

AREN'T WE tomato lovers fortunate? Thousands of varieties in all kinds of colors and flavors exist. Yet, until a few years ago, there were few selections suited to growing in small spaces or containers. Because many gardeners, especially those in urban areas, have limited growing space, varieties with a more compact habit have a great deal of appeal. And the ability to cultivate tomatoes in containers that can be placed wherever there is enough sun has obvious advantages. Now, thanks to the Dwarf Tomato Breeding Project, a collaborative effort between hobbyist tomato growers around the world, tomato lovers everywhere have some great new options.

CITIZEN SCIENTISTS TO THE RESCUE

The roots of the Dwarf Tomato Breeding Project trace back to 2006. What started as an online discussion between me—a tomato hobbyist in Raleigh, North Carolina—and Patrina Nuske Small, an Australian gardener, grew into an all-volunteer,



the worldwide dwarf Tomato Project

BY CRAIG LEHOULLIER

all-amateur, open-source (no secrets!), worldwide, non-profit breeding effort.

We assembled a team of backyard gardeners who were interested in tomato genetics and creating something new. Since the project began, more than 300 people from the United States, Canada, Mexico, Germany, and Australia have been involved. By growing in both the Northern and Southern Hemispheres we were able to cut the time of development in half—two generations of experiments could come to fruition in a single calendar year.

The goal was to develop great new dwarf tomatoes and give them freely to a seed company of our choosing for distribution, then watch the process of public opinion play out. (For more about how the project works, see the sidebar on the opposite page.)

SUNNY SPACE SOLUTIONS

The main project catalyst was the need for great tomatoes for space-challenged gardeners, as witnessed by the increasing requests each year from customers of my local seedling business—requests that were echoed by gardeners from across the country and beyond.

“Many of our customers garden in a very small space, like balconies,” says Tatiana Koucharevana, owner of Tatiana’s Tomatobase Seed Company, located near Vancouver, British Columbia. “And in our wet and cool climate, many people want tomatoes in pots, so they can move the pots under cover when it rains,” she says. What other qualities are they look-

ing for? “Sturdy and compact plants with high yields and colorful fruits, and great taste. That’s what the dwarf tomato project is all about,” says Koucharevana.

“I have had a few customers tell me they wouldn’t have room to grow tomatoes if not for the dwarf varieties,” says Steve McClaren, of Bonsall, California, who sells the dwarf varieties online through Heritage Seed Market (see “Sources,” page 22).

By growing tomatoes in containers, gardeners can take advantage of any sunny spot in the yard, even if that spot is on a patio, porch, rooftop, or driveway. “My backyard has little sun and is not a good place to grow tomatoes,” says Robert

The author harvests dwarf heirloom tomatoes from his North Carolina garden.

Mermelstein of Raleigh, North Carolina, who nonetheless successfully grows several of the new dwarf varieties in pots placed along his driveway.

Project participant Bill Yoder sells organically grown tomato plants to nurseries in and around Atlanta, Georgia. Many of his customers “are limited to container growing due to the amount of tree canopy in the yards throughout Atlanta,” he says. “The most gratifying parts of this

entire endeavor are the times when I am able to provide a plant to someone who may not have the ability to grow and care for a non-dwarf tomato plant.”

Yoder is quick to emphasize that he also has many customers who grow dwarf tomatoes in their regular garden space. “In either case, you are growing great-tasting, open-pollinated tomatoes that take up less space and are easier to take care of,” he says.

A DIFFERENT HABIT OF GROWTH

Tomato leaves, including those of dwarf varieties, are described either as regular leaf (with toothed edges) or potato leaf (with smooth edges). However, dwarfs have traits that distinguish them from other tomatoes. The texture and color of their leaves is crinkly and dark green—termed “rugose”—and the plants’ vertical growth is roughly half of the rate of indeterminate varieties, with a similar reduction in internode length.

DWARF TOMATO PROJECT LOGISTICS

In 2005, Patrina Nuske Small, an Australian gardener, and I decided to collaborate on a project that would be fun, informative, and—hopefully—result in some great new dwarf tomato varieties.

We needed a starting point, and an Isbell Seed Company catalog from 1912 provided a great clue. A tomato named ‘New Big Dwarf’ was described as the result of crossing the largest tomato of its time, the indeterminate variety ‘Ponderosa’, with ‘Dwarf Champion’, one of the few dwarf varieties. A few years of selecting for desired traits produced a stable, open-pollinated variety with large tasty fruit on a compact plant.

