



University of California Cooperative Extension

Grape Notes

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Division of Agriculture & Natural Resources

County of San Luis Obispo

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Syrah Disorder and 2003 Survey Results

A number of vineyards in the warmer areas of the Central Coast have experienced very poor results recently with their Syrah (including the varieties **Syrah**, **Syrah Noir**, and **Shiraz**, but not Petite Sirah). Symptoms include early reddening and/or senescence of the leaves, slow fruit ripening, low sugars, high pH, and poor color. The exact cause of this phenomenon remains unknown. The disorder is generally more pronounced with increased water stress, but some growers who have increased irrigation in an attempt to maintain the canopy are still seeing similar effects on fruit ripening. Nutrient imbalances, particularly potassium and magnesium, may be involved, but no consistent relationship has been seen yet. Unknown viruses or other pathogens may also play a role. It is not clear why this disorder is affecting only Syrah while adjacent plantings of Cabernet and other varieties under virtually identical conditions are not showing similar symptoms.

A condition that may or may not be related has been seen in France since the 1990's, called "Syrah Decline". Affected vines generally show enlarged graft unions, and the leaves turn red in the summer; scions typically die after one or two seasons, while the rootstock continues to grow. California symptoms do not generally have the enlarged graft unions, nor does our disorder lead to death of the scions. Observations in France indicate that their Syrah Decline occurs more often on shallow soils (non-irrigated systems, so the vines are likely under more water stress); interestingly, ENTAV's research has also indicated that Syrah tends to form fewer vascular connections between the rootstock and scion as compared to both Cabernet and Grenache.

In late October of this year I sent out a survey to all Syrah growers listed in the 2002 Paso Robles Vintners & Growers Association directory and the 2001 Viticultural Survey of Santa Barbara County (Allan Hancock College). These two lists don't encompass every planting of Syrah in the area, but probably cover most of them. My goals with this survey were to:

- 1) Determine how widespread this disorder is;
- 2) See if any patterns existed with rootstock & clone combinations;
- 3) Make summary information available to area growers, to avoid the future planting of any combinations that appear to perform poorly;
- 4) Provide background information to university & industry scientists who will ultimately attempt to identify the cause(s).

In this survey I asked the growers to provide the following information on their plantings:

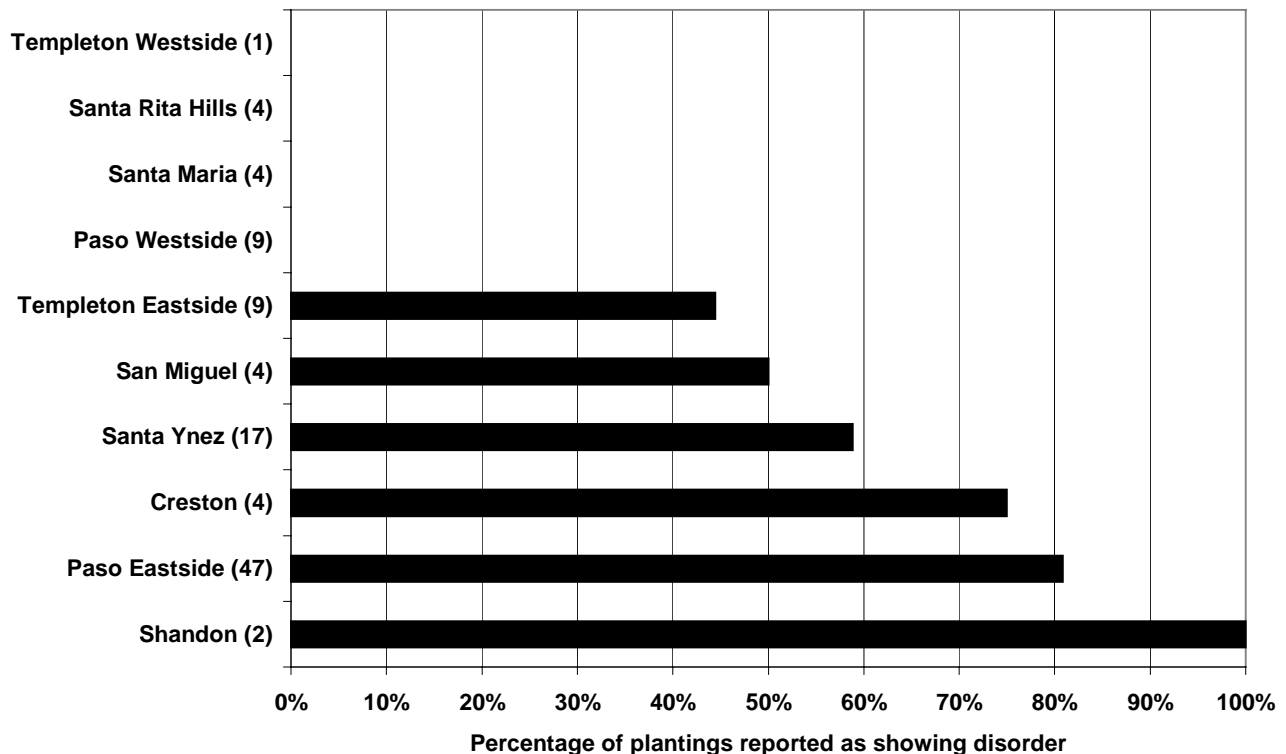
- Rootstock
- Clone
- Certified material or not
- Year planted
- Showing disorder symptoms or not
- General location

