

## A new tomato for Ontario

A large project aims to create on-the-vine greenhouse tomatoes optimized for Ontario growing conditions and consumers

June 5, 2018  
By John Greig



*Valerio Primono is the tomato plant breeder at Vineland Research and Innovation Centre. Photo: John Greig*

What do Ontarians like in a tomato?

Some like a tough skin and viscous inside. Others like sweetness and softness.

The Ontario Greenhouse Vegetable Growers gave the Vineland Research and Innovation Centre the challenge of figuring out what Ontarians prefer in a tomato-

eating experience and then developing a tomato that fits that demand. Oh, and make sure it grows well in a greenhouse.

**Why it matters:** The development of an on-the-vine tomato that grows well here and tastes great is a big, long-term project funded by the Ontario Greenhouse Vegetable Growers and its outcome could set a development process for other fruits and vegetables.

The Vineland Research and Innovation Centre opened its doors recently to explain the research to this point and the process its researchers are using to create an on-the-vine tomato that excels both in agronomics and gastronomics.

“When we release a variety, it really has to be both,” said Travis Banks, a research scientist in bioinformatics at Vineland.

“A producer needs to have a certain level of yield, so the first thing that’s looked at is of course yield.”

But the parent strains and any crosses are also evaluated for flavour.

“The goal is that our breeding material will become inundated with flavour,” he said.

Banks’ job is to help the plant breeder sort through the DNA material of some of the varieties the breeder sees and likes in the greenhouse. Vineland uses genetic markers to identify traits it wants and more often, doesn’t want, in the tomato lines it is developing.

Valerio Primomo is that plant breeder. His job is, over years, to sort through the many lines of tomatoes and breed together those lines that most meet the end goal.

He held up an on-the-vine tomato during a tour, one of several lines that are being developed as part of the project. It has to have five tomatoes on it, each weighing about 150 grams, and it has to lay flat.

“That’s what growers are looking for,” he said.

Here's how a plant breeder whittles down potential tomato hybrids, according to tomato breeder Primomo:

- Develop the inbred parent lines of the tomato-on-the-vine hybrids. They started with about 70 different parents.
- The parent lines are planted in January and by the time they are finished, around October, the vines will be 40-feet long.
- Data is collected through the trial period on fruit yield and quality.
- About 10 parents are selected and crossed, making about 90 different hybrids.
- There were about 35 selected last year to continue in this year's trials.

Ontario growers have historically used tomato seeds from Holland which are not bred for Ontario growing conditions, located further south, or Ontario consumer tastes.

That's where Dave Liscombe and the biochemistry lab at Vineland comes in. The breeders went back to early germplasm in an attempt to find the taste and consistency that will be a winner in supermarkets.



*One of the lines of tomatoes that are part of the Ontario Greenhouse Vegetable Growers trial. photo: John Greig*

---

"Tomato flavours are very complex," he said. The combination of sweetness and acids is important in tomato taste, as is texture.

“Once you have good texture, that’s where the sugars and acids and aroma volatiles are important,” he said.

“As a plant biochemist I’m amazed by tomatoes because they are amazing chemists.”

Tomatoes make more than 400 volatile chemicals, produced by the fruit when it is chewed. People then smell the compounds when they are released and those compounds are important in determining the flavour. That compares to bananas, where one chemical determines taste.

The researchers tested 56 varieties of tomatoes of all kinds — heirlooms, beefsteak, tomatoes on the vine — with a Vineland panel trained in describing tastes. They came up with 20 different terms to describe the 56 varieties. That still didn’t tell them about what people liked.

For that they found 225 people from Toronto who tasted 19 tomatoes for the researchers, said Amy Bowen, research director of the Vineland consumer insights group.

When they have that data, they can identify the chemicals that determine the popular tastes, said Liscombe. Tools now allow researchers to tie the production of certain chemicals with genetics.

The preferred genetics will continue to be tested with consumers. People want to compare the taste of the tomatoes they grow in their gardens to greenhouse tomatoes.

“We can never compete with something that you’re putting your time and effort and loving care into,” said Bowen. “You watch it and harvest it and make your favourite dish out of it. Just the experience and everything around that will add to it.”

They found that there’s not just one tomato for all people. People can tell what they like and don’t like, but if they are untrained, they have a difficult time telling why. That’s where they used the expert panel’s descriptions to interpret the consumer preferences.

The good news for the industry is that 60 per cent of people liked what they already get from greenhouse tomatoes.

“That’s really good,” said Bowen, but that also means there’s 40 per cent opportunity for improvement.

Once they figure out the taste, then there’s also the need for it to grow well in a greenhouse and also the rest of the story that makes sense to tell, said Bowen. Is local of value?

They look at appearance, price, region or origin and how the tomato is produced. Those all factor into how a product is eventually taken to market.

Then, hopefully, at the end of the process, consumers will be happy with the product and retailers will want to buy it.

<https://farmtario.com/news/a-new-tomato-for-ontario/?module=under-carousel&pgtype=homepage&i=>