

Potato Seed Treatment

Chemical	Application	Dosage ¹	Disease Control ²		Remarks
			Fungi ³	Bacteria ⁴	
Azoxystrobin (11) Dynasty, 9.6%	Water-based slurry	0.10-3.75 fl oz/cwt	X		For suppression of black scurf and stem canker and seed-borne black dot, and for protection against silver scurf.
Fenamidone (11) Reason, 44.4%	Diluted spray slurry	0.15 fl oz/cwt	X		For protection against seed-borne late blight. Do not apply in more than 2.5 fl oz of total slurry per 100 lbs of seed.
Fludioxonil (12) Maxim 0.5%	Dust	8.0 oz/cwt	X		Maxim and Maxim MZ are formulated as dusts to be applied to cut or single-drop seed before planting. Maxim products effectively suppress <i>Fusarium</i> dry rot seed decay, stem cankers and tuber black scurf caused by seed-borne <i>Rhizoctonia solani</i> and seed-borne <i>Helminthosporium solani</i> , the causal agent of silver scurf disease. Half rates are recommended for processing (fries).
Maxim 4FS	Liquid	0.04-0.08 fl oz/cwt	X		
Spirato 480FS 40.3%	Slurry	0.08 fl oz	X		
Dyna-Shield Fludioxonil, 40.3%	Slurry	0.08-0.16 fl oz/cwt	X		
Fludioxonil (12) + mancozeb (M3) Maxim MZ, 0.5%:9.6%	Dust	0.5 lb/cwt	X		
Fludioxonil (12) + Thiamethoxam Cruiser Maxx Potato 7.0%:28%	Liquid	0.19-0.27 fl oz/cwt rate depends on seeding rate	X		To aid in control of certain insects and <i>Fusarium</i> dry rot and other fungal diseases.
Fludioxonil (12) + Difenoconazole (3) + Sedaxane (7) + Thiamethoxam CruiserMaxx Vibrance Potato, 3.34%; 6.69%; 6.69%; 13.4%	Slurry or mix	0.5 fl oz/cwt	X		To aid in control of <i>Rhizoctonia</i> , <i>Fusarium</i> , <i>Helminthosporium</i> and certain insects.

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² X = product labeled for crop and disease; Blank = product not labeled for specific disease.

³ *Fusarium*, *Rhizoctonia solani* and *Helminthosporium solani*. These fungi cause dry rot, *Rhizoctonia* stem canker and silver scurf.

⁴ Includes *Erwinia*, cause of soft rot decay, and *Clavibacter*, cause of ring rot.

Potato Seed Treatment (continued)

Chemical	Application	Dosage ¹	Disease Control ²		Remarks
			Fungi ³	Bacteria ⁴	
Mancozeb (M4) Koverall, 75%	Slurry	1.25lb/50 gal water	X		For suppression of <i>Fusarium</i> dry rot, <i>Rhizoctonia</i> , seed-borne common scab and silver scurf. Only Mancozeb will reduce the spread of <i>Phytophthora infestans</i> , the cause of late blight, during seed-cutting operations. Dip seed pieces into mixture
Manzate Flowable, 37%	Slurry	1 qt/50 gal water	X		
Manzate Pros tick, 75%	Dust	1.25 lbs/50 gal water	X		
PSP 6%	Dust	1 lb/cwt	X		
PST Plus Bark 6%	Dust	1 lb/cwt	X		
Penncozeb 75%	Slurry	1 ¼ lbs/50 gal water	X		
Penncozeb 80 WP, 80%	Slurry	1.25 lb/50 gal water	X		
Roper DF Rainshield, 75%	Slurry		X		
Mancozeb (M4) + Flutolanil (7) Moncoat MZ, 6.0%: 1.5%	Dust	0.75-1lb/cwt	X		For suppression of <i>Rhizoctonia</i> and <i>Fusarium</i> dry rot seed decay. MZ added to suppress <i>Fusarium</i> dry rot seed decay.
Penflufen (7) + Prothioconazole (3) Emesto Silver 9.35%:1.68%	Diluted Spray Slurry	0.31 fl oz-cwt	X		For suppression of <i>Rhizoctonia solani</i> , black scurf, stem and stolon canker caused by seed-borne and soil-borne <i>Rhizoctonia</i> , silver scurf caused by <i>Helminthosporium solani</i> and seed piece rot caused by <i>Fusarium</i> . For added <i>Fusarium</i> protection apply a MZ product designed for potatoes. Do not apply more than 2.5 fl oz of total slurry per 100 lbs of seed.
Sedaxane (7) Vibrance, 43.7%	Slurry	0.05-0.08 fl oz/cwt	X		For suppression of black scurf, stem and stolon canker, and seed-borne silver scurf.
Thiophanate methyl (1) ST-Methyl 540 FS, 46.2%	Slurry	0.5-0.7 fl oz/cwt	X		For aiding the control of dry rot, black scurf and stem canker, and silver scurf

