provide good control of early blight in vegetables when applied early on in infection. Multiple applications of are recommended for optimum disease control through the season to vine-kill. Earliest emerging fields are at roughly 200 P-Days.

Cucurbit downy mildew spores found in Michigan. https://www.canr.msu.edu/news/statewide-monitoring-network-for-cucurbit-downy-mildew-verifies-the-2026-arrival-of-spores-in-four-michigan-counties Dr. Mary Hausbeck, vegetable pathologist at Michigan State University, has reported the confirmation of cucurbit downy mildew spores (*Pseudoperonospora cubensis*) in air sampling traps around Michigan during the last week of May. From Dr. Hausbeck's newsletter: "Cucurbit downy mildew spores have been verified in air samples from Berrien, Bay, Allegan and Muskegon counties from samples collected from May 19 to May 26. During this period, Berrien and Muskegon had 6 days with a positive detection; Allegan had 3 days that were positive for downy mildew, and Bay had 2 days that were positive. Our lab uses a Burkard volumetric spore trap coupled with qPCR molecular analysis of the spore trap tape, and any early positive samples are verified with microscopy to ensure there are no false positives. Berrien, Allegan and Muskegon counties are on the state's west side that hosts significant cucumber, pumpkin, zucchini and squash acreage. Bay County is located on the east side of the state in the Thumb region and hosts cucurbit production for the fresh and processing markets. These positive air samples confirm that airborne downy mildew spores have arrived in the state this growing season. The cucurbit downy mildew spores detected in the air may have originated from local/regional cucumber production greenhouses or from early field plantings of cucumbers and melons being grown in low/high tunnels. Elsewhere in the U.S., cucurbit downy mildew outbreaks in the field have been reported in Florida. A cucurbit downy mildew disease outbreak in the field on cucumbers or other cucurbits has **not** been reported in Michigan." **No reports of downy mildew on cucurbits in Wisconsin** at this time. For more information on cucurbit downy mildew symptoms and management, please visit: https://vegpath.plantpath.wisc.edu/diseases/cucurbit-downy-mildew/

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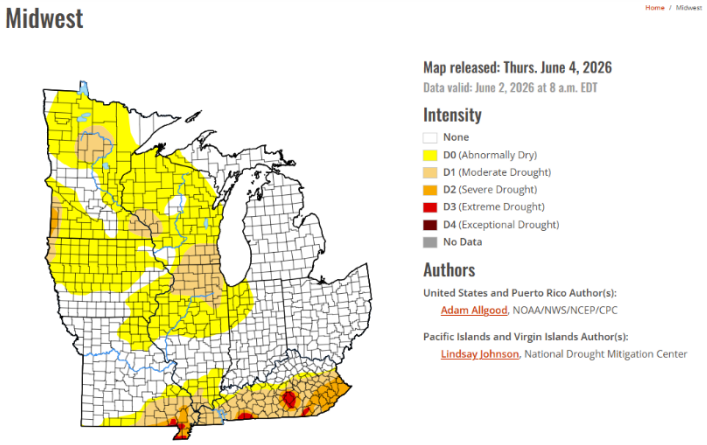
Vegetable Entomology Webpage: https://vegento.russell.wisc.edu/

Onion thrips - (https://vegento.russell.wisc.edu/pests/onion-thrips/)



Recent precipitation across much of Wisconsin brought some relief to developing drought conditions throughout the southern half of Wisconsin. Along with warm temperatures, this set of environmental conditions has led to the potential for populations of onion thrips to build in early transplant and direct seeded onions.

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.

Mass immigration to onion fields can occur any time throughout the summer but is likely coincident with harvest of infested legume and grain fields. Feeding damage causes whitish blotches and dry, yellow areas on leaves, decreased pollen set, and, under heavy infestations, brown leaf tips and distorted or undersized bulbs. Both adults and larvae can

cause silvery streaking on leaves, which becomes dry and yellow. Immature thrips prefer to feed on the youngest leaves.

