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Crown gall in Oregon Grapevines: Biology and Treatment of Planting Stock With Hot Water Dips

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The objectives of this study are to isolate and characterize pathogenic agrobacteria that cause crown gall in grapevines and test hot water dips as a method for eradicating the infectious bacteria .

Crown gall is commonly found among Oregon vineyards and the causative agent, *Agrobacterium vitis*, is known to be present in the vascular system of many symptomless plants. Wounds are required for infection to take place. Crown gall usually develops when the plants are wounded by freeze damage. However, the emphasis on planting grafted plants with phylloxera resistant rootstocks has resulted in increased production of grafted plants at nurseries, and this has been accompanied by a high incidence of crown gall appearing at the wound site of the graft union. Heat treatments in Australia have been shown to reduce the incidence of crown gall but need to be tested in Oregon using grape rootstock and scion wood that will be used in Oregon vineyards. The high variability among agrobacteria strains on grapevines also dictates that treatments be conducted using strains commonly found in Oregon vineyards.

In 1994 agrobacteria were isolated from eight vineyards and three nurseries from the Dundee, Salem, Corvallis, Eugene and Medford areas of the state. Plant sources included both grafted and nongrafted plants. Pathogenic strains were found among the 2,286 isolates characterized from vineyards and nurseries. More pathogenic isolates could be detected on plants where tumors had developed within the last year than on those with older tumors. In one case, however, pathogens were isolated from symptomless plants of 5C rootstock.

There was considerable variability among the isolates, with at least five different species of the bacteria being identified (Tables I and II). Representatives of each *Agrobacterium* species will be used when testing for eradication by hot water dips and for screening of new rootstocks for resistance to crown gall. Hot water treatments for eradication of the bacteria will begin in February of 1995.

Table I. *Agrobacterium* Isolates from Oregon Vineyards

Region	Variety	<i>Agrobacterium</i> Biotype
Salem, Site 1	PG/146-3309	1
	PN/115-3309	unknown
	PG/152-101-14	
Salem, Site 2	Gerwurtztrameiner	3 Blackberry
Eugene	Grenache/5BB	3
	PG 1250C/101-14R	Not completed
Dundee, Site 1	Pinot Noir	3
Dundee, Site 2	PN/3309	3
Dundee, Site 3	Pinot Noir	3
		Blackberry unknown
Medford, Site 1	Muscat	Not completed
	Gerwurtztrameiner	
	Muller Thurgau	
	Chardonnay	
Medford, Site 2	Reisling	Not completed
	Muller Thurgau	

Table 2. *Agrobacterium* Isolates from Oregon Nurseries

Nursery	Variety	<i>Agrobacterium</i> Biotype
A	CH96/3309G	1
	PN113/3309G	1
	PN113/101-14C	3
	CH76/101-14C	3
	PG152/3309	3
	CH/5C	1
	Reisling/5C	unknown
B	PN 115/3309	2
C	PB 151/3309	1 and 2 unknown