

Latent Viruses In Vines Sting Growers

By Patrick Cavanaugh
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In the winter of 1990-91, Fresno County grape grower John Coelho decided to expand his diverse, 1,000-acre wine, table and raisin grape farming operations by adding 40 acres of Zante Currants.

While he didn't know it at the time, Coelho was about to experience a grape grower's nightmare that initially baffled not only himself, but also several University of California farm advisors and viticultural specialists throughout the San Joaquin Valley.

Because Coelho's Riverdale, Calif., ranch is on sandy soils, he decided to field-graft the Zantes onto certified Freedom rootstock because the stocks are able to do well on sandy soils and resist the major destructive nematodes—root knot and lesion.

Once the grafts took, the Zante scion began growing up the stake. But then something unexpected happened. For no apparent reason, the second leaf Zante scionwood, throughout most of his newly planted 40 acres, began showing various symptoms including severe stunting, leaf roll, yellow and/or red leaf discoloration, and eventual desiccation and death. "It was extremely frustrating," Coelho said. "I could not figure out what was wrong."

Called in this past summer to help determine the source

of the problem were Donna Hirschfelt, farm advisor, Fresno County; Bob Beede, farm advisor, Kings County; Don Luvisi, farm advisor, Kern County. None had ever seen anything like it. Weed specialist Bill Fischer ruled out herbicide damage.

Pete Christensen, UC viticultural specialist based at Kearney Ag Center in Parlier, visited the vineyard and suggested that it looked like a viral infection. Then, Deborah Golino, of USDA's Agricultural Research Service, Davis, Calif., confirmed Christensen's theory by peeling the bark away from the graft union and noticing dead tissue, pitting

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and grooving (known as a girdling disorder).

While Coelho's vineyard symptoms looked like corky bark virus, it has not been positively confirmed. Hirschfelt said laboratory testing to confirm the presence of a virus is not always reliable. Because of that, field indexing is still the only way to confirm virus status. "In field indexing, suspect tissue is grafted onto sensitive plants then grown in the field until symptoms develop. The time frame for the test is at least two years," Hirschfelt said.

Golino has seen similar symptoms in other vineyards throughout the North Coast. First reported in the fall of 1991, growers in Napa and Sonoma valleys as well as the Lodi area complained of problems in newly replanted vineyards established on rootstocks. All showed similar symptoms as in Coelho's vineyard.

The problem, according to Golino, are one or more viruses such as leafroll, corky bark and rupestris stem pitting viruses spreading, primarily from non-certified scion budwood, causing hypersensitivity in certain rootstocks that the scion is grafted to.

Coelho and the other growers experiencing the problem had something in common. They selected budwood from what appeared to be a healthy, strong, high yielding and quality producing vineyard. But, apparently the original budwood on the selected vineyards had not been certified virus-free.

In Coelho's case, the Zante Currant budwood came from a Zante Currant vineyard growing on its own roots. In the source vineyard, the virus was present in a latent form. After grafting the bud over to Freedom rootstock there was apparent hypersensitivity, transforming the quiet latent virus to active and destructive symptoms.

"Coelho as a grower did not use poor judgement in selecting budwood from what looked to be a healthy vineyard,"



Bud union between Zante Currant scion and Freedom rootstock shows flecking—an uncommon symptom in healthy virus-free vines.

said Beede. "The mind set has been to plant certified rootstocks and bud it with wood selected from strong, healthy vineyards. That's what Coelho did."

Beede said that in the past, specialists such as Christensen have cautioned against taking scion wood from vineyards showing symptoms of fan leaf and leafroll virus as it would surely infect the vines the wood was budded to. "But the situation today is that even if the vineyard looks healthy, the virus could be present in a latent form," said Beede.

The problem with these graft transmissible viruses has been spotty throughout the state, but for several growers it has been a costly and frustrating situation. As if phylloxera infection wasn't enough of a problem, there have been several latent virus infections reported in Napa and Sonoma counties where growers are replacing their phylloxera-erated AxR-1 rootstocks with other stocks and grafting new buds to the stocks.

"Many of these new vineyards on rootstocks are susceptible to latent viruses," said Golino. The most commonly used rootstock in California for many years was AxR-1, thought to be resistant to phylloxera until about eight years ago when Type B phylloxera was identified.

Growers are now uprooting these AxR-1 vines and replanting alternative rootstocks obtained from nurseries. Many choose these alternatives for resistance to type B phylloxera, however, some if not all of them are susceptible to leafroll or other viruses.

Several of these popular alternative rootstocks—Kober 5BB, Riparia Gloire and St. George, are used to detect and identify several key viruses. "These rootstocks are useful for commercial vineyards, but extra care needs to be taken about the health of scionwood grafted to them," Golino said.

"Another reason for AxR-1's popularity was its resistance to many of the viruses today playing havoc in some vineyards," said Golino. But she noted many AxR-1 vines likely had low-grade, or latent, virus infections with no obvious symptoms. "Grafts were successful, vines looked healthy and grape quality and quantity weren't noticeably

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affected. Trouble arose when scionwood from vines with these latent infections were grafted onto the alternative rootstocks."

Richard Nagaoka, an independent viticultural consultant based in St. Helena, Calif., said he has witnessed several incidences of third leaf failures of scions. "I've seen some non-certified Cabernet Franc on certified 3309 rootstock that started up the stake fine. Then on its third leaf, the leaves turned red and they dried up and died," he said.

Nagaoka said in the same row there is Cabernet Franc on 420-A and 101-14 rootstocks and so far the bud wood looks okay. "It hasn't been a positive diagnosis on what caused the



Research has indicated that an apparent latent virus caused this scion dieback in a young, central valley vineyard.

Cabernet Franc/3309 problem, but it certainly looked like classic virus symptoms and the patient is dead."

Larry Bettiga, farm advisor in Monterey County reports a situation in a 7-year-old vineyard on Freedom rootstock with a Riesling scion, both certified. The grower grafted non-certified Pinot Noir cuttings onto the Riesling. A year later, many of the new Pinot Noir tops started to show leaf roll and corky bark symptoms.

"The grower took the budwood from a highly valued central coast Pinot Noir on AxR-1," Bettiga said. "It was a superior producing vineyard."

Bettiga said the grower is currently waiting to see the effects of regrafting the symptomatic vines with vine budwood not showing the symptoms. "We don't know if it will work, but some of the Pinot Noir cuttings appear to not be infected by the virus and hopefully the grower can selectively regraft the infected vines from the healthy plants in the same vineyard.

"Testing before going field-wide is a good way to avoid these disasters," Bettiga said.

"Testing and using certified scion materials is highly recommended," said Golino. "This is a change to what many growers have been doing.

"Over the years, California growers have relied on judgment and experience in deciding whether to use certified virus-free rootstock or scionwood," said Golino. "No law requires it, and growers have practical reasons for not doing it. For instance, certified materials are costlier, and the most popular ones are not always available.

"The bottom line message is that you can't tell by looking," said Golino. "So, to avoid problems, only known certified rootstocks and scions should be used in new and grafted vineyards."

"If certified scions are not available either from commercial nurseries or the Foundation Plant Material Service at UC Davis, the next best thing is for growers to use a specific combination of scion and root stock that has been successful in another vineyard," Hirschfeld said. "If there is any doubt, don't plant a whole vineyard before testing the combination on a few vines." □