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EXTENSION AND ADVISORY TEAM

# GUIDE TO INSECT & DISEASE MANAGEMENT IN Highbush BLUEBERRY

Nova Scotia Guide to Insect & Disease Management in Highbush Blueberry  
[HB Blue1-22]



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[HB Blue1-22]

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## LIABILITY STATEMENT

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## Important Note on Funginex

The US equivalent of Funginex has been removed from the US market and all minimum residue levels have been removed for the active ingredient of Funginex, “triflorine”. In Canada, this product is still legal to use. However, fruit that has been treated with Funginex will not be suitable for export to the US as the potential for minimum residues on the fruit exist.

## Blueberry Site Selection & Preparation

Preparation for blueberry planting must be done several years in advance. Select a site with good air and water drainage. Take a soil sample and have it analyzed. Soils should have high soil acidity (low pH) and high organic matter content. Sandy loam soils are best with a pH of 4.5 – 5.2. Organic levels can be increased using cover crops and the addition of peat moss. If the land was in sod, check for white grubs (see note under New Planting).

Nematode levels should also be checked. Sampling can be done almost anytime except in the winter when the ground is frozen. The highest populations tend to be found in June and mid-September to mid-October. Sample as you would a normal soil sample. Using a soil auger, take at least 10 -15 sub-samples from a maximum of 2.5 ha. Samples should be taken 20-25 cm deep => remove and discard the top 2 cm if the soil is bare. Mix the sub-samples well and put 0.5-1.0 L of soil in a plastic bag and refrigerate at 5-10° C. Contact Perennia Food and Agriculture Inc. for assistance in finding laboratories that do nematode analysis.

## New Planting Products

Rates of product are for mature plants. Unless the label states otherwise, use 700-1000 L of water per hectare, or use enough water to obtain good coverage of the foliage and wood.

Insect / Disease <sup>1</sup>	Product	Note
<i>Godronia</i> canker	Physical removal / cultural	Prune out and burn infected wood. Jersey, Earliblue and Bluecrop are highly susceptible; Berkeley, Blueray, Burlington, Rubel and Coville are moderately susceptible while Rancocas is quite resistant.
Phomopsis Canker	Physical removal / cultural	Weymouth, Earliblue and Berkeley are particularly susceptible varieties. Coville and Jersey are also damaged by Phomopsis.
White grubs (Several species)	Cultural	<p>Several species. Specimens should be identified to help determine appropriate action. Cultural tips:</p> <ol style="list-style-type: none"> <li>1) Delay planting for 2 years after removing sod or pasture crop.</li> <li>2) Eliminate grasses between rows and especially around bushes.</li> <li>3) Monitor white grubs in grassy areas outside plantings, e.g. Lawns, parking lots. Treat these areas with approved products if grubs reach 5/900 cm<sup>2</sup> (5/ft<sup>2</sup>). Grubs need to be properly identified. There are very few products that can be used in Nova Scotia.</li> <li>4) There are no products approved for use within plantings. Therefore, proper site preparation and clean cultivation are the only options.</li> <li>5) Monitor plants for signs of stress such as stunted growth, reduced vigor and poor root systems. If these symptoms occur, check the soil for white grubs.</li> </ol>

<sup>1</sup> Proper identification of insects and plant diseases is essential for an effective IPM program.

## Established Planting Products

Rates of product are for mature plants. Unless the label states otherwise, use 700-1000 L of water per hectare, or use enough water to obtain good coverage of the foliage and wood.

Insect / Disease	Group	Product	Rate / ha	Restricted-Entry Interval (REI)	Pre-Harvest Interval (days)	Note
<b>DORMANT</b>						
Scale	M	Lime Sulfur + Dormant oil	50L + 12.5 L in 1000 L; 25L + 6.5 L in 500 L; 5L + 1.25 L in 100 L	48 hrs	dormant	Apply once per season when plants are dormant (January-March). Spray to runoff.
	NC	Superior 70 Oil	20-30 L/ha in 1000-1500 L water/ha	12 hrs	dormant	<b>Lecanium scale only.</b> Observe product restrictions, with particular attention to weather conditions needed and timing of other products.  For Vegol Crop Oil - Do not apply to wet foliage.
		Purespray Green Spray Oil 13E	20L in 1000 L water	12 hrs	dormant	
Vegol Crop Oil	2% v/v in 700-1900 L water/ha	12 hrs	0 days			
<b>EARLY SPRING TO GREEN TIP</b>						
Mummy berry ( <i>Monilinia</i> )	3	Funginex DC	1.7-3.0 L/ha	12 hours/ 6 days (hand set irrigation)	60 days	<b>The maximum residue limit is zero (0) in the US. Funginex may still be used in Canada; however, treated blueberries are not suitable for shipment to the US since they may contain Funginex residues.</b> Do not use after Pink Bud.
		Topas	500 mL/ha	12 hrs/ 5 days (hand-harvesting and pruning)		Use no more than 2 consecutive applications to prevent resistance.  Tank mix Group 3 fungicides with a compatible Group M fungicide.
		Tilt 250 E	500 mL/ha	12 hrs <sup>1</sup> / 5 days <sup>2,3</sup>	60 days	Use no more than 2 consecutive applications to prevent resistance.

Insect / Disease	Group	Product	Rate / ha	Restricted-Entry Interval (REI)	Pre-Harvest Interval (days)	Note
<b>Mummy berry</b> ( <i>Monilinia</i> ) (cont.)	3	Propiconazole 250E	500 mL/ha	12 hrs <sup>1</sup> / 5 days <sup>2,3</sup>	60 days	Tank mix Group 3 fungicides with a compatible Group M fungicide.
		Jade	500 mL/ha	12 hrs <sup>1</sup> / 5 days <sup>2,3</sup>	60 days	
		Mission 418 EC	300 mL/ha	5 days	60 days	
		IPCO Pivot 418 EC	300 mL/ha	5 days	60 days	
		Bumper 432 EC	300 mL/ha	12 hrs <sup>1</sup> / 5 days <sup>2,3</sup>	60 days	
		Fitness 432 EC	300 mL/ha	12 hrs <sup>1</sup> / 5 days <sup>2,3</sup>	60 days	
		Indar	140 g/ha	12 hrs	30 days	
		Proline 480SC	315-420 mL/ha	24 hrs	7 days	
		Quash	188 mL/ha	12 hrs <sup>1</sup> / 72 hrs <sup>2</sup>	8 days	
		Metconazole 50 WDG	180 g/ha	12 hrs/ 3 days (thinning, training, tying)	7 days	Can also be used for suppression of Phomopsis twig blight and fruit rot.
Propi Super 25EC	500 mL/ha	12 hrs/ 5 days (hand harvesting & pruning)	60 days	First application at or near flower bud swelling; second application at leaf bud swelling.		

