Potato

Varieties	Season	Use	Scab Resistance	Appearance and Comments
Dark Red Norland	very early	market, home	good	Dark, deep red; smooth skinned; shallow eyes medium in number
Red Norland	very early	market, home	good	Bright red, oblong, smooth skinned, shallow eyes medium in number
Superior	early	chips, market	very good	White, slight russet, oval, very popular
Russet Norkotah	early	market, home	fair	Very good appearance, good baking quality, fair specific gravity
Cascade	mid-season	market, home	good	White, round
Goldrush	mid-season	market, home	fair	Very good appearance, good baking quality, fair specific gravity.
Snowden	mid-season	chips, market	good	White, very high dry matter, ideal for baking and French fries; exceptional ability to produce white potato chips; tubers sometimes rough
Atlantic	late	chips, market	good	White, blocky-round, high yield; hollow heart, internal browning, high specific gravity
Katahdin	late	market, home	fair	White, smooth, round, shallow-eyed
Kennebec	late	market, home	fair	White, long, oval
Red Pontiac	late	home garden	fair	Red, round, very high yield, low specific gravity, good boiling, mashing type
Russet Burbank				
For trial only				
Conestoga	early			A white type with good shelf life, shape, and baking quality
Somerset	mid-season			Blocky, very good appearance, high specific gravity, chips well, white
Yukon Gold	early	local market, home		Yellow flesh, good size
Russian Banana	late	specialty markets	good	Long, narrow fingerling; pale yellow flesh
Carola	late	specialty markets	good	Yellow skin and flesh, oval

Spacing

Rows 34 to 36 inches apart. Seed pieces 9 to 11 inches apart in row, depending on variety and intended use. Seed 16 to 18 100-pound bags per acre. Seed piece should be 1.5 to 2 ounces. Using B-size certified seed will save cutting labor and reduce tuber-borne diseases.

Fertilizing

Lime: To control common scab, soil pH should be within 5.0 to 5.2. However, low soil pH reduces phosphorus availability and increases availability of toxic elements such as manganese and aluminum. If the field has a history of scab, using scab-resistant varieties is recommended. Then, the soil pH can be 6.5 where phosphorus is most available.

Preplant: N: none — only a small amount such as 24 to 30 pounds with the starter fertilizer. P_2O_5: none — apply 50 to 150 pounds as a starter depending on the soil test results. K_2O: 50 to 400 pounds per acre. Adjust according to soil type, previous management, and soil test results for your state. For the most efficient phosphate application, apply the fertilizer at planting in a band 2 to 3 inches to the side and below each side of the tuber. Examples would be 500 pounds per acre of 6-24-24 or 8-16-16. Do not apply more than 200 pounds of K_2O per acre in the band at planting. On sandy soils, broadcast 30 pounds or band 15 pounds sulfur per acre.

Sidedress N: For irrigated sandy soils, two split N applications are recommended: half at emergence and half at hilling or tuber initiation. For the early maturing varieties, use 50 to 60 pounds of N per acre at each growth stage. The second application can be adjusted according to rainfall and a petiole nitrate-N analysis. For upland or finer textured soils, all of the required N can be applied preplant or shortly after emergence. For soils with more than 3 percent organic matter and following soybeans, alfalfa, or a grass-legume hay crop, apply 100 pounds N per acre. For soils with less than 3 percent organic matter and the above rotation, apply 135 pounds N per acre. For potatoes following corn, rye, oats, wheat, or a vegetable crop, apply 150 pounds N per acre. Refer to University of Minnesota recommendations for N rates adjusted for yield goal.

Vine Killing

Vine Killing Product	Treatment	Comments
Defol 750®	3.2 qts. per acre in 10-20 gals. water by ground or 5-10 gals. by air.	Apply 10 days before harvest. Do not apply in extreme heat during middle of the day.
paraquat	0.8-1.5 pts. per acre of 2.5L or 0.6-1.0 pt. per acre of 3L in 50-100 gals. of water plus 1 gal. COC or 1-2 pts. nonionic surfactant per 100 gals. spray solution. **Not for use on potatoes to be stored or used for seed.**	Begin applications when leaves begin to turn yellow. Immature potato foliage and drought-stressed potato foliage are tolerant to this product. Maximum 3 pts. of 2.5L or 2 pts. of 3L per acre per season. For split applications, use lower rate and wait 5 days between applications. Read label for complete instructions. **3L formulation not for use in Iowa or Missouri**. 3-day PHI.
Reglone®	1-2 pts. in 20-100 gals. water plus 8-64 fl. oz. nonionic surfactant.	A second application can be made if necessary. Allow at least 5 days between applications. 7-day PHI.
Rely 200®	29 fl. oz. per acre.	Do not make more than 1 application. 9-day PHI.

Chemical Sprout Control

Use maleic hydrazide (MH-30) according to label directions one week after blossoms fall. For varieties and conditions where flowering does not occur, apply four to six weeks before potatoes are mature and ready for harvest. Make only one application. Apply when no rain is expected for 24 hours. Potatoes treated with MH cannot be used for seed because sprouting will be inhibited. Follow label directions.

