2013/2014 Tomato Observation Trial

by Holly Sobetski, ECHO Florida Seed Bank Manager

The ECHO Florida Seed Bank conducted a tomato observation trial during the 2013/2014 winter season, to compare our currently-offered varieties with new varieties acquired in 2013. In this article we aim to: 1) summarize findings from our trial that may be helpful to you in selecting varieties to grow and evaluate; 2) inform you of tomato varieties available from ECHO; and 3) provide practical tips on observation trials in general. If you would like to try the varieties featured in this article, visit the Global Seed Bank page (/resources/f7abbd54-2d20-457a-be83-8b450ab9afc1) for a list of offerings and information on how to request trial packets of seed.

Methods

At ECHO's Global Demonstration Farm in southwest Florida, 24 varieties of tomato were planted in a trial containing a mix of indeterminate and determinate, open-pollinated and hybrid types. On 17 October 2013, tomato seedlings were transplanted into raised beds covered with plastic mulch. Three plants of each variety were spaced 2 ft (61 cm) apart, with 4 ft (122 cm) between varieties.

The tomatoes were fertilized with soluble fertilizer three times a week through drip irrigation. Coragen® was sprayed on the tomatoes on 25 November 2013 to kill caterpillars, and ECHO® 720 was sprayed on 27 December 2013 to treat Septoria leaf spot. Interns collected data from November 2013 to February 2014. The tomato plants were covered with cloth as needed to protect them from freezing temperatures.

Ripe tomatoes were harvested twice a week (edible fruit was counted and weighed) from 17 December 2013 to 18 February 2014 (Fig. 8). One taste test was conducted on 16 January 2014 with fruit from 20 of the 24 varieties. Plants of some of the varieties continued to produce fruit beyond the trial end date (18 February 2014). In this article, findings are shown for 13 top-performing varieties (see Fig. 9 for information on varieties offered in our seed catalog as of 2014; offerings can change over time).

Results

Plant growth traits

Significant variation was observed between cultivars with respect to plant size, fruit size, fruit color and leaf shape. Plant growth habit was mostly consistent with whether the variety was a determinate type (Floradade, Homestead, Hayslip, Komohana, Roma VFN and Walter) or indeterminate type (Beefsteak, Brazilian Beauty, Delicious, Marianna's Peace, Matt's Wild Cherry, Tropic, and Yellow Pear). Determinate types are often more compact and bear fruit for a shorter period of time than indeterminate types. In this trial, Roma VFN and Komohana were compact, while most of the other varieties (even some of the determinate types) were large and sprawling, especially Matt's Wild Cherry. Marianna's Peace had large potato-like leaves. Knowing the growth habit of a particular variety is helpful when deciding how far apart to space plants in the garden and whether or not the vines need to be supported with stakes or trellises.

Disease resistance

The tomato plants were attacked by fungus which caused foliar yellowing and die back of the lower leaves. These varieties showed some resistance: Delicious, Roma VFN, Komohana and Matt's Wild Cherry. A variety trial can be a helpful way to evaluate crop varieties for a given area, allowing you to note plant diseases and pests that affect the plants, and to select varieties that perform best under local conditions.

Fruit color, shape, taste

Fruit size varied with variety, from small grape and cherry tomatoes (Matt's Wild Cherry, Yellow Pear, Komohana), to medium-sized fruit (Roma VFN, Tropic, Homestead, Brazilian Beauty), to large fruit (Hayslip, Delicious, Floradade, Marianna's Peace, Beefsteak, Walter). Fruit color and shape also varied, with Yellow Pear looking just like its name implies and Brazilian Beauty ripening with a dark greenish-red hue. Varieties with consistently cracked fruit were Marianna's Peace and Matt's Wild Cherry. In our opinion, fruits with the best overall appearance were those of Yellow Pear, Tropic and Komohana. Matt's Wild Cherry also ranked high as far as

Figure 8: The diversity of tomatoes harvested during our 2013/2014 variety trial. *Photo by James Lee.*

color/ appearance, but the fruits tended to split when harvested. Be aware of local cultural preferences for fruit color, size/shape, and taste when evaluating new varieties.

