

Scouting Calendar for Insect Pests of Potato

April			May			June			July			August			September		
Early	Mid	Late	Early	Mid	Late	Early	Mid	Late	Early	Mid	Late	Early	Mid	Late	Early	Mid	Late
			Aster leafhopper														
			Colorado potato beetle, 1 st generation			Both generations			2 nd generation only								
			Potato leafhopper														
						Potato aphid											
									Tarnished plant bug								
												Green peach aphid					

Pesticide Rate and Usage for Insect Control on Potatoes

Insect	Active Ingredient rate/a	Commercial Product rate/a	PHI	Additional Comments
General insect control with soil-applied systemic	<i>Aphid, leaf hopper, flea beetle, Colorado potato beetle:</i>			
	0.1 – 0.2 lb clothianidin	7.2 – 12.0 fl oz Belay		Apply specified rate in sufficient carrier volume to ensure uniform coverage and incorporate into soil using either (1) narrow-band application centered over the plant row, (2) direct, in-furrow spray on the seed pieces, or (3) sidedress to both sides of the row or as directed spray at ground-cracking over the row. Cover immediately with soil.
	0.088 – 0.176 lb cyantraniliprole (<i>soil</i>)	6.75 – 13.5 fl oz Verimark		Do not apply more than 13.5 fl oz/a Verimark per crop per season. Do not apply more than 0.4 lb ai/a cyantraniliprole – containing products per crop whether applied as soil or foliar applications. The pH of the application solution should be adjusted to between pH 4 and 6
	0.2 – 0.3 lb imidacloprid	5.7 – 8.7 fl oz Admire Pro8	21	Apply as a band below seed furrow within 7 days before planting or spray in furrow at planting. Use higher rate on muck soils or for seed production. Do not exceed 8.7 fl oz/a per season.
	<i>Aphid, leaf hopper, flea beetle, and suppression of Colorado potato beetle:</i>			

*Restricted-use pesticide

Always read the pesticide label prior to use.

Disease	Active Ingredient rate/a	Commercial Product rate/a	PHI	Additional Comments
General insect control with soil-applied systemic (cont.)	Broadcast rate: 2.0 – 3.0 lb phorate Banded rate: Heavy soil – 0.22 lb/1000 ft row Light soil – 0.14 lb/1000	Banded rate: Heavy soil – 17.3 oz *Thimet 20G, *Phorate 20G Light soil – 11.3 oz *Thimet 20G, *Phorate 20G	90	Apply as band in furrow at planting or apply sidedress postemergence at hilling; do not use both. Use the lower rate only on sandy soils and all emergence applications.
	Thiamethoxam	5.0 – 8.0 fl oz Platinum 2SC 1.66 – 2.67 oz Platinum 75SG	30 30	Do not apply more than 8.0 fl oz of Platinum 2SC and no more than 2.67 oz Platinum 75SG per acre per crop season and apply sufficient water volume after in-ground application to ensure incorporation into the seed zone.
Seed piece treatment	<i>Use a seed dusting metering applicator to assure thorough coverage. Plant seed pieces as soon as possible after treatment.</i>			
	clothianidin	0.4 – 0.6 fl oz Belay/100 lb cut seed pieces		Apply as a diluted spray to ensure uniform coverage over whole or cut seed pieces. Liquid fungicides can be applied with Belay. If using a dust formulation of fungicides, apply Belay first, then the dust application. Plant seed as soon as possible after treatment. Do not apply a neonicotinoid (MoA Class 4) compound following Belay seed treatment.
	imidacloprid + thiophanate-methyl + zinc + manganese	0.75 – 1.0 lb Tops-MZ-GaUCHO/100 lb cut seed pieces		Regardless of the type of application, do not exceed 0.31 lb ai/a imidacloprid (Admire or Provado) per year. There is a 12-month rotational plantback interval for all crops except those registered.
	thiamethoxam	0.11 – 0.16 fl oz Cruiser 5FS/100 lb seed	30	Do not apply more than 4.0 fl oz of Cruiser 5FS per 100 lb of seed potato per year.
Colorado potato beetle	<p><i>Historically, the need for control was based upon percent defoliation observed on the canopy of potato at different growth stages. If you are using an active ingredient that is effective across all developmental stages of the insect (eggs, larvae, pupa, adults), then defoliation thresholds may still be useful. Few foliar-applied, broad-spectrum products remain effective for the control of Colorado potato beetle on this way, however. A high proportion of populations are resistant to the synthetic pyrethroids, carbamates, organophosphates, chlorinated hydrocarbons, and the neonicotinoids.</i></p> <ul style="list-style-type: none"> <i>Pre-flowering plants (e.g., 6 – 8 inches tall) can withstand 20 – 30% defoliation with no economic loss.</i> 			

Disease	Active Ingredient rate/a	Commercial Product rate/a	PHI	Additional Comments
Colorado potato beetle (cont.)	<ul style="list-style-type: none"> Flowering plants can withstand only 5 – 10% defoliation with no economic loss. Post-flowering plants (e.g., tuberization) can withstand <10% defoliation with no economic loss. <p>Current, reduced-risk insecticides have only limited effectiveness against very specific stages of the Colorado potato beetle and should be applied when the majority of individuals on a population have reached this stage. The specific stages of Colorado potato beetle development can be predicted based upon an accumulation of degree days using a base temperature of 52°F. Following are the specific DD₅₂ accumulation necessary for specific stages of development:</p> <ul style="list-style-type: none"> Eggs 120 1st instar larvae 185 2nd instar larvae 240 3rd instar larvae 300 4th instar larvae 400 Pupae 675 <p>When the appropriate life stages are prevalent in fields, apply 2 – 3 successive applications of reduced-risk compounds, spaced 7 – 10 days apart, to target vulnerable stages of Colorado potato beetles, primarily 1st and 2nd instar stages. Active ingredients that fit in this category include abamectin, acetamiprid, chlorantraniliprole, cyantraniliprole, novaluron, spinetoram, and Spinosad. For the second generation of Colorado potato beetle, which occurs primarily in July and August, use compounds including chlorantraniliprole and cyantraniliprole that possess a broader spectrum of activity against several of the life stage of the insect.</p> <p>Also use perimeter, or spot treatments, of early season colonizing adult insects that invade fields along outside edges.</p>			
	abamectin	8.0 – 16.0 fl oz Agrimek	14	Target first-generation larvae.
	0.028 – 0.075 lb acetamiprid	1.5 – 4.0 oz Assail 30SG	7	Begin treatment when thresholds are reached. Apply every 7 days as needed. Do not exceed 4 applications or 0.3 lb ai/a per season.
	0.025 – 0.075 lb acetamiprid	0.6 – 1.7 oz Assail 70WP	7	
	alpha-cypermethrin	3.2 – 3.8 fl oz *Fastac	1	Apply when pests reach or exceed established thresholds. Do not apply more than 11.4 fl oz of Fastac per acre per crop season.
	<i>Bacillus thuringiensis</i> subsp. <i>tenebrionis</i>	Raven	0	Make initial spray when you first observe eggs and small larvae. Rates vary with formulation.
	3.0 – 6.0 qt <i>Bacillus thuringiensis</i> subsp. <i>tenebrionis</i>	3.0 – 6.0 qt Trident	1	Use 3.0 – 6.0 quarts of Tridents per acre, in a minimum spray volume of 20 gallons of water per acre. Use the 3.0 qt per acre rate only when light populations of larvae of uniform age/size are present.
	0.0125 – 0.022 lb beta-cyfluthrin	1.6 – 2.8 fl oz *Baythroid XL	0	Apply every 5 days as needed. Do not exceed 6 applications per year. Do not exceed 0.125 lb ai/a cyfluthrin including Baythroid and Leverage 360.
0.075 – 0.096 lb bifenthrin + imidacloprid	4.8 – 6.14 fl oz *Brigadier	21	Do not apply more than 25.6 fl oz/a (0.4 lb ai/a) per season. No more than 0.5	

