Abstract

This study was initiated to correlate pre-and post-bloom temperature variables from two of the main pear production areas, Ceres and Elgin, with the most important physiological maturity variables, in order to predict harvest maturity of 'Forelle' pears more accurately. Although fruit firmness is often used to quantify optimum harvest maturity of pears, quantifying optimum harvest maturity for 'Forelle' pears cannot rely on firmness only. Firmness has been found to be lower in a season with relatively low summer temperatures, thus climate has to be considered when this parameter is used for prediction of harvest maturity. Therefore, climate parameters from the onset of winter (May) until beginning of summer (December) were included in the prediction model. The weekly maturity variables were plotted over the length of the growing season (corresponding DAFB), accumulated chill units, accumulated heat units and hours below 10°C and monthly heat units for the season - from full bloom to optimum harvest maturity for each physiological variable (firmness=6.1 kg; malic acid=0.27; total soluble solids=14.6; back ground colour >2.5) to determine the effect of climate on maturation of 'Forelle'. Using regression analyses, a straight line was fitted over the linear interval where the optimum for each maturity variable was situated. For every regression line, the equation of the fitted line was used to estimate the number of DAFB or specific climate parameter to determine the optimum of the selected maturity variable. The gradient of each fitted line was used to quantify the rate at which the variables changed over the number of days after full bloom and heat units. A prediction model was developed for each site, based on 10 years of historical maturity indexing and hourly climate data.