

Fruit Production Recommendations 2010-2011

Ontario Ministry of Agriculture, Food & Rural Affairs

Chapter 5: Berry Crops



Strawberry Calendar (fruiting years)

Read the product label and follow all safety precautions.

Consult the product label for suggested water volumes. Otherwise, use enough water to ensure thorough spray coverage.

Products are listed according to insecticide and fungicide family groups. Use products from different groups to help prevent the development of pest resistance. For resistance management, refer to *Pest Resistance to Insecticides, Fungicides, Miticides*, page 23.

For information on strawberry pest identification, monitoring and thresholds, see *ONTARIO CropIPM: Integrated Pest Management Training*, available at www.ontario.ca/cropIPM or as OMAFRA Publication AF141 in CD format.

For preharvest interval, re-entry period, maximum number of applications and chemical group, see Table 5-19. *Products Used on Strawberries*, page 122.

Diseases and Insects	Products	Rate	Comments
When new growth appears			
Red stele	Aliette WDG	5.6 kg/ha	This disease is sporadic and favoured by wet or compacted soil, and susceptible varieties (Table 5-23. <i>Strawberry Variety Disease Ratings</i> , page 126). To reduce the chance of resistance, spray only where red stele has been observed or a high risk situation occurs. Aliette: Make up to four applications per season, two in spring and two in fall. Apply in spring when plants start active growth. Apply at 30–60 day intervals. Do not apply within 30 days of harvest or after first bloom.
Botrytis grey mould	Bravo 500	3.5 L/ha	Bravo: Reduces disease inoculum and prevents infection of dying leaves. Repeat application in ten days.
Aphids	Admire 240 F	850 mL–1.2 L/ha	Apply in a high volume of water to the soil (e.g. 2,000 L water/ha). Do not apply in transplant water or through drip irrigation. Very toxic to bees. Do not apply when bloom is present.
When flower buds are visible in the crown			
Common leaf spot	Copper 53 W	3.8 kg/ha	To control leaf spot, protect new leaves as they unfold. Spray susceptible varieties such as Jewel, Mira, Kent, Veestar, MicMac. Copper: Spray copper alone. For instructions on mixing copper sprays, see <i>Use of Copper Products on Fruit Crops</i> , page 220.
	Supra Captan 80 WDG or Maestro 80 DF	4.25 kg/ha 4.25 kg/ha	
	Topas 250 E	500 mL/ha	
	Pristine WG	1.3 kg/ha	

