

Curly Top Tomato Virus

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COOPERATIVE EXTENSION

Western
Region



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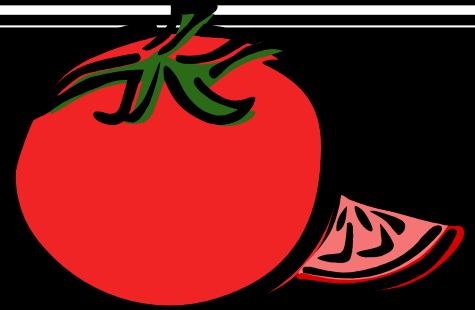


Curly Top Virus (CTV)

- Has caused significant problems to irrigated agriculture in the western United States since the late 1800s.
- CTV is transmitted by the beet leafhopper (*Circulifer tenellus*). Both the virus and the beet leafhopper have a very wide host range. The disease is largely undetected in range plants and weeds, but is manifest in horticultural crops.



Curly Top



- Disease of tomatoes and other vegetables pepper, bean, spinach and cucurbits in the west
- Over winters in weeds such as Kochia, Lambsquarter, Russian Thistle, and Four Wing Saltbush.
- Transmitted to tomatoes by the “Beet leafhopper” in early summer.
- Infected plants become stunted and eventually die fruit does not mature.

Symptoms



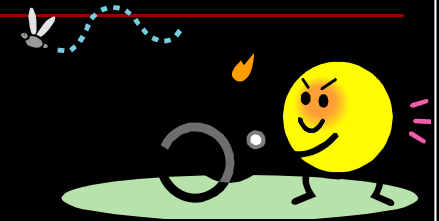
- Symptoms occur about a week after infection and include: curled leaves, stunting, yellow color, reduced fruit size, grey vein color, wilting, general decline

Control of Curly Top is Difficult

- Leaf hopper emergence and severity is unpredictable
- Wind may blow hoppers in from long distances
- 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



In 2005 and 2006 we used Master Gardener, backyard gardeners, and small market growers to help us learn more about the resistant varieties that are available

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

- Celebrity
- 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 may consider including CTR varieties in their plantings
- 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

What is next? There
should be another
solution out there!

Key in on the idea of excluding the
Beet leafhopper from feeding on
tomatoes and eliminating the chance
to spread the disease

Developed the following protocol for a study in 2010

- Choose four varieties including Celebrity as well as 2 CTR varieties
- Planted 20 of each with half covered and the other half uncovered
- Planted a separate row including each variety that received insecticide each week
- Replicated the study in two locations

2010 Project showing covered and uncovered plants



Questions

- Can the synthetic row covers exclude leafhoppers enough to prevent Curly Top?
- Does weekly insecticide spraying restrict feeding enough to prevent disease?

2010 Growing Season

- Cooler than normal temperatures early
- Tomatoes were planted 2 weeks late
- Season-symptoms are running behind
- So far the results are favorable

Results so far

- Two plants in the uncovered treatment have become diseased and removed
- One other plant is showing early symptoms in the sprayed treatment
- No plants in the covered treatments have shown symptoms



Conclusions

- Exclusion may be the most effective method of preventing Curly Top in the desert southwest



Questions?

