

Title: Influence of Cultural Practices and Vine Spacing on Performance of Wine Grapes

Team Leader and Team Members:

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Objectives:

- (1) Determine the influence of vine spacing on the yield and fruit quality of White Riesling vines.
- (2) Determine the influence of leaf removal on fruit quality for White Riesling vines managed with training systems that are both contemporary (Scott Henry) as well as traditional for the Michigan commercial industry (Mid-wire Cordon and Pendlebogen).
- (3) To compare the influence and cost of manual and mechanical leaf removal on fruit quality under both controlled experimental and commercial conditions.
- (4) To evaluate the engineering of a modestly-priced mechanical leaf removal device.

Results: (This is a report of the results of the 2002 growing season.)

(1) VINE SPACING TRIALS

(a) Northwest Station - White Riesling vines on spacings of 3, 4, 5 and 6 feet were in their 5th growing season in 2002 and produced yields of 4.0, 3.2 and 3.5 tons/acre, respectively. There were no differences in fruit quality. Vine size at the 3, 4.5 and 6-foot spacings averaged 0.9, 1.0, and 1.8 pounds of cane prunings per vine or 0.29, 0.23 and 0.22 lb. per foot of row, respectively. These data indicate that none of the vine spacings has been superior on yield or fruit quality or has resulted in excess vine size for the available vine space.

(b) Southwest Station - White Riesling vines on spacing of 3, 4.5 and 6 feet were in the 4th growing season in 2002 and produced yields of 4.7, 6.3 and 5.2 tons/acre. The excessive yields resulted from inadequate thinning. The lower yield of the vines at the 3-foot spacing resulted in significantly higher fruit soluble solids. Vine size at the 3, 4.5 and 6-foot spacing averaged 1.2, 1.8 and 1.9 pounds of cane prunings per vine or 0.4, 0.4 and 0.3lb. per foot of row, respectively. These data indicate that vine size for all vine spacings was at the top end of optimum vine size after four growing seasons. Continued increase in vine size in future years would result in excess vine size. For both of these trials, there is no indication to date that smaller vine spacings are superior to a 6-foot vine spacing. However, it will require 2-3 years of additional data to conclude if the narrower vine spacings are actually detrimental to vine productivity and fruit quality.

(2) LEAF REMOVAL

(a) Grower Trials - There were eight trials of leaf removal in grower vineyards in 2002. Leaf removal significantly increased both fruit exposure and sun scald on fruit in most trials. Manual or mechanical leaf removal did not significantly alter fruit quality in any of these trials with the exception of a significant decrease in fruit soluble solids in one location. A possible factor in the lack of response of fruit quality to leaf removal was the relatively high proportion of fruit already exposed to sunlight in control treatments. It averaged 45% for all grower trials.

(b) Training System Trials

Northwest Station - White Riesling vines trained to either Scott Henry or Pendlebogen training systems were subjected to leaf removal or not. Leaf removal had no impact on fruit quality with either training system.

Southwest Station - White Riesling vines trained to either Scott Henry or Mid-wire Cordon training systems were subjected to leaf removal or not. Leaf removal had no impact on fruit quality with either training system.

(c) Time and Method of Leaf Removal - White Riesling vines planted at the Southwest Michigan Research and Extension Center and managed with or without leaf removal. Leaf removal was performed either at fruit set or veraison and performed either manually or by a mechanical device. Crop load was adjusted to approximately 3.5 tons/acre. Leaf removal manually at veraison significantly reduced fruit soluble solids. Manual leaf removal at fruit set significantly reduced titratable acidity at the time of harvest.

An additional 2 to 3 years of data collections in these plots will reveal whether the experiences of 2002 are consistent from year-to-year or if in some years there is a greater influence of leaf removal on fruit quality under the conditions of these experiments in Michigan vineyards.

Communication Activities, Accomplishments and Impacts:

Information from this research has been and will be shared with growers in several ways to include presentations at the Northwest Orchard and Viticulture Show, The Southwest Michigan Hort Days, Great Lakes Expo, etc. This work was featured at vineyard meetings to include the Southwest Michigan Wine Growers, Parallel 45 Growers' meetings and the MSU Viticulture Field Day.

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