Diseases and Insects	Products	Rate	Comments
Cyclamen mite	Thionex 50 W or Thiodan 4 EC Agri-Mek 1.9% EC	4.0 kg/ha 5.0 L/ha 1.0 L/ha	Apply where cyclamen mite has been a problem in the past. These tiny mites feed on developing leaves in the plant crown, causing leaf distortion and stunted growth. Thiodan, Thionex: Apply in 4,000–8,000 L of water per ha as a drench over the plant row. Agri-Mek: Apply in sufficient water, to ensure thorough leaf coverage. To discourage resistance, alternate Thiodan or Thionex with Agri-Mek.
As flower buds extend from crown			
Strawberry clipper weevil	Furadan 480 F Ripcord 400 EC or Up-Cyde 2.5 EC Matador 120 EC or Silencer 120 EC	1.1 L/ha 175 mL/ha 280 mL /ha 104 mL/ha 104 mL/ha	Check edges of fields for clipped buds. See OMAFRA Factsheet <i>Strawberry Clipper Weevil: A Major Pest of Strawberries</i> , Order No. 99-031 for monitoring details and thresholds. Apply insecticide when first injury is detected, or wait until threshold is reached. Spray again if new injury is detected seven days after the first spray. Furadan: Do not use later than prebloom because of toxicity to pollinating and beneficial insects. Furadan can cause extensive burning of sepals surrounding fruit on certain varieties (e.g. Annapolis, and Cavendish). Do not use on crops destined for export to the USA.
First bloom			
INSECTICIDES ARE VERY TOXIC TO BEES. DO NOT SPRAY WHEN BEES ARE WORKING. SPRAY IN THE EVENING. SEE BEE POISONING ON PAGE 214.			
Tarnished plant bugs	Cygon 480-AG Ripcord 400 EC or Up-Cyde 2.5 EC Decis 5 EC Matador 120 EC or Silencer 120 EC Thiodan 4 EC	2.75 L/ha 250 mL/ha 400 mL /ha 200 mL/ha 104 mL/ha 104 mL/ha 2.5 L/ha	Check frequently during bloom and green fruit stage for small green tarnished plant bug nymphs. Shake blossom clusters and fruit trusses over a shallow dish. Watch for soft-bodied green insects that move quickly to escape. For thresholds and monitoring details, visit www.ontario.ca/cropipm . Cygon: Very toxic to bees, use well before bloom. Thiodan, Ripcord, Up-Cyde, Matador, Silencer or Decis: These products also control spittlebug. Ripcord or Up-Cyde, Decis, Matador or Silencer (pyrethroid insecticides): These products, except Decis, also control clipper weevil. Insecticides in this group are associated with outbreaks of spider mites and cyclamen mites. Avoid consecutive applications.
Botrytis grey mould	Rovral Elevate 50 WDG Supra Captan 80 WDG or Maestro 80 DF Folpan 80 WDG Lance WDG Pristine WG Scala SC Switch 62.5 WG Serenade ASO Actinovate SP	2.0 kg/ha 1.7 kg/ha 4.25 kg/ha 4.25 kg/ha 2.5 kg/ha 560 g/ha 1.3 kg/ha 2.0 L/ha 975 g/ha 4.0-15.0 L/ha 425 g/ha	Ensure good spray coverage to keep all flower parts protected with fungicide during bloom. Typically 2–3 sprays at 7–10 day intervals during bloom will give good control. Use shorter spray intervals (i.e. 5–7 days) during wet weather. Choose fungicides from different chemical groups and use them in rotation. See Table 2-11. <i>Fungicide/Bactericide Groups Based on Sites of Action</i> , page 26. Pristine and Lance: Both contain active ingredients in the same fungicide group. Do not alternate Pristine with Lance. Scala and Switch: Both contain active ingredients in the same fungicide group. Do not alternate Switch with Scala. Serenade ASO: Provides suppression rather than control of botrytis grey mould; see Table 2-6. <i>Efficacy Ratings for Pesticides</i> , page 12. Expect best results from multiple applications or when used in rotation with other products. See <i>Biopesticides for disease control</i> , page 13 and notes on <i>Bacillus subtilis</i> (Serenade MAX, Serenade ASO), page 14. Actinovate: Provides suppression rather than control; see Table 2-6. <i>Efficacy Ratings for Pesticides</i> , page 12. Spray to wet foliage but avoid runoff. See <i>Biopesticides for disease control</i> , page 13 and notes on <i>Streptomyces lydicus</i> (Actinovate), page 13.

