Major challenges for the Australian wine industry are the consistent supply of quality product in a variable and changing environment; adapting to limited water supply and drought; and, improving the economic sustainability of growers through increased production efficiency (i.e. higher yields for efficient use of natural resources) with reduced inputs (i.e. labour, fuel, water and chemicals). The potential to exploit genetic variability of grapevine material through adoption of alternative varieties that broaden the genetic base of the Australian industry offers an alternative approach to assist industry to meet these challenges. This is currently being explored by CSIRO in a project managed by the Grape and Wine Research and Development Corporation (GWRDC), titled ‘Enhanced varieties and clones to meet the challenges of climate change and deliver low alcohol wines’, as part of “Australia’s Farming Future: Climate Change Research” Program funded through the Australian Government Department of Agriculture, Fisheries and Forestry. This presentation will provide an update on the evaluation of 410 wine grape varieties and advanced CSIRO breeding lines grown at CSIRO Merbein in two very contrasting seasons, i.e. the very hot and dry 2010 season and the cooler, wet 2011 season. Key evaluation criteria for these studies include:-

- Enhanced flavour, colour, organic acid composition and pH, particularly at lower sugar levels
- Extended season (early and late) to reduce impacts of compressed seasons
- Early ripening with short seasonality to reduce water requirements and for use in cooler regions
- High fruit to leaf ratios to improve water use efficiency (a surrogate for crop water use index, i.e. yield to water transpired)
- Early release of flavour during fermentation to facilitate production of low alcohol wines.

While the study has been undertaken in a warm region, the approaches used have relevance to the identification of varieties suitable for cooler regions. The selection of varieties with potential for use in cooler regions, based on phenology, fruit composition and wine quality attributes will be presented.