



Curly Top Resistant Tomatoes for Southern Utah

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Western
Region

Sustainable Agriculture Research and Education

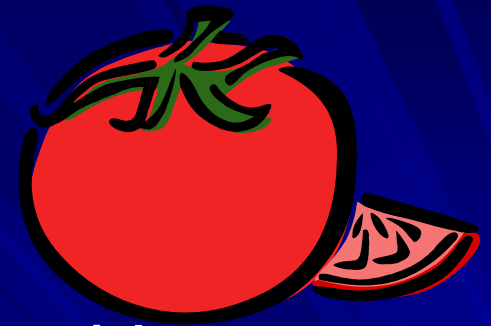


Curly Top Virus (CTV)

- Has caused significant problems to irrigated agriculture in the western United States since the late 1800s.
- CTV is transmitted only by the beet leafhopper (*Circulifer tenellus*). Both the virus and the beet leafhopper have a very wide host range.



Curly Top



- Disease of tomatoes and other vegetables pepper, bean, spinach and cucurbits in the west
- Over winters in weeds such as Kochia and other Chenopodiaceae plants, including Lambsquarter, Halogeton, Russian Thistle, Greasewood, and *Atriplex* (Four Wing Saltbush).
- Transmitted to tomatoes by the “Beet leafhopper” in early summer.
- Infected plants become stunted and eventually die (fruit never matures).



Symptoms: curled leaves, stunting, yellow color, reduced fruit size, wilting

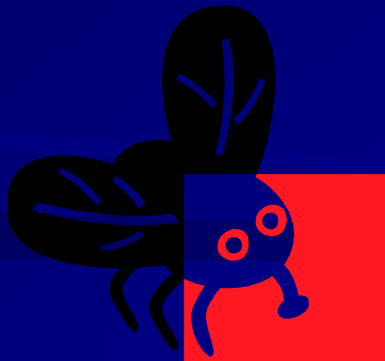
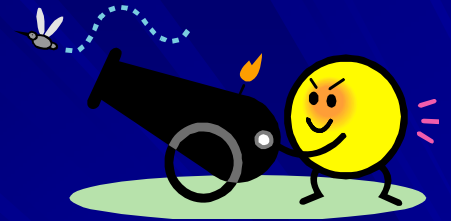
Control of Curly Top is Difficult

- Leaf hopper emergence and severity is unpredictable
- Wind may blow hoppers in from long distances (insecticide is not recommended)
- Seem to migrate to vegetables when other vegetation has dried up
- In some years damage is serious (>80%)
- Other years very little is documented



Resistant Varieties

- Roza
- Rowpac
- Columbian
- Salad Master



Resistant Varieties

- Developing high levels of resistance to CTV and combining it with good horticultural type in tomato lines has been difficult. However genes for resistance from several *Lycopersicon* species have been obtained and combined by intercrossing and selection in extensive greenhouse and field tests. Several tomato breeding lines have been developed which contain these genes in combination with those giving good horticultural characteristics. The effective utilization of these resistant breeding lines in crosses with commercial types to develop finished varieties necessitate severe exposure to CTV in several successive tests. Large F2 populations and large numbers of selections.

In 2005 and 2006 we used Master Gardener, backyard gardeners, and small market growers to help us determine which of the resistant varieties we should continue to investigate

In 2007 we developed a study to compare C.T. resistant varieties to non-resistant varieties

- Celebrity
- Celebrity Supreme
- Mtn. Fresh
- Early Girl
- Jet Star
- Columbian
- Row Pack



Comparisons

- **Yield-** no significant differences
- **Resistance to CT-** no significant differences
- **Jet Star-** highest in quality, flavor, and aroma, taste test (subjective)



Summary

- During 2006 and 2007 CTV was reported, but considered to be mild years when compared to other seasons
- Symptoms were identified on all varieties including those thought to be CT resistant
- Resistant strains had fewer infected plants
- Some CTR, infected plants continued to live after infection, but did not thrive!

Recommendations

- Home and Market gardeners should consider including CTR varieties
- Fruit size is small to medium in comparison to hybrid varieties
- Total production is as good as others
- Flavor and fruit quality is average
- These varieties will not replace popular tomato hybrids

Questions?

