

Title Harvest maturity, conditioning temperature, and ethylene treatment influence induction of ripening capacity in 'd'Anjou' pear fruit

Author D. Sugar and T.C. Einhorn

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Abstract

The relationship between 'd'Anjou' pear fruit maturity at harvest and postharvest conditioning necessary to induce ripening capacity at -0.5, 5, or 10°C was studied at two locations in Oregon. Fruit were harvested weekly for five weeks beginning at 66.7 N and conditioned for 10, 20, 30, 40, 50, or 60 d at each temperature. After 7 d ripening at 20°C, fruit firmness was measured and the conditioning duration corresponding to fruit softening to ≤ 17.8 N was calculated. At -0.5°C, ~60 d were required to induce ripening capacity in fruit harvested at initial maturity. This decreased to a minimum of ~22 d when pears were harvested 28 d later. At 5°C, fruit harvested at initial maturity required ~30 d to achieve ripening capacity, while those harvested 28 d later needed only 2 d. At 10°C, fruit harvested at initial maturity required ~18 d to achieve ripening capacity; pears harvested 21 and 28 d after initial maturity required less than 10 d at 10°C. The relationship between harvest timing and the conditioning duration necessary to induce ripening at each temperature was well-described by second-order polynomial regression. Using this relationship, the conditioning duration necessary to induce ripening capacity in 'd'Anjou' pears at -0.5, 5, or 10°C corresponding to specific harvest timings can be calculated from the regression equations. 'd'Anjou' pear fruit harvested at 66.7 N treated with 100 ml L⁻¹ ethylene at 20°C for 24 h required additional conditioning of 30 d at -0.5°C, 20 d at 5°C, and 7 d at 10°C to develop ripening capacity. After 48 h in ethylene an additional 20 d at -0.5°C, 8 d at 5°C, and 4 d at 10°C were required. Ethylene treatment for 72 h required no additional conditioning.