<sup>1</sup>General Re-entry

<sup>2</sup>Hand-pruning

<sup>3</sup>Hand-harvest

<sup>4</sup>PPE Require for Certain Activities

<sup>5</sup>U-pick Harvest

Insect / Disease	Group	Product	Rate / ha	Restricted-Entry Interval (REI)	Pre-Harvest Interval (days)	Note
<b>Mummy berry</b> ( <i>Monilinia</i> ) (cont.)	3+9	Inspire Super	558-836 mL/ha	12 hrs	1 day	For Mummyberry, apply first application at or near flower bud swelling; make a second application at leaf bud swelling. A third application at pink bloom and a fourth application can be made 7 to 10 days later at early bloom, making no more than four applications per year. For Monolinia blight apply first application when flower bud scales first appear and make a second application 10 days later. If disease pressure is high, use the highest rate and shortest interval.
	3+11	Quilt	1.0 L/ha in minimum 200 L water/ha	12 hrs	30 days	
	7, 3	Propulse	750 ml/ha	24 hours	7 days	Begin applications when 40 percent of the blossom buds have the bud scales separated. A second application of or another approved fungicide should be applied 7 to 10 days later.
	19	Diplomat 5SC	463-926 ml/ha 25-50 g a.i./ha	-	0 days	Apply as a foliar spray in sufficient water to provide thorough coverage of foliage (and fruit when present). Begin as a preventative application at green tip or when conditions favour disease development and continue on a 7-21 day interval if disease pressures persist. <b>Do not apply more than 150g a.i./he/season.</b>
	29	Allegro 500F	2.24 L/ha in 300-1000L water/ha	24 hrs	30 days	<b>Suppression only.</b>
	44	Serenade OPTI	2.0-3.3 kg/ha	When dry	0 days	<b>Biofungicide. Suppression only.</b>
	44	Serenade Max	3.5-6.0	When dry	0 days	<b>Biofungicide. Suppression.</b>



Insect / Disease	Group	Product	Rate / ha	Restricted-Entry Interval (REI)	Pre-Harvest Interval (days)	Note
<b>Mummy berry</b> ( <i>Monilinia</i> ) (cont.)	P5	Regalia Maxx	0.125 - 0.25% v/v in 400-800 L water/ha	When dry	0 days	<b>Biofungicide. Suppression only.</b>
	BM02	Double Nickel LC	2.5-5.0 L/ha	-	0 days	Can be applied up to and including the day of harvest. Begin applications at bud break and repeat at 7-10 day intervals, or as needed. Under moderate to high disease pressure, or when plant stage is conducive to rapid disease development
	NC	Actinovate SP	425-840 g/ha	1 hr	-	<b>Biofungicide. Suppression only.</b>
<b>Phytophthora Root Rot</b>	4	Ridomil Gold 480 SL	37 mL/ 100m row	12 hrs	80 days	Apply prior to bud break.
	P07	Aliette WDG	5.6 kg/ha in 300-1000 L water/ha	12 hrs (3 days for handset irrigation)	1 day	For spring applications, apply the first spray when there is 7 cm of new growth, continuing on a 14 to 21 day interval. <b>Do not exceed 22.4 kg product/ha or 4 applications per year for all uses.</b>
<b>GREEN TIP</b>						
<b>Anthracnose &amp; Phomopsis canker</b>	3	Quash	188 g/ha	12 hrs <sup>1</sup> / 72 hrs <sup>2</sup>	8 days	<b>Suppression only. Phomopsis only.</b>
	3+9	Inspire Super	1.2-1.5 L/ha	12 hrs	1 day	Make the first application during early bloom. A second application may be made 7 to 10 days later. A third application can be made if conditions remain favourable for disease development. If disease pressure is high, use the highest rate and shortest interval. No more than two applications before rotating to another fungicide group.

Insect / Disease	Group	Product	Rate / ha	Restricted-Entry Interval (REI)	Pre-Harvest Interval (days)	Note
Anthracnose & Phomopsis canker (cont.)	7+11	Pristine WG	1.3-1.6 kg/ha	When dry <sup>1</sup> / 24 hrs <sup>3</sup>	0 days	Begin applications prior to disease development and continue on a 7-14 day schedule. Use shorter interval and/or higher rates when disease pressure is high.
	9+12	Switch 62.5 WG	775 to 975 g/ha	12 hrs	1 day	Make first application during early bloom. A second application may be made 7 to 10 days later. A third application can be made if conditions remain favorable for disease development.
	11	Cabrio EG	1.0 kg/ha	12 hrs <sup>1</sup> / 24 hrs <sup>3</sup>	1 day	Do not apply more than 2 consecutive applications. Do not tank-mix or make sequential applications with Exirel.
	29	Allegro 500F	2.24 L in 300-1000 L water/ha	24 hrs	30 days	<b>Suppression only.</b> Begin applications at bud break and repeat applications every 7-10 days until petal fall.
	M5	Bravo ZN	7.2 L/ha	12 hrs (3 days for handset irrigation)	54 days	Also registered for Alternaria fruit rot. Apply two applications between green tip and petal fall. After petal fall, a protective schedule using a different registered product may be necessary to ensure continued control of fruit rot.
		Echo 90DF	4 kg/ha			
		Echo 720	5 L/ha			
	PO7	Aliette WDG	5.6 kg/ha in 300-1000 L water/ha	12 hrs (3 days for handset irrigation)	1 day	<b>Control of Anthracnose fruit rot. Suppression only of Phomopsis canker.</b> Begin foliar sprays in the spring at approximately the pink bud stage and continue on a 14-21 day interval. <b>Do not exceed 22.4 kg product/ha or 4 applications per year for all uses.</b>
		Confine Extra	4-5 L/ha	12 hrs	1 day	<b>Anthracnose only. Suppression only.</b>
P5	Regalia Maxx	0.125 - 0.25% v/v in 400-800 L water/ha	When dry	0 days	<b>Biofungicide. Suppression only.</b> Initiate preventative applications at green tip. Repeat applications at 7- to 10 day intervals depending upon crop growth and disease pressure. <b>Also registered for suppression of botrytis and alternaria.</b>	
NC	Botector	1 kg in 500-2000 L water/ha	4 hrs	0 days	<b>Anthracnose only. Suppression only.</b> Compatibility restrictions.	

