SULTANA BUNCH COUNTS HIGHER THAN LAST YEAR
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Introduction
Recent spring assessments confirm a 27% increase in Sultana bunch numbers compared to estimates obtained in spring last year. Consequently the sultana yield for the 1998 harvest is anticipated to be around 31,000 dry tonnes, only slightly higher than last year's crop.

While a number of factors can contribute to variations in the performance of Sultana vines grafted to Ramsey rootstock, the major ones appear to be associated with vigour management. Research focusing on the management practices used to manipulate vine vigour and yield is currently being investigated. This research includes spring assessments of Sultana bud and vine fruitfulness in relation to trellis design and canopy architecture. The aim is to optimise the production of Sultana vines grafted to Ramsey rootstock by determining the relationship between trellis design, vine fruitfulness, and canopy architecture. Monitoring and measuring these components will help ensure that Sultana vines grafted to Ramsey rootstock are correctly managed by growers which will benefit the dried vine fruit industry in terms of vigour control and increased production.

1995-1997 Spring Assessments
Bud and vine fruitfulness were investigated in spring using Merbein bunch count techniques (i.e. % bud burst, bunches per shoot and bunches per node). Comparative assessments of own-rooted Sultana and Sultana vines grafted to Ramsey rootstock on various trellis systems were made. These plantings were managed under similar conditions on grower's properties.

Figure 1. 1996/1997 average spring bunch counts for Sultana vines in Sunraysia.

<table>
<thead>
<tr>
<th>Trellis Type</th>
<th>Average number of bunches per vine</th>
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<tr>
<td>Sultana/Ramsey</td>
<td>120</td>
</tr>
<tr>
<td>Own-rooted Sultana</td>
<td>100</td>
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Spring bunch counts in 1995 did not include the wide T-trellis. Therefore, the average number of bunches per vine is calculated from the 1996 and 1997 seasons in which all trellises were assessed. Vines trained on the Shaw swingarm (Mark 3) and wide T-trellises had the highest fruitfulness in both seasons (Figure 1). This is due to an increase in the area of the vine canopy of the higher/wider trellises which increases light penetration, thereby reducing shoot crowding and shading, increasing bud fruitfulness and potentially improving yields. In 1995 the Shaw swingarm trellis (Mark 3) also had the highest number of bunches per vine for both own-rooted Sultana and Sultana vines grafted on Ramsey rootstock.

On average, 1997 bunch numbers are 27% higher than figures obtained at the same time last year. Of these, Sultana on Ramsey was 28% higher than 1996, whereas bunch numbers for own-rooted Sultana are 28% higher than 1996. However, as last season's crop was well below the district average, this season's increase in bunch numbers actually represents a bunch count that is 5.5% below average. Combine this with the diversion of large quantities of fruit to wineries and table grape production, as well as the large areas of Sultana vines removed from production during the past year, and only an average crop will be harvested in 1998.

1996/1997 Yield Results
Harvest measurements taken in 1996/1997 included yield, bunch and berry weights, size and maturity. In order to make valid comparisons between these treatments, all yield measurements were adjusted to compensate for different vine spacings and baume levels, and expressed as dry tonnes per acre (Figure 2).

Figure 2. 1996/1997 average yield results for Sultana vines in Sunraysia.

When growing on the same trellises, Sultana vines grafted on Ramsey rootstock always had higher yields than own-rooted Sultana vines, despite the fact that own-rooted Sultana vines had more bunches. This is because Sultana vines grafted on Ramsey rootstock generally have greater bunch and berry weights at harvest. High crop loads for Sultana vines grafted on Ramsey rootstock also reduce individual vine vigour and allow good temperature and light interception to occur.