Disease	Active Ingredient rate/a	Commercial Product rate/a	PHI	Additional Comments
Colorado potato beetle (cont.)				ai/a bifenthrin and 0.2 lb ai/a imidacloprid are allowed per season.
	chlorantraniliprole	3.5 – 7.5 fl oz Coragen	14	Do not make more than 4 applications per crop season and allow at least 3 days between applications. Do not apply more than 15.4 fl oz/a Coragen per season.
	0.03 – 0.05 lb clothianidin	1.9 – 2.8 fl oz Belay	14	Do not exceed 3 applications of Belay. Allow at least 7 days between applications. Do not make a foliar application of a neonicotinoid (MoA Class 4) compound.
	0.088 – 0.133 lb cyantraniliprole	5.0 – 13.5 fl oz Exirel	7	Do not apply more than 0.4 lb ai/a cyantraniliprole-containing products per crop whether applied as soil or foliar applications. Minimum reapplication interval is 5 days.
	0.11 – 0.2 lb cyantraniliprole + abamectin	5.5 – 10.0 fl oz *Minecto Pro	7	Do not apply more than 0.4 lb per calendar year of cyantraniliprole-containing products, or more than 0.056 lb per calendar year of abamectin-containing products.
	0.12 – 0.24 lb cyromazine	2.66 – 5.32 oz Trigard 75WP	7	Do not apply more than 1.0 lb/a Trigard per crop. Repeat applications 7 days apart.
	0.018 – 0.028 lb deltamethrin	1.5 – 2.4 oz *Delta Gold	3	Apply every 3 days as needed.
	0.05 – 0.33 lb dinotefuran	<i>Foliar:</i> 1.0 – 1.5 oz Venom 70SG <i>Soil:</i> 6.5 – 7.5 oz Venom 70SG	7	Do not follow soil applications with foliar application of any other neonicotinoid insecticide. Use only one application method. Do not apply more than 4.5 oz/a per year using foliar applications, or 7.5 oz/a per season using soil applications. See product label for application directions.
	0.05 – 0.07 lb dinotefuran (<i>foliar</i>)	2.0 – 2.75 oz Scorpion 35SL	7	Can repeat at 14-day intervals. Do not apply more than 7.75 oz per year. Use only one application method.
0.28 – 0.33 lb dinotefuran (<i>soil</i>)	11.0 – 13.0 oz Scorpio 35SL		Do not apply more than 13.0 oz per year. Apply either as a preplant, preemergence, or at ground crack. Do not follow soil applications with foliar	

Disease	Active Ingredient rate/a	Commercial Product rate/a	PHI	Additional Comments
Colorado potato beetle (cont.)				applications; use only one application method.
	0.025 – 0.05 lb esfenvalerate	5.8 – 9.6 fl oz *Asana XL	7	Do not exceed 0.35 lb ai/a per season. CPB has developed resistance in some areas.
	flupyradifurone	10.5 – 14.0 fl oz Sivanto	7	Foliar application. Apply when reach or exceed established thresholds. Do not apply more than 28.0 fl oz of Sivanto per acre per crop season.
	0.047 lb imidacloprid	3.75 fl oz Provado 1.6	7	Foliar application: Use ground equipment only. Allow at least 7 days between applications. Regardless of the type of application, do not exceed 0.31 lb ai/a imidacloprid, (Admire, Leverage 360, or Provado) per year. There is a 12-month rotational plantback interval for all crops except those registered.
	imidacloprid + beta-cyfluthrin	3.8 – 4.1 fl oz *Leverage 360	0	Do not apply more than 15.4 fl oz/a per season and allow at least 7 days between applications.
	0.11 lb indoxacarb	6.0 oz Avaunt 30 DG	7	Wait at least 5 days between applications. Do not apply more than 24.0 oz/a Avaunt (0.44 lb ai/a) per crop. In areas where Colorado potato beetles are resistant to other insecticides, addition of piperonyl butoxide (PBO) as a tank mix with Avaunt may be required. Adult beetles will cease to feed following exposure to Avaunt but may not die for several days.
	0.02 – 0.03 lb lambda-cyhalothrin	1.28 – 1.92 fl oz *Warrior II	7	Do not apply more than 0.12 lb ai/a per season. Do not feed treated foliage to animals.
	lambda-cyhalothrin + chlorantraniliprole	6.0 – 9.0 fl oz *Besiege	14	Do not apply more than 27.0 fl oz/a Besiege per season and allow at least 7 days between applications.
	0.017 – 0.03 lb lambda-cyhalothrin + thiamethoxam	3.5 – 4.5 fl oz *Endigo ZC	14	Do not follow soil applications with foliar application of any other neonicotinoid insecticide. Do not exceed 10.0 fl oz/a Endigo ZC, or 0.12 lb ai/a of products containing lambda-cyhalothrin or 0.094 lb ai/a of products containing thiamethoxam.

Disease	Active Ingredient rate/a	Commercial Product rate/a	PHI	Additional Comments
Colorado potato beetle (cont.)	0.058 – 0.078 lb novaluron	9.0 – 12.0 fl oz Rimon 0.83EC	14	Apply when population is between egg hatch and second instar. Use higher rates for larger larvae. DO not apply more than twice to a single generation of Colorado potato beetles and do not apply to successive generations. Do not apply more than 24.0 oz/a per season.
	0.5 – 1.0 lb oxamyl	2.0 – 4.0 pt *Vydate L	7	Treat first-generation larvae. Use low rates for light infestation; higher rates for severe infestation.
	0.1 – 0.2 lb permethrin	4.0 – 8.0 oz *Permethrin 3.2 EC	14	Do not exceed 32.0 oz/a per year.
	1.0 lb phosmet	1.33 lb Imidan WP	7	Use only on potatoes to be machine harvested.
	9.6 – 11.5 lb sodium aluminofluoride	10.0 – 12.0 lb Prokil Cryolite 96, Kryocide	0	Treat beginning at 20% egg hatch at a minimum of 7-day intervals. Do not exceed 96.0 lb per season. Mortality does not occur for 2 – 4 days. Does not affect beneficial insects. Cryolite can be abrasive to equipment; check the label.
	0.047 – 0.094 lb pinetoram	6.0 – 8.0 oz Radiant SC	7	Do not apply more than 32.0 oz/a Radiant (0.25 lb ai/a) per crop and do not make more than 4 applications per crop.
	spinosad	1.7 – 3.3 oz Blackhawk	3	Apply when pests reach or exceed established thresholds. Do not make more than two successive applications of a Group 5 material and do not apply more than 14.4 oz/a Blackhawk per crop season in potato. Do not exceed 4 exceed 4 applications in a year.
		3.0 – 10.0 fl oz Entrust SC	7	Target application for eggs at hatching and small larvae. Use higher rates for heavier infestations and for older larvae. Do not apply more than 21.0 fl oz/a per crop.
	thiamethoxam	1.5 – 3.0 oz Actara 25WDG	14	Apply before pests reach damaging levels. Allow at least 7 days between applications. Do not exceed 3.0 oz/a per season.