Insect / Disease	Group	Product	Rate / ha	Restricted-Entry Interval (REI)	Pre-Harvest Interval (days)	Note	
<b>PINK BUD</b>							
<b>Anthracnose /Phomopsis canker</b>	<b>Refer to Green Tip</b>						
<b>Powdery Mildew</b> <i>(Microsphaera vaccinii-blueberry)</i>	3	Nova	340 g/ha	12 hrs	6 days (1 day for mechnaical harvesting)	Apply at the first sign of disease development and repeat in 7-14 days. Pre-bloom, bloom, and immediately after bloom are the most critical times for the control of powdery mildew.	
<b>Leafroller/ Winter Moth</b>	3	Decis 5 EC	150 mL in 1200-1500 L water/ha	12 hrs	14 days	Do not apply more than 3 times per year.	
		5	Delegate	100-200 g/ha	12 hrs	3 days	Monitor insect populations to determine application timing. Apply at egg hatch or to small larvae.
			Entrust	267-364 mL/ha	When dry		
		Success	145-182 mL/ha				
	11	Bioprotec 3P	0.72-1.45 kg/ha in minimum 600 L water/ha	-	1 day	Foliar application. Apply at first signs of infestation when larvae are small. Repeat applications as necessary to maintain control. Minimum reapplication interval of 7 days.	
	18	Confirm 240F	1.0 L/ha	12 hrs	14 days	<b>Leafrollers.</b> Begin applications at early egg hatch for each generation. Make the first application before webbing and sheltering begins. Make a second application in 10 to 14 days to ensure complete coverage of rapidly expanding fruits or foliage.	
		Intrepid	0.5 L/ha	12 hrs	7 days	Apply to overwintering larvae as soon as they start feeding in the spring or at the beginning of egg hatch for the summer generation. Repeat applications after 7-14 days if required based on population monitoring.	
28	Exirel	500-1000 mL/ha	12 hrs	3 days	Begin applications when treatment thresholds have been reached. Thorough coverage is essential for optimum control.		
	Altacor	215-285 g/ha	12 hrs	1 day			

Insect / Disease	Group	Product	Rate / ha	Restricted-Entry Interval (REI)	Pre-Harvest Interval (days)	Note
Mummy berry ( <i>Monilinia</i> )	Refer to Green Tip					
<b>BLOOM</b>						
<b>WARNING – Spraying pesticides during bloom is hazardous to bees. Spray in the evening or when bees are not working.</b>						
Botrytis twig and blossom blight, Botrytis grey mold	3+9	Cantus WDG	560 g/ha	12 hrs	0 days	Use once and then rotate to a different fungicide group. <b>Suppression only.</b>
	7	Kenja 400 SC	0.987-1.24 L/ha	12 hrs 12 hrs	7 days	Use once and then rotate to a different fungicide group. <b>Suppression only.</b> Begin applications preventatively. First application at early flowering. Continue as needed, on a 7-14 day interval. Shorter intervals when high disease pressure.
		Sercadis	250-660 mL/ha		0 days	
		Luna Tranquility	1200 mL/ha		0 days	
	7+9	Pristine WG	1.3-1.6 kg/ha	24 hrs	0 days	Begin applications prior to disease development and continue on a 7 to 14 day schedule. Use a shorter interval and/or higher rates when disease pressure is high.
	7+11	A20560	0.8-1.0 L/ha	12 hrs	1 day	Make the first application during early bloom.
	7+12	Scala SC	2 L/ha	12 hrs	0 days	Apply maximum of 2 applications per growing season.
	9	Switch 62.5 WG	775 to 975 g/ha	12 hrs	1 day	Apply first during early bloom. Second application may 7-10 days later. Third application if conditions remain favorable for disease development. <b>One of the actives in this product is persistent and may carryover. It is recommended that any products containing the active ingredient fludioxonil not be used in areas treated with this product during the previous season.</b>
	9+12	Elevate 50 WDG	1.70 kg	4 hrs	1 day	
17	Diplomat 5SC	463-926 mL/ha 25-50 g a.i./ha	When dry	0 days	<b>Suppression.</b> Begin as a preventative application when conditions favour disease development and continue on a 7-21 day interval as needed. Do not apply more than 150g a.i./ha/season.	

Insect / Disease	Group	Product	Rate / ha	Restricted-Entry Interval (REI)	Pre-Harvest Interval (days)	Note
Botrytis twig and blossom blight, Botrytis grey mold (cont.)	19	Serenade Opti	1.7-3.3 kg/ha (Grey mold)  0.6-1.7 kg/ha (Bacterial blight)	When dry	0 days	<b>Biopesticide. Suppression only.</b> Begin applications at first sign of the disease or when conditions favour disease development. Repeat as necessary on a 7-10 day interval.
	44	Serenade Max	3.0-6.0 kg/ha	When dry	0 days	<b>Biopesticide. Suppression only.</b> Begin application prior to disease development and repeat on 7-10 day intervals.
	44	Timorex Gold	1.5-2.0 L/ha	4 hrs	2 days	Do not tank-mix with Supra Captan, Maestro, or Sulphur products.
	46	Botector	1 kg in 500-2000 L water/ha	4 hrs	0 days	<b>Suppression only.</b>
	M	Maestro 80 DF	2.25 kg	72 hrs	2 days	Do not use within 14 days of oil. Do not tank-mix or in sequential application with Exirel.
		Captan 80 WDG				
		Ferbam 76 WDG	3.75 kg	12 hrs	40 days	Do not apply later than mid-bloom.
		Inspire Super	1.0-1.5 L/ha	12 hrs	1 day	Begin applications during early bloom or prior to disease onset when conditions are conducive for disease. Apply on a 10 to 21 day schedule. If disease pressure is high, use the highest rate and shortest interval. DO NOT apply more than two applications per crop per season.
	NC	Regalia Maxx	0.125-0.25% v/v in 400-800 L water/ha	When dry	0 days	<b>Suppression only.</b> For best results, use multiple applications or rotate with other products.
	P5	Double Nickel LC	2.5-5.0 L/ha	-	0 days	Begin preventative applications before disease appears, repeat on 3-10 day intervals or as needed. Under situations where disease pressure is likely to be high, use the high rate and apply more frequently (every 3-7 days).
BM 02	Nova	340 g/ha	12 hrs	6 days (1 day for mechnaical harvesting)	Apply at the first sign of disease development and repeat in 7-14 days. Pre-bloom, bloom, and immediately after bloom are the most critical times for the control of powdery mildew.	

