2016

High Tunnel Tomato Variety Report URI 2016

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HIGH TUNNEL TOMATO VARIETIES FOR 2016 (SEE 2014-2015 VARIETIES, APPENDED)- Andy Radin, Extension Agent, Department of Plant Science and Entomology, University of Rhode Island

Once again, I grew several varieties of tomatoes in one of our high tunnels using the lean and lower technique of trellising (with one exception). Seed for nearly all of these varieties were donated by Paramount Seeds (https://paramountseeds.com/). They offer some reasonably priced seed of a number of different vegetables, and good tomato varieties beyond those I trialed in 2016.

While this report contains some accurately collected data, I will confess to all issues that arose over the course of the summer. Experimental conditions are never perfect, and the people who design and carry out studies aren't either. It all started in March when mice ate the first round of seedlings…

Production practices

Two-foot-wide swaths were treated as beds, and fertilizer application per acre was calculated for each 2' X 88' bed (0.004 acre). The following fertilizers were rototilled into beds to a depth of approx. 6 inches: Peanut meal (8-1-1) at 135 lb. N/ac; 0-0-60 sulfate of potash at 40 lb K_2O/ac. No pre-plant phosphorous was added since I intended to fertigate over the course of the summer. Fertigation through drip tapes (two per bed) was begun on June 30 with 3 lbs water soluble 20-9-20 and continued every 10 days until early September. I also installed a pair of electronic moisture sensors at 12" and 18" depths in each 88' bed (Watermark) which measure resistance (saturated soil has zero resistance to current flow, and the drier it gets, the more resistance is read on the meter).

I will add here that installing electronic or vacuum gauge moisture sensors is something everyone who grows tomatoes in high tunnels should consider. Spending money on tools that help you to monitor moisture is important in a crop that can gross you over $20,000 in under a tenth of an acre.

All indeterminate plants were spaced at 16" within rows, and 46" from center to center. (I fit 6 rows in 25' wide tunnel, which is a little tight: 6 rows in 30' would be better for air flow, and would allow for slightly tighter spacing within the rows.)

One determinate variety ('Grebe', 29 plants) was planted at 24" within the row.

Production issues

High temperatures in 2016 made it necessary to water frequently, and the result was high humidity in the tunnel. Powdery mildew became a problem fairly early in the season. Most likely, this was brought in on transplants from the URI greenhouses. Though it was kept somewhat in check throughout the growing season, fungicide spray was applied approximately every 10 days. This was a mixture of M-pede (potassium fatty acid insecticidal soap, also labeled for powdery mildew), Milstop (potassium bicarbonate), and Cueva (copper octanoate) which are all OMRI approved products. This cocktail was effective in keeping plants productive all season long. We picked fruits and collected data until mid-September. However, plants continued to produce well into October, though one can argue that it's not worth it to keep them up past a certain point of productivity.

Root disease: So far, we are blessed at URI in that we have not seen *Fusarium* or *Verticillium* in our tunnels yet. We have been seeing this in some people's tunnels, though. If you want to keep cropping on the same ground, it is important to consider growing resistant varieties (check your seed catalogs) or if you already have trouble, use grafted plants. Resistant rootstocks work, though which ones are best for overall fruit productivity is not yet settled. Some rootstocks increase the vegetativeness of the scion, others increase the fruit productivity ("generative"). But be sure that if you have had a particular disease diagnosis, that you choose a rootstock that is known to be at least resistant, if not highly resistant. For the most up to date grafting guide from Ohio State University, you can request one here for download: https://u.osu.edu/vegprolab/grafting-guide/

Varieties: the following are catalog descriptions; all are hybrids except Rutgers 250 and Brandywine

OWL		Indeterminate beefsteak, vigorous plant, short internodes
TANGERINE		Indeterminate orange ruffled or fluted beefsteak
GERONIMO		Indeterminate large fruited beefsteak
QUASIMODO		Indeterminate red ruffled beefsteak, short internodes
GUILLEMOT		Indeterminate pink beefsteak, short internodes, cold tolerance
RUTGERS 250		Semi-indeterminate red beefsteak, open pollinated
TORREO		Indeterminate red beefsteak, large fruit, sparser foliage
TANAGER		Indeterminate red beefsteak, alleged better flavor
BRANDYWINE		Indeterminate pink heirloom beefsteak, famous flavor
GREBE		Determinate large red fruited

Results: in the following table

Variety	Total yield /plant (lbs)	Mkt/plant (lbs)	% Marketable	Mean fruit weight (Oz)
GREBE	23.9	14.5	61	10.2
GERONIMO	22.3	17.1	76	11.0
TORREO	18.5	15.1	81	10.7
TANAGER	18.2	11.6	64	9.6
GUILLEMOT	15.8	8.2	52	7.4
OWL	14.7	10.7	73	9.0
QUASIMODO	14.0	7.5	53	9.7
TANGERINE	13.3	8.0	60	9.9
RUTGERS 250	10.9	5.7	52	7.5
BRANDYWINE	6.0	1.7	29	12.8

Comments on individual varieties; also see photos of each (courtesy of Shayna Krasnoff, one of my summer farm assistants)

Grebe: The determinate won the total per plant contest. This variety is really semi-indeterminate, unlike Mountain Pride or Celebrity, which really have limited production period after the terminals end in flower clusters. I did an incomplete experiment on this: after about 4 weeks after transplanting, I pruned 5 plants each to different numbers of branches, 3 through 7. Unfortunately, we didn't follow up and keep track of each of these treatments- my two student assistants had all they could do to keep up with other projects. It might be a good idea to find out if a once-over pruning like this could improve productivity and/or quality. NOTE that only 61% of this variety was marketable.