Disease Control

Diseases Controlled	Treatment	Comments
Black Leg	Plant cut seed tubers that have been stored under conditions for rapid healing of cut surfaces and treated with a labeled potato seed treatment.	Plant whole seed tubers where possible.
Early Blight	Choose a cultivar with some resistance to early blight.	Avoid droughty, wet, or compacted soils, and other conditions (such as insufficient nitrogen) that might add undue stress to the crop and increase susceptibility to early blight. Rotate fields away from potato production for 2-3 years.
	Amistar 80WP® at 2-5oz. per acre.	Do not make more than 1 application before alternating to a fungicide with a different mode of action. For a 7-day application schedule, use the 2 oz. rate. If the interval is increased to 14 days, use the 4 oz. rate. 14-day PHI.
	Several chlorothalonil formulations (e.g., Bravo®, Echo®, Equus®) are labeled for use at various rates.	Begin applications at the low rate when vines are exposed to disease and leaf wetness occurs. Repeat applications at higher labeled rates at 5-10 day intervals when vines close between rows or crop reaches 300-P days. 7-day PHI.
	Endura 70WG® at 2.5-4.5 oz. per acre.	Do not make more than 2 applications before alternating to a fungicide with a different mode of action. The maximum is 4 applications per season. 10-day PHI.
	Gavel 75DF® at 1.5-2 lbs. per acre.	Use a 5-7 day schedule when disease pressure is high. When disease pressure is low use a 7-10 day schedule. 14-day PHI.
	Gem 500SC® at 2.9-3.8 fl. oz. per acre, or Gem 25WDG® at 6-8 oz. per acre.	Do not make more than 1 application before alternating to a fungicide with a different mode of action. 7-day PHI.
	Headline® at 6-9 oz. per acre.	Do not make more than 1 application before alternating to a fungicide with a different mode of action. 3-day PHI.

Diseases Controlled	Treatment	Comments
Early Blight **(continued)**	Several mancozeb formulations (e.g., Dithane®, Manzate®, Penncozeb®) are labeled for use at various rates.	14-day PHI.
	Maneb® or Manex® at 0.8-1.6 qts. per acre for liquid formulations, or 1.5-2.0 lbs. per acre for dry formulations.	Begin when plants are 2-6 inches high. 14-day PHI.
	Quadris 2.08SC® at the following rates: **7-day spray intervals:** 6.0 fl. oz. per acre. **14-day spray intervals:** 12.4 oz. per acre.	Do not make more than 1 application of Quadris® before alternating to a fungicide with a different mode of action, such as Bravo®, Dithane®, Rovral®, or Super Tin®. 14-day PHI.
	Quadris Opti® at 1.6 pts. per acre.	Do not make more than 1 application of Quadris Opti® before alternating to a fungicide not in group 11. 14-day PHI.
	Reason® at 5.5-8.2 oz. per acre.	Do not make more than 1 application of Reason® before alternating to a fungicide with a different mode of action. 14-day PHI.
	Revus Top 2.08SC® at 5.5-7 fl. oz. per acre.	Adjuvant recommended. 1-day PHI.
	Rovral® at 1-2 pts. per acre for flowable formulations.	14-day PHI.
	Scala® at 7 oz. per acre.	Use Scala® only in a tank mix with another effective early blight fungicide. 7-day PHI.
	Super Tin 80WP® at 2.5-3.75 oz. per acre, or Super Tin 4L® at 4-6 fl. oz per acre.	Lower Super Tin® rates may be used if combined with another fungicide labeled for early blight. 7-day PHI. **RUP**.
	Tanos 50WDG® at 6 oz. per acre.	Tanos® must be tank-mixed with another fungicide with a different mode of action. Do not make more than 1 application before alternating to a contact (protectant) fungicide. 14-day PHI.
Fusarium Dry Rot	Mertect 340-F® at 0.42 oz. per 2,000 lbs. of tubers. Treat potatoes as they go into storage.	This product should be applied uniformly as a fine mist. Avoid bruising at harvest. Cure potatoes in storage at 60°F before lowering temperature. Provide adequate ventilation.
Late Blight	Destroy all potato cull piles.	
	Acrobat 50WP® at 4-6.4 oz. per acre.	4-day PHI.
	Amistar 80WP® at 4 oz. per acre.	Apply Amistar® on a 7-day preventative schedule. If late blight symptoms develop or conditions favor disease, switch to a non-group 11 fungicide and use a 5-day schedule. 14-day PHI.
	Several chlorothalonil formulations (e.g., Bravo®, Echo®, Equus®) are labeled for use at various rates.	7-day PHI.
	Curzate 60DF® at 3.2 oz. per acre.	Use only in combination with a labeled contact fungicide. 14-day PHI.
	Forum 4.18SC® at 4-6 fl. oz. per acre.	4-day PHI.
	Gavel 75DF® at 1.5-2 lbs. per acre.	Use a 5-7-day schedule when disease pressure is high. When disease pressure is low use a 7-10-day schedule. 14-day PHI.
	Gem 500SC® at 3.8 oz. per acre, or Gem 25WDG® at 8 oz. per acre.	Tank mix Gem® with a contact fungicide (use 75% of contact fungicide rate). Do not make more than 1 application of Gem® before alternating to a fungicide with a different mode of action. 7-day PHI.
	Headline® at 6-12 oz. per acre.	Do not make more than 1 application of Headline® before alternating to a fungicide with a different mode of action. 3-day PHI.

