

Summary of Grape Powdery Mildew Trials from 1989 to 2004.

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The combination of susceptible cultivars, thick canopies, and favorable weather for the development of grape powdery mildew results in high disease pressure every year at OSU's Botany and Plant Pathology Field Laboratory which is located across the Willamette River from Corvallis, OR. The objective of this report is to summarize, in a simple way, the various grape powdery mildew control trials conducted from 1989 to 2004.

Trial results are summarized relative to the nontreated control and expressed on a percentage basis. For example, if the nontreated control had 90% powdery mildew and a certain treatment had 10% powdery mildew then the percent control would be calculated as $(1 - (10/90)) \times 100 = 89\%$ control. Generally the last powdery mildew severity rating for the season was used. It should be noted that this approach does not focus on rates, timing, weather or other factors highly important for interpretation of the data.

Trials were conducted on any of several cultivars highly susceptible to powdery mildew including Pinot Noir, Chardonnay, Riesling, and/or Cabernet Sauvignon. Most test vines were trained to bilateral cordons with spur pruning but some Guyot trained vines have also been used. Results have been averaged across cultivars and training systems. All materials were deployed prior to bloom with repeated applications at 1 to 2 week intervals through veraison.

Several fungicide products and programs have been evaluated including sulfur or synthetic materials used alone (Table 1), materials used in tank mixes or alternated (Table 2) and organic or biological materials (Table 3). The number of times a product or program has been evaluated is indicated by the "number of trials" column. Some were tested only once while others were tested for multiple years. The more times a product was evaluated (or the higher the number of trials) the more confidence one can have in the summary statistic presented. For example, it would be unwise to expect 100% control every time one might use a Rubigan/Flint alternation.

Leaf and cluster data are summarized separately. Unfortunately, there are no statistical comparisons possible between any of these materials given the way this data was summarized. It is not possible to say that 99% control is significantly different from 88% control. Powdery mildew varies from year to year (data not shown) but in 1998 average control of powdery mildew on clusters was 26% among all treatments. If data from 1998 is left in the data set then it results in much lower overall control (Table 2 and 3). Other than 1998, there was no attempt to adjust any other data points.

Two or more materials were often alternated during the growing season. This is indicated with a "/" symbol, however, there is no indication (in this report) of how often in a trial each material was used, how many times they might have been used or which material was used first. In general, materials were switched with each succeeding application. Products mixed together and then applied are indicated with a "+" symbol.

Overall, it appears that sulfur, DMI, strobilurine (QoI), and Quintec can be expected to provide good to excellent control of powdery mildew. Organic and biological materials seem to give more variable disease control, however, more testing of various products is necessary for more firm conclusions.

Table 1. Materials Used Alone*.

Material	# of Trials	% Control of Powdery Mildew	
		Leaves	Clusters
Sulfur	6	90	78
Rally 40 W	9	97	87
Rubigan	3	93	87
Abound	4	91	95
Cabrio	1	98	88
Flint	2	98	99
Pristine	4	99	99
Sovran	3	98	99
Quintec	3	99	98

* It is not recommended to use any single material for all applications to control grape powdery mildew. Use different materials from different chemical classes to help prevent the buildup of resistant fungi.

Table 2. Materials Used in Tank Mix or Alternation.

Material	# of Trials	% Control of Powdery Mildew	
		Leaves	Clusters
Sulfur + Copper	1	89	96
Sulfur / Rally	5 (3)*	94	55 (89)*
Sulfur / Procure	2	99	96
Sulfur / M-Pede	3	92	95
Rally / Abound	2		96
Rally / Flint	1	93	96
Rally / Pristine	1	100	85
Rally / Sovran	6 (4)*	91	74 (95)*
Rally / Quintec	2	99	94
Rally / Auxigro	1	49	74
Rubigan / Flint	1	100	100
Quintec / Abound	1	99	91

* Data in parenthesis indicate the average when data from 1998 is removed from the set. That year there was an average control of powdery mildew on the clusters of 26% among all the treatments. There was no attempt to adjust any other data points.

Table 3. Organic and Biological Materials Tested.

Material	# of Trials	% Control of Powdery Mildew	
		Leaves	Clusters
Water alone	2	43	31
Silwet L-77	1	98	45
Sulfur	6	90	78
JMS Stylet Oil	5 (4)*	91	65 (79)*
Sunspray Oil	1	60	87
Neem Oil	5 (4)*	69	41 (49)*
Kaligreen (bicarbonate)	1	95	85
Rock Flour	1	69	53
Messenger	1	7	40
Compost Tea (plant based)	2	25	31
Whey	2	74	50
AQ-10	3	41	35
Sonata	1	97	28

* Data in parenthesis indicate the average when data from 1998 is removed from the set. That year there was an average control of powdery mildew on the clusters of 26% among all the treatments. There was no attempt to adjust any other data points.