

GUIDELINES FOR FERTILISER USE ON VINEYARDS

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Grapevine nutrient status is an important influence on grapevine performance. When all other factors are optimal, strong responses to increasing vine nutrient status are observable. However, making quantitative estimates of fertiliser applications necessary for remedial action where vine nutrition limits vine performance is difficult.

Apart from nutrient supply, soil factors that affect vine nutrition, and need to be considered, include:

- irrigation management (delivery of nutrients to vine roots can be decreased by under watering, however waterlogging can cause iron deficiency),
- soil texture (soils with high clay contents generally have more exchangeable potassium),
- soil salinity (saline soils generally have lower levels of available potassium, calcium and magnesium),
- soil management (continuous cultivation is associated with rapid breakdown of nitrogen from covercrops) and
- application timing (grapevine roots take up nutrients, esp. nitrogen, at different rates and at different times during the growing season).

Vine nutrient concentrations are also influenced by the following plant factors:

- rootstock (e.g. vines on Ramsey tend to have higher nitrogen, phosphorus and potassium levels than vines on own roots),
- antagonism between nutrients during uptake (e.g. high potassium uptake decreases magnesium uptake),
- antagonism between nutrients in the leaves (e.g. high leaf phosphorus can make leaf zinc less available for its various functions) and

- vine vigour (growth generally dilutes nutrients and growth restriction tends to make apparent concentrations high).

The identification of nutrient limitations on vine performance is possible through petiole sampling at flowering and comparison to appropriate petiole standards that reflect the relationship between the nutrient status of the variety in question and its performance. Petiole nutrient standards for each of the varieties used for producing dried vine fruit in the Sunraysia have recently been defined. These standards take into account whether the vines are on their own roots or grafted onto Ramsey rootstock.

Identification of nutrient-limited vine performance only allows qualitative decisions regarding the appropriateness, or otherwise, of vineyard fertiliser programs. In other words, petiole sampling alone will only indicate that a particular program is insufficient, adequate or excessive. But, on-going annual petiole sampling at flowering allows a picture to be built up of the fertiliser program in relation to vine performance and nutrient status, which, in conjunction with accurate records of vine performance and fertiliser inputs, should allow decisions to be more quantitative.

Current research aims to improve the interpretation of petiole analysis by devising a vigour index to remove the effect of vigour on petiole nutrient concentrations and thus make subsequent decisions more precise by establishing new updated guidelines for soil nutrient availabilities.

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