Curly Top Resistant Tomato Varieties For Southern Utah

2007 IPM Mini-grant Proposal (2nd Year)

Project Leaders:
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Chad Reid, Agriculture Agent, Iron County
Carolyn Washburn, Family and Consumer Science Agent, Washington County

Specialists (advisors):
Dan Drost, Vegetable Specialist, Utah State University
Brian Nummer, Food Scientist, Utah State University

Cooperators:
Larry Hancock, Sandia Nursery
Southern Utah University Greenhouse
Frye Fruit Market, Santa Clara
Larry Ward, New Harmony

Please note that this request for funding a second year with modifications and additions to the 2006 project.

Curly Top Resistant Tomato Varieties For Southern Utah

Situation
Curly top (CT) is a serious disease on tomatoes and other vegetable crops in the western states. This virus is harbored in weeds, such as mustard, and Russian thistle where it is found in rangelands and vacant lots. It is felt that the beet leafhopper picks up the virus while feeding and transmits (vectors) it to cultivated plants. The warmer regions of the desert southwest provide a suitable over wintering area for the beet leafhopper, where they come in contact with the virus before migrating north in the spring (Thompson).

Control of the beet leafhopper is difficult as their emergence is erratic and determined largely by unpredictable weather patterns. To apply insecticide when first noticed is of little use, as they only need to feed once on a plant to cause infection. Infected weeds are symptomless, and even if infected plants could be identified, removal over many acres of rangeland is not practical.

Background
During the 2002 and 2003 growing seasons, numerous cases of curly top were reported on tomatoes in southern Utah. Small acreage growers in Washington and Iron counties suffered as much as 80-90% losses. The same growers reported approximately 50% loss in 2004. Dan Drost, USU Vegetable Specialist, has suggested using resistant varieties as the most practical means of control.

In the Spring of 2006 seeds of the tomato varieties, Columbian, and Rowpac, Salad Master and Roza (from (Washington State University Extension Service) were planted by Sandia Nursery and Southern Utah University. Plants were then distributed to Master Gardeners and a few small market growers. See attached page for Master Gardener survey results.

Justification
With one trial season under our belts, and a growing interest in the CT resistant tomato varieties from Washington State, we plan to propagate more plants in 2007 and get them out to more growers for trial. The reports from Master Gardeners were favorable, and we would like to get the varieties into the hands of a few fresh market growers this season. We will select two of the CT varieties in 2007(Columbia and Roza) that have shown the most potential for marketing and home production for trial in 2006. They will be compared to four varieties being currently used by home and market growers.

Procedures
Tomato plants will be propagated at Sandia Nursery and Southern Utah University for Spring planting. Each grower will receive Columbian and Rowpac plants as well as selections of Jet Star, Celebrity and Mountain Pride. We will be able monitor yield and fruit quality on at least two sites (Frye and Ward).

The following information will be recorded:
Planting date
Date of first fruit
Report incidence of disease (when, which varieties, etc.)
Brix and pH measurements will be taken on each variety
Quality ratings to be determined by taste testing
Canned product will also be tested for Brix and pH

A survey checklist will be provided to each cooperator to help in gathering the needed information. In at least two of the locations, yield data will be collected (in addition to the other information) throughout the season. Surveys and yield data will be analyzed in order to draw conclusions and make comparisons on all varieties in the study.

Experimental Design

In the two larger fields, where yield data is to be taken, tomatoes will be planted in a randomized design. Each plant will be represented in every row and replicated 4 times. Yield as well as fruit size will be determined. Brix and pH measurements will be taken on harvested fruit. Some of each variety will be canned and the pH will be tested both before and after.

Outreach

Little information is available on the CT resistant tomato varieties. We plan to publish our results in one of the trade magazines (American Vegetable Grower, Organic Gardening). A bulletin will also be prepared giving a description of each variety.

There is concern about the pH of tomato products in recent year from a home canning aspect. We would like to provide some information on the pH of different varieties both before and after canning. This will be included in our study.

Proposed Budget

Growing transplants (both locations)	$1,000
Printing costs	$250
Total Request	$1,250