Diseases and Insects	Products	Rate	Comments
Anthracnose fruit rot	Cabrio EG Pristine WG	1.0 kg/ha 1.3 kg/ha	Bloom is the best time to control this disease. Warm wet weather during bloom favours the development of anthracnose fruit rot. Pristine and Cabrio: Both contain active ingredients in the same fungicide group. Make no more than two consecutive applications with either product, and then alternate with fungicides from different families. See Table 2-11. <i>Fungicide/Bactericide Groupings Based on Sites of Action</i> , page 26.
7 to 10 days after first bloom			
Botrytis grey mould	Use one of the fungicides listed at Bloom .		
Anthracnose fruit rot	Use one of the fungicides listed at Bloom .		
Tarnished plant bugs	Ripcord 400 EC or Up-Cyde 2.5 EC Decis 5 EC Matador 120 EC or Silencer 120 EC Thiodan 4 EC	250 mL/ha 400 mL/ha 200 mL/ha 104 mL/ha 104 mL/ha 2.5 L/ha	Check frequently during bloom and green fruit stage for small green tarnished plant bug nymphs. Shake blossom clusters and fruit trusses over a shallow dish. Watch for soft-bodied green insects that move quickly to escape. For thresholds and monitoring details, visit www.ontario.ca/cropipm . Thiodan, Ripcord, Up-Cyde, Matador, Silencer or Decis: These products also control spittlebug. Ripcord or Up-Cyde, Decis, Matador or Silencer (pyrethroid insecticides): These products, except Decis, also control clipper weevil. Insecticides in this group are associated with outbreaks of spider mites and cyclamen mites. Avoid consecutive applications.
Thrips	Delegate WG	280 g/ha	Check blossoms and under calyces for small thread-like yellow thrips. Expect more problems where insecticides have not been applied for tarnished plant bug. Delegate is registered for suppression, rather than control of thrips; see Table 2-6. <i>Efficacy Ratings for Pesticides</i> , page 12. Delegate is also labelled for greenhouse use.
Preharvest			
Botrytis grey mould	If sprinkler irrigation is used, water early in the day to allow plants to dry off before nightfall. Use one of the fungicides listed at Bloom .		
Anthracnose fruit rot	Warm wet weather favours development of anthracnose. In these conditions, use one of the fungicides listed at Bloom .		
Slugs	Sluggo	25.0 kg/ha	Apply 50 kg/ha if population is very high. Apply when infestation begins. Reapply as bait is consumed or at least every two weeks if slugs and snails continue to be a problem.
Thrips	Delegate WG	280 g/ha	Check blossoms and under calyces for small thread-like yellow thrips. Expect more problems where insecticides have not been applied for tarnished plant bug. Delegate is registered for suppression, rather than control of thrips; see Table 2-6. <i>Efficacy Ratings for Pesticides</i> , page 12. Delegate is also labelled for greenhouse use.
Two-spotted spider mite	Pyramite or Nexter Apollo SC Agri-Mek 1.9% EC Oberon	600 g/ha 600 g/ha 500 mL/ha 1.0 L/ha 880 mL/ha	Use high water volumes to ensure good coverage of the underside of leaves. To discourage resistance, alternate products from year to year and do not apply any product more than once each year. See Table 5-21. <i>Miticides Registered on Strawberries</i> , page 124, for details on timing. Apollo: Kills mite eggs and very young nymphs, but not older nymphs and adults. Apply when monitoring indicates mites are developing, mostly in the egg stage. Agri-Mek: Apply in sufficient water to ensure thorough leaf coverage. Oberon: This product is translaminar but not systemic. Good spray coverage of both upper and lower leaf surfaces is needed for control. Use adequate water volume for complete coverage.