Diseases Controlled	Treatment	Comments
Late Blight **(continued)**	Several mancozeb formulations (e.g., Dithane®, Manzate®, Penncozeb®) are labeled for use at various rates.	14-day PHI
	Maneb® or Manex® at 0.8-1.6 qts. per acre for liquid formulations, or at 1.5-2.0 lbs. per acre for dry formulations.	Begin when plants are 2-6 inches high. 14-day PHI
	Omega 500F® at 5.5 oz. per acre.	Start applications when plants are 6-8 inches tall. May be effective when used in rotation with other pesticides labeled for late blight. 14-day PHI.
	Quadris 2.08SC® at 12 fl. oz. per acre.	Use on a 7-day schedule prior to late blight development. If late blight develops, switch to a non-group 11 fungicide and a 5-day spray schedule. 14-day PHI.
	Quadris Opti® at 1.6 pts. per acre.	Do not make more than 1 application of Quadris Opti® before alternating to a fungicide not in group 11. 14-day PHI.
	Ranman 400SC® at 1.4-2.75 fl oz per acre.	7-day PHI.
	Reason® at 5.5-8.2 oz. per acre.	Do not make more than 1 application of Reason® before alternating to a fungicide with a different mode of action. 14-day PHI.
	Revus Top 2.08SC® at 5.5-7 fl. oz. per acre.	Adjuvant recommended. 1-day PHI.
	Ridomil Gold Bravo® at 2.5 pts. per acre, or Ridomil Gold MZ® at 2.5 lbs. per acre.	Do not apply more than once before alternating to a fungicide with a different mode of action. 14-day PHI.
	Super Tin 80WP® at 2.5-3.75 oz. per acre, or Super Tin 4L® at 4-6 fl. oz. per acre.	Lower Super Tin® rates may be used if combined with another fungicide labeled for early blight. 7-day PHI. **RUP.**
	Tanos 50 WDG® at 6-8 oz per acre.	14-day PHI.
Rhizoctonia Canker	Avoid heavily infested fields, and plant uncontaminated seed tubers.	
Scab	Plant resistant varieties.	Maintain high moisture levels (near field capacity) during tuber set and enlargement. Do not apply manure or other organic matter immediately before planting. Avoid excessive liming, and maintain acid soil pH.
	Follow 3-4 year rotation schedule.	
Verticillium Wilt	Employ at least a 2-year rotation with small grains to manage fungus populations in the soil.	Good weed control also is important in reducing pathogen populations.
Virus Diseases and Purple-Top Wilt (Aster Yellows)	Plant only certified seed tubers.	Practice clean cultivation. Rogue first infected plants, including tubers.
	Control aphids and leafhoppers with insecticides.	
Root Knot and Lesion Nematodes	Methyl bromide, sodium methyl dithiocarbamate, or Vydate L®.	Sample fields during growing season for parasitic nematodes before planting. Avoid fields with high numbers of root knot and/or lesion nematodes. Methyl bromide and sodium methyl dithiocarbamate give best results when nematode populations are moderate to high. Vydate® gives adequate control when nematode populations are low to moderate. **Vydate® and methyl bromide formulations are RUPs.**

Weed Control

Weeds Controlled[1]	Treatment[2]	Comments
Annuals (emerged) — treatment applied before crop emergence or transplanting	Gramoxone Inteon 2L® at 1-2 pts. per acre, or Gramoxone Max 3L® at 0.7-1.3 pts. per acre.	Use 1 qt. of COC or 4-8 fl. oz. of nonionic surfactant per 25 gallons of spray solution. Apply before planting, or after planting but before ground cracks. **RUP.**
Annuals and Perennials (emerged) — crop not present or protected from spray	Glyphosate products at 0.75-2.75 lbs. acid equivalent (ae) per acre. Use formulations containing 3 lbs. ae/gal. (4 lbs. isopropylamine salt/gal.) at 1-5 qts. per acre, or formulations containing 4.5 lbs. ae/gal. (5 lbs. potassium salt/gal.) at 0.66-3.3 qts. per acre.	Broadcast before planting, after planting before ground cracks, or apply between crop rows with wipers or hooded or shielded sprayers. Use low rate for annuals and higher rates for perennials. See label for suggested application volume and adjuvants. 14-day PHI.
Broadleaves (emerged) — crop not present or protected from spray	Aim EC® at 0.5-2 fl. oz. per acre.	Apply prior to or within 24 hours of planting, or apply between crop rows with hooded sprayer. Do not allow spray to contact crop. Use COC or nonionic surfactant. Weeds must be actively growing and less than 4 inches tall. Do not exceed 6.1 fl. oz. per acre per season.
Some Broadleaf Weeds (not emerged)	Chateau 51WDG® at 1.5 oz. per acre to soil covered potato. **Minnesota only.**	Apply to potatoes after hilling. A minimum of 2 inches of soil must cover vegetative plant parts when applied to avoid injury. Provides suppression of lambsquarters, nightshades, pigweeds, wild mustard, and wild radish. Tank-mixes recommended to improve efficacy. No PHI listed.
Broadleaves and Grasses (not emerged)	Dual Magnum® or Dual II Magnum® at 1-2 pts. per acre.	Use lower rates on coarse soils. Apply and incorporate before planting, or apply after planting before weeds emerge. May also be applied at 1.67 pts. per acre after hilling. Dual® might delay maturity and/or reduce yield of Superior and other early maturing varieties if cold, wet soil conditions occur after treatment. Dual® can be tank-mixed with Lorox®, Sencor®, Prowl® or Eptam®. See labels. Do not exceed 3.6 pts. per acre. 60-day PHI if applied before drag-off. 40-day PHI if applied at lay-by.
	Eptam 7E® at 3.5-7 pts. per acre, or Eptam 20G® at 15-20 lbs. per acre.	Apply before planting, after drag-off, or as directed spray at lay-by. Incorporate immediately. On muck soils, supplement with Lorox®/Linex® or Sencor® applied before crop emerges and after drag-off. The Superior variety may be sensitive. Suppresses nutsedge. 45-day PHI.
	Outlook® at 12-21 fl. oz. per acre.	Apply after planting or drag-off and before weeds emerge. In cold and wet conditions potatoes may emerge slowly or be stunted. May be tank-mixed with a number of other potato herbicides. 40-day PHI.
	Pendimethalin products. Use 3.3EC formulations at 1.2-3.6 pts. per acre or Prowl H_2O® at 1.5-3 pts. per acre.	Use low rates on coarse soils. Broadcast after planting but before emergence or drag-off, or after potatoes have fully emerged before potatoes are 6 in. tall. May be incorporated. Not effective on muck soils. Do not apply postemergence to stressed potatoes.
	Trifluralin products at 0.5-1 lb. a.i. per acre. Use 4EC formulations at 1-2 pts. per acre, or 60DF formulations at 0.8-1.7 lbs. per acre.	Use low rate on soils with less than 2% organic matter. Broadcast and incorporate after planting but before emergence, immediately after drag-off, or after potatoes have fully emerged. Not effective on muck or high organic matter soils.
Grasses (not emerged)	Dacthal W-75® at 6-14 lbs. per acre, or Dacthal Flowable® at 6-14 pts. per acre.	Apply at planting, drag-off, or layby. Preplant incorporation not recommended.