A total of 139 surveys were mailed out; 44 growers have responded so far (32%), with information representing 102 individual plantings of Syrah. Current information is presented in the graphs on the following pages; these graphs will be updated over time as more surveys are returned. If you never received a survey and would like to participate, contact me at 781-5948.

When interpreting the survey results, be aware that some categories had very few samples. The number of samples is in parenthesis following each category name; for example, "San Miguel (4)" means that there were only four plantings reported on for the San Miguel area. *The smaller the sample size, the less likely that the graph value is truly representative.* Also, it is likely that these survey results tended to over-estimate the problem, because growers with affected plantings were probably more interested in participating as compared to non-affected growers.

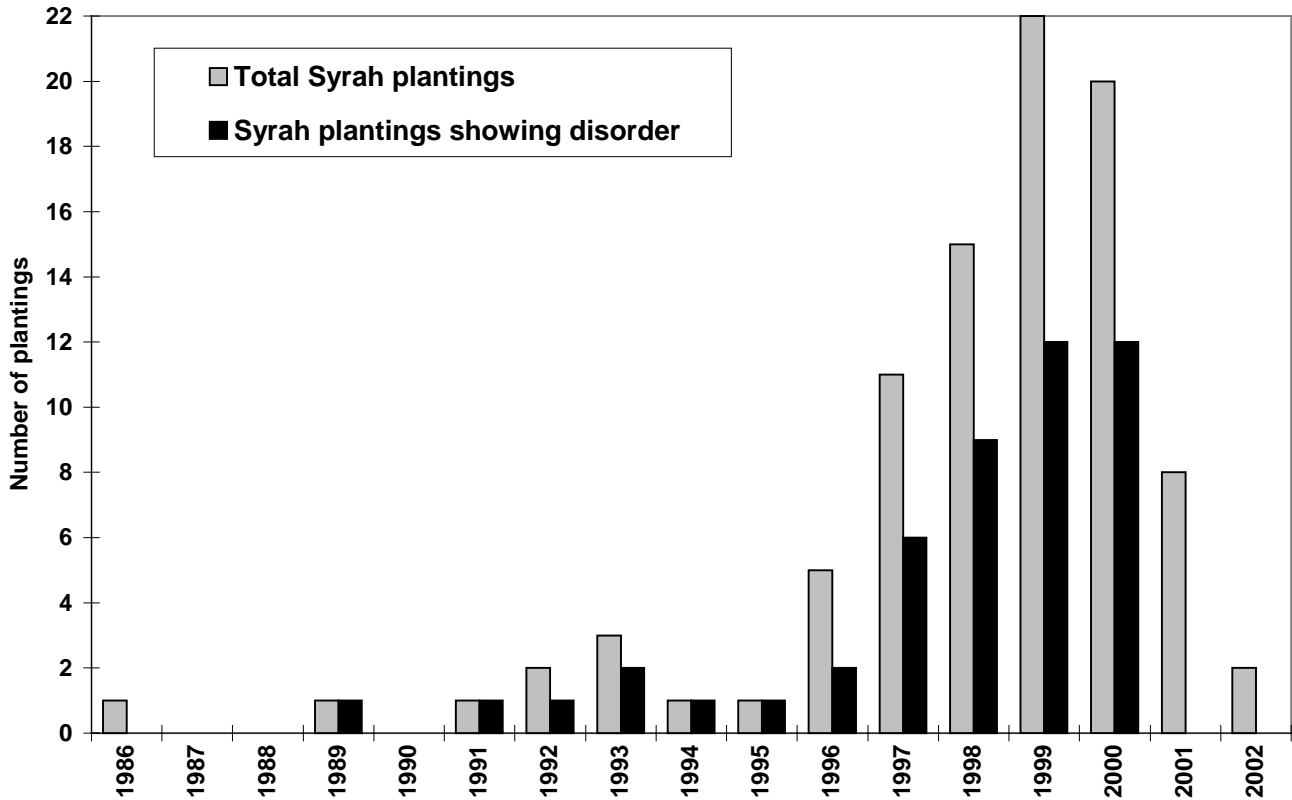
In Figure 1 below, the occurrence of the disorder with respect to climate is fairly distinct. There were a total of 18 plantings reported on in the cooler areas of Templeton Westside, Santa Rita Hills, Santa Maria, and Paso Westside, and none were reported as showing the disorder.

