for the critical levels used to evaluate winegrape nutrient status. The failure to obtain increased yields on vines that were clearly K deficient by existing criteria and that greatly increased K status following treatments raises at least two questions that require further study. First, the extent of genetic differences in vine K requirements needs to be better established. There is also evidence of differences in petiole K concentration and yield response to K among rootstocks (see Better Crops, Winter 1992-93, pp. 19-21). In a separate experiment, Chardonnay grapes on St. George rootstock (used in this experiment) responded poorly to K fertilization.

Second, the standard of K status, bloomtime petiole K of basal leaves, may not give accurate estimates for some genotypes or growing conditions. If K deficiencies develop later than bloom due to soil drying and K fixation on certain clay soils, for example, the standard sampling approach may not detect the ensuing deficiency.

## Summary

Supplemental irrigation above the STD practice maintained high SWC in the rooting zone and increased both the
uptake of applied and indigenous soil K. The benefit of increased K uptake late in one season was apparent in vine K status early in the subsequent season.

Potassium fixation may be a concern on many North Coast soils such as at this site with K fixing clays, but the application of $8 \mathrm{lb} \mathrm{K}_{2} \mathrm{SO}_{4}$ under the drip emitter resulted in movement of significant K to a depth of at least 36 inches under both irrigation regimes. Significant differences in root distribution caused by irrigation and K fertilizer treatments were not detected. About 75 to 80 percent of the root intercepts were encountered at the top 36 inches of the soil in all treatments.

Although bloom petiole K of 0-STD (control) grapevines was near the previous established critical level of 1.0 percent dry weight, the application of K did not significantly increase yields one, two, or three years after applications. Further studies to evaluate the role of varieties and rootstocks relative to yield responses and in interpretation of petiole values is recommended.

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