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New Fungicides for Berry Crops

Pam Fisher, Berry Crop Specialist, OMAF

Several new fungicides have been registered for control of Botrytis grey mould on berry crops. These new registrations include the bushberry group: currants, gooseberries, elderberries and huckleberries.

Botrytis is a concern when cool wet weather occurs during the bloom stage of these crops. On currants, Botrytis infection has been implicated in the syndrome known as "run-off". This sudden drop of developing currants is thought to be the result of Botrytis infection at bloom.

Elevate 50 WDG: Elevate was previously labeled for Botrytis grey mould on strawberries and raspberries, and is now labelled on blueberries and bushberries. Apply Elevate 50 WDG as a protectant spray beginning at 10% bloom stage and subsequently depending on weather and disease severity. Elevate (fenhexamid) is very effective against grey mould, but you should not expect control of other diseases from this product. On strawberries and raspberries, use it in rotation with a broad -spectrum fungicide such as Captan or Maestro to keep leaf spot (strawberries) and spur blight (raspberries) in check.

The re-entry period is 4 hours after application and the preharvest interval is 1 day. The registrant for Elevate 50 WDG is Arvesta.

Lance WDG is a new fungicide, recently registered on many crops. The active ingredient in Lance is boscalid, it is effective against botrytis grey mould in berries, and several diseases (sclerotinia, alternaria) in vegetable crops. The product should be applied as a protectant spray, beginning at bloom and re-applied as necessary. The re-entry period is 4

hours after application, the preharvest interval is 0 days. The registrant for Lance WDG is BASF.

Resistance management: There is always a risk that Botrytis will develop resistance to Elevate, Lance and many other fungicides that have a single mode of action fungi. How well these products work for you in the future depends a great deal on how they are used. Resistance management guidelines are included on each new product label. Read these over, and make note of product-specific recommendations. General guidelines for resistance management of almost any product include the following:

- 1) Know what family of fungicide each product belongs to. After one or two applications of fungicides in one family, switch to a different family. See "*Fungicide Groups for Berry Crops*"
- 2) Observe the recommended maximum number of applications per year (approx. 2 applications per season if the fungicide has a single site mode of action).
- 3) Don't cut the rate, or exceed the rate on the label.
- 4) Use fungicides as a way to prevent disease. Attempting to "cure" a disease outbreak is not effective, and it also encourages the development of resistance.
- 5) Make sure your sprayer provides good coverage.

Fungicide Groups for Berry Crops

Mike Celetti, Plant Pathology Program Lead, Horticultural Crops, OMAF.

Source: Fungicide Resistance Action Committee <http://www.frac.info>

Group No.	Group	# Mode of action sites	Products	Crop Labeled on:	Resistance Risk
1	MBC (Methyl Benzimidazole Carbamates)	single	Senator 70 WP	Strawberry, Raspberry, Blueberry	High
2	Dicarboximides	single	Rovral	Strawberry Raspberry	Medium - High
			Ronilan EG	Strawberry	
3	DMI SBI: Class 1 (Demethylation Inhibitors)	single	Funginex 190 EC	Blueberry	Medium
			Topas 250 E		
4	PA (Phenylamides)	single	Ridomil 480 EC	Strawberry, Raspberry, Blueberry	High
7	Carboximides	single	Lance WDG	Strawberry, Raspberry, Blueberry, Currant	Medium
11	QoI (Strobilurins)	single	Cabrio EG	Strawberry, Blueberry	High

Group No.	Group	# Mode of action sites	Products	Crop Labeled on:	Resistance Risk
17	Hydroxylanilides SBI:Class III	single	Elevate 50 WDG	Strawberry, Raspberry, Blueberry	Low - Medium
33 (U)	Phosphonate	unknown	Aliette WDG	Strawberry Raspberry	Low
M	Inorganic	multi	Copper 53 W	Strawberry Raspberry, Blueberry	Low
	EBDC Ethylene-Dis- Dithiocarbamates	multi	Ferbam 76 WDG	Raspberry, Blueberry	Low
	Phthalimides	multi	Captan 80 WDG Maestro 80 DF	Strawberry, Raspberry, Blueberry	Low
			Folpan 50 WP	Strawberry	
	Chloronitriles	multi	Bravo 500	Strawberry	Low
	Guanidines	multi	Equal 65 WP	Strawberry	Low - Medium

Root Weevils in Strawberries: Have you seen them?

