

Disease Management in Organic Tomatoes-Allee Demonstration Garden-2001

Colleen Rossiter, Horticulture Assistant/Iowa master gardener
Kathleen Delate, Assistant Professor
Dennis Shannon, ISU Farms Manager

Introduction

The focus of the organic demonstration garden in 2001 was to conduct a fourth year trial on the use of copper wire in tomatoes for disease management, the most important problem in organic tomato production. There had been numerous reports about the successful use of copper wire and other organically approved methods, such as spraying with hydrogen peroxide, from growers nationwide. Results from the 1998 and 1999 Allee Garden copper wire trials included increased tomato fruit production from plants containing the copper wire insert. Heirloom tomatoes were grown for the trial.

Materials and Methods

Six plants each of five heirloom varieties were grown: Garden Peach, Spanish Sun, Clear Pink early, Flamme, and Pineapple. Tomato beds were prepared by rototilling 1.5 tons/acre of hoop house compost in Fall, 2000. Beds were spring rototilled to 6 inches. All tomatoes were transplanted on June 10, 2001, caged with concrete reinforcement wire (5' x 2' diameter) and covered with black plastic mulch and grass-hay around the perimeter. Drip irrigation was utilized on an as-needed basis. Two plants of each variety were planted side-by-side. One plant did not receive any treatments (untreated) while the other plant received a copper wire insert into the stem of the tomato. When the treated plant's stem reached the diameter of a pencil, a 3-inch piece of 16-gauge copper wire was inserted through the center of the plant's stem (leaving equal amounts of copper wire on either side of the stem) approximately a half-inch above the soil line. All tomatoes in the trial were sprayed weekly with 3% undiluted hydrogen peroxide as a preventative against fungal attack. A subsample of each plant was monitored for the number of fruits per stem and the weight of the fruit per stem. Fruit yield and number of fruits were recorded at each harvest date until September 30, 2001.

Results and Discussion

A total of six plants of five cultivars were used in the trial. A description of the varieties is contained in Table 1. The 2001 growing season did not experience the

same drought conditions of 2000. There were no significant differences between the treated and untreated tomatoes in the number of fruit or the harvested yield in any of the varieties (Table 2). ‘Pineapple’ fruits were less than all other cultivars and harvest weight was significantly lower. All fruits were marketed through the local Farmers’ Market.

Table 1. Description of Tomato Varieties, Allee Trial, 2001.

Clear Pink Early: Determinate Russian heirloom with 58 day maturity. Grows 2-3 feet tall, and produces abundant, smooth, round, clear pink 3-6 oz fruit. Very good, sweet , yet sharp flavor.

Flamme: Indeterminate heirloom with 70 day maturity. An orange salad tomato with sweet flavor and fruity overtones.

Garden Peach: Indeterminate heirloom with 75-85 day maturity. Abundant clusters of small yellow tomatoes with a pink blush. Skin is somewhat fuzzy resembling a peach. Flavor excellent – sweet and mild. Constant supply of uniform tomatoes with no breaks in production.

Pineapple: Indeterminate heirloom with 85 day maturity. Bicolor: red and yellow fruit. Very large beefsteak-type tomatoes. Streaked with red both inside and out. Rich, sweet flavor. Good producer.

Spanish Sun: Determinate heirloom with 78 day maturity. Deep red, medium to small tomatoes. Great flavor. Steady producer.

Table 2. Copper wire-tomato trial harvests over 2001 season, Allee Farm.

Variety	Treated Yield (lb) ± SE	Untreated Yield (lb) ± SE	Treated Fruit Number ± SE	Untreated Fruit Number ± SE
Clear Pink Early	2.90 ± 0.88	2.88 ± 0.91	16.9 ± 4.3	20.17 ± 6.22
Flamme	3.78 ± 0.50	3.36 ± 0.54	57.33 ± 14.89	59.44 ± 21.10
Garden Peach	4.08 ± 0.67	3.96 ± 0.76	77.89 ± 27.62	69.67 ± 24.67
Pineapple	2.39 ± 0.85	2.49 ± 0.73	6.56 ± 2.79	8.50 ± 4.37
Spanish Sun	3.11 ± 0.81	3.81 ± 0.82	24.17 ± 8.05	27.33 ± 12.18