Advanced Trellis Methods and Mechanical Harvesting for Grape Tomatoes

Steve Bogash, Regional Horticulture Educator

Penn State Cooperative Extension

Labor Saving Devices

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The market for grape tomatoes continues to heat up. According to USDA, ERS statistics, the consumption of grape tomatoes increased by 302% from 1999-2003 and by another 36% from 2004- 2007 with a value of $295M. Although very high yielding and potentially highly profitable, efficient harvesting and vine management of these tomatoes remains a problem. Currently, all harvesting of grape tomatoes is by hand. In a small demonstration / proof of concept trial in 2008, grape tomatoes showed promise in a shake harvest system if trellised and trained properly.

Most grape tomatoes are grown using various versions of modified Florida weave or large wire cages. These methods are well-suited to slicing tomatoes, but do not meet the requirements of efficient production of these smaller tomatoes. This project has evaluated various methods of trellising, training, and pruning grape tomatoes along the lines of raspberry trellising as well as an angled system using horticultural mesh on a combination wooden and metal stakes. Both hand harvesting and relatively simple modifications of normal farm machinery to create a shaking motion using a time and motion evaluation will be used to harvest fruit. Evaluation will be based on yield per production area, trellis expense, and timed harvests.

In the 2008 proof of concept trial, we tried to trellis 3 varieties of grape tomatoes onto a raspberry-like trellis system using tall posts, T bars and heavy twine running between the posts. Heavy winds at the trial site forced most of the growth onto the Eastern side of the trellis, thus making vine management difficult. Using our lessons from 2008, we were successful in getting a NE-SARE partnership grant to support further exploration of this concept.

In 2009, we set up 3 trellis systems on 2 farms to further explore this concept. The trellis systems included a standard Florida Weave, a 30 degree incline and a “V” system. Both the incline and “V” system used Hortonova mesh as the primary support fabric.

Heavy vine growth proved to be too much mass for the Hortonova as it required the addition of several pieces of wire just to keep the tomato vines off of the ground. The Florida Weave system while requiring the most labor to manage vines, proved the best in supporting the tomato vines.

Our original idea was to modify a battery-powered drill with a cam and hook to shake the vines, but this proved challenging for the operator due to the extreme shaking. Matt Steiman, Dickinson College Farm, Assistant Farm Manager, suggested using a battery powered reciprocating saw which worked extremely well in shaking off ripe fruit. We arc welded a hook onto an old reciprocating saw blade.

Presently, this project has demonstrated that shaking is a feasible method of removing ripe grape tomatoes although some sorting is required post shaking. A trellis system using vertical posts with angled posts at 8-10 degrees off vertical and Florida weaving the vines onto the angled posts with twine will be trialed in 2010.