Preventive control of powdery mildew on grapevines

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Several recently developed fungicides effectively controlled powdery mildew of grapevines.

Powdery mildew attacks the upper and lower surfaces of grape leaves, young shoots, flowers, and fruit, producing a dusty or powdery appearance on infected areas. If not controlled, the fungus, *Uncinula necator*, can cause complete crop loss. Less severe infections can lower yields and depress fruit and wine quality. Early treatments with fungicides are effective in controlling powdery mildew.

Trials

Several new triazole fungicides were evaluated in a Cabernet Sauvignon vineyard in Monterey County near Soledad in 1986 and 1987. Plots consisted of three vines replicated four times for each treatment. Powdery mildew was present before the first application in 1986.

Fungicides compared in 1986 were Bayleton (triadimefon), Rally (myclobutanil), Spotless (diniconazole), Topas (penconazole), and Nustar (flusilazol); an untreated control was included. The first application was on May 14, when shoot growth averaged 20 inches; there were three additional applications at about 21-day intervals, on June 4, June 24, and July 17. The first application was sprayed at 100 gallons of water per acre; the others were at 150 gallons. All treatments were applied at 150 psi with a hand spray gun.

Clusters were evaluated for disease incidence and severity on June 19, July 10, and August 5 (veraison). Incidence was measured as the percentage of 25 randomly selected clusters per replication showing any sign of powdery mildew. Severity was determined by visually estimating the percentage of berries per cluster that were infected with mildew.

Results of the final cluster evaluations are shown in table 1. Because of high mildew incidence in 1986, untreated control vines had 100 percent cluster infection by June. At veraison (August 5), vines treated with Rally at the high rate had significantly lower disease incidence than those treated with the other fungicides. The high rate of Spotless, both rates of Rally and Nustar, and Topas all resulted in significantly lower disease incidence then Bayleton at 2 ounces (4 ounces product). All fungicide treatments lowered disease severity more than Bayleton did at the 2-ounce rate.

In the 1987 trial, fungicides tested were Bayleton, Rally, Spotless, Topas, Nustar, Folicur (BAYHWG 1608), and Rhone-Poulenc LS 84-608, along with an untreated control. The first application was on May 6, when shoot growth averaged 10 inches. Four additional sprays were applied, on May 27, June 17, July 7, and July 29 on a 21-day schedule. The first was applied at a volume of 50 gallons of water per acre, the second at 100 gallons, and all remaining applications at 150 gallons per acre. All treatments were applied with a hand spray gun at 150 psi.

Clusters were evaluated on June 22, July 20, and August 6 (veraison). Disease incidence and severity (table 2) were measured by examining 25 clusters per replication, as described previously.

Mildew incidence was low early in the season, but untreated control vines showed 100 percent cluster infection by July 20. At veraison, all fungicide-treated vines had low disease incidence and severity compared with untreated vines. Vines treated with Bayleton and LS 84-608 had slightly higher disease incidence and severity. In 1987, all fungicide treatments provided effective control of powdery mildew, exceeding commercial acceptance levels.

TABLE 1. Control of grapevine powdery mildew with fungicides, based on disease incidence and severity, August 5, 1986

Treatment	Rate (oz. ai/acre)	Incidence*	Severity[3]
Rally 40WP	1.60	15. e	0.2 e
Topas 10WP	0.50	39. d	0.8 e
Nustar 20 DF	0.50	40. d	1.2 e
Spotless 25 WP	0.32	44. cd	2.2 de
Nustar 20 DF	0.35	61. c	2.7 de
Rally 40 WP	0.80	64. bc	2.8 de
Spotless 25 WP	0.16	85. a	6.3 c
Bayleton 50 WP	3.00	82. ab	5.3 cd
Bayleton 50 WP	2.00	99. a	15.3 b
Control	—	100. a	100.0 a

NOTE: Results expressed as average of four replications; 25 clusters per replication examined. Means followed by the same letter are not significantly different at 5% level (Duncan's multiple range test).
* Incidence = % infected clusters.
[3] Severity = % infected berries per cluster.

TABLE 2. Control of grapevine powdery mildew with fungicides, based on disease incidence and severity, August 6, 1987

Treatment	Rate (oz. ai/acre)	Incidence*	Severity[3]
Folicur 45DF	1.80	0. c	0.00 b
Topas 10WP	0.50	0. c	0.00 b
Nustar 20DF	0.50	0. c	0.00 b
Nustar 20DF	0.35	0. c	0.00 b
Spotless 25WP	0.40	0. c	0.00 b
Rally 60DF	1.20	1. c	0.00 b
Rally 60DF	1.60	0. c	0.01 b
LS 84-608	1.04	5. bc	0.05 b
LS 84-608	0.80	12. b	0.17 b
Bayleton 50WP	2.00	6. bc	0.18 b
Control	—	100. a	67. a

NOTE: See table 1 NOTE.
* Incidence = % infected clusters.
[3] Severity = % infected berries per cluster.

Conclusions

In 1986 Rally, Topas, Nustar, and Spotless gave significantly better control of powdery mildew on grapes than Bayleton applied at a rate of 2 ounces active ingredient per acre. In 1987, all fungicides effectively controlled powdery mildew. Bayleton is registered for this use; the other fungicides tested are not currently registered for this use in California.

Recent studies have shown that it is important to start control programs before the onset of disease and to reduce spray intervals depending on fungicide rates being used. In the 1987 trial, treatment began before there were any signs of powdery mildew, as opposed to 1986, when disease was present before vines were sprayed. This and the lower disease incidence early in the season may in part explain the better disease control in 1987.

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