Insect / Disease	Group	Product	Rate / ha	Restricted-Entry Interval (REI)	Pre-Harvest Interval (days)	Note
<b>Powdery Mildew</b> ( <i>Microsphaera vaccinii-blueberry</i> )	3	Nova	340 g/ha	12 hrs	6 days (1 day for mechnaical harvesting)	Apply at the first sign of disease development and repeat in 7-14 days. Pre-bloom, bloom, and immediately after bloom are the most critical times for the control of powdery mildew.
<b>Anthracnose &amp; Phomopsis canker</b>	<b>Refer to Green Tip.</b> Spray from Bloom through to Petal Fall. Do not apply Bravo beyond Petal Fall.					
	3+11	Quilt	1 L/ha	12 hrs	30 days	Do not tank-mix or make sequential applications with Exirel.
<b>POST-BLOOM</b>						
<b>Scale</b>	23	Movento 240 SC	365-585 mL/ha in 200-3000 L water/ha	12 hrs	7 days	<b>Suppression only. Lecanium scale only.</b> Apply at egg hatch.
<b>GREEN FRUIT TO FRUIT RIPENING</b>						
<b>Cherry fruitworm</b> ( <i>Grapholita packardi</i> ) <b>&amp; Cranberry fruitworm</b> ( <i>Acrobasis vaccinii</i> )	The National Identification Service reported in 2015 that Cherry fruitworm, <i>Grapholita packardi</i> , has been reported in New Brunswick (prior to this it was not believed to be in the Maritimes. Therefore, monitoring and proper identification of all specimens is highly recommended.					
		Malathion 85E	1000-2500 mL/ha	12 hrs	3 days	Maximum number of applications/year 3
	1	Sevin XLR	4.00 L/ha in 1200-1400 L water/ha	5-9 days	2 days	<b>Cranberry fruitworm only.</b>
		Assail 70 WP Aceta 70 WP	160 g/ha in minimum 187 L water/ha	12-48 hrs	7 days	Begin application when egg hatch begins.
	4	Bioprotec CAF	1.4-2.8 L/ha	12 hrs	0 days	
	4-15	Sevin XLR	4 L/ha	5 days <sup>1</sup> / 9 days <sup>2,3</sup>	2 days	Residual activity is 5-7 days.

Insect / Disease	Group	Product	Rate / ha	Restricted-Entry Interval (REI)	Pre-Harvest Interval (days)	Note	
<b>Cherry fruitworm</b> ( <i>Grapholita packardii</i> ) & <b>Cranberry fruitworm</b> ( <i>Acrobasis vaccinii</i> ) (cont.)	11	Dipel 2X DF	1.68 kg/ha	12 hrs	0 days	Apply on a 10-14 day interval with a maximum of 3 applications per year.	
		Rimon 10 EC	1.35-2 L/ha in 374-1122 L water/ha	12 hrs	8 days		
	15	Confirm 240 F	1.2 L/ha	12 hrs	14 days	<b>Cranberry fruitworm only.</b> Apply at first upswing of trap captures and reapply in 10-14 days.	
	18	Intrepid	0.5 L/ha	12 hrs	7 days	<b>Cranberry fruitworm only.</b> Apply at first upswing of trap captures and reapply in 10-14 days. Do not apply more often than once every 7 days. Do not exceed 645 g/ha or 3 applications per season.	
		Altacor	215-285 g/ha	12 hrs	1 day		
	28	Exirel	0.5-1.0 L/ha	12 hrs	3 days	See label for tank-mix restrictions.	
Cormoran		1.4 L/ha	12 hrs	8 days	Repeat applications if needed to maintain control, but DO NOT apply more than once every 10 to 14 days. Max 3 app/year.		
<b>Blueberry fruit fly</b> ( <i>Rhagoletis mendax</i> ) <b>a.k.a. Blueberry maggot fly</b>	1A	Lagon 480 E	830 mL	12 hrs <sup>1</sup> / 12 days <sup>3</sup>	21 days	Do not use on crops destined for US markets due to a very low limit for residual dimethoate. Residual activity 10-12 days.	
	1B	Cygon 480-AG	830 mL 1.6 kg	12 hrs <sup>1</sup> / 12 days <sup>3</sup> 3 days <sup>1,4</sup> / 15 days <sup>5</sup>	21 days 15 days	Do not use on crops destined for US markets due to a very low limit for residual dimethoate. Residual activity 10-12 days. Residual activity 10-12 days.	
		Imidan 70-WP					
		Malathion 85 E	550 mL/ha	48 hrs	1 day		Residual activity 5-7 days.
		Assail 70 WP Aceta 70 WP	136-160 g/ha	12 hrs <sup>1</sup> / 48 hrs <sup>2</sup>	7 days		Maximum of two products from group 4A per season.
	4	Admire 240 Flowable	230-350 mL/ha	24 hrs	3 days	Maximum of two products from group 4A per season. Toxic to certain beneficial insects. Rotate with insecticides outside of Group 4.	
Sivanto Prime		0.75-1.0 L/ha	12 hrs	3 days			

Insect / Disease	Group	Product	Rate / ha	Restricted-Entry Interval (REI)	Pre-Harvest Interval (days)	Note
<b>Blueberry fruit fly</b> <i>(Rhagoletis mendax)</i> <b>a.k.a. Blueberry maggot fly</b> (cont.)	4-15	Maestro 80 DF	2.25 kg	72 hrs	2 days	Do not use within 14 days of oil or as a tank-mix or sequential application with products such as Exirel or Timorex Gold.
	4D	Entrust	219-440 ml/ha	When dry	1 day	Use the maximum rate when insect pressure is high. Use a maximum of three applications per season
	5	GF-120 Fruit Fly Bait	1.0-1.5 L	12 hrs	-	<b>OMRI listed product.</b> Begin applications as soon as traps indicate flies are present. Repeat on 7 day intervals, use a shorter interval during rainy periods. Apply to one side of every row.
	5	Movento 240 SC	365-435 mL/ha in 200-3000 L water/ha	12 hrs	7 days	Allow for 7 days between applications.
	23	Exirel	*1000-1500 mL/ha	12 hrs	3 days	<b>Suppression only.</b> Begin applications when treatment thresholds have been reached. For blueberry maggot, begin applications when populations are low. If blueberry maggot populations are high, use a registered insecticide with a different mode of action to reduce the pest populations before applying Exirel.
	28	Cormoran	1.2-1.4 L/ha/	12 hrs	8 days	Repeat applications if needed to maintain control, but DO NOT apply more than once every 10 to 14 days. Max 3 app/year.
<b>Botrytis twig and blossom blight,</b> <b>Botrytis grey mold</b> <b>Botrytis twig and blossom blight,</b> <b>Botrytis grey mold</b>	3+9	Cantus 70 WDG	0.56 kg	12 hrs	0 days	<b>Suppression only (Sercadis).</b> Use once, then rotate to a different fungicide group.
	7	Kenja 400 SC	0.987-1.24 L/ha	12 hrs	7 days	<b>Suppression only (Sercadis).</b> Use once, then rotate to a different fungicide group. Apply prior to harvest to improve postharvest disease control.
		Sercadis	250-666 mL/ha	12 hrs	0 days	
		Luna Tranquility	1.2 L/ha		0 day	
	7+9	Pristine WG	1.3-1.6 kg/ha	24 hrs	0 days	Begin applications prior to disease development and continue on 7-14 day schedule. Use shorter interval and/or higher rates when disease pressure is high.
7+11	Scala SC	2 L/ha	12 hrs	0 days		