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³ *Fusarium*, *Rhizoctonia solani* and *Helminthosporium solani*. These fungi cause dry rot, *Rhizoctonia* stem canker and silver scurf.

⁴ Includes *Erwinia*, cause of soft rot decay, and *Clavibacter*, cause of ring rot.

Potato Soil Application

Chemical (Fungicide Group)	Application	Dosage ¹	Control of Rhizoctonia ²	Pythium Leak	Pink Rot	Remarks
<i>Bacillus subtilis</i> Strain QST 713 (44) Serenade ASO 1.34%	In-furrow at planting	2-6 fl qt/A	X			Apply as directed spray in the seed furrow and to the covering soil at planting for management of <i>Rhizoctonia</i>
Azoxystrobin (11) Quadris, 22.9% Satori, 22.9% Equation, 22.9% Tetraban, 22.9%	In-furrow spray	0.4-0.6 fl oz/1,000 ft. of row (5.8-8.7 fl oz/A with 36" rows)	X			Resistance statement 5 ³ . For control of black scurf (<i>Rhizoctonia solani</i>) and Silver scurf (<i>Helminthosporium solani</i>). Also controls black dot caused by <i>Colletotrichum coccodes</i> . Apply as in-furrow spray in 5-15 gal of water at planting.
Pyraclostrobin (11) Headline EC, 23.6% Headline SC, 22.3%	In-furrow spray	0.4-0.8 fl oz/1,000 ft. of row	X			Maximum application rate is 0.73 fl oz/1,000 feet of row.
Fluoxastrobin (11) Evito, 40.3%	In-furrow spray	0.16-0.24 fl oz/1,000 ft of row	X			For control of black scurf, silver scurf and black dot. Do not use more than 22.8 fl oz/acre per year.
Cyazofamid (21) Ranman 34.5%	In-furrow lay by	0.42 fl. oz/1,000ft row 2.75 fl oz/A in minimum of 20 gallons of finished spray solution			X	For additional control of Pink Rot.
Azoxystrobin(11)+ Mefenoxam (4) Quadris Ridomil Gold SL	In-furrow spray	0.82 fl oz/1,000 ft. of row	X	X	X	Maximum application rate of 1.5lb of azoxystrobin and 0.5 lb of mefenoxam products per acre per season.
Azoxystrobin (11) + Benzovindiflupyr (7) Elatus, 30.0%; 15.0%	In-furrow spray	0.34-0.5 oz/1,000 ft. of row	X			Also manages black dot and silver scurf. Do not apply more than 9.5 fl oz/A per year. PHI = 14 days.
Fluazinam (29) Omega 500F, 40%	In-furrow spray	1.5-3.0 pts/A				For suppression of Powdery Scab. Apply in- furrow over the seed piece immediately prior to covering over the seed piece with soil using at least 5 to 10 gpa. Use 1.5 pint per acre rate on fields with a history of low levels of powdery scab or with low numbers of spore balls present in the soil. Apply 3 pints per acre rate to fields with a history of moderate to heavy disease pressure or with moderate to high numbers of spore balls present in the soil. 24 c labels for use in Minnesota and North Dakota.

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³See fungicide resistance management statement on Pages 7-8.

