

**Contract**

UNL Year 1 Nutrient Deficiency Study - #18-13-059

**Grant Amount**

\$2,980

**Contact**

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**Issue of Interest**

A need was identified to explore the relationships between different grape cultivars' parentage. The parentage of cultivars has been known to relate to a serious problem encountered in western Nebraska. The problem was a nutritional deficiency tentatively identified as high pH-induced iron deficiency. Subsequent studies demonstrated that it was indeed high pH-induced iron deficiency and that specific cultivars (mostly of *Vitis labrusca* parentage) could be identified as exhibiting greater susceptibility (e. g., Niagara, Concord, Edelweiss, and Valiant). Treatment with iron sulfate proved a short-term cure, but further studies are necessary to determine more effective and efficient treatments. Cultivar selection also provided amelioration of this problem.

**Approach to Problem**

Goals were achieved by application of several nutrient treatments by James Schild at the UNVP vineyard site at the Panhandle Extension and Research Center (PREC). Subsequent observations and data acquisition by Mr. Schild and UNVP personnel were also of importance.

**Goals/Achievement of Goals**

Funds for this project were used to evaluate grape nutrient deficiencies in western Nebraska vineyards. There were three primary objectives of this project. First, UNVP sought to identify cultivar differences in expressing chlorosis and determine which one or more chemical elements are involved through petiole and soil tests. An additional objective was to apply nutrient compounds with or without chelation to correct the deficiencies and eliminate chlorosis. Finally, examining the genetic background of susceptible cultivars (expressing chlorosis symptoms) versus those not exhibiting chlorosis was a vital project component.

**Results, Conclusions, Lessons Learned**

The premise that cultivars with a significant percentage of *Vitis labrusca* in their heritage would be more prone to high pH-induced micronutrient deficiencies was confirmed. Application of small amounts of ferrous sulfate around the base of the affected vines followed by irrigation or rainfall led to near or complete recovery from the interveinal chlorosis symptoms exhibited by vines of Niagara, Concord, Edelweiss, and Valiant grapevines.

**Progress According to Outcome Measures**

The results of this research provided a basis for recommending that growers who have sites with a high soil pH, such as those found in much of western Nebraska, should avoid trying to grow cultivars that have significant *Vitis labrusca* in their parentage (e.g., Niagara, Concord, Edelweiss, Valiant, and others of similar genetic background). However, for growers who already have plantings of susceptible cultivars, it can be recommended that applications of ferrous sulfate near the base of the affected vines or spraying foliage with chelated iron solutions can help remedy the problem and lead to obtaining a marketable crop.