Insect / Disease	Group	Product	Rate / ha	Restricted-Entry Interval (REI)	Pre-Harvest Interval (days)	Note
Botrytis twig and blossom blight, Botrytis grey mold Botrytis twig and blossom blight, Botrytis grey mold (cont.)	9	Switch 62.5 WG	775-975 g/ha	12 hrs	1 day	<b>One of the actives in this product is persistent and may carryover. It is recommended that any products containing the active ingredient fludioxonil not be used in areas treated with this product during the previous season.</b>
	9+12	Elevate 50 WDG	1.70 kg	4 hrs	1 day	
	17	Diplomat 5SC	463-926 mL/ha	When dry	0 days	<b>Suppression.</b> Begin as a preventative application when conditions favour disease development and continue on a 7-21 day interval as needed.
	19	Serenade OPTI	1.7-3.3 kg/ha (Botrytis grey mould)  0.6-1.7 kg/ha (Bacterial blight)	When dry	0 days	<b>Suppression only.</b> For best results, use multiple applications or rotate with other products.
	44	Timorex Gold	1.5-2.0 L/ha	4 hrs	2 days	Do not tank mix or alternate with Supra Captan, Maestro, or sulphur products.
	46	Botector	1 kg in 500-2000 L water/ha	4 hrs	0 days	<b>Suppression only.</b>
	M	Captan 80 WDG Inspire Super	2.25 kg 1.2-1.5 L/ha	72 hrs 12 hrs	2 days 1 day	Do not use within 14 days of oil or as a tank-mix or sequential application with products such as Exirel or Timorex Gold. No more than two consecutive applications before rotating with a different fungicide group.
	P5	Delegate	100-200 g/ha	12 hrs	3 days	Reapply as necessary on a 7-10 day schedule. Toxic to bees exposed to direct treatment, drift or residues on blooming plants.
	NC	Regalia Maxx	0.25% v/v in 400-800 L water/ha	When dry	0 days	<b>Suppression only.</b> For best results, use multiple applications or rotate with other products.

<sup>1</sup>General Re-entry

<sup>2</sup>Hand-pruning

<sup>3</sup>Hand-harvest

<sup>4</sup>PPE Require for Certain Activities

<sup>5</sup>U-pick Harvest

Insect / Disease	Group	Product	Rate / ha	Restricted-Entry Interval (REI)	Pre-Harvest Interval (days)	Note
Leafroller	5	Entrust	267-364 mL/ha	When dry	3 days	Reapply as necessary on a 7-10 day schedule. Toxic to bees exposed to direct treatment, drift or residues on blooming plants. Spray when and where pests are actively feeding.
		Success	145-182 mL/ha	When dry 12 hrs	0 days	
		Bioprotec CAF	1.4-2.8 L/ha			
	11	Dipel 2X DF	525-1125 g/ha	12 hrs	0 days	Spray when and where pests are actively feeding.
	11	Confirm 240 F	1.0 L/ha	12 hrs	14 days	Active on eggs and young larvae
	18	Intrepid	0.5 L/ha	12 hrs	7 days	Active on eggs and young larvae Thorough coverage is essential for optimal control.
		Altacor	215-285 g/ha	12 hrs	1 day	
	28	Exirel	0.5-1.0 L/ha	12 hrs	3 days	See label for tank-mix and compatibility restrictions.
Exirel		0.5-1.0 L/ha	3 days		See label for tank-mix and compatibility restrictions.	
Spotted wing Drosophila	<b>Emergency registrations for additional products are added annually. Please watch for the release of the emergency registration list in the spring of every year. Information on emergency registrations can be found on the highbush blueberry page of the Perennia website.</b>					
	1	Delegate	315-420 g/ha	12 hrs	1 day	Use higher rate and shorten interval between applications under high pest pressure.
	3	UP-Cyde 2.5EC/	245 - 285 mL/ha	12 hrs	2 days	Timing of applications should be based on the presence of adult pest (flies) as determined by local monitoring. Allow a minimum of 7 days between treatments. Do not apply more than two treatments. Use sufficient water for thorough coverage. It is recommended that use of Up-Cyde 2.5 EC for spotted wing drosophila be part of an integrated pest management program. <b>Toxic to bees. DO NOT apply during the crop blooming period.</b>
	3	Malathion 85E	1000-2500 mL/ha (1023-2559 g a.i./ha)	12 hrs	2 days	Foliar application only. Use a minimum of 500 L of water per hectare. Use higher rate when pest populations are high. Minimum application interval 7 days between application. Maximum 3 applications per crop/year.
	5	Entrust	334-440 mL/ha	When dry 12 hrs	1 day	Use higher rate and shorten interval between applications under high pest pressure. See label for tank-mix and compatibility restrictions.
Success		165-220 mL/ha	1 day			
Exirel		1.0-1.5 L/ha	3 days			

Insect / Disease	Group	Product	Rate / ha	Restricted-Entry Interval (REI)	Pre-Harvest Interval (days)	Note
Spotted wing Drosophila (cont.)	28	Cyclaniliprole 50SL	1.2-1.6 L/ha	12 hrs	1 day	Use degree day models to determine application timing. Repeat applications at 7 day intervals if required. Make a maximum of 3 applications per crop year. <b>Toxic to bees.</b>
	28	Mako	150-175 mL/ha	12 hrs	2 days	Ground application only, do not apply using aerial application. Timing of applications should be based on the presence of adult flies. <b>Toxic to bees.</b>
		Imidan WP	1.6 kg of product in 1000 litres of water/ha	Dependant on activity see label	17 days hand harvest 15 days mechanical	Check REI depending on the activity
Anthracnose	Most infections take place during bloom. Fungicides at this time are not necessary if good control was achieved earlier.					
	3	Quash	188 ml/ha	12 hrs	8 days	Do not make more than 3 applications per season. Do not make more than 2 sequential applications. Do not apply more than 564 mL/ha/season.
	3	Inspire Super	1.2-1.5 L/ha	12 hrs	1 day	No more than two consecutive applications before rotating with a different fungicide group.
	3+9	Pristine WG	1.3-1.6 kg/ha	24 hrs	0 days	Max. 4 applications/season.
	7+11	Switch 62.5 WG	775-975 g/ha	12 hrs	1 day	
	9+12	Cabrio EG	1 kg/ha	12-24 hrs	1 day	Do not tank-mix or make sequential applications with Exirel.
	11	Regalia Maxx	0.25%v/v in 400-800 L water/ha	When dry	0 days	<b>Suppression only.</b> For best results, use multiple applications or rotate with other products.
	P5	Botector	1kg in 500-2000 L water/ha	4 hrs	0 days	<b>Suppression only.</b>
	NC	Botector	1kg in 500-2000 L water/ha	4 hrs	0 days	<b>Suppression only.</b>

