

Pomological and vegetative changes during transition from flood irrigation to drip irrigation: Starkrimson Delicious apple variety

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Abstract:

Considering that apple growers have commonly used flood irrigation method instead of drip irrigation for many decades, this study aims to determine the effects of transition from flood irrigation to drip irrigation on vegetative growth and fruit quality (fruit diameter, length, weight, colour, firmness and classification). An apple orchard which had been irrigated by flood irrigation for many years was used for the study, during which flood irrigation was continued in one section as a control treatment, while drip irrigation was applied for rest of the apple orchard. Two different irrigation intervals (4 and 7 days) and four different pan coefficients (0.50, 0.75, 1.0, 1.25) were applied during drip irrigation treatments. Flood irrigation included only one treatment (20 days irrigation interval). Transition to drip irrigation method for apple trees indicated positive consequences on vegetative growth and fruit quality. Fruit diameter, length and weight values were the highest in Kcp₃ (1.0) treatments in drip irrigation. Kcp₃ treatments also showed the highest red colour density values. Kcp₃ and Kcp₄ (1.25) represented a more marketable fruit size (extra and class 1) than flood irrigation. Lower amount of irrigation water was consumed with drip irrigation compared to flood irrigation.

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To obtain the highest quantity of marketable apples, Kcp treatment with 1.0 and irrigation interval with 4 days (I₁Kcp₃ treatment) is recommended during transition from flood irrigation to drip irrigation for similar climatic and soil conditions.

Key words: Apple, drip irrigation, flood irrigation, fruit quality, vegetative growth.