Disease	Active Ingredient rate/a	Commercial Product rate/a	PHI	Additional Comments
Colorado potato beetle (cont.)	thiamethoxam (cont.)	0.11 – 0.16 fl oz Cruiser 5FS/100 lb seed pieces	0 – 30	Use rate chart on label to select proper application rate. Do not exceed 0.125 lb ai/a
	0.047 lb thiamethoxam + chloraniliprole	4.0 oz Voliam Flexi	14	Do not exceed a total of 8.0 fl oz/a Voliam Flexi or 0.094 lb ai/a of thiamethoxam-containing products or 0.2 lb ai/a of chloranthraniliprole-containing products per growing season.
	0.02 – 0.025 lb zeta-cypermethrin	3.2 – 4.0 oz *Mustang Maxx	1	Apply at thresholds and do not exceed 24.0 oz/a Mustang Maxx per season. May provide inadequate control in areas where CPD are resistant to other synthetic pyrethroids.
	0.04 – 0.1 zeta-cypermethrin + bifenthrin	4.0 – 10.3 fl oz *Hero	21	Do not exceed 0.2 lb ai/a per season or make more than 2 applications per season.
Cutworms, loopers	<i>Before July 25 treat when counts exceed four per row foot; after July 25 treat when counts exceed eight per row foot. Use spot treatments of infestations are patchy.</i>			
	alpha-cypermethrin	1.3 – 3.8 fl oz *Fastac	1	Apply when pests reach or exceed established thresholds. DO not apply more than 11.4 fl oz of Fastac per acre per crop season.
	<i>Bacillus thuringiensis</i> subsp. <i>kurstaki</i>	Agree, Biobit, DiPel	0	Rates vary with formulations for loopers.
	1.0 – 2.0 lb <i>Bacillus thuringiensis</i> subsp. <i>kurstaki</i>	1.0 – 2.0 lb Lepinox WDG	0	Treat early instar larvae before noticeable feeding damage occurs. Repeat as needed.
	0.0125 – 0.022 lb beta-cyfluthrin	1.6 – 2.8 fl oz *Baythroid XL	0	Apply every 5 days as needed. Do not exceed 6 applications per year.
	1.0 – 2.0 lb carbaryl	1.0 – 2.0 qt Sevin XLR Plus	7	Repeat applications as necessary up to a total of 6 times per year but not more than once every 7 days. Do not exceed 6.0 qt per crop per year. Do not apply when crop or nearby weeds are in bloom.
	chlorantraniliprole	3.5 – 7.5 fl oz Coragen	14	Do not make more than 4 applications per crop season and allow at least 3 days between application. Do not apply more than 15.4 dl oz/a Coragen per season.

Disease	Active Ingredient rate/a	Commercial Product rate/a	PHI	Additional Comments
Cutworms, loopers (cont.)	0.012 – 0.028 lb deltamethrin	1.0 – 2.4 oz *Delta Gold	3	Apply every 3 days as needed.
	0.025 – 0.05 lb esfenvalerate	2.8 – 9.6 fl oz *Asana XL	7	Do not exceed 0.35 lb ai/a per season.
	imidacloprid + beta-cyfluthrin	3.8 – 4.1 fl oz *Leverage 360	0	Do not apply more than 15.4 fl oz/a per season and allow at least 7 days between applications.
	0.015 – 0.025 lb lambda-cyhalothrin	0.96 – 1.6 fl oz *Warrior II	7	Do not apply more than 0.12 lb ai/a per season. Do not feed treated foliage to animals.
	lambda-cyhalothrin + chlorantraniliprole	5.0 – 8.0 fl oz *Besiege	14	Do not apply more than 27.0 fl oz Besiege per season and allow at least 7 days between applications.
	0.017 – 0.03 lb lambda-cyhalothrin + thiamethoxam	2.5 – 4.5 fl oz *Endigo ZC	14	Do not follow soil applications with foliar application of any other neonicotinoid insecticide. Do not exceed 10.0 fl oz/a Endigo ZC, or 0.12 lb ai/a of products containing lambda-cyhalothrin or 0.094 lb ai/a of products containing thiamethoxam.
	0.058 – 0.078 lb novaluron	9.0 – 12.0 fl oz Rimon 0.83EC	14	Apply when population is between egg hatch and second instar. Use higher rates for a larger larvae. Do not make more than 2 application or exceed 24.0 oz/a per season.
	0.1 – 0.2 lb permethrin	4.0 – 8.0 oz *Permethrin 3.2EC	14	Do not exceed 32.0 oz ai/a per year.
	0.047 – 0.094 lb spinetoram	6.0 – 8.0 oz Radiant SC	7	Do not apply more than 32.0 oz/a Radiant (0.25 lb ai/a) per crop and do not exceed 4 applications per crop.
spinosad	1.7 – 3.5 oz Blackhawk	3	Apply when pests reach or exceed established thresholds. Do not make more than two successive applications of a Group 5 material and so not apply more than 14.4 oz/a Blackhawk per crop season in potato. Do not exceed 4 applications in a year.	