Potato Soil Application (Continued)

Chemical (Fungicide Group)	Application	Dosage ¹	Control of Rhizoctonia ²	Pythium Leak	Pink Rot	Remarks
Flutolanil (7) Moncut, 70%	In-furrow	0.79-1.18 oz/1,000 ft. row of a 36 in row	X			
Fluxapyroxad (7)+ Pyraclostrobin (11) Priaxor 14.33%: 28.58%	In-furrow spray	0.48-0.6 fl oz/1,000 ft. row.	X			Resistance statement 5 and 6 ³ For 34-inch rows or less, use a maximum of 0.48 fl oz product per 1000 row feet
Penthiopyrad (7) Vertisan, 20.6%	In-furrow	0.7-1.6 fl oz/1,000 ft row	X			Maximum rate per acre per application is 24 fl oz.
Mefenoxam (4) Ridomil Gold EC or SL, 48%	6-8 inch band, in furrow or impregnated on dry fertilizer	0.42 fl oz /100 ft. of row		X	X	Resistance statement 4 ³ . For postharvest control of pythium leak and pink rot caused by <i>Phytophthora</i> <i>erythroseptica</i> .
Ultra Flourish, 25.1%		0.84 fl oz /100 ft. of row		X	X	
Platinum Ridomil Gold, 9%		2.2 fl oz /1,000 ft. row		X	X	Platinum Ridomil Gold contains 4.5% thiamethoxam for control of various potato insects.
Phosphites (33) Sodium (mono - and - dibasic) Potassium, and Ammonium Phosphites (33), Several products		check label			X	Apply in a band at planting directly over the seed pieces. For Pythium leak control, apply in combination with mefenoxam fungicide. Soil applications have not been shown to be efficacious with this fungicide. Foliar applications are recommended.

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³See fungicide resistance management statement on Pages 7-8.

Potato Foliar Sprays

Chemical (Fungicide Group)	Application ¹	Dosage ²	Disease Control ³		Remarks ⁴
			Late Blight	Early Blight	
SDHI Boscalid (7) Endura, 70%	Spray or fungigation	2.5-4.5 oz/a (EB) 5.5-10 oz/A (white mold)		X	Resistance statement 6 ⁵ . Recent NDSU Research has indicated that >90% of the <i>A. solani</i> is resistant to boscalid. 10-day PHI. Also controls <i>Sclerotinia</i> white mold and Botrytis. For white mold control, apply prior to infection generally just prior to row closure. For early blight control, apply prior to disease onset. Do not exceed 20 oz/A per season.
Penthiopyrad (7) Vertisan, 20.6%	Spray or fungigation	10-24 fl oz/A (early blight) 14-24 fl oz/A (white mold) 14-24 fl oz/A (black dot)		X	Resistance statement 6 ⁵ . Recent NDSU research demonstrated that >70% of <i>Alternaria solani</i> isolates are resistant to another FRAC 7 product, Boscalid, and over 50% of those isolates are also resistant to Penthiopyrad. Begin applications prior to disease development. Repeat applications every 7-14 days. For white mold, make initial application at full bloom. Do not exceed 72 fl oz/A per season and make no more than 2 sequential applications. PHI = 7 days
<i>Bacillus subtilis</i> strain QST 713 (44) Serenade ASO, 1.34%	Spray or fungigation	2-6 qt/A	X	X	Include in a multiple spray program for management of early blight.
Chlorothalonil (M5) Bravo WeatherStik, Equus 720, Echo 720, Praiz, Vabro or Chloronil 720, 54%	Spray or fungigation	0.75 pt/ A 1 st application. 1.0-1.5 pt/A subsequent applications	X	X	Do not apply more than 11.25 lb ai of chlorothalonil per acre per season (23 pt of 40.4%, 16 pt of 54%, 14.5 lb of 82.5%, 13 lb of 90%). Do not apply within 7 days of harvest. A 24 (C) state label has been granted to Echo 720, Echo ZN to allow up to 16 lb ai per acre per season for late blight control. Do not apply more than 16 lb ai of Bravo Zn, Bravo Weatherstik or Bravo ZN per season (30.5 pt Bravo Zn, 21.5 pt of Bravo Weatherstik or Bravo Weatherstik Zn). Bravo Ultrex has a maximum 10-day interval between applications for potato late blight control.
Bravo Ultrex DG, 82.5%	Spray or fungigation	0.7-1.4 lb/A	X	X	
Bravo Zn, Echo Zn or Terranil Zn, 38.5%	Spray or fungigation	1.0-2.13 pt/A	X	X	
Equus DF, 82.5%	Spray or fungigation	0.7 lb/A first application. 0.9-1.36 lb/A subsequent applications	X	X	
Echo 90 DF, 90%	Spray or fungigation	0.63-1.25 lb/A	X	X	
Orondis Opti B 54.0%	Spray or fungigation	0.75 pt/A 1 st application. 1.5 pt/A subsequent applications.	X	X	

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⁴Check the NDSU blight hotline, (888) 482-7286, for information on infection potential of early blight and late blight. Whenever late blight is severe, vine killing is extremely important and should be done at least 2 weeks before harvest to prevent tuber infections. Hilling of soil around the vines should be done just before killing them. ⁵See fungicide resistance management statement on Pages 7-8.