Diseases and Insects	Products	Rate	Comments
Renovation (after mowing)			
Cyclamen mite	Thionex 50 W or Thiodan 4 EC	4.0 kg/ha 5.0 L/ha	These tiny mites feed on developing leaves in the plant crown, causing leaf distortion and stunted growth. High water volumes are needed to wet the new growth in the crown. Apply one of these chemicals in 5,000–8,000 L of water per ha as a drench over the plant row.
Renovation (after mowing, to new growth)			
Two-spotted spider mite	Pyramite or Nexter Agri-Mek 1.9% EC Apollo SC Oberon	600 g/ha 600 g/ha 1.0 L/ha 500 mL/ha 880 mL/ha	For best results, use high water volumes to ensure good coverage of the underside of leaves. To discourage resistance, alternate products from year to year and do not apply any product more than once each year. Apollo: Kills mite eggs and very young nymphs, but not older nymphs and adults. Apply when monitoring indicates mites are beginning to hatch or are mostly in the egg stage. Agri-Mek: Apply in sufficient water, minimum 375 L/ha, to ensure thorough leaf coverage. Oberon: This product is translaminar but not systemic. Good spray coverage of both upper and lower leaf surfaces is needed for control. Use adequate water volume for complete coverage.
Powdery mildew	Nova 40 W Pristine WG Actinovate SP	340 g/ha 1.6 kg/ha 425 g/ha	Begin applications on susceptible varieties (Annapolis, Jewel, Veestar) when disease first appears on new growth or when conditions (warm humid weather, or frequent dews) favour development. Alternate fungicides. Actinovate: Provides suppression rather than control; see Table 2-6. <i>Efficacy Ratings for Pesticides</i> , page 12. Spray to wet foliage but avoid runoff. See <i>Biopesticides for disease control</i> , page 13 and notes on <i>Streptomyces lydicus (Actinovate)</i> , page 13.
Mid-August and again once or twice at 2-week intervals			
Common leaf spot	Copper 53 W Supra Captan 80 WDG or Maestro 80 DF Topas 250 E Pristine WG	3.8 kg/ha 4.25 kg/ha 4.25 kg/ha 500 mL/ha 1.3 kg/ha	To control leaf spot, ensure good coverage of the lower leaf surface. Spray susceptible varieties such as Jewel, Mira, Kent, Veestar, MicMac. Spray copper alone. For instructions on mixing copper sprays, see <i>Use of Copper Products on Fruit Crops</i> , page 220.
Fall			
Botrytis grey mould	Bravo 500	3.5 L/ha	Bravo helps control <i>Botrytis</i> by reducing disease inoculum. Apply in late October.
Red stele	Ridomil Gold 480 SL Aliette WDG	1.0 L/ha 5.6 kg/ha	This disease is sporadic and favoured by wet or compacted soil, and susceptible varieties (Table 5-23. <i>Strawberry Variety Disease Ratings</i> , page 126). To reduce the chance of resistance, spray only where red stele has been observed or a high risk situation occurs. Ridomil: Do not apply later than October 31. Do not apply in the spring before harvest. Apply in sufficient water (2,500 L/ha) to ensure movement into the root zone. Aliette: Make up to four applications per season, two in spring and two in fall. Apply in spring when plants start active growth. Apply at 30–60 day intervals. Do not apply within 30 days of harvest (after first bloom). Make postharvest applications when soil conditions favour disease development (e.g. high soil moisture and cool soil temperatures).

Table 5-19. Products Used on Strawberries

Use this as a guide but refer to product label for specific information.

The **preharvest interval** is the number of days between the last spray and first harvest.

The **re-entry period** is the minimum interval that must be observed between application of the pesticide and work in the treated crop without protective equipment. If no re-entry period is stated on the label, assume that the spray solution must be dry before re-entry can occur.

The **maximum number of applications** is the labelled maximum number for the growing season and may be higher than what is recommended for resistance management or for the preservation of beneficial insects and mites.

Product name	Registration number	Common name	Group	Preharvest interval	Minimum re-entry	Maximum number of applications per season
Products used to control or suppress insects and mites						
Admire 240F	24094	imidacloprid	4	30 days	24 hours	1
Agri-Mek 1.9% EC	24551	abamectin	6	3 days		2
Apollo SC	21035	clofentezine	10	15 days	12 hours	1
Cygon 480-AG	25651	dimethoate	1B	7 days		2
Decis 5 EC	22478	deltamethrin	3	14 days		2
Delegate WG	28778	spinetoram	5	1 day	12 hours	3
Furadan 480 F	10828	carbofuran	1A	Use prebloom only	48 hours	1
Malathion 25 W	14656	malathion	1B	3 days		
Matador 120 EC	24984	lambda-cyhalothrin	3	7 days	24 hours	3
Nexter	25135	pyridaben	21	10 days	24 hours	2
Oberon	28905	spiromesifin	23	3 days	12 hours	3
Pyramite	25135	pyridaben	21	10 days	24 hours	2
Ripcord 400 EC	15738	cypermethrin	3	7 days		3
Silencer 120 EC	29052	lambda-cyhalothrin	3	7 days	24 hours	3
Sluggo	27096	ferric phosphate				
Surround WP	27469	kaolin		1 day		
Thiodan 4 EC	15747	endosulfan	2A	7 days	48 hours	2
Thionex 50 W	14617	endosulfan	2A	7 days	5 days	2
Up-Cyde 2.5 EC	28795	cypermethrin	3	7 days	12 hours	3
Products used to control or suppress diseases						
Actinovate SP	28672	<i>Streptomyces lydicus</i>	NC		1 hour	
Aliette WDG	24458	fosetyl al	U	30 days		4