Disease	Active Ingredient rate/a	Commercial Product rate/a	PHI	Additional Comments
Cutworms, loopers (cont.)		4.5 – 10.0 fl oz Entrust SC	7	Target application for eggs at hatching and small larvae. Use higher rates for heavier infestations and for older larvae. Do not apply more than 21.0 fl oz/a per acre.
	0.047 lb thiamethoxam + chlorantraniliprole	4.0 oz Voliam Flexi	14	Do not exceed a total of 8.0 fl oz/a Voliam Flexi or 0.094 lb ai/a of thiamethoxam-containing products or 0.2 lb ai/a of chlorantraniliprole-containing products per growing season.
	0.01 – 0.025 lb zeta-cypermethrin	1.76 – 4.0 oz Mustang Maxx	1	Apply at thresholds and do not exceed 24.0 oz/a Mustang Maxx per season.
	0.04 – 0.1 lb zeta-cypermethrin + bifenthrin	4.0 – 10.3 fl oz *Hero	21	Do not exceed 0.2 lb ai/a per season or make more than 2 applications per season.
European corn borer	0.047 – 0.075 lb acetamiprid	2.5 – 4.0 oz Assail 30SG	7	Begin treatment when thresholds are reached. Apply every 7 days as needed. Do not make more than 4 applications or exceed 0.3 lb ai/a per season.
	0.05 – 0.075 lb acetamiprid	1.1 – 1.7 oz Assail 70WP	7	
	alpha-cypermethrin	1.8 – 3.8 fl oz *Fastac	1	Apply when pests reach or exceed established thresholds. Do not apply more than 11.4 fl oz of Fastac per acre per crop season.
	1.0 – 2.0 lb <i>Bacillus thuringiensis</i> subs. <i>kurstaki</i>	1.0 – 2.0 lb Lepinox WDG	0	Treat early instar larvae before noticeable feeding damage occurs. Repeat as needed.
	0.0125 – 0.022 lb beta-cyfluthrin	1.6 – 2.8 fl oz *Baythroid XL	0	Apply every 5 days as needed. Do not exceed 6 applications per year.
	1.0 – 2.0 lb carbaryl	1.0 – 2.0 qt Sevin XLR Plus	7	Repeat applications as necessary up to a total of 6 times per year but not more than once every 7 days. Do not exceed 6.0 pt per crop per year. Do not apply when crop or nearby weeds are in bloom.
	chlorantraniliprole	3.5 – 7.5 fl oz Coragen	14	Do not make more than 4 applications per crop season and allow at least 3 days between applications. Do not apply more than 15.4 fl oz/a Coragen per season.

Disease	Active Ingredient rate/a	Commercial Product rate/a	PHI	Additional Comments
European corn borer (cont.)	0.044 – 0.088 lb cyantraniliprole (<i>overhead irrigation only</i>)	7.0 – 13.5 fl oz Verimark		Do not apply more than 0.4 lb ai/a cyantraniliprole-containing products per crop whether applied as soil or foliar applications. Minimum reapplication interval is 5 days.
	0.11 – 0.2 cyantraniliprole + abamectin	5.5 – 10.0 fl oz *Minecto Pro	7	Do not apply more than 0.4 lb per calendar year of cyantraniliprole-containing products, or more than 0.056 lb per calendar year of abamectin-containing products.
	0.018 – 0.028 lb deltamethrin	1.5 – 2.4 oz Delta Gold	3	Apply every 3 days as needed.
	0.3 – 0.5 lb esfenvalerate	5.8 – 9.6 oz *Asana XL	7	Do not exceed 0.35 lb ai/a per season.
	imidacloprid + beta-cyfluthrin	2.8 fl oz *Leverage 360	7	Minimum interval between applications is 7 days and maximum allowable crop use per season is 12.8 fl oz/a
	0.065 – 0.11 lb indoxacarb	3.5 – 6.0 Avaunt	7	Do not exceed 0.26 lb ai/a per season.
	0.02 – 0.03 lb lambda-cyhalothrin	1.28 – 1.92 fl oz *Warrior II	7	Do not apply more than 0.12 lb ai/a per season. Do not feed treated foliage to animals.
	lambda-cyhalothrin + chlorantraniliprole	6.0 – 9.0 fl oz *Besiege	14	Do not apply more than 27.0 fl oz/a Besiege per season and allow at least 7 days between applications.
	0.02 – 0.027 lb lambda-cyhalothrin + thiamethoxam	3.0 – 4.0 fl oz *Endigo ZC	14	Do not follow soil applications with foliar application of any other neonicotinoid insecticide. Do not exceed 10.0 fl oz/a Endigo ZC, or 0.12 lb ai/a of products containing lambda-cyhalothrin or 0.094 lb ai/a of products containing thiamethoxam.
	0.1 – 0.2 lb permethrin	4.0 – 8.0 oz *Permethrin 3.2EC	14	Do not exceed 32.0 oz/a per year.
0.047 – 0.094 lb spinetoram	6.0 – 8.0 oz Radiant SC	7	Do not apply more than 32.0 oz/a Radiant (0.25 lb ai/a) per crop and do not exceed 4 applications per crop.	

Disease	Active Ingredient rate/a	Commercial Product rate/a	PHI	Additional Comments
European corn borer (cont.)	spinosad	1.7 – 3.3 oz Blackhawk	3	Apply when pests reach or exceed established thresholds. Do not make more than two successive applications of a Group 5 material and do not apply more than 14.4 oz/a Blackhawk per crop season in potato. Do not exceed 4 applications in a year.
		3.0 – 10.0 fl oz Entrust SC	7	Target application for eggs at hatching and small larvae. Use higher rates for heavier infestations and for older larvae. Do not make more than 2 applications per generation. Do not apply more than 2 applications per generation. Do not apply more than 21.0 fl oz/a per crop.
	0.047 lb thiamethoxam	4.0 oz Voliam Flexi	14	Do not exceed a total of 8.0 fl oz/a Voliam Flexi or 0.094 lb ai/a of thiamethoxam-containing products or 0.2 lb ai/a of chlorantraniliprole-containing products per growing season.
	0.01 – 0.025 lb zeta-cypermethrin	1.76 – 4.0 oz *Mustang Maxx	1	Apply at thresholds and do not exceed 24.0 oz/a Mustang Maxx per season.
	0.04 – 0.1 lb zeta-cypermethrin + bifenthrin	4.0 – 10.3 fl oz *Hero	21	Do not exceed 0.2 lb ai/a per season or make more than 2 applications per season.
Grass-hoppers	<i>Treat when defoliation exceeds 10%</i>			
	alpha-cypermethrin	3.2 – 3.8 fl oz *Fastac	1	Apply when pests reach or exceed established thresholds. Do not apply more than 11.4 fl oz of Fastac per acre per crop season.
	2.0 lb carbaryl	Sevin Bait	0	Broadcast. See label for rate.
	chlorantraniliprole	2.0 – 5.0 fl oz Coragen	14	Do not make more than 4 applications per crop season and allow at least 3 days between applications. Do not apply more than 1.5.4 fl oz/a Coragen per season.
	0.25 – 0.5 lb dimethoate	0.5 – 1.0 pt Dimethoate EC	0	

