

Title Genetic variation in chilling requirement in apple progeny.
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Abstract

Genetic variation in chilling requirement was investigated over three growth periods using clonal progenies of six apple (*Malus sylvestris* var. *domestica* [*Malus pumila*]) families derived from crosses of high and low chill-requiring cultivars. Two quantitative measurements related to chilling requirement, viz., the time of initial budbreak (vegetative and reproductive) and the number of breaking buds over a specified time interval, were used as evaluation criteria. Genetic and environmental variances of the traits are presented as intra-class correlation coefficients for clones within and between families. For budbreak time, reproductive and vegetative, broad-sense heritability averaged around 75 and 69% respectively, indicating a high degree of genetic determination in this material. For budbreak number, moderate to low genetic determination was found with broad-sense heritabilities around 30%. Estimates of genetic components of variance between families were generally very low in comparison to the variance within families and predict potentially favourable responses to truncation selection on the traits within these progeny groups. Analysis of the data showed that distribution of budbreak time is typical of quantitative traits with means distributed closely around midparent values. Skewed distributions towards low budbreak number were obtained in varying degrees in all families.