Small volunteered to kick off our effort by making the crosses between colorful, tasty, indeterminate heirloom tomatoes and whatever dwarf tomatoes she could acquire in order to provide some new hybrids as our starting points. We immediately ran into our first road block—a scarcity of dwarf options. We found, however, that a handful of available dwarfs—including ‘Golden Dwarf Champion’, ‘Dwarf Champion’, and ‘New Big Dwarf’ was adequate when combined with the genes from great heirlooms such as ‘Cherokee Purple’, ‘Paul Robeson’, and ‘Green Giant’. Some of our best releases, as it turned out, emerged from the first set of crosses.

Through the Internet, we found many volunteers willing to help us in our efforts. A tomato discussion board (Tomatoville.com)—launched in 2006—was the ideal format to share information among project participants. Results from project members, including photos, are regularly posted for discussion.

With Small and me acting as project managers, the process works like this: The initial crosses result in new hybrids

that are assigned a “family” name. Once the hybrid produces fruit, seed is saved and distributed to volunteers interested in working within that particular family.

Growing out the second generation seed is where the dwarf growth habit emerges, usually in 25 percent of the seedlings, and volunteers are encouraged to grow as many seedlings as they can manage.

“The nice thing about the project was that members could choose their level of involvement by the number of plants they grew out from their selections,” says project participant Dee Sackett, who gardens in northern Minnesota.

The range of possibilities that present themselves in each parent line is narrowed in subsequent generations. Depending upon the genetics of each variety, results demonstrate that at least six, and up to 10, generations are required to stabilize a new variety.

We enlist volunteers to grow seed for the seed companies who distribute the new varieties (see “Sources,” page 22). We chose companies that are interested in the project, appreciative of having a new exclusive variety, and would share information about our project so that customers would know how the variety came to be.

A few years ago, we had to modify our program because regulation changes made sharing seeds with Australia impossible without costly testing for specific tomato diseases. Fortunately, by that time we were well on our way to getting the project going.

And though we are now slightly limited in our ability to share discoveries freely, both the Northern and Southern Hemisphere project groups have plenty of material to take forward separately. We still share results, pictures, and the simple joy of discovery.

—C. L.



The author and Patrina Nuske Small, shown here at a tomato tasting, came up with the idea for the Dwarf Tomato Breeding Project.

favorite dwarf varieties

Here are a few of the dwarf varieties recommended by one or more of the project participants.



'Dwarf Emerald Giant'

strongly resembles the male breeding parent, 'Green Giant', in all respects, except for the dwarf growth character. This potato-leaf type is mid- to late season in maturity and most gardeners will find that it tops out at four feet by the end of the growing season. Fruit is in the eight- to 12-ounce range.



'Dwarf Kelly Green'

is an extremely prolific, regular-leaf dwarf that tops out at four feet tall, and begins to ripen its fruit relatively early. The tomatoes are round, three to five ounces in size and have green flesh when ripe. The clear skin creates a bit of a challenge for determining picking time; a slight pink blush at the blossom end of the fruit is a good indicator.

'Rosella Purple'

is a mid-season ripening dwarf with regular foliage. It is on the shorter end of the spectrum of our new releases, topping out at three feet. Its six- to 10-ounce, deep red fruit with a purplish cast produces few seeds; its flavor is similar to 'Cherokee Purple'. According to Alexandra Neale of Holly Springs, North Carolina, "Its flavor is very rich and screams 'tomato'."

ALL PHOTOS ON THIS SPREAD COURTESY OF MIKE DUNTON, VICTORY SEEDS, EXCEPT FOR 'DWARF EMERALD GREEN', COURTESY OF STEVE MCCLARE, AND 'DWARF MR. SNOW' BY CRAIG LEHOULLIER



'Dwarf Mr. Snow'

is a mid- to late-season ripening variety. A potato-leaf type, its stems are quite stout, and the plant grows to about four feet in height. The smooth, six- to eight-ounce, oblate fruit ripen to a lovely ivory color, often sporting a pale pink blush on the blossom end. The flavor is sprightly, balanced, full, and delicious.



'Fred's Tie Dye'

is a regular-leaf, mid-season variety that grows to about four feet in height. The purple fruit is striped with gold and green and averages five to six ounces. Interior flesh is deep crimson and has a rich, balanced flavor.



'Dwarf Blazing Beauty'

is an attractive potato leaf, mid- to late season producer that reaches around four feet tall. The medium to medium-large fruit is orange inside and out and has an intensely tart flavor. Project member Dee Sackett calls this her favorite dwarf variety due to its "assertive blast of flavor and beautiful orange color.