Pam Fisher, Berry Crop Specialist, OMAF

Root weevils have caused serious economic losses in strawberries, particularly eastern Canada and the U.S.. There are several species, including the black vine weevil and the strawberry root weevil. Root weevil larvae feed on plant roots, causing stunted and weakened plants. To diagnose root weevil injury, plants should be dug up carefully, not pulled out of the ground. Keep the root system intact and gently shake soil off the roots. The weevil larvae, or grubs, will be present in the root zone in early spring through the early bloom period. These larvae are about 1/4-1/2 inch, creamy-pinky white, legless, with brown head capsules. They turn to pupae during bloom and harvest and begin to emerge from the soil as adults when harvest is ending. Adults feed on strawberry leaves causing a characteristic notching on the leaf edges. Leaf injury is not serious, but serves to alert growers and scouts when adult root weevils are present.

Control of root weevils is not easy. The weevil larvae feed underground and are not susceptible to most insecticides. We have few insecticides registered in eastern Canada. One key to root weevil control is the fact that adults do not fly. They can only crawl from one planting to another. Good crop rotation is important in limiting build-up of the problem. New plantings should be established at some distance from infested plantings. Infested plantings should be mowed and older plantings should be ploughed down as soon as possible after harvest. Cultivated barriers between fields may reduce migration of weevils from one field to the next. Beneficial nematodes that prey on insect larvae are

commercially available and have been tested for root weevil control. Progress in this area has been slow.

In 2004, a nation-wide research project will begin on root weevil management in strawberries. This project, led by Dr. Kenna McKenzie, at Agriculture and Agri-Food Canada in Kentville, N.S., includes researchers from Nova Scotia, New Brunswick, P.E.I, Quebec, Ontario, Alberta, British Columbia and from Connecticut, USA. The goal of the project is to develop a root weevil integrated pest management strategy for strawberry production.

Part of the project includes a survey of root weevils found in Ontario. We would like to collect samples from as many fields as possible, and collect information on which species of root weevils are pests in Ontario. We will also be testing different traps and barrier trenches for monitoring and control of root weevils.

- We are looking for infested fields for field work in 2004.
- We are interested in collecting samples wherever root weevil problems occur.

If you have observed root weevils in recent years, or if you come across infested sites in 2004, please contact us.

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Raspberry Selections Show Promising Winter-Hardiness

Becky Hughes and Candy Keith, University of Guelph, New Liskeard Agricultural Research Station

The New Liskeard Agricultural Research Station (NLARS) has been the winter-hardiness testing site for the Ontario Coordinated Berry Crops Variety Trials since 1984. This past winter was ideal for testing the winter-hardiness of several new raspberry cultivars and selections from across northeastern North America. In the fall of 2002, many woody plants in the north appeared not to go into dormancy with some retaining their leaves all winter. This included the raspberries in our current raspberry observation trial. Rapid drops in temperature with little snow cover early in the winter resulted in substantial winter injury.

Two selections from Agriculture and Agri-Food Canada (AAFC) in Kentville Nova Scotia, K93-9 and K93-11, had the least amount of winter injury in 2003. These were followed by several selections from the University of Guelph raspberry breeding

program, 88-117, 88-18b and 88-078. The New York cultivar, Prelude, also exhibited relatively little injury in 2003.

Encore suffered the worst injury of the group in 2003 followed by one Guelph selection and two selections from New York. It should be noted though, that Encore and 88-020 suffered very little winter injury in 2002 while Prelude and K93-11 had more than 20% winter kill.

All plots with greater than 30% winter kill were mowed to the ground in 2003 and left to recover for a year. The remaining six were harvested in 2003. Of these, only one selection managed to produce a reasonable yield. K93-11 produced 3.2 t/ha. K93-11 (Nova x Glen Moy) is a late midseason variety with short canes and shiny, firm, light-red fruit.

According to Dr. Andrew Jamieson (AAFC, Kentville, NS) K93-9 (K85-3 x Glen Moy) has been preferred over K93-11 for both its productivity and fruit in trials elsewhere. Evaluation of all the selections in this trial will continue over the next several years to determine winter hardiness, yield and quality in northern Ontario.

Cultivar or Selection ¹	Winter Kill (%)		
	2002	2003	Average
K93-9	5	17	11
K93-11	24	19	22
88-117	3	20	12
88-18b	4	28	16
Prelude	26	29	28
88-078	4	31	18
Boyne	na	33	33
88-112d	6	36	21
NY-253	18	44	31
NY-258	5	46	26
88-020	4	51	28
Encore	8	64	36

¹ Planted in 10-plant observation plots in the spring of 2001 with the exception of Boyne which was planted in June, 2002.