Title Predictive modelling of disease risk and storage potential in table grapes (cv. 'Thompson Seedless') using an integrated systems approach

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Abstract

Storage life and market quality of table grapes can be significantly reduced by fungal infections, moisture loss and physical injury. Categorising batches of table grapes at harvest according to the risk of rot development and accelerated quality loss would allow industry more market flexibility. Low-risk fruit batches could be identified at harvest for long-term storage or export to distant markets and high-risk fruit marketed domestically. This study investigated the feasibility of using predictive models for determining the effect of production practices, climate and post-harvest temperature management on 'Thompson Seedless' table grape quality. Experimental data was collected over three seasons from storage experiments using fruit batches collected from six field trials established in commercial vineyards in the Sunraysia district in Victoria.

The work showed that Botrytis incidence assessed at harvest was a good predictor of post-harvest Botrytis bunch rot development. The study also highlighted that the storage potential of fruit batches will be limited by disease pressure from other rots at harvest and the capacity of sulphur dioxide to control superficial infection, and suppress latent infection. Quality prediction models were developed for stem browning, berry shatter and, discoloration and decay at berry attachments during long-term cool storage. Bunch structure and stem maturity at harvest were also good predictors for the rate of quality loss in table grapes.

The development and application of an integrated systems approach using prediction models, suitable assessment techniques and 'real-time' monitoring would enable implementation of management practices based on the requirements of individual fruit batches and move away from prescriptive and 'standard' product treatments such as the use of sulphur dioxide for rot control.