

Vine breeding at Merbein

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Grape breeding has been in progress at Merbein since 1964. In the early stages important aims were improved drying cultivars with greater resistance to fruit damage from rain at harvest and wine cultivars better adapted to hot climates through later maturity and higher acidity. More recently resistance to fungus diseases has been considered and a current interest is maximum yield of sugar per unit of planted area at the highest possible concentration.

Parents available include about 200 wine grape cultivars and 100 table grape cultivars from *Vitis vinifera*, 40 American hybrid cultivars in which *V.labrusca* and *V.aestivalis* are the most important species other than *V.vinifera*, and 20 French hybrid cultivars in which *V.rupestris* and *V.lincecurdi* are also important components. As well there is species material of *V.berlandieri*, *V.cinerea*, *V.rupestris*, *V.champini*, *V.longii*, *V.aestivalis*, *V.caribaea*, *V.cordifolia*, *V.riparia* and *V.rotundifolia* and there are hybrids of some of these, including more than 30 rootstock cultivars, and also of *V.amurensis*.

Even the *vinifera* cultivars are highly heterozygous and it might be questioned whether it is legitimate to refer to an F1 and further generations when the genetic constitution of the parents is unknown. With this reservation, experience at Merbein has confirmed that in most cases direct selection from large F1 populations raised from carefully selected parents is the most efficient way of obtaining a cultivar with the characteristics desired. Self pollination has been tried with a number of varieties but many weak to very weak seedlings resulted and only a few developed well enough even to allow assessment for valuable characters. Other systems which have rarely given useful progeny include back crossing to the same cultivar, crossing selections with both parent cultivars in common, crossing selections with one parent cultivar in common or crossing related cultivars such as Cabernet Sauvignon and Cabernet Franc.

Cultivars appear to carry many deleterious recessive genes and the crossing of even apparently unrelated cultivars often gives many sub standard offspring. Increasing the degree of inbreeding gives further reductions in the proportion of useful offspring. Some homozygous recessives are self eliminating e.g. complete albino; some can be recognised as seedlings and discarded e.g. variegated partial albino. Others may be responsible for weaknesses which show up later, sometimes only after several years. Perhaps one should be wary of breeding systems in which progeny are selected as parents before they can be evaluated. Probably the most sustained and successful effort in vine breeding was the production of the French hybrids, of which some idea can be obtained from Galet (1956). One reason for the success may be that when the breeders back crossed their species hybrids to *V.vinifera* they used a different cultivar in each successive generation.

Galet, P. (1956). "Cultures et Vignobles de France. Tome I, Les Vignes Américaines" (Paul Dehan: Montpellier).