

Mechanical blossom thinning in South Carolina peach orchards

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Abstract

Blossom and/or green fruit thinning is the most labor intensive and costly operation in the production of southeastern peaches. Efforts to utilize caustic chemicals or hormones to reduce fruit set have been largely unsuccessful. Past ineffective efforts at mechanical flower thinning involved ropes, pressurized water or air. Recently, mechanization developed for apples in Europe was adapted to peaches in the United States. This technology (i.e., the Darwin 250 string thinner) was evaluated for 3 years in South Carolina grower orchards trained as either open center, quad-V or perpendicular-V systems. Treatments varied each year with the primary ones being two sections of cords (i.e., strings) opposite each other with either 9 or 18 cords per section. Tractor speeds were 2.9-4.0 km/h with spindle speeds from 180 to 230 rpm. Passes per tree were either two (horizontally over the top down one side and back the other) or four (horizontally over the top and angled on the side on both sides of the tree). All treatments were followed by green fruit removal with labor costs calculated from crew timesheets. Past research suggested a goal of 45-50% flower removal. The Darwin worked best in V and quad-V systems. Open center trees were less uniformly thinned. Darwin treatments advanced fruit maturity and significantly increased the number of larger fruit. However, yields were not always better than the controls, and crop values varied among cultivars and years. In 2011, Darwin treatments cost \$143 to \$1215/ha less than standard green fruit thinning, but associated gross revenue ranged from an 8.3% decrease to an 8.1% increase. The Darwin was not as uniform in thinning compared to hand removal, but labor savings with increased fruit size were obtained. The scaffold orientation in open center systems must be uniformly trained to be thinned evenly by the Darwin and to reduce over-thinning in the upper canopy.