Potato Foliar Sprays (continued)

Chemical (Fungicide Group)	Application ¹	Dosage ²	Disease Control ³		Remarks ⁴
			Late Blight	Early Blight	
Chlorothalonil (M5) + Zoxamide (22) Zing! 40%, 6.8%	Spray or fungigation	32-34 fl oz/A	X	X	Apply on preventative schedule. Do not make more than 2 sequential applications before alternating with a fungicide that has a different mode of action. Do not make more than 8 applications or apply more than 1.52lb zoxamide and 8.8lb chlorothalonil per acre per season. Do not apply within 7 days of harvest.
SDHI + QoI Fluxapyroxad (7) + Pyraclostrobin (11) Priaxor 14.33%:28.58%	Spray or fungigation	4 to 8 fl oz/A	X	X	Resistance Statements 5 and 6 ⁵ Recent NDSU research demonstrated that >90% of <i>Alternaria solani</i> isolates are resistant to another FRAC 7 product, Boscalid, and greater than 50% of those isolates are also resistant to Fluxapyroxad. Also, >90% of <i>A. solani</i> isolates are resistant to pyraclostrobin Also for control of Black dot, Brown Spot and blackpit, and suppression of Botrytis gray mold. For suppression of late blight only Do not apply more than 3 applications or 24 fl oz/A per season. PHI=7 days.
Copper (M1) Basicop WP, 53% Champ DP, 57.6% Champ WG, 77% Champ Formula 2 Flowable, 37.5% Champlon++ 46.1% Cuprofix Ultra 40 Disperss 71.1% Kocide 2000, 53.8% Kocide 3000, 46.1% Kocide 4.5 LF, 37.5% MasterCop, 21.46% Badge X2, 45.31% Badge SC, 32.17%	Spray Spray or fungigation Spray or fungigation Spray or fungigation Spray or fungigation Spray or fungigation Spray or fungigation Spray or fungigation Spray or fungigation Spray or fungigation	3-6 lbs/A 0.66-2.66 lb/A 1-1 ½ lbs/A 0.66-2.66 pt/A 0.5-1.75 lb/A 0.75-3.0 lb/A 1.25-6lb/A 0.5-1.75 lb 0.66-2.66 pt/A 0.5-1.5 pt/A 0.5-1.75 lbs/A 1-4 pt/A	X X X X X X X X X X X X	X X X X X X X X X X X X	Do <u>not</u> apply Basicop through irrigation system. Coppers are not effective under high disease pressure. Control will be improved by tank mixing with other compatible registered fungicides.

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⁵See fungicide resistance management statement on Pages 7-8.

Potato Foliar Sprays (continued)

Chemical (Fungicide Group)	Application ¹	Dosage ²	Disease Control ³		Remarks ⁴
			Late Blight	Early Blight	
Copper Sulfate (M1) Blue Viking Star Glow Powder or Triangle Brand Copper Sulfate Instant Powder	Spray	10 lb/A			For application with Diquat desiccant to enhance vine desiccation and suppress late blight.
Cymoxanil (27) Curzate 60 DF, 60%	Spray or fungigation	3 1/3 oz/A	X		Must be tank-mixed with a protectant fungicide. Do not apply within 14 days of harvest.
Dimethomorph (40) Forum, 43.5%	Spray or fungigation	6 oz/A	X		Do not exceed 30 oz/A per season. Do not apply Forum alone; must be tank-mixed with fungicides other than mefenoxam or metalaxyl registered for late blight control. 4-day PHI.
Fluopyram (7) + Pyrimethanil (9) Luna Tranquility 11.3%:33.8%	Spray or fungigation	11.2 fl oz/A		X	Resistance statement 6 ⁵ . None of the currently known SDHI mutations of the pathogen causing early blight (<i>Alternaria solani</i>) that affect boscalid appear to affect fluopyram. Also effective against white mold, botrytis, brown spot, and black dot. Apply Luna Tranquility mid-season on a 7 to 14-day interval. For resistance management of early blight and improved late blight management mix Luna Tranquility with an EBDC or chlorothalonil. Do not apply more than 2 sequential applications or any Group 7 or 9 containing fungicide before rotating with a fungicide from a different group. PHI=7 days.
Fluazinam (29) Omega 500F, 40%	Spray or fungigation	5.5 fl oz/A for late blight 5.5-8 fl oz/A for white mold 1.5-3.0 pints/A in-furrow for powdery scab	X		Begin applications when conditions favor disease development. Repeat applications at 7-10 days. Do not apply more than 3.5 pts per acre per season. Do not apply within 14 days of harvest. Provides some tuber protection against late blight when used at the end of the season.
Iprodione (2) Rovral 4F, 41.6% Nevado 4F, 41.6% Meteor, 41.6%	Ground spray or fungigation	1-2 pt/A, early blight		X	Resistance statement 2 ⁵ . Rovral Nevado 4F also are labeled for control of white mold. Do not apply within 14 day of harvest. If pH of spray water is above 7.0, buffer it to pH 5.0-7.0.

