

Fungal disease management in grapes throughout the growing season, 2013

Wendy McFadden-Smith, Tender Fruit & Grape IPM Specialist, OMAF and MRA

Infosheet

APRIL 2013

The following table (on pgs 3 & 4) was developed as a means of summarizing the information provided in OMAF and MRA Publication 360, Guide to Fruit Production 2012-13, including new products for 2013. It highlights the periods during the growing season when specific diseases may be a problem and which fungicides are recommended at a particular growth stage. This will vary somewhat depending on the susceptibility of the grape variety, the weather conditions and the history of disease in the vineyard.

The main purpose of this table is to give some idea of the fungicide combinations/mixtures that may be used throughout the season to manage specific diseases present in your vineyard. However, this table is not meant as method of indicating compatibility of products in a spray mixture. You should read the label to determine whether a fungicide will cause injury (e.g. burning or discoloration) on a particular variety or under specific drying conditions and also whether specific tank mixes are not recommended. (See Table 6-5 Publication 360 as well as fungicide labels.). It is also important that **you confirm that a particular fungicide is acceptable for use by your processor and follow their pre-harvest intervals** for individual pesticides

How to use this table: The table is broken down by growth stage and within each growth stage the diseases that may be present are listed.

- If a disease is **shaded**, it is of primary concern at that growth stage. For example, at 80% bloom to immediate post-bloom, powdery and downy mildew and black rot can infect the berries (and leaves) while Botrytis is a risk only in susceptible varieties. At berry touch, powdery and downy mildew should still be controlled on the foliage but Botrytis infection of fruit is of special concern at this stage. Early season diseases such as anthracnose are of concern only in vineyards where there is a history of the disease.

Large bold + = registered use but not necessarily recommended for this timing

Large bold shaded cells = OMAF recommended use pattern for registered uses for products

Small + = collateral control; uses not registered but listed based on efficacy listed in various publications and reports from research trials

+ = suppression; ++ = moderate control; +++ excellent control

While several of the fungicides are labeled for use throughout the season and are listed throughout the calendar in Publication 360, in the table below they are recommended at specific growth stages. For example Inspire, Pristine, Cantus, Revus, Presidio, Acrobat, Zampro, Vivando and Quintec are recommended specifically during the period when fruit are susceptible to powdery and downy mildew and black rot, that is, as soon as the first caps fall until berry touch. These products are our “big guns” and should be used to keep the fruit disease-free. It is also important to be sure to maintain tight spray intervals during this time to ensure that the berries are protected. From berry touch through August, it is important to keep the foliage healthy to optimize fruit ripening and wood maturity and keep overwintering fungus to a minimum.

The growth stages listed are a guide. Generally, you should keep a 7-day interval between sprays from your first spray until berry touch. New growth will not be protected from infection if you stretch beyond this interval. Once the period for fruit infection is past, you can usually stretch spray intervals to 2 week intervals.

While powdery mildew resistance to Nova, Flint and Sovran has not yet been identified in Ontario, it is well-established in many vineyards in the northeastern US and Ontario powdery mildew populations have most likely shifted toward resistance. When a population is shifted, and conditions for disease development are optimal, control failures can be spectacular, resulting in major losses. This occurred in some New York vineyards several years ago. For this reason, Nova, Flint and Sovran are not highlighted for the immediate pre-bloom through fruit set to pea-sized berry.

In order to reduce the probability of resistance development, do not use any of the site-specific fungicides (anything that isn't a "M" group) once disease symptoms are present. Do not use the same chemical family in back-to-back sprays. Co-formulations containing more than one chemical group are becoming more common. This must be considered when making product selections in order to optimize resistance management and prolong the life of these products. Refer to the next article, *Fungicide Rotation Strategies*, for more information.

PureSpray Green Spray Oil has not been tested on all varieties so try it on a small area in the vineyard before widespread use. It should not be sprayed with 14 days (before or after) a captan/Maestro application to avoid injury. It will remove the waxy bloom on fruit so it is not recommended for use on table grapes. Brix suppression has been noted when applied more than once after berry touch.