Figure 1.
Percentage of Syrah plantings showing disorder, by location.



In Figure 2 below, there does not appear to be any strong correlation between the year of planting and the likelihood of showing the disorder. We are probably observing more young plantings with problems simply due to the large number of plantings made between 1996 and 2001.

Figure 2.
Percentage of Syrah plantings showing disorder, by year planted; all areas.



In Figures 3, 4 & 5 on the following two pages, only data corresponding to the areas showing the disorder is displayed on the charts, i.e. the data from Templeton Westside, Santa Rita Hills, Santa Maria, and Paso Westside are not included. Also, only categories with four or more samples are listed, to avoid presenting misleading results due to small sample sizes.

In Figure 3, Syrah Estrella and Syrah Noir were the most frequently reported clones (25 and 14 plantings respectively), and showed nearly identical affected percentages of 76% and 79%. The other clones listed on the chart all had six or fewer samples reported; a total of 17 different Syrah clones were reported back in the survey results.

Figure 3.
Percentage of Syrah plantings showing disorder, by clone; data only from areas showing disorder, and only for categories with 4 or more reports.

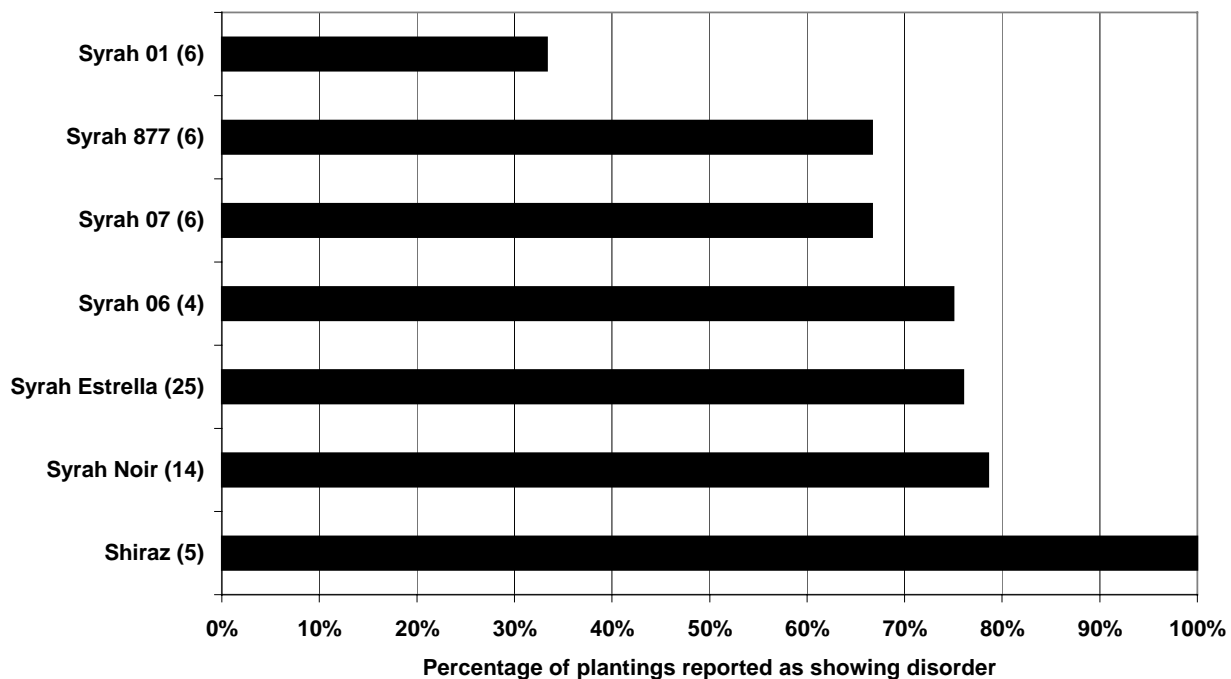


Figure 4.
Percentage of Syrah plantings showing disorder, by rootstock; data only from areas showing disorder, and only for categories with 4 or more reports.