Weeds Controlled[1]	Treatment[2]	Comments
Broadleaves and Grasses (not emerged and newly emerged)	Lorox 50DF® at 1.5-3 lbs. per acre, or Linex 4L® at 1.5-4 pts. per acre.	Do not use on sand, loamy sand, or soils with less than 1% organic matter. Apply after planting but before crop emergence, when weeds are less than 2 in. tall. Seed pieces must be planted at least 2 in. deep.
	Matrix 25DF® at 1-1.5 oz. per acre.	Use 0.5 pt. of nonionic surfactant per 25 gallons of spray solution if emerged weeds are present. Apply after planting before crop emerges, at hilling, drag-off, or reservoir tillage, to a clean, newly prepared seedbed. Apply post when weeds are less than 1 in. tall. Avoid using adjuvants when potatoes are under heat stress. Do not exceed 2.5 oz. per acre per year. 60-day PHI.
Broadleaves and Grasses (not emerged), and Broadleaves (newly emerged)	Sencor 4F® at 0.5-2 pts. per acre, or Sencor 75DF® at 0.33-1.32 lbs. per acre. **Not for early-maturing or red-skinned varieties.**	Apply after planting before crop emerges, or apply up to 1 pt. of Sencor 4F® (1.32 lbs. of Sencor 75DF®) after emergence. Check label for sensitive varieties. Avoid spraying when potatoes are 12-15 in. tall. Do not apply within 3 days of cool, wet, or cloudy weather, or crop injury may occur. Do not apply within 1 day of other pesticide applications. Do not exceed 2 pts. of Sencor 4F® or 1.32 lbs. of Sencor 75DF® per acre per year. 60-day PHI.
Grasses (emerged)	Poast 1.5E® at 1-2.5 pts. per acre.	Use 1 qt. of COC per acre. Spray on actively growing grass. Use high rate on quackgrass. Do not exceed 5 pts. per acre per season. 30-day PHI.
	Prism 0.94EC® at 12.8-34 fl. oz. per acre.	Use 1 qt. of COC per 25 gallons of spray solution (1% v/v). Spray on actively growing grass. Wait at least 14 days between applications. 30-day PHI.
	Select Max® at 12-32 fl. oz. per acre, or Select 2EC® at 6-16 fl. oz. per acre.	

[1]For specific weeds controlled by each herbicide, check Table 19 on page 37.

[2]Rates given are for overall coverage. For band treatment, reduce amounts according to the portion of acre treated.

Insect Control

Insect Controlled	Treatment	Comments
Aphids (Green Peach Aphid, Melon Aphid, Potato Aphid, and others)	Conserve natural enemies.	Limiting insecticide use will conserve predators and parasites that help control aphid populations.
	Seed applied or seed piece treatment materials	
	Admire PRO® at 5.7-8.7 fl. oz. per acre.	Apply directly to seed piece or below seed piece at planting. Can expect 70-90 days of control. Do not exceed 0.31 lb. a.i. per acre per season.
	Cruiser 5FS® or Cruiser Maxx®. Rates vary according to seeding rate and row spacing. See labels.	For best results plant potatoes immediately after treatment.
	Platinum 2SC® at 5-8 fl. oz. per acre, or Platinum Ridomil Gold® at 2.2 fl. oz. per 1,000 linear ft. of row.	Apply directly to seed piece in sufficient water to cover entire seed piece. Do not exceed 8 fl. oz. of Platinum 2SC®, or 38 fl. oz. of Platinum Ridomil Gold® per acre per season. Can expect 90-100 days control.
	Foliar applied materials	
	Actara® at 3 oz. per acre.	Do not exceed 6 oz. per acre per season. 14-day PHI.
	Assail 70WP® at 1-1.7 oz. per acre.	Do not exceed 4 applications per year. 7-day PHI.
	Dimethoate 400® or Dimethoate 4E® at 0.5-1 pt. per acre, or Dimethoate 2.67EC® at 0.75-1.5 pts per acre.	0-day PHI for Dimethoate 400® and Dimethoate 2.67EC®. 2-day PHI for Dimethoate 4E®.
	Endosulfan 3EC® at 0.66-1.33 qts. per acre.	Do not exceed 4 qts. per acre per season. 1-day PHI.