Insect / Disease	Group	Product	Rate / ha	Restricted-Entry Interval (REI)	Pre-Harvest Interval (days)	Note
<b>POST-HARVEST</b>						
Spotted wing drosophila	<b>Emergency registrations for additional products are added annually. Please watch for the release of the emergency registration list in the spring of every year. Information on emergency registrations can be found on the highbush blueberry page of the Perennia website.</b>					
	1B	Cygon 480 or Lagon 480 E	830 mL/ha in up to 1000 L water/ha 334-440 mL/ha	12 hrs	21 days 1 day	Apply post-harvest only, to control spotted wing drosophila (adults and larvae in fruit) that may otherwise infest adjacent crops. <b>*Potentially harmful to bees*</b> Maximum 2 applications per year with a reapplication interval of 15 days. Application should be based on the presence of adult pests (flies) as determined by local monitoring.
	1B 5	Entrust SC Exirel	830 mL/ha in up to 1000 L water/ha 334-440 mL/ha 1000-1500 mL/ha	12 hrs 12 hrs	21 days 1 day 3 days	Apply post-harvest only, to control spotted wing drosophila (adults and larvae in fruit) that may otherwise infest adjacent crops. <b>*Potentially harmful to bees*</b> Maximum 2 applications per year with a reapplication interval of 15 days. Application should be based on the presence of adult pests (flies) as determined by local monitoring. Begin applications when populations are low. Exirel targets the adult life stage of Spotted wing drosophila. If populations are high, use a registered insecticide with a different mode of action to reduce the pest populations.

## Potential or Occasional Pests

Insect / Disease / Other	Note
<b>Birds</b>	Observation has indicated that the best way to repel birds is to drive them away very early in the morning by using special noise-making shotgun shells. Other noise-making devices are apparently less effective. Some useful tips can be gleaned from the BC Bird IPM Plan at <a href="http://www.agf.gov.bc.ca/cropprot/birdipmplan.pdf">www.agf.gov.bc.ca/cropprot/birdipmplan.pdf</a>
<b>Phytophthora root rot</b>	This disease has not been found in Nova Scotia. However, <b>Ridomil Gold</b> is registered for control should the disease appear here. Apply 37 mL of Ridomil Gold 480EC / 100 m of row to the soil surface in a one-meter-wide band centered over the row. Apply in the early spring prior to growth. Apply a minimum of 200 L of water / hectare. Do not apply more than once a year. <b>Phostrol</b> at 2.9-5.8 L/ha. Begin foliar sprays in the spring at approximately the pink bud stage and continue on a 14 day interval. Use sufficient volume of water for good coverage. Max 4 applications/season. Also, for control of LeafSpot ( <i>Septoria spp.</i> ).
<b>Crown gall <i>Agrobacterium spp.</i></b>	Blueberries are susceptible to crown gall. This bacterium that causes the condition can attack crowns and roots causing galls to form. The organism can carry-over in soils for many years or can be introduced on infected planting stock. To reduce the risk of crown gall problems, purchase healthy plants from reputable nurseries. Also, avoid mechanical injury to the roots and over fertilization. Winter injury and feeding damage from soil inhabiting insects can also promote crown gall infections.
<b>Aphids</b>	<b>Movento 240 SC</b> can be used to control Aphids. Apply post bloom at 220-365 mL/ha. There is a 12-hour REI and a 7 day PHI. Allow 7 days between applications and do not apply more than 1.833 L/ha per year. <b>Fulfill 50WG</b> can be used at 193 g/ha (500-1000 L of water/ha). Apply pre-bloom and post-harvest application only. Maximum 2 applications per year. <b>Do not apply within 85 days of harvest.</b> <b>Sivanto Prime</b> can be used to control aphids. Apply at a rate of 500-750 mL/ha. Apply as a directed foliar spray to ensure thorough coverage. PHI: 3 days. <b>Purespray Green Spray Oil 13E.</b> Deter feeding by <i>aphids</i> , suppression of <i>spider mites</i> . Apply 10 L in 1000 L water (1% solution) otherwise phytotoxicity may result. Use sufficient spray volume (up to 1000 L/ha) to ensure thorough crop coverage. Begin when mites and/or aphids appear. Apply at 7 – 14 day intervals. Do not apply more than 8 summer spray applications per growing season. Apply <b>Pyganic EC 1.4 II</b> at a rate of 2.32-4.65 L/ha when pests are first observed. Do not reapply more often than every 7 days. <b>Toxic to bees.</b> REI: 12 hrs <b>Cormoran:</b> 750 mL/ha. Repeat applications if needed to maintain control, but DO NOT apply more than once every 10 to 14 days. Max 3 app/year. REI: 12 hrs. PHI: 8 days. <b>Closer:</b> 100-200 mL/ha : Use the maximum rate for high insect pressure and for longer residual control. Use in sufficient water to ensure thorough coverage usually 200 to 1000 litres of water per hectare. Reapplication interval of a minimum of 7 days if populations warrant. Use a maximum of 3 applications for aphids, Do not apply within 1 day to harvest. Do not apply more than 190 g ai/ha (800 mL product /ha) per growing season.REI: 12 hours

Insect / Disease / Other	Note
<b>Weevils</b>	<b>Actara 25 WP</b> can be used to control weevils. Apply at 210-280 g/ha. Maximum two applications per year. <b>This product is highly toxic to bees, do not apply to blooming crops and wait at least 5 days before placing beehives in a treated field. PHI: 3 days</b>
<b>Japanese Beetle</b>	<b>Imidan WP</b> or <b>Imidan 50 WP</b> (Pesticide Group 1B) can be used to control Japanese Beetle. Restricted entry interval of 3 days and a Pick Your Own (PYO) REI of 15 days. Pre-harvest interval of 15 days. Apply <b>Imidan WP</b> at a rate of 1.6 kg/1000L water/ha. Apply <b>Imidan 50 WP</b> at a rate of 2.25 kg/1000L water/ha. Begin applications when adult Japanese beetles are first observed; 2 <sup>nd</sup> application may be required. Maximum 2 applications per season.
<b>Brown marmorated stink bug</b>	<b>Not found in Nova Scotia but has been found in Ontario and Quebec.</b>
<b>Bacterial blight</b>	<p><b>M1 - Cueva</b>                      0.5-2% solution, applied 470-940 L/ha                      4 hrs REI; 1 day PHI                      Apply at the start of flowering and continue every 7 to 10.                      Apply before fall rains and again during dormancy before spring.</p> <p><b>Copper Spray Fungicide- M</b>                      Apply 2-4 kg in 500-1000 L/ha. Apply once before fall rains, once at 50% leaf fall and once at bud burst, then at 14 day intervals during wet weather.                      48 hrs REI; 2 day PHI                      Maximum 6 applications per year.</p> <p><b>Pura-fi 420- M01</b>                      For control of bacterial blight apply Pura-fi 420 as a foliar application at a rate of 180 – 200 ppm in 600-1200 L of water per hectare.</p>