The greatest yields (dry T/acre) were obtained for Sultana vines grafted on Ramsey rootstock on wide T and Shaw trellises (Mark 1, 2 & 3). The greatest yield for 1996 was 6.23 dry T/acre for Sultana vines grafted on Ramsey rootstock on a wide T-trellis. Spring bunch counts taken in 1996 for this trellis had the highest average of 120 per vine. As a result this trellis obtained the highest yield in 1997 (4.45 dry T/acre). The Shaw swingarm trellis (Mark 3) obtained the second highest yield for Sultana vines grafted on Ramsey rootstock in 1997 as well as the highest yields for own-rooted sultana vines. These trellises (Mark 3 and wide T) benefit from an increase in vine spacing and trellis width, which enlarges the area of the vine canopy for the vigorous
Ramsey rootstock. In fact, the Shaw swingarm trellis (Mark 3) increases the height of the canopy by encouraging the replacement shoots to grow upward, providing better exposure to sunlight during bud initiation, thereby increasing bud fruitfulness and hence potential yields.

Low bunch counts recorded in 1996 (52% lower than 1995) resulted in lower yields during the 1997 harvest compared to the 1996 harvest at all sites and on all trellis systems. While higher bunch counts recorded in spring 1997 should result in greater yields for 1998, a range of other factors (yield components) will determine the extent of the potential yield increase. Yield components are determined in both the previous and current season. Berries per bunch are determined after fruit set, whereas bunch, berry weights and sugar levels are determined at harvest. These factors enabled some Sultana vines with low bunch numbers in 1996 to obtain relatively high yields at harvest 1997.

Conclusion

Trellises designed higher and wider than the standard 12"T (wideT and Mark 3) increase fruitfulness and hence yields of Sultana vines grafted on Ramsey rootstock. This is due to an increase in the area of the vine canopy which increases light penetration, thereby reducing shoot crowding and shading, increasing bud fruitfulness and hence improving yields. Sultana vines grafted on Ramsey rootstock obtain higher yields than own-rooted Sultana vines regardless of the trellis type due to greater bunch and berry weights at harvest.

Higher spring bunch counts in 1997 compared to 1996 indicate the 1998 crop will be slightly higher than last year's low tonnage. However, the larger crop currently estimated will now be influenced by 'yield components' (previously discussed), the amount of fruit diverted to winery and table grape production, and the removal of Sultana vines from production over the last year. Therefore, if vines set well and have high bunch and berry weights, a satisfactory crop may be harvested in 1998.

Acknowledgments

The authors wish to thank all growers involved for allowing experiments on their properties and the Dried Fruits Research and Development Council for providing funding. This research forms part of a Dried Fruits Research and Development Council project “Optimising vine management for mechanisation and managing vigour of Ramsey rootstock". It is a joint project under the Riverlink initiative, with research based at both the Sunraysia Horticultural Centre, Irymple and CSIRO, Merbein. Thanks also to Karen Bunney of Agriculture Victoria, Irymple and David Emanuelli of CSIRO, Merbein for their contribution to the project.

RAPID NITROGEN SAP TEST

By S. Nagarajah,
Sunraysia Horticultural Centre

Agriculture Victoria is pleased to provide a rapid, inexpensive nitrogen sap test service for grapegrowers to take the guesswork out of using nitrogen fertiliser. The test results will provide information on the nitrogen status of vines and any requirements to use nitrogen fertiliser.

Nitrogen is the main problem nutrient in many Sunraysia vineyards. Both nitrogen deficiency and excessive nitrogen levels reduce the productivity of vines.

The nitrogen sap test was developed for sultana vines by Agriculture Victoria and the Dried Fruits Research and Development Council. It may be used for other vine varieties, however, the results need to be treated with caution, as research to establish standards is still being carried out in varieties other than sultana.

Collection Procedure

The nitrogen sap test can only be carried out at flowering which usually occurs in early November. To carry out the test:

- collect petioles between 9.00 a.m. and 5.00 p.m.;
- collect 100 petioles from a patch of uniformly vigorous vines;
- keep petioles from different vine varieties separate (own-rooted vines and rootstock vines in separate bags);
- place in a plastic bag and send (on the same day) to any of the following collection centres:
  - Sunraysia Horticultural Centre
  - branches of Growmart IAMA or Vineleaf Stores
  - D & W Adams (Mildura)
  - Elders (Mildura and Robinvale)

Blank sample registration forms are available at the collection centres and must be filled out when delivering the petiole samples. A report will be sent back within three working days. The cost of each test is $20 and an account will be sent along with the results.

More information can be obtained by telephoning Mr Nagarajah of the Sunraysia Horticultural Centre on 5051 4500.