

“SPANISH” PEPPER TRELLIS SYSTEM AND HIGH PLANT DENSITY CAN INCREASE FRUIT YIELD, QUALITY, AND REDUCE LABOR IN A HYDROPONIC, PASSIVE-VENTILATED GREENHOUSE CROP

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The production and quality of hydroponic red bell pepper (*Capsicum annum* L. cv. HA3378) fruits were evaluated in a passive-ventilated greenhouse with minimum heating during spring and summer 2000 in Gainesville, Florida. Two plant growing systems were used: 1) “V” trellis system (plants pruned to two stems, individually and vertically trained); and 2) “Spanish” system (plants not pruned, with lateral horizontal strings for vertical canopy support). Plants were grown in flat bags (20.4 L, 1-m long) and polyethylene pots (11.5 L), both filled with perlite. Plant population densities were 1.5, 1.9, 3.0, and 3.8 plant/m². Low night winter temperatures (4 to 15°C) during first flowering and fruit setting led to the production of flat-shaped parthenocarpic fruits in the first harvest (3/1/2000). Marketable fruit yield was similar in both growing systems (27 No· m⁻², 5.0 kg· m⁻²) although production of extra-large grade yield was higher in non-pruned (21 No· m⁻², 4.9 kg· m⁻²) than in pruned (13 No· m⁻², 3.0 kg· m⁻²) plants. Marketable yield per m² increased linearly with plant density from 3.5 kg· m⁻² (1.5 plant/m²) to 7.4 kg· m⁻² (3.8 plant/m²). Plants in bags produced the same marketable yield than plants in pots. In spring and summer, the production of fruits with blossom-end rot (BER), epidermal cracking, and yellow spots was high. Non-pruned plants had a lower percentage of BER (39%) than pruned plants (62%). In non-pruned plants, the number of nodes was greater than in pruned plants (105 vs. 59) but fruit set was lower (34 vs. 50%). Fruit set per plant decreased with plant density while plant height slightly increased. In a greenhouse with simple environmental control systems and productions under high temperatures, the “Spanish” trellis system with a density of 3.8 plant/m² resulted in reduced labor (one-fourth the labor used in the “V” system) and in greater yield of extra-large fruits.