Insect / Disease / Other	Note
<p><b>Valdensinia leaf spot</b> (<i>Valdensinia heterodoxa</i>)</p>	<p>Apply <b>PROLINE 480 SC</b> Foliar Fungicide at the first sign of disease. After the initial application, one additional application may be made 10-14 days afterwards if conditions remain favourable for continued or increased disease development. Apply up to two (2) applications of PROLINE 480 SC per year. Apply at a rate of 400 mL/ha. Applications may be made by ground application equipment only. Apply with a non-ionic surfactant, AgSurf or Agral 90 at 0.125% v/v. REI = 24 hours. PHI = 7 days. Also good for the suppression of Septoria leaf spot. <b>Quilt</b> at 1.0 L/ha for suppression of Valdensinia leaf spot. Apply at the first sign of disease in the spout year. After the initial application, one additional application may be made 10-14 days afterwards if conditions remain favourable for continued or increased disease development. Use a minimum of 200 L per hectare of water or an appropriate water volume to provide full coverage. REI = 12 hours. PHI = 30 days. <b>Propulse: Suppression of Valdensinia leaf spot.</b> 1000 ml/ha. Apply at the first sign of disease. After the initial application, one additional application may be made 10-14 days afterwards if conditions remain favourable for continued or increased disease development. REI: 24 hours PHI: 7 days.</p>
<p><b>Blueberry leaftier</b> (<i>Croesia curvalana</i>)</p>	<p>Apply <b>Decis 5 EC</b> at a rate of 150mL/ha in 1200-1500L/ha of water. Also controls spanworm at a 125mL/ha rate, and other caterpillars such as winter moth and leafrollers if applied when insects or damage first appear prior to bloom.</p> <p>Apply <b>Poleci 2.5 EC</b> at a rate of 300mL/ha in 1200-1500L water/ha. Will also control spanworm at 250mL/ha. REI: 12 hours. PHI: 14 days.</p>
<p><b>Leafhopper</b></p>	<p>Sharp nosed leafhoppers are a vector of blueberry stunt phytoplasma, which causes blueberry stunt disease. Control of leafhopper is important when blueberry stunt is a problem. Apply <b>Pyganic EC 1.4 II</b> at a rate of 2.32-4.65 L/ha when pests are first observed. Do not wait until plants are heavily infested. Reapply if needed. Do not use when bees or other beneficial insects are present. REI: 12 hrs</p> <p>Apply <b>Admire 240 Flowable</b> at a rate of 175 ml/ha. Do not make foliar applications following a soil application of a Group 4A insecticide. Maximum of two applications of products from group 4A per season.</p> <p><b>Closer:</b> 200-400 mL/ha : Use the maximum rate for high insect pressure and for longer residual control. Use in sufficient water to ensure thorough coverage usually 200 to 1000 litres of water per hectare. Reapplication interval of a minimum of 7 days if populations warrant. Use a maximum of 2 applications for leaf hopper. Do not apply within 1 day to harvest. Do not apply more than 190 g ai/ha (800 mL product /ha) per growing season. REI: 12 hours. Supression only for leafhopper.</p>

Insect / Disease / Other	Note
<p><b>Spanworm</b></p>	<p><b>Confirm 240 F</b>, Group 18                      Begin applications when first signs of feeding damage appear or when infestations reach threshold levels.                      Apply at 1.0 L/ha                      REI= 12 hours, PHI= 14 days  <b>Delegate Insecticide</b>, Group 5                      For the suppression of blueberry spanworm, apply 100-200 grams of product per hectare. Apply a maximum of 3 applications per year.                      Apply at a rate of 200 g/ha.                      PHI: 3 days</p>
<p><b>Armyworm cutworm</b></p>	<p>Confirm 240 F, Group 18                      Begin applications when first signs of feeding damage appear or when infestations reach threshold levels.                      Apply at 1.0 L/ha                      REI= 12 hours, PHI= 14 days</p>

<sup>1</sup>General Re-entry

<sup>2</sup>Hand-pruning

<sup>3</sup>Hand-harvest

<sup>4</sup>PPE Require for Certain Activities

<sup>5</sup>U-pick Harvest



## PESTICIDE INFORMATION SUMMARY

Read product labels for re-entry intervals, precautions, and other product specific details.

\* Days to harvest intervals and toxicity ratings are provided as a guide only. Always refer to the label.

Trade Names	Common Name	Days To Harvest*	Toxicity*			
			To Pred Mites	To Bees	To Applicator	
					Oral	Dermal
<b>INSECT/MITE CONTROL</b>						
Actara 25WG	thiamethoxam	3	-	high	low	low
Admire 240 Flowable	imidacloprid	3	low	mod	low	low
Altacor	chlorantraniliprole	1	-	mod	low	low
Assail	acetamiprid	7	-	mod	low	low
Bioprotec	<i>Bacillus thuringiensis</i>	0	low	low	low	low
Confirm 240 F	tebufenozide	14	low	low	low	low
Cygon 480-AG	dimethoate	21	low	high	low	low
Decis	deltamethrin	14	high	high	low	low
Delegate	spinetoram	3	low	high	low	low
Dipel 2X DF	<i>Bacillus thuringiensis</i>	0	low	low	low	low
Entrust/ Success 480SC	spinosad	3	low	high	low	low
Exirel	cyantraniliprole	3	-	high	low	low
GF-120 NF Naturalyte Fruit Fly Bait	spinosad	-	low	high	low	low
Imidan	phosmet	15	mod	high	mod	low
Intrepid	methoxyfenozide	7	-	low	low	low
Lagon	dimethoate	15	high	mod	mod	mod
Malathion	malathion	1	low	high	low	low
Movento	spirotetramat	7	mod	high	mod	mod
Purespray Green Spray Oil 13E	mineral oil	-	low	-	low	low
Pyganic EC 1.4 II	pyrethrins	-	low	high	low	low
Rimon	novaluron	8	low	mod	mod	mod
Sevin	carbaryl	2	mod	high	mod	mod
Sivanto Prime	flupyradifurone	3	low	mod	high	low
Superior 70 Oil	mineral oil	-	low	-	low	low
Vegol Crop Oil	mineral oil	0	low	-	low	low
<b>DISEASE CONTROL</b>						
Actinovate SP	<i>Streptomyces lydicus</i>	-	low	low	low	low
Aliette WDG	fosetyl-al	1	low	low	low	low
Allegro	fluazinam	30	low	low	low	low
Botector	<i>Aureobasidium pullulans</i>	0	low	low	low	low
Bravo/Echo 90DF/Echo 720	chlorothalonil	54	low	low	low	low