Insect Controlled	Treatment	Comments
Aphids (Green Peach Aphid, Melon Aphid, Potato Aphid, and others) **(continued)**	Fulfill® at 2.75-5.5 oz. per acre.	Requires up to 7 days to see results. Best control achieved with more than 10 gallons of water per acre. Do not exceed 5.5 oz. per acre per season. 14-day PHI.
	Lannate SP® at 0.5-1 lb. per acre.	Do not exceed 4.5 lbs. a.i. per acre per season. 6-day PHI. **RUP.**
	Leverage 2.7SE® at 3-3.8 fl. oz. per acre.	Do not use if Admire® was used at planting. Do not exceed 15 fl. oz. per acre per season. 7-day PHI. **RUP.**
	M-Pede® at 1-2% by volume.	Must contact aphids to be effective. 0-day PHI.
	Monitor 4® at 1.5-2 pts. per acre. **Not for melon aphids.**	Do not exceed 8 pts. per acre per season. 14-day PHI. **RUP.**
	Provado 1.6F® at 3.8 fl. oz. per acre.	Do not use if Admire® was used at planting. Do not exceed 15 fl. oz. per acre per season. Allow 7 days between treatments. 7-day PHI.
	Thimet 20G® at the following rates: **Light or sandy soils:** 8.5-11.3 oz. per 1,000 linear ft. of row for any spacing (minimum 32 in. spacing). **Heavy or clay soils:** 13.0-17.3 oz. per 1,000 linear ft. of row.	Apply as a band application on each side of row and beneath the soil surface, or in the seed furrow. 90-day PHI. **RUP.**
	Vydate C-LV® at 17-33 fl. oz. per acre, or Vydate L® at 2-4 pts. per acre.	Do not exceed 198 fl. oz. of Vydate C-LV® or 24 pts. of Vydate L® per acre per season. 7-day PHI. **RUP.**
Colorado Potato Beetles	Crop rotation.	Planting fields as far as possible from last year's potato fields will reduce potato beetle damage.
Allowable Defoliation From Colorado Potato Beetles **Preflowering:** 20-30% **Flowering:** 5-10% **Tuber Formation:** 30% **Manage Resistance** *See Colorado Potato Beetle Resistance Management on page 137.*	Scouting.	Regular (weekly) field scouting will allow you to determine the necessity for, and improve the timing of, insecticide treatments.
	Soil applied or seed piece treatments	
	Admire PRO® at 5.7-8.7 fl. oz. per acre.	Apply directly to seed piece or below seed piece at planting. Can expect good control of first generation potato beetle and 70-90 days of aphid control. Do not exceed 0.31 lb. a.i. per acre per season.
	Cruiser 5FS® or Cruiser Maxx®. Rates vary according to seeding rate and row spacing. See labels.	For best results plant potatoes immediately after treatment.
	Platinum® at 5-8 fl. oz per acre, or Platinum Ridomil Gold® at 2.2 fl. oz. per 1,000 linear ft. of row.	Apply directly to seed piece in sufficient water to cover entire seed piece. Provides seasonlong control of potato beetles and aphids at higher label rates. Do not exceed 8.0 fl. oz. of Platinum 2SC®, or 38 fl. oz. of Platinum Ridomil Gold® per acre per season.
	Provado 1.6F® at 3.8 fl. oz. per acre.	Do not use if Admire® was used at planting. Do not exceed 15 fl. oz. per acre per season. Allow 7 days between treatments. 7-day PHI.
	Thimet 20G® at the following rates: **Light or sandy soils:** 8.5-11.3 oz. per 1,000 linear ft. of row for any spacing (minimum 32 in. spacing). **Heavy or clay soils:** 13.0-17.3 oz. per 1,000 linear ft. of row.	Apply as a band application on each side of row and beneath the soil surface or in the seed furrow. 90-day PHI. **RUP.**
	Vydate C-LV® at 8.5-33 fl. oz. per acre, or Vydate L® at 1-4 pts. per acre.	Do not exceed 198 fl. oz. of Vydate C-LV® or 24 pts. of Vydate L® per acre per season. 7-day PHI. **RUP.**
	Foliar applied products	
	Actara® at 1.5-3 oz. per acre.	Do not exceed 6 oz. per acre per season. 14-day PHI.
	Agri-Mek 0.15EC® at 8-16 fl. oz. per acre.	Do not exceed 32 fl. oz. per acre per season. 14-day PHI. **RUP.**

