

Fungicide	Phomopsis Cane & Leaf Spot	Black Rot	Downy Mildew	Powdery Mildew	Botrytis Bunch Rot
Azoxystrobin (Abound Flowable)	++	++++	++++a	++++a	+
captan (Captan 50 W, 80 WDG, Captec 4L)	++++	+	+++	0	+
copper hydroxide (Champ Formula 2 Flowable, Kocide 3000 Dry Flowable)	+	+	+++	++	0
cyazofamid (Ranman Fungicide 50 WG)	0	0	+++	0	0
cyprodinil (Vangard WG Fungicide)	0	0	0	+	++++
difenoconazole + mandipropamid (Revus Top)	0/+?	++++	++++	++++f	0
fenhexamid (Elevate 50 WDG)	0	0	0	+	++++
iprodione (Rovral Brand 4 Flowable Fungicide)	0	0	0	0	++++g
mancozeb (Dithane F-45 Rainshield, Manzate Pro-Stick)	++++	+++	+++	+	0
mandipropamid (Revus fungicide)	0	0	++++	0	0
mefanoxam + mancozeb (Ridomil Gold MZ WG)	d	d	++++	d	0
metrafenone (Vivando Fungicide)	0	0	0	++++	0
myclobutanil (Rally)	0	++++	0	+++f	0
paraffinic oil (JMS Stylet Oil)	0	0	0	+++	0
phosphorous acid (Phostrol Agricultural Fungicide)	0	0	+++	0	0
potassium dihydrogen phosphate (Nutrol)	0	0	0	++	0
pyraclostrobin + boscalid (Pristine)	++	++++	++++a	++++a	++/++++b
quinoxifen (Quintec)	0	0	0	++++	0
sulfur (Microthiol Disperss)	+	0	0	+++e	0
tebuconazole (TebuStar 45 WDG, Amtide Tebuconazole 45 WDG, Orius 20AQ)	0	++++	0	+++f	0
tetraconazole (Mettle 125 ME)	?	+++	0	+++f	0
ziram (Ziram 76 DF)	++++	+++	++	0	0

These ratings are relative rankings, based on standard application rates, good spray coverage, and proper spray timing.
Actual levels of disease control will be influenced by these factors in addition to varietal susceptibility and disease pressure.

Key:	+++ Good	++ Moderate	+ Slight	0 Not Effective
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Material adapted from "2015 New York and Pennsylvania Pest Management Guidelines for Grapes"

Notes:

- a. NOTE: Powdery mildew (PM) resistance to the strobilurin fungicides (Abound, Flint, Sovran) has occurred in multiple vineyards, sometimes resulting in significant crop loss. When such resistance occurs, none of the strobilurin fungicides will provide commercial control of PM if applied alone, and they must be tank-mixed with an unrelated, effective powdery mildew fungicide to avoid crop loss. Pristine, a product that combines a strobilurin fungicide with the unrelated material, boscalid component, which also is at risk for resistance development, Pristine should be used sparingly and with caution where problems with strobilurins have been encountered. Quadris Top is a new product that similarly combines azoxystrobin (Abound) and the DMI fungicide, difenoconazole. Difenoconazole has provided very good to excellent PM control in strobilurin-resistant vineyards. Nevertheless, all Group 11 fungicides considered together should be applied no more than two times per season IN TOTAL, ADDITIONALL: Downy mildew resistance to the strobilurins is common in the mid-Atlantic and southern regions of the U.S., and is suspected in some NY control downy mildew, so all of these materials must be tank-mixed with an effective DM fungicide if that disease has become resistant to the strobilurins.
- b. Fair control at the lower rate labeled for powdery mildew, good to excellent control at the higher rate labeled for other diseases.
- c. [Refers only to fixed copper formulations listed in Table 8.3 Most insecticides labeled for use on grapes are incompatible with lime. Check insecticide label for incompatibility with alkaline spray materials. See New York Food and Life Sciences Bulletin No. 118 \(www.nysaes.cornell.edu/pubs/fls/OCRPDF/118.pdf\) for information on effects of alkaline hydrolysis on pesticides.](#)
- d. Ridomil MZ formulations (Ridomil + mancozeb) will give moderate control of Phomopsis and black rot, due to the partial rate of mancozeb that is provided through this formulation. Ridomil copper formulations will provide moderate suppression of powdery mildew, particularly on moderately resistant cultivars.
- e. Sulfur activity is strongly influenced by rate and frequency of application, and by weather. It is highly effective when applied at relatively high rates and short (7-day) spray intervals, but efficacy can decline as intervals increase and/or rates decrease, especially in rainy weather.
- f. Powdery mildew resistance to the DMI fungicides (difenoconazole products, ^Elite, ^Mettle, *Procure, Rally, Rubigan, Vintage) appears to be present at varying levels throughout most of the viticultural districts of New York and Pennsylvania. Although these materials continue to provide significant control in most vineyards, they generally are less active than in the past and most should not be relied upon as the primary tool for powdery mildew management. However, difenoconazole products have provided excellent control even in vineyards where other DMI products have started to "slip"; hence, it's higher rating. Nevertheless, all DMI fungicides remain valuable in rotational programs with newer and often more active powdery mildew fungicides.
- g. Although poorly documented, resistance to iprodione appears to be common in vineyards where this fungicide has been used regularly over a long period of time. Become iprodione resistance "dies down" over time if the product isn't used, it is recommended that this fungicide be avoided for 1 to 2 years where it has been regularly in the past, then applied no more than once per season if and when use resumes. Iprodione is very effective against Botrytis when not compromised by resistance.