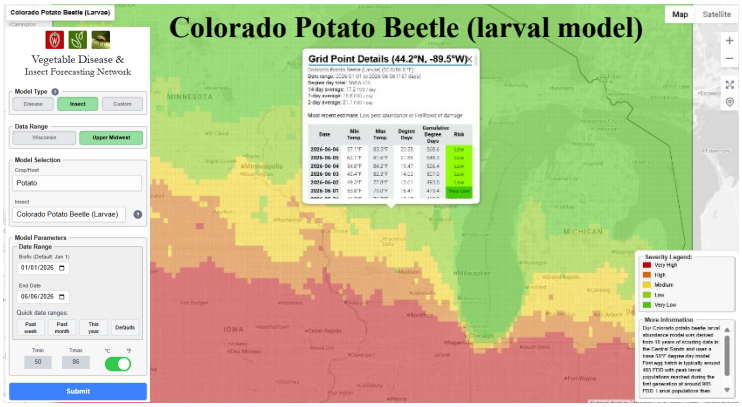
Begin to monitor plants weekly, and scout plants on field edges as thrips are more common at borders in the early part of the season. Depending upon the cultivar planted, action thresholds can vary from 1-3 thrips per onion leaf. For example, if onions currently have 8 leaves, and the mean number of thrips per plant now has exceeded 24 immature thrips per plant, it is appropriate to initiate controls.

Control using insecticides can be a struggle because of thrips' protected location in plants. Applications should be directed over plants in beds where possible and delivery should be provided in sufficient application volume (e.g., 20+ gallons per acre). Many of the registered insecticides used for onion thrips control require an appropriate adjuvant to penetrate the leaf cuticle, so always read the label and choose an appropriate adjuvant for the specific insecticide used. Cornell University has published a very useful guide for pesticide selection and product rotation to achieve season-long success with onion thrips management. Remember to alternate chemical modes of action to minimize the potential for resistance development in this pest.

Colorado potato beetle – (**https://vegento.russell.wisc.edu/pests/colorado-potato-beetle/**)

Potato producers and scouts need to continue checking potato fields for colonizing Colorado potato beetle (CPB) adults and large numbers of egg masses. In much of southern Wisconsin, larval populations are well into mid- and later stages of larval development, whereas only early larval stages are present in most fields within central Wisconsin. Mentioned last week, early detection of these initial infestations can be especially critical to initiate applications at the correct time to be most successful.

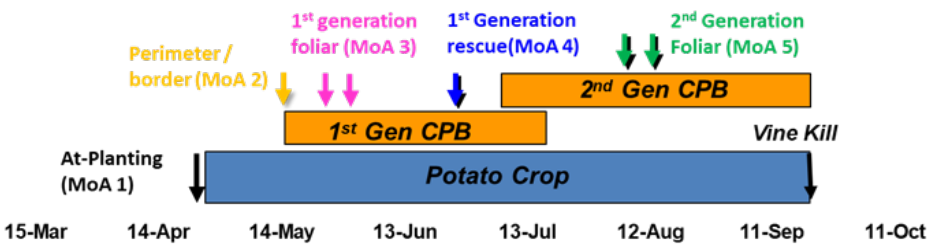
There are several 1st generation larvicides that can be very effective in controlling this generation of developing CPB, and suggested materials are listed in the attached supplement to this week's newsletter. In central Wisconsin, it is appropriate to initial applications of novaluron (Rimon® 0.83EC) or ledprona (Calantha®) this week as we have reached and recently exceeded 10% egg hatch. In the earliest planted fields, it is possible that 2nd instar larvae are present and producers could consider other foliar products for the control of larval populations (e.g., Blackhawk® 36WDG, Delegate® WG, Agri-Mek® SC)



Producers should develop an annual plan of control for the CPB and make efforts to try to limit consecutive exposures of similar mode of action (MoA) insecticide classes across generations as defined by IRAC (iraconline.org). Specifically, pest management practitioners should consider the specific MoA of each insecticide used at different points throughout the production season (**Supplement below**). In the attached example, be certain that the compound used for each of the following time points, i) at-plant systemic, ii) perimeter, contact adulticide, iii) 1st generation, foliar larvicide(s), iv) 1st generation rescue, v) 2nd generation, foliar insecticide, are classified as unique MoA to implement the best overall insecticide resistance management plan.

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.



Initial applications of ledprona (Calantha) and novaluron (Rimon) should be applied when 10% egg hatch has occurred. Foliar applications of compounds including, tolfenpyrad (Torac), spinosad (Falcondor, Blackhawk, generics) spinetoram (Radiant, Delegate), or abamectin (Agri-Mek, generics) should be applied when nearly 50% of egg masses have hatched, and a only 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.