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⁵See fungicide resistance management statement on Pages 7-8.

Potato Foliar Sprays (continued)

Chemical (Fungicide Group)	Application ¹	Dosage ²	Disease Control ³		Remarks ⁴
			Late Blight	Early Blight	
Mancozeb (M3) Dithane DF Rainshield NT, 75%	Spray or fungigation	0.5-2 lb/A	X	X	Do not apply within 14 days of harvest. Vine kill should occur 14 days before harvest. Do not apply more than 11.2 lb ai/A per season of total EBDC (mancozeb, maneb or metiram). We recommend that this product be used with an Integrated Pest Management Program.
Dithane F-45, 37%	Spray or fungigation	0.8-1.6 qt/A	X	X	
Dithane M-45, 80%	Spray or fungigation	1-2 lb/A	X	X	
Koverall, 75%	Spray or fungigation	1-2 lb/A	X	X	
Manex II, 37%	Spray or fungigation	0.8-1.6 qt/A	X	X	
Manzate ProStick, 75%	Spray or fungigation	1-2 lb/A	X	X	
Manzate Flowable, 37%	Spray or fungigation	1-2 lb/A	X	X	
Penncozeb, 80%	Spray or fungigation	1-2 lb/A	X	X	
Penncozeb DF, 75%	Spray or fungigation	1-2 lb/A	X	X	
Roper DF Rainshield, 75%	Spray or fungigation	1-2 lb/A	X	X	
Mancozeb (M3) + Copper (M1) Mankocide, 15.0%:46.1%	Spray or fungigation	1.5-5.0 lbs/A	X	X	Do not use within 3 days of harvest.
Mancozeb (M3) + Zoxamide (22) Gavel, 66.7%:8.3%	Spray or fungigation	1.5-2 lb/A	X	X	Do not apply within 14 days of harvest. Do not make more than 6 applications or apply more than 12 lbs (8 lbs active mancozeb + 1 lb active zoxamide) per acre per season. Provides some tuber protection against late blight when used at the end of the season.
Mancozeb (M3) + Chlorothalonil (M5) Elixir, 62.5%; 12.5%	Spray or fungigation	1.2-2.0 lbs/A	X	X	Do not apply with 14 days of harvest. Do not apply more than 18.0 lbs/A per season. Recommended that this product be used in an Integrated Management Program.
Mandipropamid (40) + Difenoconazole (3) Revus Top, 21.9%:21.9%	Spray or fungigation	5.5-7.0 fl oz/A	X	X	Begin applications before disease development and continue on 7- to 10-day intervals. Also controls black dot and brown spot. Do not make more than 2 applications before switching to a different mode of action. Do not apply within 14 days of harvest or apply more than 28 fl oz/season.

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⁵Mefenoxam provides average control of new mating types of the late blight fungus; it provides excellent control for mefenoxam-sensitive strains of the A1 mating type. Most late blight strains present since 1998 are resistant to mefenoxam.

⁶See fungicide resistance management statement on Pages 7-8.