Insect Controlled	Treatment	Comments
Colorado Potato Beetles **(continued)** **Allowable Defoliation From Colorado Potato Beetles** **Preflowering:** 20-30% **Flowering:** 5-10% **Tuber Formation:** 30% **Manage Resistance** *See Colorado Potato Beetle Resistance Management on page 137.*	Ambush 25W® at 3.2-12.8 oz. per acre.	Do not exceed 1.6 lbs. a.i. per acre per season. 14-day PHI. **RUP.**
	Asana XL® at 5.8-9.6 fl. oz. per acre.	Do not exceed 0.35 lb. a.i. per acre per season. 7-day PHI. **RUP.**
	Assail 70WP® at 0.6-1.7 oz. per acre.	Do not exceed 4 applications per year. 7-day PHI.
	Avaunt 30WDG® at 3.5-6.0 oz. per acre.	Do not exceed 24 oz. per acre per season. 7-day PHI.
	Baythroid® at 1.6-2.8 fl. oz. per acre.	Do not exceed 16.8 fl. oz. per acre per season. 0-day PHI. **RUP.**
	Endosulfan 3EC® at 0.67-1.33 qts. per acre.	Do not exceed 4 applications or 2.66 qts. per acre per season. 1-day PHI.
	Entrust® at 1-2 oz. per acre.	Do not exceed 6.5 oz. per acre per season. Observe resistance management restrictions. 7-day PHI.
	Epi-mek 0.15EC® at 8-16 fl. oz. per acre.	Do not exceed 32 fl. oz. per acre per season. 14-day PHI. **RUP.**
	Furadan 4F® at 1-2 pts. per acre.	Do not exceed 2 applications or 2 pts. per acre per year. Do not apply to foliage if Furadan® was used at planting. 14-day PHI. **RUP.**
	Kryocide® at 10-12 lbs. per acre.	Apply by air in 5-15 gallons of water per acre, or by ground in 25-100 gallons of water per acre at a minimum of 7-day intervals. Do not exceed 96 lbs. per acre per season. 0-day PHI.
	Leverage 2.7SE® at 3-3.8 fl. oz. per acre.	Do not use if Admire® was used at planting. Do not exceed 15 fl. oz. per acre per season. 7-day PHI. **RUP.**
	Monitor 4® at 1.5-2 pts. per acre.	Do not exceed 8 pts. per acre per season. 14-day PHI. **RUP.**
	Mustang Max® at 1.76-4 fl. oz. per acre.	Do not exceed 0.3 lb. a.i. per acre per season. 1-day PHI.
	Novodor® at 1-3 qts. per acre. **Small Colorado potato beetle larvae only.**	*Bacillus thuringiensis* based insecticide. 0-day PHI.
	Platinum 2SC® at 5-8 fl. oz. per acre, or Platinum Ridomil Gold® at 2.2 fl. oz. per 1,000 linear ft. of row.	Apply directly to seed piece in sufficient water to cover entire seed piece. Do not exceed 8 fl. oz. Platinum 2SC®, or 38 fl. oz. Platinum Ridomil Gold® per acre per season. Can expect 90-100 days control.
	Pounce 25WP® at 6.4-12.6 oz. per acre.	Do not exceed 1.6 lbs. a.i. per acre per season. 14-day PHI. **RUP.**
	Prokil Cryolite 96® at 10-12 lbs. per acre, or Prokil Cryolite 50D® at 19-23 lbs. per acre.	Apply by air in 5-15 gallons of water per acre, or by ground in 25-100 gallons of water per acre at a minimum of 7-day intervals. Do not exceed 96 lbs. of Prokil Cryolite 96® per acre per season. Do not exceed 184 lbs. Prokil Cryolite 50D® per acre per season. 0-day PHI.
	Provado 1.6F® at 3.8 fl. oz. per acre.	Do not use if Admire® was used. Do not exceed 15 fl. oz. per acre per season. Allow 7 days between applications. 7-day PHI.
	Rimon 0.83EC® at 9-12 fl. oz. per acre.	Do not exceed 24 fl. oz. per acre. 14-day PHI.
	Sevin XLR PLUS® at 1-2 qts. per acre.	Do not exceed 6 qts. per acre per crop. 7-day PHI.
	SpinTor 2SC® at 3-6 fl. oz. per acre.	Do not exceed 21 fl. oz. per acre per season. Observe resistance management restrictions. 7-day PHI.
	Warrior® at 2.56-3.85 fl. oz. per acre.	Do not exceed 15.36 fl. oz. per acre per season. 7-day PHI.