Trade Names	Common Name	Days To Harvest*	Toxicity*			
			To Pred Mites	To Bees	To Applicator	
					Oral	Dermal
Bumper 432 EC	propiconazole	60	low	low	low	low
Cabrio	pyraclostrobin	29	low	low	low	low
Cantus	boscalid	0	low	low	low	low
Captan, Maestro	captan	2	low	mod	low	low
Confine Extra	mono- and di-potassium salts or phosphorous acid	1	low	low	low	low
Cueva	copper	1	?	?	low	low
Diplomat	Polyoxin D Zinc salt		low	low	low	low
Elevate	fenhexamid	1	low	low	low	low
Ferbam	ferbam	40	low	low	low	low
Fitness	propiconazole	60	low	low	low	low
Funginex	triforine	60	low	low	low	low
Indar	fenbuconazole	30	-	low	low	low
Inspire Super	difenoconazole + cyprodinil	1	low	low	low	low
Jade	propiconazole	60	low	low	low	low
Kenja 400SC	isofetamid	7	low	low	low	low
Lime Sulphur	calcium polysulphide	-	high	mod	mod	low
Luna Tranquility	fluopyram + pyrimethanil	0	low	low	low	low
Phostrol	mono- and dibasic sodium, potassium and ammonium phosphates	0	low	low	low	low
Pristine	boscalid, pyraclostrobin	0	low	low	low	low
Proline 480SC	prothioconazole	7	-	low	low	low
Quash	metconazole	7	low	low	low	low
Quilt	propiconazole + azoxystrobin	30	low	low	low	low
Regalia Maxx	extract of <i>Reynoutria sachalinensis</i>	0	low	low	low	low
Ridomil Gold 480 EC	metalaxyl-M	80	-	low	low	low
Scala SC	pyrimethanil	0	low	low	low	low
Sercadis	fluxapyroxad	0	low	low	low	low
Serenade OPTI	<i>Bacillus subtilis</i>	0	low	low	low	low
Switch	cyprodinil, fludioxonil	1	-	low	low	low
Tilt 250 E	propiconazole	60	low	low	low	mod
Timorex Gold	tea tree oil	2	low	low	low	low
Topas, Mission, Propi Super	propiconazole	60	low	low	low	low

## Label Definitions

**DAYS TO HARVEST** - Is the minimum number of days from the last application of the product to first harvest. This interval has been set to ensure that any residue of the pesticide left on the fruit at harvest is within an acceptable tolerance. Read the label and do not spray nearer to harvest, or later than the growth stage recommended.

**TOXICITY TO BEES** - Bees are important pollinators of highbush blueberries. If a pesticide must be applied during the bloom period, choose products with the least toxicity to bees. Spray in late evening or early morning when bees are not present. Spray deposit should be dry before bees begin foraging. If you have rented bees, notify the beekeeper that you intend to spray. Give enough advance notice so that the bees can be moved. Do not allow pesticide spray to drift onto hives. The presence of large numbers of dead bees at the hive entrance may be an indicator of pesticide poisoning.

**TOXICITY TO APPLICATOR** - Poisoning as a result of pesticide exposure can result from inhalation, ingestion (Oral), or absorption through the skin (Dermal). It is essential that protective clothing, respirator and eye protection are worn when handling products listed as having a high or moderate toxicity. However, since pesticides may also have adverse effects after long term sublethal exposures it is recommended that protective equipment be worn when using all pesticides. Some of the wettable powder (W or WP) formulations recommended in this guide are now available in low exposure packaging (Instapak, Solupak) or low dust formulations such as dry flowable (DF) and wettable dry granule (WDG). Use of these products reduces inhalation exposure during handling.

**RESISTANCE MANAGEMENT** - The inappropriate use of some products leads to selection pressures within pest populations which gradually increase the number of more tolerant organisms within the population. Current disease concerns are for the development of resistance in the Botrytis blight fungus to Elevate, Senator and Lance (they are from different chemical families). To slow the development of resistance, use the products at appropriate rates and rotate with other fungicides from different chemical families or groups. Avoid application of more than two consecutive sprays of the same fungicide or a fungicide from the same chemical family. If additional protection or control is required, choose a product from a different chemical family. Refer to the labels for more detailed information on resistance management.

Insect resistance management is based on the same principles. Among the key strategies are 1) monitor insect populations, 2) use economic thresholds and treat only as a last resort, 3) rotate controls (chemical vs non-chemical options) and modes of action (different chemical families), and 4) use appropriate rates. For a very informative self-paced course on insect resistance management, have a look at the free online NCGA course on the Dow AgroSciences web site at <http://209.98.16.17/index.html?org=dow>.

**PESTICIDE POISONING** - If you suspect poisoning from exposure to a pesticide, consult the label for immediate first-aid instructions. Transport the person to your nearest hospital or call 911. Take the label information or the sealed pesticide container with you since it supplies treatment information. **The Pest Control Products Act Number (P.C.P. No.) on the label will enable the attending physician to obtain specific treatment guidelines from the Poison Control Centre.**

## HOW TO REDUCE / AVOID PESTICIDE USE

By applying good management practices, growers can sometimes reduce or eliminate the need for some pesticides. Good management practices include:

- Learn to recognize blueberry pests and diseases.
- Monitoring is essential to establishing an effective IPM program.
- If new to implementing an IPM program, uncertainty and risk can be reduced or eliminated by using qualified supervision. Perennia can provide advice on who to contact and how to proceed.
- Learn the thresholds and trust them. Thresholds have been established based on cost/benefit analyses and years of experience. Minimum or threshold adjustments may be warranted in some cases but should be discussed with an IPM Specialist/Consultant before using. If economic or action thresholds do not exist for a particular pest, lobby for research that will help resolve this situation.
- Sanitation. Remove and destroy diseased stems and branches from the field. This is especially important for canker control.
- Know the product you are using. Some products are more effective under specific conditions, such as temperature, or are only effective when the target pest is at a specific stage of development. Read the label carefully.
- Choose the planting site carefully. Wet, poorly drained soils can lead to root problems.

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