Disease	Active Ingredient rate/a	Commercial Product rate/a	PHI	Additional Comments
Grass-hoppers (cont.)	0.2 – 0.5 lb esfenvalerate	3.9 – 9.6 oz *Asana XL	7	Do not exceed 0.35 lb ai/a per season.
	imidacloprid + beta-cyfluthrin	3.8 – 4.1 fl oz *Leverage 360	0	Do not apply more than 15.4 fl oz/a per season and allow at least 7 days between applications.
	0.02 – 0.03 lb lambda-cyhalothrin	1.28 – 1.92 fl oz *Warrior II	7	Do not apply more than 0.12 lb ai/a per season. Do not feed treated foliage to animals.
	lambda-cyhalothrin + chlorantraniliprole	6.0 – 9.0 fl oz *Besiege	14	Allow at least 7 days between applications. Do not apply more than 27.0 fl oz/a Besiege per season.
Green peach aphid, potato aphid	<i>Control when green peach aphids exceed one per 10 leaves for seed production or three aphids per 10 leaves for table stock.</i>			
	0.047 – 0.075 lb acetamiprid	2.5 – 4.0 oz Assail 30SG	7	Begin treatment when thresholds are reached. Apply every 7 days as needed. Do not exceed 4 applications or 0.3 lb ai/a per season.
	0.044 – 0.075 lb acetamiprid	1.0 – 1.7 oz Assail 70WP	7	
	alpha-cypermethrin	3.2 – 3.8 fl oz *Fastac	1	Apply when pests reach or exceed established thresholds. Do not apply more than 11.4 fl oz of Fastac per acre per crop season.
	0.022 lb beta-cyfluthrin	2.8 fl oz *Baythroid XL	0	Maximum Baythroid XL allowed per 7-day interval is 2.8 oz/a and season total allowed per crop season oz 16.8 fl oz/a
	0.075 – 0.096 lb bifenthrin + imidacloprid	4.8 – 6.14 fl oz *Brigadier	21	Do not apply more than 25.6 fl oz/a (0.4 lb ai/a) per season. No more than 0.5 lb ai/a bifenthrin and 0.2 lb ai/a imidacloprid are allowed per season.
	0.03 – 0.05 lb clothianidin	1.9 – 2.8 fl oz Belay	14	Do not exceed 3 applications of Belay. Allow at least 7 days between applications. Do not make a foliar application of Belay following an at-plant application of a neonicotinoid (MoA Class 4) compound.
	0.088 – 0.134 lb cyantraniliprole (overhead irrigation only)	13.5 – 20.5 fl oz Verimark		Do not apply more than 0.4 lb per calendar year of cyantraniliprole-containing products per crop whether

Disease	Active Ingredient rate/a	Commercial Product rate/a	PHI	Additional Comments
Green peach aphid, potato aphid (cont.)				applied as soil or foliar applications. Minimum reapplication interval is 5 days.
	0.2 lb cyantraniliprole + abamectin	10.0 fl oz *Minecto Pro	7	Do not apply more than 0.4 lb per calendar year of cyantraniliprole-containing products, or more than 0.056 lb per calendar year of abamectin-containing products
	0.018 – 0.028 lb deltamethrin	1.5 – 2.4 oz *Delta Gold	3	Apply every 3 days as needed.
	0.25 – 0.5 lb diazinon	Several formulations	35	Repeat applications as necessary. Allow at least 7 days between applications. Do not use on potatoes that will be hand harvested. Limit of 5 applications per season.
	0.25 – 0.5 dimethoate	0.5 – 1.0 pt Dimethoate 400EC	0	Potatoes may be mechanically harvested on a day of application. Highly toxic to bees – do not apply when crop or nearby weeds are in bloom. Wait at least 7 days between treatments. Do not exceed 0.5 lb ai/a per treatment. Do not exceed 1.0 lb ai/a per year. Re-entry interval is 48 hours.
	0.025 – 0.05 lb esfenvalerate	5.8 – 9.6 fl oz *Asana XL	7	For potatoes aphid only. Do not exceed 0.35 lb ai/a per season.
	0.062 – 0.089 lb flonicamid	2.0 – 2.8 oz Beleaf 50SG	7	Thorough coverage is required for optional control. Do not apply more than 2.8 oz/a Beleaf 50SG (0.089 lb ai/a) per treatment and do not exceed 8.4 oz/a (0.267 lb ai/a) per season. Allow at least 7 days between applications; rapidly growing plants often require re-treatment. Limit of 3 applications per year.
	flupyradifurone	7.0 – 10.5 fl oz Sivanto	7	Foliar application. Apply when pests reach or exceed established thresholds. Do not apply more than 28.0 fl oz of Sivanto per acre per crop season.
	<i>I. fumosorosea</i> (20%)	1.0 – 2.0 lb PFR-97	1	Repeat applications at 3- to 10-day intervals over 2 – 3 weeks or as needed to maintain control. Frequent application may be required under dry conditions, during periods of increased

Disease	Active Ingredient rate/a	Commercial Product rate/a	PHI	Additional Comments
Green peach aphid, potato aphid (cont.)				pest buildup or reproduction, or rapid host plant growth.
	0.047 lb imidacloprid	3.75 fl oz Provado 1.6F	7	Foliar application: Use ground equipment only. Allow at least 7 days between applications. Regardless of the type of application, do not exceed 0.31 lb ai/a imidacloprid (Admire or Provado) per year. There is a 12-month rotational plantback interval for all crops except those registered.
	imidacloprid + beta-cyfluthrin	3.8 – 4.1 fl oz *Leverage 360	0	Do not apply more than 15.4 fl oz/a per season and allow at least 7 days between applications.
	0.02 – 0.03 lb lambda-cyhalothrin	1.28 – 1.92 fl oz *Warrior II	7	Do not apply more than 0.12 lb ai/a per season. Do not need treated foliage to animals.
	lambda-cyhalothrin + chlorantraniliprole	6.0 – 9.0 fl oz *Besiege	14	Do not apply more than 27.0 fl oz/a Besiege per season and allow at least 7 days between applications.
	0.027 – 0.03 lb lambda-cyhalothrin + thiamethoxam	4.0 – 4.5 fl oz *Endigo ZC	14	Do not follow soil applications with foliar applications of any other neonicotinoid insecticide. Do not exceed 10.0 fl oz/a Endigo ZC, or 0.12 lb ai/a of products containing lambda-cyhalothrin or 0.094 lb ai/a of products containing thiamethoxam.
	0.6 – 0.9 lb malathion	Several formulations	0	Short residual.
	0.45 – 0.90 lb methomyl	1.5 – 3.0 pt *Lannate LV	6	Repeat application as necessary up to 10 times per crop. Do not exceed 15.0 pt/a per crop.
	0.5 – 1.0 lb oxamyl	2.0 – 4.0 pt *Vydate L	7	Foliar application. Do not exceed 6 applications per season.
	0.1 – 0.2 lb permethrin	4.0 – 8.0 oz *Permethrin 3.2EC	14	Do not exceed 32.0 oz/a per year.