Potato Foliar Sprays (continued)

Chemical (Fungicide Group)	Application ¹	Dosage ²	Disease Control ³		Remarks ⁴
			Late Blight	Early Blight	
Mefenoxam (4) + Chlorothalonil (M5) Ridomil Gold/Bravo WP, 4.5%:72% Ridomil Gold/Bravo Liquid	Spray or fungigation Spray or fungigation	2 lb/A 1 container/ 10 acres	X ⁵	X	Resistance statement 4 ⁶ . Do not apply Ridomil Gold/Bravo, Ridomil Gold/Bravo Liquid or Ridomil Gold/Copper within 14 days of harvest. For late blight control, begin applications when conditions are favorable for late blight, but before infection, and continue at 14-day intervals until threat of disease is over. To minimize the potential for resistance, do not make more than 3 applications. The full rate of a protectant fungicide should be applied between Ridomil applications, regardless of the Ridomil formulation used. See label for rotation restrictions: waiting period to plant after application of Ridomil (all formulations) is 0 days for dry beans, soybeans, potatoes and sugarbeets; 40 days for wheat, barley, and oats; 9 months for corn; and 12 months for all other crops. A minimum of two applications at 2 lb/A (flowering and 14 days later) for all Ridomil formulations will control A1 late blight tuber rot, <i>Pythium</i> leak and <i>Phytophthora erythroseptica</i> pink rot. For aerial applications a minimum of 5 gal/A spray volume is recommended.
Mefenoxam (4) + Copper Hydroxide (M1) Ridomil Gold/Copper WP, 5%:60%	Spray or fungigation	2.0 lb/A + 0.8 lb ai/A of maneb, mancozeb, metiram or chlorothalonil	X ⁵	X	
Mefenoxam (4) + Mancozeb (M3) Ridomil Gold MZ, 4%:64%	Spray or fungigation	2.5 lb/A	X ⁵	X	Resistance statement 4 ⁶ . Do not apply Ridomil Gold MZ within 14 days of harvest. For late blight control, begin applications when conditions are favorable for late blight, but before infection, and continue at 14-day intervals until threat of disease is over. To minimize the potential for resistance, do not make more than 3 applications. The full rate of a protectant fungicide should be applied between Ridomil applications, regardless of the Ridomil formulation used. See label for rotation restrictions: waiting period to plant after Ridomil application (all formulations) is 0 days for dry beans, soybeans, potatoes and sugar beets; 40 days for wheat, barley and oats; 9 months for corn and sweet corn; and 12 months for all other crops. Two applications (flowering and 14 days later) at 2.5 lb rate will control A1 late blight tuber rot, <i>Pythium</i> leak and <i>Phytophthora erythroseptica</i> pink rot. For aerial applications, minimum of 5 gal/A spray is recommended.

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⁵See fungicide resistance management statements on Pages 7-8.

Potato Foliar Sprays (continued)

Chemical (Fungicide Group)	Application ¹	Dosage ²	Late Blight Control ³	Early Blight Control ³	Remarks ⁴
Metconazole (3) Quash 50%	Spray or fungigation	2.5-4.0 fl oz/A		X	Also effective on black dot, brown spot, and white mold. Use in a tank mix with Chlorothalonil or Mancozeb. Do not apply more than 2 applications per season. PHI=1 day
Metiram (M3) Polyram 80 DF, 80%	Spray or fungigation	1.5-2 lb/A	X	X	Do not apply within 14 days of harvest. Vine kill should occur 14 days before harvest. Do not exceed 14 lbs/A per season. We recommend that this product be used with an Integrated Pest Management Program. See label for further restrictions.
Potassium Phosphite (33) + Chlorothalonil (M5) Catamaran	Spray or fungigation	4.0-5.5 pt/A	X	X	Also for pink rot. See label for application instructions. Do not apply more than 17 pts/A/season. Do not apply within 6 weeks of harvest.
Propamocarb (28) Previcur, 66.5%	Spray or fungigation	0.7 pt/A low disease risk 0.9 pt/A medium disease risk 1.2 pt/A high disease risk	X		Do not apply more than 6 pts of Previcur/acre/season. Do not apply within 14 days of harvest. Use in a tank mix with 0.9 lb ai/acre of chlorothalonil (1.2 pt/acre of Bravo Weatherstik or equivalent) or 1 lb ai mancozeb (1.25 lb/acre of Dithane M-45 or equivalent).
Pyrimethanil (9) Scala, 54.6%	Spray or fungigation	7 fl oz/A		X	Also effective against Botrytis. Use only in tank mix with protectant such as mancozeb and chlorothalonil. Do not apply more than 35 fl oz/A per season. Do not make more than 2 consecutive applications of Scala. PHI= 7 days.
Mandipropamid (40) Orondis Ultra B 23.3%	Spray or fungigation	8 fl oz/A	X		Begin applications prior to disease development. Make no more than 2 sequential applications of a group 40 fungicide. Do not apply more than 32 fl oz/A per season. PHI = 14 days.