In the past, we have recommended sulphur for powdery mildew control after the critical fruit susceptibility period. However, Dr. Gavin Sacks of Cornell University determined that sulphur residues were significant in juice from grapes sprayed less than 6 weeks pre-harvest. These residues resulted in elevated hydrogen sulphide in wines giving the rotten egg smell. In whites, this can be rectified by allowing the juice to settle as residues remain in the sediment. The impact on reds is currently being investigated by Sacks' team. To err on the safe side, avoid the application of sulphur fungicides within 6 weeks of harvest. If you want to keep foliage disease free during this period, use a multi-site fungicide such as Pristine or Luna Tranquility plus a product for downy mildew if it's a problem.

<p>Table note: As this table is very large to accommodate all diseases and fungicides it has been spread across two pages. In order to read the table effectively, please print off pages 3 and 4 and tape the two edges of the table together.</p>
--

For more information:
Telephone: 905-562-3833
E-mail: wendy.mcfadden-smith@ontario.ca
www.ontario.ca/omafra

Growth Stage	Diseases	Lime Sulphur	captan\Maestro (M)	Folpan (M)	Polyram (M)	Ferbam (M)	Manzate 200WP/Pencozeb (M)	coppers (M)	Revus (40)	Acrobat (40)	Zampro (40 + 45)	Ridomil Gold Mz (4 + M)	Phostrol (33)	Presidio (43) in tank mix	Nova (3)	Inspire (3)
Dormant	Anthraxnose	++														
	Phomopsis	+														
1-3 leaves	Phomopsis		+++	+++												
	Anthraxnose		++	++												
3-5 leaves	Phomopsis		+++	+++	+	+	+									
	Anthraxnose		+	+	+	+	+								+++	+++
	P mildew															+++
	Black rot		+	+	++	++	++								+++	+++
20-25 cm shoot growth	Phomopsis		+++	+++	+	+	+									
	Anthraxnose		+		+	+	+								+++	
	P mildew							+							+++	+++
	Black rot		+	+	++	++	++								+++	+++
	D mildew		+++	++	++	+	++	++	+++	+++	+++	+++	+++	+++		
Immediate pre-bloom to trace bloom (first cap fall)	P mildew							+							+++	+++
	Black rot		+		++	++	++								+++	+++
	D mildew		++	++	++		++	++	+++	+++	+++	+++	+++	+++		
80% bloom to immediate post-bloom	P mildew							+							+++	+++
	Black rot		+	+	++		++	+							+++	+++
	D mildew		+++	++	++		++	++	+++	+++	+++	+++	+++	+++		
	Botrytis															
Fruit set to pea-size berry	P mildew							+							+++	+++
	Black rot			+	++			+							+++	+++
	D mildew		++	++	++		++	++	+++	+++	+++	+++	+++	+++		
Berry touch	P mildew							+							+++	+++
	D mildew		++	++	++		++	++	+++	+++	+++	+++	+++	+++		
	Botrytis															
Veraison to early Sept.	P mildew foliage							+							+++	+++
	D mildew foliage		++	++	++		++	++	+++	+++	+++		+++	+++		
	Botrytis															
Early Sept. to harvest	Botrytis															

Con't on pg 4

																	Diseases	Growth Stage
																	Anthracnose	Dormant
																	Phomopsis	
																	Phomopsis	1-3 leaves
																	Anthracnose	
																	Phomopsis	3-5 leaves
																	Anthracnose	
																	P mildew	
																	Black rot	
																	Phomopsis	20-25 cm shoot growth
																	Anthracnose	
																	P mildew	
																	Black rot	
																	D mildew	Immediate pre-bloom to trace bloom (first cap fall)
																	P mildew	
																	Black rot	
																	D mildew	
																	P mildew	80% bloom to immediate post-bloom
																	Black rot	
																	D mildew	
																	Botrytis	
																	P mildew	Fruit set to pea-size berry
																	Black rot	
																	D mildew	
																	P mildew	Berry touch
																	D mildew	
																	Botrytis	
																	P mildew foliage	Veraison to early Sept.
																	D mildew foliage	
																	Botrytis	
																	Botrytis	Early Sept. to harvest

Con't from pg 3