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

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	+	-	+++	++
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.										
Platinum 75SG	thiamethoxam	4A	pH < 7	none (see notes)	0	2.67 oz	+	-	+++	++
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.										
Admire Pro (generics)	imidacloprid	4A	pH < 7	none (see notes)	0	8.7 fl oz	+	-	+++	++
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.										

Verimark SC	cyantraniliprole	28	pH < 6.5	none (see notes)	0	13.5 fl oz	+	-	+++	++
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.										
Regent 4SC	fipronil	2B		none (see notes)	90	3.2 fl oz	-	-	-	-
For use as an at-plant, distributed in-furrow application for the control of Asiatic garden beetle, other white grubs and wireworms.										

1st 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)
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 (0-48rows) 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).										

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)
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 3rd or 4th foliar application 7 days after previous application as needed through only the 1st generation of CPB. Do not use Calantha on 2nd 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)	++	++	+++	+++
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).										
Exirel 0.83SC	cyantraniliprole	28	pH < 6.5	MSO (0.25-0.5 % V:V)	7	5.0-13.5 fl oz	++	++	+++	+++
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).										

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)
Minecto Pro	abamectin + cyantraniliprole	6 + 28	pH < 6.5	MSO (0.25-0.5 % V:V)	14	5.5-10 fl oz	++	++	+++	+++
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).										
Besiege	chlorantraniliprole + lambda-cyhalothrin	28 + 3	pH < 6.5	MSO (0.25-0.5 % V:V)	14	6.0-9.0 fl oz	++	++	+++	+++
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).										
Harvanta	cyclaniliprole	28	pH < 6.5	MSO (0.25-0.5% V:V)	7	10.9-16.4 fl oz	++	++	+++	+++
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).										
Elevest	chlorantraniliprole + bifenthrin	28 + 3	pH < 6.5	MSO (0.125 – 0.25% V:V)	21	5.6-9.6 fl oz/A	++	++	+++	+++
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).										
Voliam Flexi	chlorantranilprole + thiamethoxam	28+4A	pH < 6.5	MSO (0.25-0.5 % V:V)	14	4.0 fl oz	++	++	+++	+++
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).										

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)
Zivalgo	isocycloseram (Plinazolin-technology)	30	pH < 6.5	MSO (0.25-0.5 % V:V)	14	1.0 fl oz	+++	++	+++	+++
Initiate applications after the emergence of the 2nd generation of CPB, and when defoliation estimates have reached or exceeded 5-10%. Initial foliar application (1.0 fl oz/ac) can be applied to the entire field. Subsequently, apply 2nd foliar application (1.0 fl oz/ac) over entire field one to two weeks later. Continue to scout field and consider a 3rd foliar application 7-10 days later only if populations continue to defoliate. For best control, apply Zivalgo with ground application equipment. With aerial application, the resulting level and duration of control could be less than with ground application. Zivalgo may be applied via overhead chemigation in a volume of up to 0.25 inches of water per acre, however the resulting level and duration of control could be less than with ground application. Only three successive applications of Zivalgo are allowed in succession per crop season for control of the Colorado potato beetle. Do not apply a Group 30 material if a Group 30 material was applied earlier in the production season.										

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	+	-	++	+
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.										
Actara 25WG (foliar)	thiamethoxam	4A	pH < 7	none (see notes)	14	1.5-3.0 oz	+	-	++	+
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.										
Assail 30SG (foliar)	acetamiprid	4A	pH < 7	NIS (0.25-0.5 % V:V)	7	1.5-4.0 oz	+	-	++	+
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.										
Venom	dinotefuran	4A	pH < 7	none (see notes)	7	1.0-1.5 oz	+	-	++	+
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.										
Avaunt eVo	indoxacarb	22	pH < 7	NIS (0.25% V:V)	7	3.5-6.0 fl oz	+++	-	-	-

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)
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.										
Brigade 2EC	bifenthrin	3A	N/A	N/A	21	2.1-6.4 fl oz	+	-	-	-
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.										
Imidan 70W	phosmet	1B	pH < 6.5	N/A	7	1.33	+	-	+	-
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.										