Nitrogen Requirements

SEASONAL

Recommended N application rates for raisin production range from 0 to 60 lbs/acre depending on the irrigation system, soil type and vigor of the vines. The yield of wine grapes is generally lower than raisin and thus the required application rates for wine grapes may be substantially lower than the values reported in the table below. However, the values reported in the table for drip irrigated systems correspond to the N rate generally recommended for wine grapes.

Suggested N Application Rates in Raisin Vineyards

<table>
<thead>
<tr>
<th>Vineyard Condition</th>
<th>Rate (lbs N/Acre)</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Furrow</td>
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<tr>
<td>Vigorous vines, some excess growth</td>
<td>0</td>
</tr>
<tr>
<td>Medium vigor, medium to fine textured soils</td>
<td>20-40</td>
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<tr>
<td>Weak vigor, inadequate canopy, sandy soils</td>
<td>50-60</td>
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</tbody>
</table>

When groundwater is used for irrigation, the nitrate in the water can contribute a significant part of the vineyard’s N requirement. Fertilizer application rates should be corrected for the amount of N contained in the irrigation water.

Information regarding raisin and wine grape fertility management, including placement, fertilizer source, phosphorus and potassium are available at:

www.cdfa.ca.gov/go/FREPguide

SELECTED REFERENCES


Nitrogen uptake is relatively high between bloom and veraison. During this period, about half of the annual N demand is taken up. Studies in San Joaquin Valley vineyards showed that N is best applied in spring during a period starting after budbreak until fruit set or post-harvest.

Petiole Analyses
In California, petioles of leaves opposite the flower clusters, sampled at full bloom, are generally used to determine the nutritional status of grapevines. Grapes are in full bloom when approximately two-thirds of the caps have loosened or fallen from the flowers. Petiole nitrate-N concentrations of 500-1200 ppm are generally considered adequate.

Leaf symptoms appearing after the beginning of ripening are caused by the translocation of N from the leaves to the berries. On average, about 2.9 lbs. of N is removed from the vineyard in one ton (2000 lbs.) of fresh grapes, with values ranging from 1.8 to 4.1 lbs.

Late-season and post-harvest N applications refill storage reserves in permanent structures and support leaf growth the following spring. However, available N in late summer should not be high enough to encourage late-season shoot growth, delay maturity, or promote immature canes.

Postharvest applications need to be made as long as the canopy is healthy and functional to ensure adequate uptake. Nitrogen applications in late fall after leaf fall are inefficient, because N may be leached below the root zone by winter rains.

Mode of Application
Under drip irrigation, 2-5 lbs. N/acre may be applied weekly in spring. However, when leaching during the growing season is minimized, one single application may be as effective as multiple small applications, provided the soil is not very sandy in texture.

Under furrow irrigation, high application rates should be split. Urea and ammonium forms should always be drilled at least 2 inches deep into the soil or immediately incorporated, since they are subject to volatilization losses if left on the surface. For young vines and on sandy soils, fertilizer should be applied within 3 feet of the row to ensure root access.

For more information and references about N management in grapes, access the crop fertilization guidelines at: www.cdfa.ca.gov/go/FREPguide