Geronimo: This is a proven variety but I wanted it in the trial for just that reason. But it turned out to be what I would categorize as HIGHLY RESISTANT to the powdery mildew that plagued all the other varieties in the tunnel. A tunnel full of these would have produced over 3 tons of marketable fruit. This might well have grossed $25,000. Though something else is bound to go wrong…

Torreo: This variety was the quality winner, with over 80% of marketable quality. These fruits were firm and held very well. If you are going to use the costly real estate and labor intensive management of the high tunnel, you get the most out of your investment with a variety like this. With more focused attention, it's probably possible to increase per plant yield.

Quasimodo: This very attractive variety has some heirloom blood in it; 53% marketable isn't so impressive, though true heirlooms can easily do worse (see below). While Paramount's picture is of a pinkish green fruit, we allowed full ripening, and the color is very nice. This variety compares well with the hybrid heirloom-types of last year's trial (Marbonne, Margold – the latter had not-so-good quality).

Rutgers 250: This just came my way- it's a recent reissue by Rutgers and I thought I'd have a look. It is open pollinated so one can save the seed. It was not impressive, though, at least not as a commercial variety. Plants were irregular: some grew as compact indeterminates, some just "dead ended." Quality was not very good. Tasted pretty good, but so did all the varieties.

Brandywine: Good ol' Brandywine performed terribly. Fruits were predictably giant, and under 30% were intact enough to sell. Plants were terribly diseased, yet we treated them identically to all other varieties. It's quite possible that they do worse in the high tunnel than in the open field. Regardless, it's a risky tomato.


Quasimodo


Owl


Guillemot


Tangerine


Torreo


Tanager


Bigdena


Grebe

Tomato Varieties 2014-15; all are hybrid except for Valencia

- **Sun Peach**: Available from Johnnys, Osborne, Veseys; beautiful consistent pink cherry tomato, very good flavor and quality- I highly recommend
- **Esterina**: Available from High Mowing, Territorial, Veseys; sweet gold cherry tomato, less complex flavor than sungold, just as vigorous
- **Favorita**: Available from Johnnys, Paramount; excellent red cherry with very good flavor, holds well on the vine, can be slightly large; I highly recommend but if not this, then **Sakura**
- **Aligote**: Available from Siegers; firm good tasting grape with large clusters of fully red fruit
- **Vittoria**: Available from Thompson and Morgan; firm LONG grape tomato with good flavor
- **Granadero**: Red plum available from Johnnys, High Mowing, Siegers, others; Barrel shaped, very firm, holds well; Fresh eating flavor is bland, but excellent sauce flavor; Productive!
- **Golden Rave**: Yellow plum available from Johnnys, Park, Harris, Stokes, others; Pleasantly shaped, uniform; Best flavor when deep-yellow ripe; Very attractive, high retail appeal; Very productive; I highly recommend
- **Kakao**: Available from Johnnys; beautiful new "chocolate" mini-slicing- the answer to the "Kumato"; 3 to 5 oz firm but not hard fruits with really good flavor; holds on the vine well, very little cracking. I highly recommend
- **Margold**: Available from Johnnys, Thompson and Morgan; large "heirloom/hybrid", resembling Striped German; great flavor, pretty consistent fruit but susceptible to sunscald and radial cracking…
- **Marbonne**: Available from Johnnys; large crimson ribbed fruits with excellent flavor; has had some Blossom End Rot and cracking (not as bad as others); very attractive!
- **Valencia**: Available from Johnnys, a few others; angular fruit not uncommon, and fruits inconsistent but vines good; not very productive
- **Be Orange**: Available from Johnnys (sold out early this year), maybe others? Great textured large consistent round slicing tomato; hopefully still available! I highly recommend if you have customers who want this
- **Pink Wonder**: Large pink slicer available from Johnnys, Jung, others; not very firm, prone to sunscald, green shoulders and radial cracking; Very good flavor but many quality problems
- **Panzer**: Available from Harris; high quality large red slicing tomato with decent flavor; had early blight on outside row
- **Arbason**: Available from Johnnys, High Mowing, Harris, others; large red slicing tomato with decent flavor; more disease resistant than BB and Panzer in this trial
- **Bigdena**: Large red slicer, decent flavor, very similar to Big Beef but may turn out to have a smaller percentage of culls
- **Big Beef**: Widely available, might be most popular HT variety; large red slicing tomato with decent flavor, though not so consistent here
- **Frederik**: Large red slicing available from Johnnys; decently flavored firm fruits on more compact indeterminate vine; overall more consistent quality than Big Beef;