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INFLUENCE OF IRRIGATION, CROP THINNING  
AND CANOPY MANIPULATION ON COMPOSITION  
AND AROMA OF RIESLING GRAPES.

by

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SUMMARY

Variations in the aroma of experimental lots of Riesling grape juice were investigated by subjective and objective means. These methods were used to assess the effect of viticultural practices: irrigation and lighter pruning, crop load, and shoot directioning which are suspected of affecting wine quality. Two years data are presented on the effect of these viticultural practices on fruit yield, vegetative growth and fruit composition during ripening. One seasons data on juice aroma assessment are presented.

Irrigation and lighter pruning resulted in an approximate doubling of fruit yield per vine with only a small delay in ripening. Crop thinning of irrigated and lighter pruned vines caused a halving of yield and a hastening of ripening compared with irrigated; such fruit ripened earlier than unirrigated but with the same yield. Shoot directioning on irrigated and lighter pruned vines had only minor effects.

Monoterpenes, a component of aroma, were extracted from the juice and measured by colour reaction. The concentration of 'free volatile terpenes' (FVT) in the juice was not affected by the experimental treatments but significant treatment effects on the concentration of 'potential volatile terpenes' (PVT) were observed. Irrigation and lighter pruning caused a significant reduction in PVT while crop thinning of irrigated vines resulted in a significant enhancement compared with irrigated alone in season two.

The concentration of PVT increased as grapes ripened.

Subjective assessment of juice aroma was carried out by a panel of six winemakers with experience in juice assessment. Although there were difficulties in data interpretation, panelists were able to discern differences in aroma intensity associated with fruit ripening and four members of the panel detected differences between

experimental treatments.

Multiple linear regression analysis of aroma score and FVT of all samplings showed a negative correlation for four of the six members of the panel. Regression analysis of aroma score and PVT concentration showed a positive correlation for two of the six members; there was no correlation for the other four members. However, when the data from the four treatments were compared at the same stage of commercial harvest (21 °Brix), the two low-yielding treatments (unirrigated and irrigated plus crop thinned) had higher PVT and aroma scores than the high-yielding treatments.

The significance and implications of these findings are discussed.

STATEMENT

I hereby declare that the thesis here presented is my own work, that it contains no material previously published, except where due reference is made in the text, and that no part of it has been submitted for any other degree.

I consent to this thesis being made available for photocopying and loan if accepted for the award of the degree.

(M.G.McCarthy)

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