Insect Controlled	Treatment	Comments
Cutworms	Asana XL® at 5.8-9.6 fl. oz. per acre.	Do not exceed 0.35 lb. a.i. per acre per season. 7-day PHI.
	Baythroid® at 0.8-1.6 fl. oz. per acre.	Do not exceed 16.8 fl. oz. per acre per season. 0-day PHI. **RUP.**
	Lannate SP® at 0.5 lb. per acre.	Do not exceed 4.5 lbs. a.i. per acre per season. 6-day PHI. **RUP.**
	Leverage 2.7SE® at 3-3.8 fl. oz. per acre.	Do not use if Admire® was used at planting. Do not exceed 15 fl. oz. per acre per season. 7-day PHI. **RUP.**
	Monitor 4® at 1.5-2 pts. per acre.	Do not exceed 8 pts. per acre per season. 14-day PHI. **RUP.**
	Sevin XLR PLUS® at 1-2 qts. per acre.	Do not exceed 6 qts. per acre per crop. 7-day PHI.
	Warrior® at 1.92-3.20 fl. oz. per acre.	Do not exceed 15.36 fl. oz. per acre per season. 7-day PHI.
European Corn Borers	Avaunt 30WDG® at 3.5-6.0 oz. per acre.	Do not exceed 24 oz. per acre per season. 7-day PHI.
European Corn Borer Threshold 1 egg mass per 25 leaves	Baythroid® at 1.6-2.8 fl. oz. per acre.	Do not exceed 6 applications or 16.8 fl. oz. per acre per season. 0-day PHI. **RUP.**
	Endosulfan 3EC® at 1.0-1.33 qts. per acre.	Do not exceed 4 applications or 2.66 qts. per acre per season. 1-day PHI.
	Entrust® at 1-2 oz. per acre.	Do not exceed 9 oz. per acre per season. Observe resistance management restrictions.7-day PHI.
	Furadan 4F® at 1-2 pts. per acre.	Do not exceed 2 applications or 2 pts. per acre per season. Do not apply to foliage if Furadan® was used at planting. 14-day PHI. **RUP.**
	Leverage 2.7SE® at 3.0-3.8 fl. oz. per acre.	Do not use if Admire® was used at planting. Do not exceed 15 fl. oz. per acre per season. 7-day PHI. **RUP.**
	Monitor 4® at 1.5-2 pts. per acre.	Do not exceed 8 pts. per acre per season. 14-day PHI. **RUP.**
	Pounce 25WP® at 6.4-12.8 per acre.	Do not exceed 1.6 lbs. a.i. per acre per season. 14-day PHI.
	Rimon 0.83EC® at 9-12 fl. oz. per acre.	Do not exceed 24 fl. oz. per acre. 14-day PHI.
	Sevin XLR PLUS® at 1-2 qts. per acre.	Do not exceed 6 qts. per acre per crop. 7-day PHI.
	SpinTor 2SC® at 3-6 fl. oz. per acre.	Do not exceed 29 fl. oz. per acre per season. Observe resistance management restrictions.7-day PHI.
	Warrior® at 2.56-3.85 fl. oz. per acre.	Do not exceed 15.36 fl. oz. per acre per season. 7-day PHI.
Flea Beetles	Actara®, Admire®, Asana®, Ambush®, Baythroid®, Endosulfan®, Furadan®, Kryocide®, Leverage, Monitor®, Platinum®, Pounce®, Provado, or Vydate® as described for Colorado potato beetles.	Be sure to check PHI on product labels.
Flea Beetle Threshold 2 per sweep	Cruiser 5FS® or Cruiser Maxx®. Rates vary according to seeding rate and row spacing. See labels.	For best results, plant potatoes immediately after treatment.
	Lannate SP® at 0.5 lb. per acre.	Do not exceed 4.5 lbs. a.i. per acre per season. 6-day PHI. **RUP.**
	Sevin XLR PLUS® at 1-2 qts. per acre.	Do not exceed 6 qts. per acre per crop. 7-day PHI.

Insect Controlled	Treatment	Comments
Flea Beetles **(continued)** **Flea Beetle Threshold** 2 per sweep	Thimet 20G® at the following rates: **Light or sandy soils:** 8.5-11.3 oz. per 1,000 linear ft. of row for any spacing (minimum 32 in. spacing). **Heavy or clay soils:** 13.0-17.3 oz. per 1,000 linear ft. of row.	Apply as a band application on each side of row and beneath the soil surface or in the seed furrow. 90-day PHI. **RUP.**
	Warrior® at 2.56-3.85 fl. oz. per acre.	Do not exceed 15.36 fl. oz. per acre per season. 7-day PHI.
Potato Leafhoppers	**Soil applied or seed piece treatment materials**	
	Admire PRO® at 5.7-8.7 fl. oz. per acre.	Apply directly to seed piece or below seed piece at planting. Can expect 40-50 days of control. Do not exceed 0.31 lb. a.i. per acre per season.
	Cruiser 5FS® or Cruiser Maxx®. Rates vary according to seeding rate and row spacing. See labels.	For best results, plant potatoes immediately after treatment. **RUP.**
	Furadan 4F® at 1-2 pts. per acre.	Do not exceed 2 applications or 2 pts. per acre per year. 14-day PHI.
	Platinum 2SC® at 5-8 fl. oz. per acre, or Platinum Ridomil Gold® at 2.2 fl. oz. per 1,000 linear ft. of row.	Apply directly to seed piece in sufficient water to cover entire seed piece. Do not exceed 8 fl. oz. of Platinum 2SC®, or 38 fl. oz. of Platinum Ridomil Gold® per acre per season. Can expect 90-100 days control.
	Thimet 20G® at the following rates: **Light or sandy soils:** 8.5-11.3 oz. per 1,000 linear ft. of row for any spacing (minimum 32 in. spacing). **Heavy or clay soils:** 13.0-17.3 oz. per 1,000 linear ft. of row.	Apply as a band application on each side of row and beneath the soil surface or in the seed furrow. 90-day PHI. **RUP.**
	Foliar applied materials	
	Actara® at 1.5-3 oz. per acre.	Do not exceed 6 oz. per acre per season. Control may require 2 applications at a 7-10 day interval. 14-day PHI.
	Ambush 25W® at 6.4-12.6 oz. per acre.	Do not exceed 1.6 lbs. a.i. per acre per season. 14-day PHI. **RUP.**
	Asana XL® at 5.8-9.6 fl. oz. per acre.	Do not exceed 0.35 lb. a.i. per acre per season. 7-day PHI. **RUP.**
	Assail 70WP® at 0.6-1.7 oz. per acre.	Do not exceed 4 applications per year. 7-day PHI.
	Baythroid® at 0.8-1.6 fl. oz. per acre.	Do not exceed 16.8 fl. oz. per acre per season. 0-day PHI. **RUP.**
	Dimethoate 400® or Dimethoate 4E® at 0.5-1 pt. per acre, or Dimethoate 2.67EC® at 0.75-1.5 pts per acre.	0-day PHI for Dimethoate 400® and Dimethoate 2.67EC®. 2-day PHI for Dimethoate 4E®.
	Endosulfan 3EC® at 0.66-1.33 qts. per acre.	Do not exceed 4 applications or 2.66 qts. a.i. per acre per season. 1-day PHI.
	Furadan 4F® at 1-2 pts. per acre.	Do not make more than 2 foliar applications per season. Do not apply to foliage if Furadan® was used at planting. 14-day PHI. **RUP.**
	Lannate SP® at 0.5-1 lb. per acre.	Do not exceed 4.5 lbs. a.i. per acre per season. 6-day PHI. **RUP.**
	Leverage 2.7SE® at 3.0-3.8 fl. oz. per acre.	Do not use if Admire® was used at planting. Do not exceed 15 fl. oz. per acre per season. 7-day PHI. **RUP.**
	Monitor 4® at 1.5-2 qts. per acre.	Do not exceed 8 pts. per acre per season. 14-day PHI. **RUP.**
	Mustang Max® at 1.76-4 fl. oz. per acre.	Do not exceed 0.3 lb. a.i. per acre per season. 1-day PHI.
	Pounce 25WP® at 6.4-12.6 oz. per acre.	Do not exceed 1.6 lbs. a.i. per acre per season. 14-day PHI. **RUP.**

