

Curly Top Resistant Tomato Varieties for Southern Utah

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Curly Top is a virus disease which causes wilting and death of tomatoes and other vegetables. Tomato losses have been reported as high as 80% in southern Utah. Curly Top is an insect vectored virus that is thought to be transmitted by the beet leafhopper (*Circulifer tenellus*). Control with chemical sprays is extremely difficult since the timing of when the beet leafhopper moves into tomato fields and home gardens varies from year to year. Exclusion is not practical, especially as vines get larger during the growing season. It is thought that the beet leafhopper feeds on virus infected weeds such as Russian Thistle, Lambsquarter and Salt bush. Hoppers then move to home gardens and commercial tomato fields and infect healthy plants. Symptoms include purple leaf veins, wilting, stunting, loss of yield and death.

In 2007 we selected two curly top resistant tomato varieties to compare with other popular varieties. The varieties Columbian and Row Pack are from (breeding program) Washington State University and thought to be curly top resistant. They were compared to Jet Star, Mountain Fresh and Celebrity. We decided to compare disease resistance, yield, fruit size, pH and eating quality.

Results:

Six plants of each of the five varieties were planted in a randomized design and replicated three times. All varieties showed some symptoms of Curly Top virus except Jet Star. Two Row Pack, One Columbian, five Celebrity, and two Mountain Fresh plants were infected. The infected Celebrity and Mountain Fresh Plants died rather quickly after symptoms were noticed. The Columbian and Row Pack plants became somewhat stunted and the leaves had purple veins, but plants were slow to die. Fruit yields and quality were adversely affected. No statistical differences were noted as far as disease susceptibility.

Fruit size of the Columbian and Row Pack varieties were in the small to medium range with an average diameter of 2 to 2 ½ inches. Jet Star fruit size averaged around 2 ½ to 2 ¾ inches and the Celebrity and Mountain fresh were the largest averaging 2 ¾ to 3 inches in diameter. Averages were determined by taking a sample of 10 fruit from each variety at harvest and measuring the diameter.

Average yields per plant were as follows:

Variety	lb. per plant
Celebrity	9.2
Columbian	4.8
Jet Star	4.8
Mtn. Fresh	5.6
Row Pack	7.8

The differences in yield were not statistically different from each other.

The pH or acidity is often used in determining if a product is safe to home can. Tomato products with a pH value of 4.6 or higher are not considered safe without adding lemon juice to increase acidity. Whole

tomatoes were canned with each variety being kept separate from each other. Lemon juice was added to one batch as per USDA recommendations to lower the pH. The results are show in the table below.

Variety	Tomato pH	pH of tomato + lemon
Celebrity	3.70	3.30
Columbian	3.92	3.54
Jet Star	4.07	3.82
Mtn.Fresh	4.00	3.66
Row Pack	3.99	3.59

All five varieties that were grown for this study in 2007 had a pH low enough to be canned without using lemon juice and still be safe for consumption. In each case the pH dropped when lemon juice was added. The average pH change due to lemon juice was .35 over the five varieties.