Product name	Registration number	Common name	Group	Preharvest interval	Minimum re-entry	Maximum number of applications per season
Bravo 500	15723	chlorothalonil	M	30 days	48 hours	3
Cabrio EG	27323	pyraclostrobin	11	1 day	12 hours	5
Copper 53 W	9934	tri-basic copper sulphate	M	1 day		
Elevate 50 WDG	25900	fenhexamid	17	1 day	4 hours	4
Folpan 80 WDG	27733	folpet	M	1 day	24 hours	6
Lance WDG	27495	boscalid	7	0 days	4 hours	5
Maestro 80 DF	26408	captan	M	2 days	48 hours	
Nova 40 W	22399	myclobutanil	3	3 days		6
Pristine WG	27985	boscalid + pyraclostrobin	7+11	1 day	24 hours ¹	5
Ridomil Gold 480 SL	28474	metalaxyl-M and S	4	Use post-harvest only	12 hours	2
Rovral	15213	iprodione	2	1 day	12 hours	
Scala SC	28011	pyrimethanil	9	1 day	24 hours	3
Serenade ASO	28626	<i>Bacillus subtilis</i>	44	0 days		
Supra Captan 80 WDG	24613	captan	M	2 days	48 hours	
Switch 62.5 WG	28189	cyprodinil + fludioxonil	9+12	1 day	12 hours	3
Topas 250 E	24030	propiconazole	3	1 day		4
<p>A blank cell indicates the information is not specified on the product label. ¹ For hand labour, otherwise when dry.</p>						

Notes on Strawberry Diseases and Insects

For information on strawberry pest identification, monitoring and thresholds, see *ONTARIO CropIPM: Integrated Pest Management Training*, available at www.ontario.ca/cropIPM or as OMAFRA Publication AF141 in CD format.

For information on the activity of fungicides on strawberry diseases, see Table 5-20. *Activity of Fungicides on Strawberry Diseases*, page 124. For information on miticides registered on strawberries, see Table 5-21. *Miticides Registered on Strawberries*, page 124. For information on the activity of insecticides on strawberry pests, see Table 5-22. *Activity of Insecticides on Strawberry Pests and Bees*, page 125. For information on the response of different strawberry varieties to diseases, see Table 5-23. *Strawberry Variety Disease Ratings*, page 126.

Table 5-20. Activity of Fungicides on Strawberry Diseases

Ratings in shaded boxes indicate that the disease is listed on the product label for control or suppression. Please see the product label or crop calendars for registered uses. Use fungicides only for diseases listed on the product label for the crop and for the disease. Additional information is provided in this table to assist the grower in choosing the best fungicide for control of diseases listed on the product label.