Disease	Active Ingredient rate/a	Commercial Product rate/a	PHI	Additional Comments
Green peach aphid, potato aphid (cont.)	pymetrozine	2.75 oz Fulfill 50WDG	14	Apply according to label directions when aphids first appear. May repeat treatment in 7 days. Do not exceed 2 applications per crop or 5.5 oz ai/a per season. May be applied through chemigation.
	0.06 – 0.08 lb spirotetramat	2.0 – 2.5 fl oz Movento HL	7	Do not apply more than 0.17 lb per calendar year of spirotetramat-containing products.
	0.023 – 0.047 lb sulfoxaflor	0.75 – 1.5 oz Transform WG	7	Do not apply more than a total of 8.5 oz of Transform WG (0.266 lb ai or sulfoxaflor) per acre per year.
	thiamethoxam	3.0 oz Actara 25WDG	14	Apply every 7 – 10 days as needed. Do not exceed 6.0 oz/a per season.
		0.11 – 0.16 fl oz Cruiser 5FS/100 lb seed pieces	0 – 30	Use rate chart on label to select proper application rate. Do not exceed 0.125 lb ai/a.
	0.047 lb thiamethoxam-chlorantraniliprole	4.0 oz Voliam Flexi	14	Do not exceed a total of 8.0 fl oz/a Voliam Flexi or 0.094 lb ai/a of thiamethoxam-containing products or 0.2 lb ai/a of chlorantraniliprole-containing products per growing season.
	0.02 – 0.025 lb zeta-cypermethrin	3.2 – 4.0 oz *Mustang Maxx	1	Apply Mustang Maxx only after populations have exceeded thresholds and do not exceed 240 oz/a per season.
	0.04 – 0.1 lb zeta-cypermethrin + bifenthrin	4.0 – 10.3 fl oz *Hero	21	Do not exceed 0.2 lb ai/a per season or make more than 2 applications per season.
Potato flea beetle	0.028 – 0.047 lb acetamiprid	1.5 – 2.5 oz Assail 30SG	7	Begin treatment when thresholds are reached. Apply every 7 days as needed. Do not exceed 4 applications or 0.3 lb ai/a per season.
	0.025 – 0.05 lb acetamiprid	0.6 – 1.1 oz Assail 70WP	7	
	alpha-cypermethrin	1.8 – 3.8 fl oz *Fastac	1	Apply when pests reach or exceed established thresholds. Do not apply more than 11.4 fl oz of Fastac per acre per crop season.
	0.0125 – 0.022 lb beta-cyfluthrin	1.6 – 2.8 fl oz *Baythroid	0	Apply every 5 days as needed. Do not exceed 6 applications per year.
	0.075 – 0.096 lb bifenthrin + imidacloprid	4.8 – 6.14 fl oz *Brigadier	21	Do not apply more than 25.6 fl oz/a (0.4 ai/a) per season. No more than 0.5 lb

Disease	Active Ingredient rate/a	Commercial Product rate/a	PHI	Additional Comments
Potato flea beetle (cont.)				ai/a bifenthrin and 0.2 lb ai/a imidacloprid.
	0.5 – 1.0 lb carbaryl	0.5 – 1.0 qt Sevin XLR Plus	7	Repeat application as necessary up to a total of 6 times per year but not more than once every 7 days. Do not exceed 6.0 qt per crop per year. Do not apply when crop or nearby weeds are in bloom.
	0.03 – 0.05 lb clothianidin	1.9 – 2.8 fl oz Belay	14	Do not exceed 3 applications of Belay. Allow at least 7 days between treatments. Do not make a foliar application of Belay following as at-plant application of a neonicotinoid (MoA Class 4) compound.
	0.088 – 0.134 lb cyantraniliprole (<i>overhead irrigation only</i>)	13.5 – 20.5 fl oz Verimark		Do not apply more than 0.4 lb ai/a cyantraniliprole-containing products per crop whether applied as soil or foliar applications. Minimum reapplication interval is 5 days.
	0.2 lb cyantraniliprole + abamectin	10.0 fl oz *Minecto Pro	7	Do not apply more than 0.4 lb per calendar year of cyantraniliprole-containing products, or more than 0.056 lb per calendar year of abamectin-containing products.
	0.018 – 0.028 lb deltamethrin	1.5 – 2.4 oz *Delta Gold	3	Apply every 3 days as needed.
	0.25 – 0.5 lb diazinon	Several formulations	35	Repeat applications as necessary. Allow at least 7 days between applications. Do not use on potatoes that will be hand harvested.
	0.05 – 0.33 lb dinotefiran	<i>Foliar:</i> 1.0 – 1.5 oz Venom 70SG <i>Soil:</i> 6.5 – 7.5 oz Venom 70SG	7 -	Do not follow soil applications with foliar application of any other neonicotinoid insecticide. Use only one application method. Do not apply more than 4.5 oz/a per year using foliar applications, or 7.5 oz/a per season using soil applications. See product label for directions.
	0.05 – 0.07 lb dinotefuran (<i>foliar</i>)	2.0 – 2.75 oz Scorpion 35SL	7	Can repeat at 14-day intervals. Do not apply more than 7.75 oz per year. Use only one application method.

Disease	Active Ingredient rate/a	Commercial Product rate/a	PHI	Additional Comments
Potato flea beetle (cont.)	0.28 – 0.33 lb dinotefuran (soil)	11.0 – 13.0 oz Scorpion 35SL		Do not apply more than 13.0 oz per year. Apply either as a preplant, preemergence, or at ground crack. Do not follow soil applications with foliar applications; use only one application method.
	0.025 – 0.05 lb esfenvalerate	5.8 – 9.6 fl oz *Asana XL	7	Do not exceed 0.35 lb ai/a per season.
	0.047 lb imidacloprid	3.75 fl oz Provado 1.6F	7	Use ground equipment only. Allow at least 7 days between applications. Regardless of the type of application, do not exceed 0.31 lb ai/a imidacloprid (Admire, Leverage 360, or Provado) per year. There is a 12-month rotational plantback interval for all crops except those registered.
	imidacloprid + beta-cyhalothrin	3.8 – 4.1 fl oz *Leverage 360	0	Do not apply more than 15.4 fl oz per season and allow at least 7 days between applications.
	0.02 – 0.03 lb lambda-cyhalothrin	1.28 – 1.92 fl oz *Warrior II	7	Do not apply more than 0.12 lb ai/a per season. Do not feed treated foliage to animals.
	lambda-cyhalothrin + thiamethoxam	6.0 – 9.0 oz *Besiege	14	Do not apply more than 27.0 fl oz/a Besiege per season and allow at least 7 days between applications.
	0.017 – 0.03 lb lambda-cyhalothrin + thiamethoxam	2.5 – 4.5 fl oz *Endigo ZC	14	Do not follow soil applications with foliar application of any other neonicotinoid insecticide. Do not exceed 10.0 fl oz/a Endigo ZC, or 0.12 lb ai/a of products containing lambda-cyhalothrin or 0.094 lb ai/a of products containing thiamethoxam.
	0.05 – 0.2 lb permethrin	*Ambush, *Pounce	14	Several formulations; see label for rate. Do not exceed 1.6 lb ai/a per season.
	spinosad	1.7 – 3.3 oz Blackhawk	3	Apply when pests reach or exceed established thresholds. Do not make more than two successive applications of a Group 5 material and do not apply more than 14.4 oz/a Blackhawk per crop season in potato. Do not exceed 4 applications in a year.

