

## PLANT DENSITY AFFECTS FRUIT YIELD AND QUALITY OF GREENHOUSE STRAWBERRY GROWN IN PINEBARK UNDER PESTICIDE-FREE CONDITIONS

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Strawberry (*Fragaria x ananassa* Duch.) production in greenhouses using soilless substrates can eliminate dependency on methyl bromide and enhance off-season production. In Fall 2001, eight plant densities (10.8 to 22 plants per m<sup>2</sup>) and in Fall 2002, twelve plant densities (10.8 to 27.5 plants per m<sup>2</sup>) of 'Sweet Charlie' strawberry were evaluated for fruit yield and quality using six between-row spacings (BRS) (65, 60, 55, 50, 45, and 40 cm) and two within-row spacings (WRS) (35 and 17.5 cm). Plants were grown in a passive-ventilated greenhouse in north-central Florida using elevated horizontal troughs filled with pinebark. In Fall 2001, the early and total yield per m<sup>2</sup> increased linearly for all combinations of BRS and WRS as plant density increased. In Fall 2002, the early and total yield per m<sup>2</sup> increased as BRS decreased from 65 cm to 45 cm, however, there was a reduction in yield at 40 cm BRS. Also, yields per m<sup>2</sup> were higher at 17.5 cm WRS compared to 35 cm WRS. During both seasons, the average berry weight ranged from 17 to 20 g, and more than 90 percent of the yield was marketable. During Fall 2001, limited success was achieved when biological control agents such as *Aphidius colemani* and *Lysiphlebus testaceipes* parasitic wasps, and *Neoseiulus californicus* predatory mites were used in conjunction with chemical insecticides for controlling aphids (*Aphis gossypii*) and two-spotted spider mites (*Tetranychus urticae*). However, during Fall 2002, exclusive use of biological control agents resulted in 95 percent aphid parasitism by parasitic wasps within six weeks of release and 100 percent control of two-spotted spider mites by preventive monthly releases of predatory mites. Thus, high plant densities affect fruit yield and quality of greenhouse-grown strawberries and enhance off-season production, and effective biological control agents offer a unique opportunity for producing pesticide-free strawberries and increase the dollar value of the product.