Fungicide Group	Product	Angular leaf spot	Anthraxnose (<i>C. acutatum</i>)	Anthraxnose (<i>C. gloeosporioides</i>)	Botrytis grey mould	Common leaf spot	Leather rot	Leaf scorch	Phomopsis leaf blight and fruit rot	Phytophthora crown rot	Powdery mildew	Red stele root rot
M	Copper 53 W	+P	+P	+P	+P	+P	+P	+P	+P	0	+P	0
M	Captan 80 WDG	0	++	++	++	+++	+		+ to ++	0	0	0
M	Folpan 80 WDG	0	++	++	++	+++	+		+ to ++	0	0	0
M	Maestro 80 DF	0	++	++	++	+++	+		+ to ++	0	0	0
M	Bravo 500	0			++	+		+	+	0		0
2	Rovral	0	0	0	+++R	++	0		0	0	0	0
3	Nova 40 W	0	0	0	0	++	0		+++	0	+++	0
3	Topas 250 E	0	0	0	0	+++	0		+++	0		0
4	Ridomil Gold SL	0	0	0	0	0	++	0	0	++ to +++	0	++ to +++
7	Lance WDG	0			+++	+++	0	+++	0	0	++	0
7&11	Pristine WG	0	+++	+++	+++	+++	0	+++	+++	0	+++	
9	Scala SC	0	+		+++		0			0		0
9&12	Switch 62.5 WG		++		+++		0		++	0	+	
11	Cabrio EG	0	+++	+++	+ to ++	+	0	++	+++	0	+++	0
17	Elevate 50 WDG	0	0	0	+++		0	0	0	0	0	0

U	Aliette WDG	0	0	0	0	0	++	0	0	++	0	++
44	Serenade ASO				+							

0 = No control; + = Poor to fair control; ++ = Good control, some limitations; +++ = Excellent control, few if any limitations.
Blank cell = Information is unavailable.
P = May be phytotoxic.
R = Pathogen resistance to the fungicide has occurred in some locations outside Ontario.

Table 5-21. Miticides Registered on Strawberries

	Mite species controlled	Stage of mite controlled	Comments	For use before harvest	For use after harvest
Apollo SC	Two-spotted spider mite	Eggs, very young nymphs	Should be applied when most mites are in the egg stage. This miticide works best if applied early in the season, when generations tend to be most synchronous.	✓	
Agri-Mek 1.9% EC	Two-spotted spider mite, cyclamen mite	Adults, nymphs	Translaminar (locally systemic). Absorbed best by new, expanding leaves. Registered for both cyclamen mite and two-spotted spider mite. Do not use with surfactants or oil.	✓	✓
Pyramite, Nexter	Two-spotted spider mite	Adults, nymphs	A contact miticide providing rapid knockdown of adults and nymphs.	✓	✓
Oberon	Two-spotted spider mite	Eggs, adults, nymphs	A slow acting miticide which prevents eggs from hatching and nymphs from moulting to the next stage. Best used when mites are young.	✓	✓

Table 5-22. Activity of Insecticides on Strawberry Pests and Bees

Ratings in shaded cells indicate pests are listed on the product label for control or suppression. Use products only for pests listed on the label for the crop and for the pest. Additional information is provided in this table to assist the grower in choosing the best insecticide or miticide for control of pests listed on the product label.

Group	Insecticide/miticide	Aphids	Clipper weevil	Tarnished plant bug	Root weevil larvae	Root weevil adults	Flower thrips	Leaf rollers	Potato leafhopper	Two-spotted spider mite	Cyclamen mite	Spittle bug	Honey bees
1A	Furadan 480 F	+	+++	+	+	++	NA	+++	NA	0	0	++	HT
1B	Cygon 480-AG	+++	+	+++	0		NA	+++	++	0	0	++	HT
1B	Malathion 25 W	+	+	++	0	0		++	++	0	0	++	HT
2A	Thiodan (various formulations)	+++	+	+++	0	+	+	++	+	0	+++	++	MT
3	Decis 5 EC	0	0	+++	0	0	++	+++	++	0	0	++	HT
3	Ripcord 400 EC	0	+++	+++	0	++	++	+++	++	0	0	++	HT
3	Matador 120 EC	0	+++	+++	0	++	++	+++	++	0	0	++	HT
3	Silencer 120 EC	0	+++	+++	0	++	++	+++	++	0	0	++	HT

