



THE BENEFITS TO CALIFORNIA FROM GRAPE VARIETIES RESISTANT TO POWDERY MILDEW

Grape powdery mildew (PM), *Erisiphe necator*, is the most prevalent disease of California grapes, accounting for approximately three-quarters of pesticide use in grape production. Annual costs of controlling grape PM in California are around \$180 million per year, including product and application costs. PM-resistant grape varieties are currently being developed (e.g., the [VitisGen](#) project). The introduction and adoption of PM-resistant grapevines has the potential to reduce the use of chemicals for PM control, yielding cost savings.

Drawing on UC Cooperative Extension Cost Studies, we constructed budgets for hypothetical “representative” vineyards using conventional and PM-resistant vines. We created budgets for select varieties and regions for each type of grape production (wine, raisin and table grapes) chosen to represent the parts of each industry most affected by PM. We chose Chardonnay as the wine grape variety most susceptible to PM, and the Central Coast as a region with relatively high PM pressure. Annual cost savings from adopting PM resistant varieties range from \$186 per acre for raisin grapes to \$287 per acre for Crimson Seedless table grapes and \$280 for Chardonnay in the Central Coast region (Table 1).

Table 1: Saving in Costs per Acre and per Region from Adopting PM-Resistant Vines

	Current Annual PM Cost	Savings in Cultural Costs per Acre				Total Area, 2011	Maximum aggregate benefit
		Labor	Fuel, Lube, and Repair	Materials	Total		
		<i>\$US/Acre/Year</i>				<i>Acres</i>	<i>\$US Million/Year</i>
Wine Grapes							
Central Coast Chardonnay	369	43	47	190	280	26,804	7.5
Table Grapes							
Crimson Seedless	329	77	51	159	287	12,950	3.7
All Raisin Grapes	222	29	20	137	186	195,899	36.4

Table 2: Total Present Value of Benefits from PM-Resistant Varieties—Central Coast Chardonnay

Maximum Adoption Rate	Lag Until Adoption			
	10	20	30	40
<i>percent</i>	<i>\$ Millions</i>			
20	25.6	19.0	14.2	10.5
60	76.8	57.1	42.5	31.6
100	127.9	95.2	70.8	52.7

The potential benefits are large but depend critically on the lag until the resistant varieties become available, as well as the subsequent rate of adoption (Table 2). The net present value of benefits for Central Coast Chardonnay can be as large as \$127.9 million with 100% adoption in 10 years, or as small as \$10.5 million with 20% adoption in 40 years. Benefits range from \$51 to \$600 million for raisin grapes, and from \$5.2 to \$63.2 million for Crimson Seedless table grapes. Additional discussion of the potential benefits from PM resistance is published

in *ARE Update*: http://giannini.ucop.edu/media/are-update/files/articles/V17N5_1_oJKhJes.pdf.

As a follow-up to this study, the research team is collecting information on grower preferences for specific traits. **We would appreciate if you could take a few minutes to respond to their survey questions:** https://okstatecasnr.az1.qualtrics.com/SE/?SID=SV_5AwMOELdrMZ9xJ3