Disease	Active Ingredient rate/a	Commercial Product rate/a	PHI	Additional Comments
Potato flea beetle (cont.)	thiamethoxam	0.11 – 0.16 fl oz Cruiser 5FS/100 lb seed pieces	0 – 30	Use rate chart on label to select proper application rate. Do not exceed 0.125 lb ai/a.
		1.5 – 3.0 oz Actara 25WDG	14	Apply when pests reach or exceed established thresholds. Do not apply more than 6.0 oz of Actara 25WDG per acre per crop season. Actara is applied as a foliar spray.
	0.047 lb thiamethoxam + chlorantraniliprole	4.0 oz Voliam Flexi	14	Do not exceed a total of 8.0 fl oz/a Voliam Flexi or 0.094 ai/a of thiamethoxam-containing products or 0.2 lb ai/a of chlorantraniliprole-containing products per growing season.
	0.01 – 0.025 lb zeta-cypermethrin	1.76 – 4.0 oz *Mustang Maxx	1	Apply at thresholds and do not exceed 24.0 oz/a Mustang Maxx per season.
	0.04 – 0.1 lb zeta-cypermethrin + bifenthrin	4.0 – 10.3 fl oz *Hero	21	Do not exceed 0.2 ai/a per season or make more than two applications per season.
Potato leafhopper	<i>Sample nymphs and adults. Do not treat if fewer than 0.5 adults per sweep unless there are more than 2.5 nymphs per 25 leaves. If 0.5-1.0 adults per sweep, treat if they remain at the same level for 10-14 days or if nymphs are present. If 1.0-1.5 adults per sweep, treat within 5-7 days or immediately if nymphs are present. If more than 1.5 adults per sweep, treat immediately.</i>			
	0.028 – 0.075 lb acetamiprid	1.5 – 4.0 oz Assail 30SG	7	Begin treatment when thresholds are reached. Apply every 7 days as needed. Do not exceed 4 applications or 0.3 lb ai/a per season.
		0.6 – 1.7 oz Assail 70WP	7	
	alpha-cypermethrin	3.2 – 3.8 fl oz *Fastac	1	Apply when pests reach or exceed established thresholds. Do not apply more than 11.4 fl oz pf Fastac per acre per crop season.
	0.0125 – 0.022 lb beta-cyfluthrin	1.6 – 2.8 fl oz *Baythroid XL	0	Apply every 5 days as needed. Do not exceed 6 applications per year.
	0.075 – 0.096 bifenthrin + imidacloprid	4.8 – 6.14 fl oz *Brigadier	21	Do not apply more than 25.6 fl oz/a (0.4 lb ai/a) per season. No more than 0.5 lb ai/a bifenthrin and 0.2 lb ai/a imidacloprid are allowed per season.
	0.5 – 1.0 lb carbaryl	0.5 – 1.0 qt Sevin XLR Plus	0	Repeat applications as necessary up to a total of 6 times per year but not more than one every 7 days. Do not exceed 6.0 qt per crop per year. Do not apply when crop or nearby weeds are in bloom.

Disease	Active Ingredient rate/a	Commercial Product rate/a	PHI	Additional Comments
Potato leafhopper (cont.)	0.03 – 0.05 lb clothianidin	1.9 – 2.8 fl oz Belay	14	Do not exceed 3 applications of Belay. Allow at least 7 days between treatments. Do not make a foliar application of Belay following an at-plant application of a neonicotinoid (MoA Class 4) compound.
	0.018 – 0.028 lb deltamethrin	1.5 – 2.4 oz Delta Gold	3	Apply every 3 days as needed.
	0.25 – 0.5 lb dimethoate	0.5 – 1.0 pt Dimethoate 400EC	0	Potatoes may be mechanically harvested on day of application. Highly toxic to bees – do not apply when crop or weeds nearby are in bloom. Wait at least 7 days between treatments. Do not exceed 0.5 lb ai/a per treatment. Do not exceed 1.0 lb ai/a per year. Re-entry interval is 48 hours.
	0.05 – 0.33 lb dinotefuran	<i>Foliar:</i> 1.0 – 1.5 oz Venom 70SG <i>Soil:</i> 6.5 – 7.5 oz Venom 70SG	7 -	Do not follow soil applications with foliar application of any other neonicotinoid insecticide. Use only one application method. Do not apply more than 4.5 oz/a per year using foliar applications, or 7.5 oz/a per season using soil applications. See product label for directions.
	0.05 – 0.07 lb dinotefuran (<i>foliar</i>)	2.0 – 2.75 oz Scorpion 35SL	7	Can repeat at 14-day intervals. Do not apply more than 7.75 oz per year. Use only one application method.
	0.28 – 0.33 lb dinotefuran	11.0 – 13.0 oz Scorpion 35SL		Do not apply more than 13.0 oz per year. Apply either as a preplant, preemergence, or at ground crack. Do not follow soil applications with foliar applications; use only one application method.
	0.015 – 0.05 lb esfenvalerate	2.9 – 9.6 fl oz *Asana XL	7	Do not exceed 0.35 lb ai/a per season.
	flupyradifurone	7.0 – 10.5 fl oz Sivanto	7	Foliar application. Apply when pests reach or exceed established thresholds. Do not apply more than 28.0 fl oz of Sivanto per acre per crop season.
	0.047 lb imidacloprid	3.75 fl oz Provado 1.6F	7	Foliar application: Use ground equipment only. Allow at least 7 days between applications. Regardless of the type of application, do not exceed 0.31

Disease	Active Ingredient rate/a	Commercial Product rate/a	PHI	Additional Comments
Potato leafhopper (cont.)				lb ai/a imidacloprid (Admire or Provado) per year. There is a 12-month rotational plantback interval for all crops except those registered.
	imidacloprid + beta-cyfluthrin	3.8 – 4.1 fl oz *Leverage 360	0	Do not apply more than 15.4 fl oz/a per season and allow at least 7 days between applications.
	0.015 – 0.025 lb lambda-cyhalothrin	0.96 – 1.6 fl oz *Warrior II	7	Do not apply more than 0.12 lb ai/a per season. Do not apply more than 0.12 lb ai/a per season. Do not feed treated foliage to animals.
	lambda-cyhalothrin + chlorantraniliprole	5.0 – 8.0 fl oz *Besiege	14	Allow at least 7 days between applications. Do not apply more than 27.0 fl oz/a Besiege per season.
	0.017 – 0.03 lb lambda-cyhalothrin + thiamethoxam	2.5 – 4.5 fl oz *Endigo ZC	14	Do not follow soil applications with foliar application of any other neonicotinoid insecticide. Do not exceed 10.0 fl oz/a Endigo ZC, or 0.12 lb ai/a of products containing lambda-cyhalothrin or 0.094 lb ai/a of products containing thiamethoxam.
	0.6 – 0.9 lb malathion	Several formulations	0	Short residual will protect beneficial insects.
	0.45 – 0.9 lb methomyl	1.5 – 3.0 pt *Lannate LV	6	Repeat applications as necessary up to 10 times per crop. Do not exceed 15.0 pt/a per crop.
	0.1 – 0.2 lb permethrin	4.0 – 8.0 oz *Permethrin 3.2EC	14	Do not exceed 32.0 oz/a per year.
	1.0 lb phosmet	1.33 lb Imidan WP	7	Use only on potatoes to be machine harvested.
	thiamethoxam	1.5 – 3.0 oz Actara 25WDG	14	Apply every 7-10 days as needed. Do not exceed 6.0 oz/a per season.
	0.11 – 0.16 fl oz Cruiser 5FS/100 lb seed pieces	0 – 30	Use rate chart on label to select proper application rate. Do not exceed 0.125 lb ai/a.	