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²Dosage = amount of formulated product to apply.

³X = product labeled for crop and disease; Blank = product not labeled for specific disease.

⁴Check the NDSU blight hotline, (888) 482-7286, for information on infection potential of early blight and late blight. Whenever late blight is severe, vine killing is extremely important and should be done at least 2 weeks before harvest to prevent tuber infections. Hilling of soil around the vines should be done just before killing them.

⁵See fungicide resistance management statements on Pages 7-8.

*Designates restricted-use pesticide.

Potato Foliar Sprays (continued)

Chemical (Fungicide Group)	Application ¹	Dosage ²	Disease Control ³		Remarks ⁴
			Late Blight	Early Blight	
Sodium (mono - and dibasic -), Potassium, and Ammonium Phosphites (33) Several products	Spray or fungigation	check label	X		Provides better control when alternated with other fungicides. Also provides suppression of storage rot diseases such as pink rot.
Thiophanate methyl (1) Topsin M WSB, or T-Methyl E-AG 70 WSB, 70%	Spray or fungigation	1-1.5 lbs/A			Resistance statement 1 ⁵ . Topsin M, Topsin 4.5 FI acre, Incognito 4.5F, Incognito 85 WDG, and Thiophanate methyl WDG are labeled for white mold control in potatoes.
Topsin 4.5 FL, 45% or T-Methyl E-AG 4.5F, Cercobin, 41.3%	Spray or fungigation	20-30 fl oz/A			
Thiophanate Methyl 85 WDG, 85% Incognito 85 WDG, 85%	Spray or fungigation	0.8-1.2 lb/A			
Incognito 4.5F, 46.2%	Spray or fungigation	20-30 fl oz/A			
Oxathiapiprolin (U15) Orondis Opti A 10.2%	Spray or fungigation	1.6-4.8 fl oz/A	X		Use higher rates when disease is present, for longer application intervals or for susceptible varieties. Do not exceed 27.2 fl oz/A per year. PHI = 5 days.
Orondis Ultra A 10.2%	Spray or fungigation	1.6-4.8 fl oz/A	X		

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⁴Check the NDSU blight hotline, (888) 482-7286, for information on infection potential of early blight and late blight. Whenever late blight is severe, vine killing is extremely important and should be done at least 2 weeks before harvest to prevent tuber infections. Hilling of soil around the vines should be done just before killing them.

⁵See fungicide resistance management statements on Pages 7-8.

***Designates restricted-use pesticide**

Potato Foliar Sprays (continued)

Chemical (Fungicide Group)	Application ¹	Dosage ²	Disease Control ³		Remarks ^{4,5}
			Late Blight	Early Blight	
QoIs					
Azoxystrobin (11) Quadris, 22.9% Satori, 22.9% Equation, 22.9% Tetraban, 22.9%	Spray or fungigation	6.0-15.5 fl oz/A	X	X	Resistance statement 5 ⁵ For all Early blight: 6.2 fl oz/A on a 7-day interval or 12.4 fl oz/A on a 14-day interval. Late blight: 6.2 fl oz/A on a 7-day interval as a preventive, 12.4-15.4 fl oz/A on a 5-day interval when late blight is present. Do not make more than 6 applications per acre per year. Do not apply within 14 days of harvest. Also labeled for black dot control. See label for application instructions.
Azoxystrobin (11) + Chlorothalonil (M5) Quadris Opti, 4.6%: 46%	Spray	1.6 pt/A	X	X	Also controls blackdot, brown spot, powdery mildew and Septoria leafspot. Apply on a 7- to 14-day interval; do not make more than 2 sequential applications before rotating to an alternate MOA. Quadris top should be used with an adjuvant such as a non-ionic based surfactant or crop oil concentrate or blend. Do not exceed 55.3 oz/A/season. PHI = 14
Azoxystrobin (11) + Difenconazole (3) Quadris Top 18.2%:11.4%	Spray or fungigation	8-14 oz/A	X	X	Use 6 oz/A for early blight and 8 oz/A for late blight. Do not make more than 1 application of Tanos before alternating with a fungicide that has a different mode of action. Maximum of 72 oz/A/season.
Famoxadone (11) + Cymoxanil (27) Tanos, 25%: 25%	Spray or fungigation	6-8 oz/A	X	X	Use 6 oz/A for early blight and 8 oz/A for late blight. Do not make more than 1 application of Tanos before alternating with a fungicide that has a different mode of action. Maximum of 72 oz/A/season.
Fenamidone (11) Reason, 44.4%	Spray or fungigation	5.5-8.2 fl oz/A	X	X	Resistance statement 5 ⁵ . A 2 (ee) allows application of Reason at 4 fl oz/A tank mixed with mancozeb, chlorothalonil for control of early and late blight. Reason can be applied early in the season for management of black dot. Tank mix with a different mode of action for resistance management. Applications should be on a 5- to 10-day interval and alternated with a fungicide with a different mode of action. Do not apply more than 24.6 oz/A of Reason per season. PHI = 14 days.
Fluoxastrobin (11) Evito, 40.3%	Spray or fungigation	3.8 fl oz/a			Do not apply within 7 days of harvest. Do not make more than 6 applications per season.