'Dwarf Sweet Sue'

is a potato-leaf variety that grows four to five feet tall. Its bright yellow fruit, which averages five to 10 ounces, ripens mid to late season, often displaying a pink blush at the blossom end. Its flavor is well balanced and very sweet. It's a favorite of Steve Nagar of Raleigh, North Carolina, who says, "Sweet Sue is the best one in my opinion in terms of taste, reliability, and yield, and is perhaps more disease resistant than some of the others." (For details on the breeding and selection of this variety see the web special linked to this article on the AHS website.)



'Uluru Ochre'

represents a new color in tomatoes. It ripens to an amber-orange-green on the outside and it retains some green pigment in its orange flesh upon ripening. This regular-leaf dwarf is compact, topping out at three feet, and very productive. The oblate fruit run quite large, averaging six to 12 ounces; the flavor is intense, rich, and smoky.



Left: Typical heirloom dwarf tomatoes like these thrive in containers. Right: At Mother Catherine Academy in Mechanicsville, Maryland, student Bradley McDermott and teacher Sarah Gascon tend 'Dwarf Emerald Giant' tomatoes growing in the school garden.

Since most dwarfs grow three or four feet tall—sometimes more—and get heavy with fruit, they need to be short-staked or caged. They thrive in five-gallon containers and need far less work than standard varieties to keep them vertical.

Project member Dee Sackett, who gardens in northern Minnesota, says, “The dwarf trait is usually easy to spot by the time of the first true leaves, and often before because the seedling is just short and chunky compared to normal seedlings.”

DWARF TOMATOES GO TO SCHOOL

The project has provided learning opportunities for gardeners beyond its active members. Last summer, Jerry Spence, the garden and agricultural liaison for the Mother Catherine Academy in Mechanicsville, Maryland, grew two of the project’s varieties, ‘Dwarf Sweet Sue’ and ‘Dwarf Emerald Giant’ in the school’s garden. He and the students also grew two of the varieties used in the original crosses. Students “were very interested in seeing the different traits in the dwarf tomatoes that were inherited from the parental lines,” says Spence.

Both dwarf varieties were productive, with harvest into the first week of October. “I highly recommend these varieties to the home gardener with limited space, or larger gardens where less training and pruning of the vines is desired,” Spence says.

RESULTS AND FUTURE PLANS

As of late 2015, the project has released

58 new dwarf tomato varieties. Many are potato-leaved, which makes the plants themselves quite attractive.

Maturity dates for dwarf varieties range from relatively early to relatively late, and from my experience, they flower and fruit until frost, like indeterminate varieties, though there is some variability.

Fruit colors include red, pink, purple, brown, yellow, orange, green, and white, plus a few swirls, and stripes. Fruits vary in size from an ounce or two to a pound or more. Some are round, some oblate, and a few are heart-shaped.

When it comes to flavor, the new dwarf varieties really shine, ranging from sweet and mild, tart and exciting, to full and intense. “There is now just about any combination of fruit size, shape, color, and flavor available to those ‘space challenged’ gardeners,” says Mike Dunton, founder of Victory Seeds. “Even folks with standard gardens will benefit from these new varieties.”

The project’s new dwarf tomato varieties are available to home gardeners through a small number of seed companies (see “Sources” on this page). “Many of the new varieties are also listed in the Seed Savers Exchange (SSE) Annual Yearbook, and are available to SSE members.

The project is far from finished. As breeding and selection continue, future objectives include development of great tasting and productive dwarf cherry and paste tomatoes, more heart-shaped tomatoes, and additional varieties with distinct stripes. But already, those who love the indeterminate heirlooms but lack the space needed to grow those sprawling giants can enjoy a similar taste experience from plants with a compact habit. As Dunton puts it, “Being able to provide choices for a broader base of gardeners is a good thing.”

A resident of Raleigh, North Carolina, Craig LeHoullier is the author of Epic Tomatoes and Growing Vegetables in Straw Bales (2015), both from Storey Publishing. Visit his blog at www.craiglehoullier.com.

Resources

Dwarf Tomato Project,

<http://dwarftomato-project.net>.

Epic Tomatoes by Craig LeHoullier,

Storey Publishing, North Adams, MA, 2015.

Tomatoville, www.tomatoville.com.

Sources

Heritage Seed Market,

www.heritage-seed-market.com.

Sample Seed Shop,

www.sampleseeds.com.

Southern Exposure Seed Exchange,

www.southernexposure.com.

Victory Seeds, www.victoryseeds.com

www.victoryseeds.com/dwarf-tomato-project.html.

Tatiana's TOMATObase,

<http://tatianastomatobase.com/wiki/>

Category: Tomato_Seeds.