Insect Controlled	Treatment	Comments
Potato Leafhoppers **(continued)**	Provado 1.6F® at 3.8 fl. oz. per acre.	Do not use if Admire® was used at planting. Do not exceed 15 fl. oz. per acre per season. Allow 7 days between treatments. 7-day PHI.
	Sevin XLR PLUS® at 0.5-1 qts. per acre.	Do not exceed 6 qts. per acre per crop. 7-day PHI.
	Vydate C-LV® at 17-33 fl. oz. per acre, or Vydate L® at 2-4 pts. per acre.	Do not exceed 198 fl. oz. of Vydate C-LV® or 24 pts. of Vydate L® per are per season. 7-day PHI. **RUP.**
	Warrior® at 2.56-3.85 fl. oz. per acre.	Do not exceed 15.36 fl. oz. per acre per season. 7-day PHI.
Wireworms	Site selection.	Wireworms are most likely to be a problem in fields recently planted to sod or pasture, or in fields that have had a grassy weed problem.
	Sampling.	Check for the presence of wireworms by burying a potato 6 inches deep in 5 locations per field prior to planting. Mark the spots with flags. Dig up the potatoes and inspect for wireworms 7 days later.
	Admire PRO® at 5.7-8.7 fl. oz. per acre.	Apply directly to seed piece or below seed piece at planting. Can expect 70-90 days of control. Do not exceed 0.31 lb. a.i. per acre per season.
	Cruiser 5FS® or Cruiser Maxx®. Rates vary according to seeding rate and row spacing. See labels.	For best results plant potatoes immediately after treatment.
	Thimet 20G® before or at time of planting at the following rates: **Light or sandy soils:** 8.5-11.3 oz. per 1,000 linear ft. of row for any spacing (minimum 32 in. spacing). **Heavy or clay soils:** 13.0-17.3 oz. per 1,000 linear ft. of row.	No effective treatment after planting. Treatment at planting may only provide 65% control. Apply as a band application on each side of row and beneath the soil surface, or in the seed furrow. 90-day PHI. **RUP.**

Early blight of potatoes can be managed by crop rotation, fall tillage, and a combination of contact and systemic fungicides.

Colorado Potato Beetle Resistance Management

In some areas of the Midwest, Colorado potato beetle populations are resistant to many insecticides. If a previously effective insecticide is no longer effective, consider switching to another chemical class. If insecticides are still effective, alternating between classes will help prolong their effective lives. If planting time applications of neonirotinoids (Admire®, Gaucho®, Genesis®, Platinum®) are used, foliar neonirotinoids (Actara®, Leverage®, Provado®) should not be used.

The following table shows the active ingredients and chemical classes of Colorado potato beetle insecticides, and should be used to make resistant management decisions. To avoid promoting insect resistance, make sure to rotate between products that have different Insecticide Resistance Action Committee (IRAC) Group Numbers.

Insecticide	Active Ingredient	Chemical Class	IRAC Group Number
Actara®	thiamethoxam	neonicotinoid	4A
Platinum®	thiamethoxam	neonicotinoid	4A
Admire®	imidacloprid	neonicotinoid	4A
Genesis®	imidacloprid	neonicotinoid	4A
Gaucho®	imidacloprid	neonicotinoid	4A
Provado®	imidacloprid	neonicotinoid	4A
Leverage®	imidacloprid + cyfluthrin	neonicotinoid + pyrethroid	4A + 3
Baythroid®	cyfluthrin	pyrethroid	3
Ambush®	permethrin	pyrethroid	3
Pounce®	permethrin	pyrethroid	3
Agri-Mek®	abamectin	GABA agonist	6
Epi-Mek®	abamectin	GABA agonist	6
Furadan®	carbofuran	carbamate	1A
Monitor®	methomidaphos	organophosphate	1B
Endosulfan®	endosulfan	cyclodiene	2A
Kryocide®, Cryolite®	sodium aluminofluoride	mineral	9A
M-Trak®, Novodor®, Raven®	*Bacillus thuringiensis*	bacterium	11C
Entrust®	spinosad	naturalyte	5
SpinTor®	spinosad	naturalyte	5
Warrior®	lambda cyhalothrin	pyrethroid	3