3	Up-Cyde 2.5 EC	0	+++	+++	0	++	++	+++	++	0	0	++	HT
5	Delegate WG				0		++	+					HT
6	Agri-Mek 1.9% EC	0	0	0	0	0	+	0	+	+++	++		HT
10	Apollo SC	0	0	0	0	0	0	0	0	+++	0	0	S
21	Nexter	0	0	0	0	0	0	0	0	+++	++	0	HT
21	Pyramite	0	0	0	0	0	0	0	0	+++	++	0	HT
23	Oberon	0	0	0	0	0	0	0	0	+++		0	S
	Surround WP				0		NA		++	++			I

0 = No control; + = Poor to fair control; ++ = Good control, some limitations; +++ = Excellent control, few if any limitations.
 NA= Not used at the timing for this pest.
 Blank cell = Information is unavailable.
 R – Pest resistance has occurred in some crops.
 Bee toxicity: HT= highly toxic; MT= moderately toxic; S = relatively safe or non-toxic; I = irritant.

Table 5-23. Strawberry Variety Disease Ratings

	Leaf spot*	Leaf scorch ¹	Powdery mildew	Botrytis grey mould	Verticillium	Red stele ^{2*}	Bacterial angular leaf spot ³	Black root rot	Anthraxnose fruit rot
Albion	MR		MR	S	R				MR
Allstar ⁴	MR	S	MR	MR	MR	S	HS		
Annapolis	MR	MR	S	S	MR	R	HS		S
Brunswick	MR	MR	MR	MR		R		MR	
Cabot	MR	MR	R	S	S	R		MR	
Cavendish	MR	R	S	MR	MR	R	HS	MR	S
Evangeline	MR	R	MR	MR	S	S		S	
Glooscap	MR	MR	MR	S	S	S	S		
Gov. Simcoe	MR	MR	HS	MR	MR	S	S		S
Honeoye	MR	MR	MR	MR	HS	S	HS	S	
Itasca	MR	R	R			R			
Jewel ⁵	HR	MR	S	MR	S	S	HS	HS	
Kent	HS	S	MR	S	S	S	HS	HS	S
L'Amour			S	MR			S		

	Leaf spot*	Leaf scorch ¹	Powdery mildew	Botrytis grey mould	Verticillium	Red stele ² *	Bacterial angular leaf spot ³	Black root rot	Anthraxnose fruit rot
Mesabi ⁶	R	R	MR	S		R			
Micmac	S	HS	MR	S	MR	S	S		
Mira	HS	R	R	MR	S	R	S	S	
Mohawk ⁷		MR	MR			MR			
Redcoat	MR	MR	MR	HS	S	S	S		
Sable	R	R	S	S		R	HS		
St. Pierre ⁸	MR	S	MR	R		S			S
Sapphire		MR	MR						
Seascape	S		HS						
Serenity		MR	MR						S
Sparkle	S	MR	MR	MR	S	HR	S		
Tribute	MR	MR	S	MR	R	MR			
Tristar	MR	MR	S	MR	R	MR	MR		
V151	S	S							S
Valley Sunset							S		
Veestar	S	MR	S	MR	MR	S	S		
Wendy	S	MR	MR	MR	S	MR	HS		
Winona ⁶	R	MR	MR			R	HS	S	

HR – Highly Resistant; R – Resistant; MR – Moderately Resistant; S – Susceptible; HS – Highly Susceptible.

Blank cell = Information is unavailable.

* Race dependent.

¹ Leaf scorch ratings according to Xue, Sutton, Dale, and Sullivan 1996, for some cultivars.

² Red stele ratings from Dr. N. Nickerson and Dr. A. Jamieson, Agriculture & Agri-Food Canada, Kentville, Nova Scotia except Itasca.

³ P.D. Hildebrand, P.G. Braun et. al., Can. J. Plant.Pathol.27:16-24 (2005) and field observation.

⁴ Gene Galletta, USDA, Maryland, (1991).

⁵ Marvin Pritts, Cornell, N.Y. (1991).

⁶ University of Minnesota Extension, 2002.

⁷ Galletta, Mass, Enns & Draper, 1995.

⁸ Shahrokh Khanizadeh, HortScience 37(7) 2002.

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