Disease	Active Ingredient rate/a	Commercial Product rate/a	PHI	Additional Comments
Potato leafhopper (cont.)	0.047 lb thiamethoxam + chlorantraniliprole	4.0 oz Voliam Flexi	14	Do not exceed a total of 8.0 fl oz/a Voliam Flexi or 0.094 lb ai/a of thiamethoxam-containing products or 0.2 lb ai/a of chlorantraniliprole-containing products per growing season.
	0.01 – 0.025 lb zeta-cypermethrin	1.76 – 4.0 oz *Mustang Max	1	Apply at thresholds and do not exceed 24.0 oz/a Mustang Maxx per season.
	0.04 – 0.1 lb zeta-cypermethrin + bifenthrin	4.0 -10.3 fl oz *Hero	21	Do not exceed 0.2 lb ai/a per season or make more than 2 applications per season.
Tarnished plant bug	<i>Treat when insect sweep net counts exceed on average of 1 bug/sweep.</i>			
	<i>alpha-cypermethrin</i>	3.2 – 3.8 fl oz *Fastac	1	Apply when pests reach or exceed established thresholds. Do not apply more than 11.4 fl oz of Fastac per acre per crop season.
	<i>0.0125 – 0.022 lb beta-cyfluthrin</i>	1.6 – 2.8 fl oz *Baythroid XL	0	Apply every 5 days as needed. Do not exceed 6 applications per year.
	1.0 – 2.0 lb carbaryl	1.0 – 2.0 qt Sevin XLR Plus	7	Repeat applications as necessary up to a total of 6 times per year but not more than once every 7 days. Do not exceed 6.0 qt per crop per year. Do not apply when crop or nearby weeds are in bloom.
	0.018 – 0.028 lb deltamethrin	1.5 – 2.4 oz *Delta Gold	3	Apply every 3 days as needed.
	0.025 – 0.05 lb esfenvalerate	5.8 – 9.6 fl oz *Asana XL	7	Do not exceed 12 applications per season.
	imidacloprid + beta-cyfluthrin	3.8 – 4.1 fl oz *Leverage 360	0	Do not apply more than 15.4 fl oz/a per season and allow at least 7 days between applications.
	0.02 – 0.03 lb lambda-cyhalothrin	1.28 – 1.92 fl oz *Warrior II	7	Do not apply more than 0.12 lb ai/a per season. Do not feed treated foliage to animals.

Disease	Active Ingredient rate/a	Commercial Product rate/a	PHI	Additional Comments
Tarnished plant bug (cont.)	Lambda-cyhalothrin + chlorantrzniliprole	6.0 – 9.0 fl oz *Besiege	14	Do not apply more than 27.0 fl oz/a Besiege per season and allow at least 7 d ays between applications.
	0.02 – 0.027 lb lambda-cyhalothrin + thiamethoxam	3.0 – 4.0 fl oz *Endigo ZC	14	Do not follow soil applications with foliar application of any other neonicotinoid insecticide. Do not exceed 10.0 fl oz/a Endigo ZC, or 0.12 lb ai/a of products containing lambda-cyhalothrin or 0.094 lb ai/a of products containing thiamethoxam.
	0.1 – 0.2 lb permethrin	4.0 – 8.0 oz *Permethrin 3.2EC	14	Do not exceed 32.0 oz/a per year.
	0.01 – 0.025 lb zeta-cypermethrin	1.76 – 4.0 oz *Mustang Maxx	1	Apply at thresholds and do not exceed 24.0 oz/a Mustang Maxx oer season.
	0.1 lb zeta-cypermethrin + bifenthrin	10.3 fl oz *Hero	21	Do not exceed 0.2 lb ai/a per season or make more than 2 applications per season.
Two-spotted spider mite	0.125 – 0.25 lb bifenazate	16.0 – 24.0 oz Acramite 4SC	14	Apply in at least 50 gallons of water to ensure uniform coverage and canopy penetration. Do not apply more than once per year.
	0.11 – 0.2 lb cyantraniliprole + abamectin	5.5 – 10.0 fl oz *Minecto Pro	7	Do not apply more than 0.4 lb per calendar year of abamectin-containing products.
	<i>I. fumosorosea</i> (20%)	1.0 – 2.0 lb PFR-97	1	Repeat applications at 3- to 10-day intervals over 2-3 weeks or as needed to maintain control. Frequent application may be required under dry conditions, during periods of increased pest buildup or reproduction, or rapid host plant growth.
	0.06 – 0.08 lb spirotetramat	2.0 – 2.5 fl oz Movento HL	7	Do not apply more than 0.16 lb per calendar year spirotetramat-containing products.
Wireworms	0.15 – 0.3 lb <i>Bacillus amyloliquefaciens</i> strain D747 + bifenthrin	12.75 – 25.5 fl oz *Ethos XB		Ethos is applied as incorporated treatments as a soil-incorporated broadcast, directed bed spray, or a T-band spray into the planting furrow. Do not applu more than 0.5 lb bifenthrin active ingredient per acre per season,

Disease	Active Ingredient rate/a	Commercial Product rate/a	PHI	Additional Comments
Wireworms (cont.)				including at-plant and foliar applications of other bifenthrin products.
	bifenthrin	<i>At-plant: 19.2 oz</i> <i>*Brigade 2EC</i> <i>Lay-by: 3.2 – 9.6 oz</i> <i>*Brigade</i>		Apply as an in-furrow spray or T-band spray at planting. May be applied as a lay-by treatment as a banded spray over the drilled area.
		12.75 – 25.5 oz <i>*Capture LFR</i>	34 (at-plant) 35 (lay-by)	Do not exceed 0.3 lb ai/a per season as an at-plant application. Do not apply more than 0.5 lb ai/a per season including other bifenthrin products.
	4 – 6 lb ethoprop	2.1 lb/1000 ft row <i>*Mocap EC</i>		Band in row at planting.
		40.0 – 60.0 lb <i>*Mocap G</i>		Preplant broadcast if severe infestation is likely.
	0.09 – 0.1 lb fipronil	2.9 – 3.2 oz Regent 4SC	90	Make only one in-furrow treatment. Apply as a 5- to 7-inch-wide band and cover thoroughly. See label for plantback restrictions.
	Banded rate: <i>heavy soil:</i> 0.22 lb/1000 ft row phorate <i>light soil:</i> 0.14 lb/1000 ft row phorate	<i>Heavy soil:</i> 17.3 oz <i>*Thimet 20G, *Phorate 20G</i> <i>Light soil:</i> 11.3 oz <i>*Thimet 20G, *Phorate 20G</i>	90	Apply as fertilizer band treatment at planting.