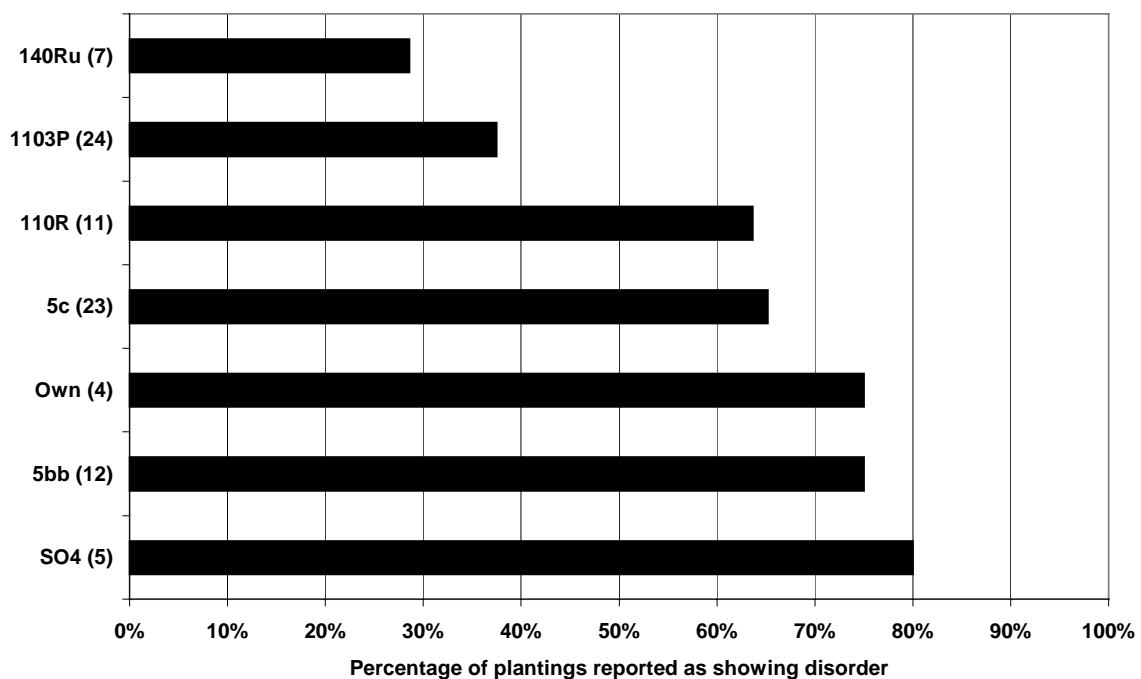
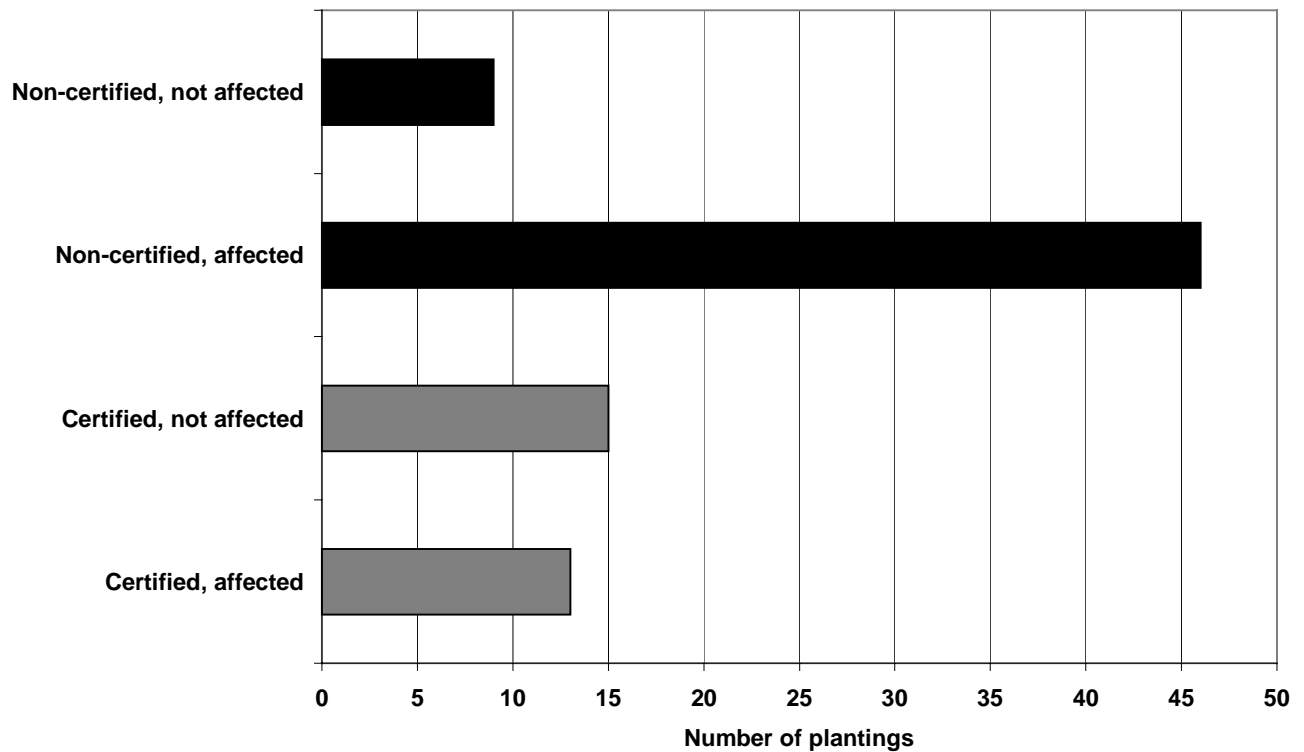


