

Evaluation of Greenhouse, Field and Heirloom Tomato Varieties in Hydroponic Greenhouse Production

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The greenhouse tomato industry in North America accounts for 37% of fresh tomato sales compared to 10% in 1999. This rapid growth in supply has led to declining prices, which challenges growers to be profitable. Controlling disease and insects can often be eliminated with good management practices and variety choice. However, greenhouse growers struggle more than field growers to control pests and diseases during their crop's long-term production in an enclosed environment. Thus, developing greenhouse varieties with pest and disease resistance would support the US greenhouse tomato industry. The first step in initiating our greenhouse tomato breeding program was to evaluate existing cultivars and germplasm. In this study, indeterminate heirloom varieties, resistant field germplasm and greenhouse hybrids were grown using commercial hydroponic production standards. Fruit were harvested and graded using USDA standards. Field varieties produced a greater percentage of large or extra large fruit and the heaviest fruit; however, they produced so few fruit, it would not be profitable to use these in greenhouse production. Greenhouse lines produced fruit earlier and higher number of large or extra large fruit. However, average fruit weight for the greenhouse lines was less than 200 g and the brix readings were in the bottom half of the lines studied. Thus, greenhouse growers require lines developed specifically for greenhouse production, but with some of the traits of lines used in field production.