Abstract

To be commercially successful, kiwifruit need a long storage life that enables them to pass through the supply chain and still provide consumers with a reasonable shelf life in the home. Future cultivars will need to provide storage/softening characteristics that match or exceed those of current cultivars. Thus it is important to develop tools that allow assessment of these characteristics in seedling populations. Fruit from 47 seedling vines, which comprised 17 families, and several commercial 'Hayward' lines, were assessed for firmness by puncture with an 8 mm Effegi probe on up to 10 occasions during storage at 1°C. Data were analyzed using a number of models to separate each softening curve into an initial lag phase in which fruit soften slowly, a period of rapid softening and finally again a slow rate to a lower threshold after which there is little or no further softening. The Boltzman function fitted as a Non-Linear Mixed Effects (NLME) model was described the early period of softening, and the inverse exponential polynomial function with multiplicative errors described the late period of softening. A delayed softening curve was usually associated with a shallow slope. Genotypes from some families seemed to cluster according to how they softened while genotypes from other families were spread throughout the scatterplot of estimated parameter values. Minimum firmness was associated with the lower plateau of the softening curve. The estimated minimum firmness varied among genotypes within families, and few matched the high values obtained for 'Hayward'. It is probable that protocols and methods to measure fruit softening behaviour effectively for the identification of lines with superior storage potential for breeding and selection can be developed.