Figure 4 on the previous page shows that growers employ a broader range of rootstocks as compared to scions. The three rootstocks with the highest affected percentages, SO4, 5bb and 5c, are generally considered to have relatively low drought tolerance, while the two rootstocks with the lowest affected percentages, 140Ru and 1103P, are generally considered to have relatively greater drought tolerance. The anomaly to this pattern is 110R, which is considered to have good drought tolerance but shows a fairly high affected percentage; otherwise, this pattern seems to support grower observations that symptoms appear more pronounced with increasing water stress. The four samples of own-rooted plantings are on average 10 years old, and could be additionally affected by other factors such as phylloxera or nematodes.

Figure 5 below shows how the presence of the disorder was related to whether or not the original vine planting stock was certified. With non-certified material, 46 out of 54 plantings showed the disorder (84%), whereas with certified material, 13 out of 28 plantings showed the disorder (46%). Planting certified material does not eliminate the chance of being affected by the disorder, but the use of non-certified material appears to notably increase the likelihood of being affected by the disorder.

Figure 5.
Number of Syrah plantings showing disorder and certification status of the planting material; data only from areas showing disorder.



Next steps

Interactions between multiple factors may be leading to the disorder symptoms that we see; a short list of possible causal factors that need to be looked at more closely include:

- Nutrient imbalances, particularly K and Mg
- Vine water stress (enhanced by dry winters, deficit irrigation, & salinity)
- Soil and irrigation water salinity (increasing in the last few years due to drought)
- Vascular function, particularly at graft union
- Viruses or other pathogens
- Soil pH effects

I would like to continue and expand this survey for next season, and attempt to include more of the above factors. This will require more grower participation, and perhaps a very modest expenditure for interested participants. Using every available Syrah planting as a source of information will provide us with the most accurate picture of what is occurring in the affected areas; the numerous possible interactions between causal factors makes this the most sensible approach. Additional data that I would like to include next year are:

- Bloomtime and veraison petiole nutrient analysis (you are probably already doing this)
- Soil texture, pH, and rooting depth estimates
- Measurement of soil moisture (an automated device will cost about \$100 per site)
- Estimate of soil and irrigation water salinity

Separately, I will seek external funding to research vascular function in affected and non-affected plantings at one or more exemplar locations.

Upcoming Syrah Meeting

On January 9, 2004 at 10:00 am, a meeting to discuss the Syrah disorder will be held at the J. Lohr Wine Center east of Paso Robles, at 6169 Airport Road; all interested industry personnel are invited to attend. Dr. Deborah Golino and Dr. Andy Walker from UC Davis will provide their perspectives on Syrah issues in California and France. **Seating space is limited; if you would like to attend, you must RSVP by Jan. 5, 2004 at 805-781-5940.** Jerry Lohr has generously offered to provide lunch to all attendees after the meeting.

Other Unrelated Items:

Varietal Winegrape Production Short Course

A three-day viticulture short course offered by UC Davis Extension

March 2-4, 2004, at the University of California, Davis

Covers vine physiology, vineyard establishment & management, and grape pests.

For enrollment information:

800-752-0881

<http://www.extension.ucdavis.edu>

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GRAPE NOTES

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