The tomatoes that received the best overall taste ratings by ECHO staff members were Yellow Pear, Matt's Wild Cherry, Marianna's Peace, Komohana and Brazilian Beauty. Marianna's Peace produced large, reddish-pink fruit that were soft and difficult to transport, but very meaty and tasty.

Fruit yield

Fruit yield data are shown in Figure 9. The grape and cherry types produced many more tomatoes than the mid- and large-sized types (Fig. 9 Top). Matt's Wild Cherry and Komohana produced over 2000 fruits during the season.

Fruit weights, however, were highest with the large-sized tomato types (Fig. 9 Bottom). Top-performing large-sized types were Hayslip, Floradade and Marianna's Peace.

Keep in mind that grape and cherry tomato types are typically more heat tolerant than larger-sized varieties. They make excellent additions to salads and other dishes. If you want to experiment with mid- or larger-sized tomatoes in the warm tropics, try varieties known for their heat tolerance, such as Floradade, and plant during the coolest time of year (likely during the dry season, when watering/irrigation is especially important and plant disease pressure is less).

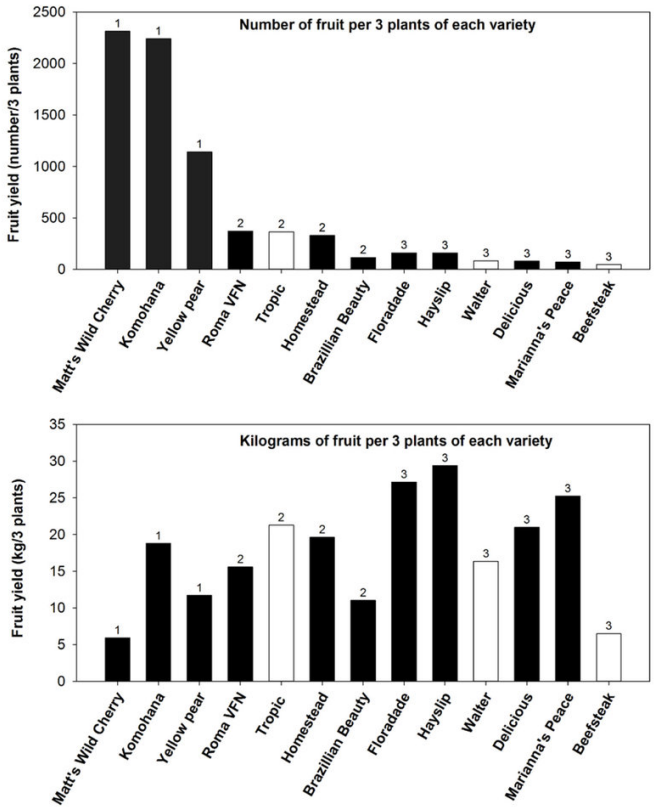

Figure 9: Number (Top) and kilograms (Bottom) of fruit produced from top-performing tomato varieties trialed during the winter of 2013/14. Solid bars represent varieties for which seeds are currently, as of 2014, offered in our network seed catalog. Numbers above varieties represent grape and cherry tomatoes (1), medium-sized tomatoes (2), and large-sized tomatoes (3).

Suggestions for Conducting an Observation Trial

Comments from ECHO intern, Brian Lawrence: If many varieties of a particular crop are available, collect seeds or plants prior to the study and plant them all at the same time. Record observations of plant health (along with other measurements that are deemed important), in successive intervals from planting time until the completion of the study. If you are taking notes in the field, consider carrying a notebook or paper listing all the varieties and their locations. Record any observations you see; notes on crop size, harvest duration, and pest resistance can be important, but so can the color of leaves and fruit, taste, and even scent. The scope of data collected can be quite broad! If the study aims to identify marketability in addition to growth habits, a taste test can be helpful.

An observation trial lacks the scientific rigor of a randomized, replicated experiment, but it can still be a very helpful tool. A large-scale replicated plot trial can be difficult to set up, especially if there are many varieties to compare. Starting with an observation trial allows opportunity for mistakes to be made without harming important data; unforeseen biases to be identified; and the process of collecting and plotting information to be refined. A later randomized, replicated trial could then be done with a smaller investment of time and money, focusing on only a few best-performing varieties.