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⁴Check the NDSU blight hotline, (888) 482-7286, for information on infection potential of early blight and late blight. Whenever late blight is severe, vine killing is extremely important and should be done at least 2 weeks before harvest to prevent tuber infections. Hilling of soil around the vines should be done just before killing them.

⁵See fungicide resistance management statements on Pages 7-8.

***Designates restricted-use pesticide**

Potato Foliar Sprays (continued)

Chemical (Fungicide Group)	Application ¹	Dosage ²	Disease Control ³		Remarks ^{4,5}
			Late Blight	Early Blight	
QoIs (Continued)					
Pyraclostrobin (11) Headline EC, 23.6%	Spray or fungigation	6-9 fl oz/A early Blight	X	X	Use 6-9 fl oz/A for early blight and 6-12 fl oz/A for late blight. *Do not apply within 3 days of harvest. Do not make more than 6 applications per season. Also controls black dot. Apply prior to disease onset.
Headline SC, 23.3%		6-12 fl oz/A late Blight	X	X	
Pyraclostrobin (11) + Metiram (M3) Cabrio Plus, 5.0%:55%	Spray or fungigation	2.0-2.9 lbs/A for black dot & early blight; 2.9 lbs/A for late blight	X	X	PHI=14 days.
Trifloxystrobin (11) Gem 500 SC 42.6%	Spray	2.9-3.8oz/A early blight 3.8 oz/A late blight	X	X	For early blight, begin application preventively and continue as needed on a 7- to 10-day interval. For late blight, begin applications preventively. Alternate Gem with a protectant fungicide registered for late blight on a 7- to 10-day schedule. Do not apply more than 23 oz. GEM 500SC per season. Do not apply within 7 days of harvest. Do not make more than 6 total applications per acre per season.
Cyazofamid (21) Ranman, 34.5%	Spray or fungigation	0.42 fl oz/1,000 linear ft. row or 1.4-2.75 fl oz/A as broadcast spray	X		Also for pink rot and <i>Pythium</i> leak control. Do not apply more than 27.5 fl oz per season. Alternate sprays of Ranman with a fungicide from a different chemistry class.
Triphenyltin Hydroxide (TPTH)* RUP (30) Super Tin 80WP AgPak, 80% or Agri Tin, 80%	Spray or fungigation	2.5-3.75 oz/A	X	X	RESTRICTED-USE PESTICIDE. Do not apply within 7 days of harvest. Do not exceed 11.25 oz/A TPTH per season. May use 1.87 oz/A TPTH when used in combination with another fungicide. Ground application must be with closed cab. Do not enter treated area within 48 hours of treatment without proper PPE specified on label.
or Super Tin* 4L, or Agri Tin* 4L, 40%	Spray or fungigation	4-6 fl oz/A	X	X	Super Tin 4L label says "do not exceed 18 fl oz/a/season."

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⁴Check the NDSU blight hotline, (888) 482-7286, for information on infection potential of early blight and late blight. Whenever late blight is severe, vine killing is extremely important and should be done at least 2 weeks before harvest to prevent tuber infections. Hilling of soil around the vines should be done just before killing them.

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