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Preference-lead research brings consumers into the lab

Consumer intelligence is put to work for horticulture in a sensory lab through tastings, online testing and focus groups

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Vineland – The last decade has seen many new horticultural innovations in development at the Vineland Research and Innovation Centre (Vineland). These range from new rose, tomato and apple varieties to harder trees and robotic solutions for the greenhouse industry.

All are the result of needs identified by fruit and vegetable growers and many are developed in collaboration with Vineland's consumer insights team to ensure research is relevant to the industry.

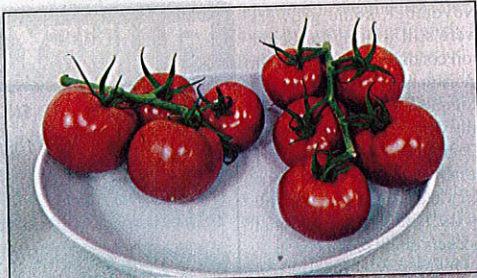
Vineland consumer insights lead Amy Bowen and her team recently invited bloggers and journalists to the Vineland campus for a look behind the scenes at how researchers measure and analyze consumer selections and preferences and how those play a key role in driving innovation.

"We are putting consumer intelligence to work for horticulture in our sensory lab through tastings, online testing and focus groups to understand what drives consumers to make their choices and what they prefer," explained Bowen, citing Vineland's tomato breeding program as an example.

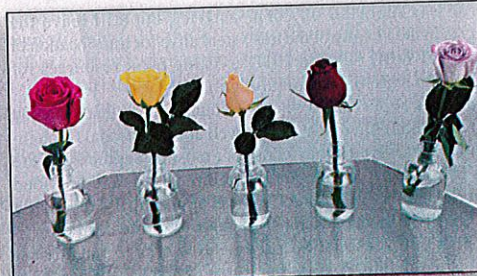
"We are working at developing a more flavourful tomato so it's important for us to know what flavour means to consumers and how we can create a tomato that consumers desire," she said.

This research influences a lot of the breeding and production at Vineland, but how a product is positioned and what makes a brand resonate with people is also important, so Bowen's team also conducts consumer insight research that helps guide marketing and commercialization plans for new varieties developed at the campus.

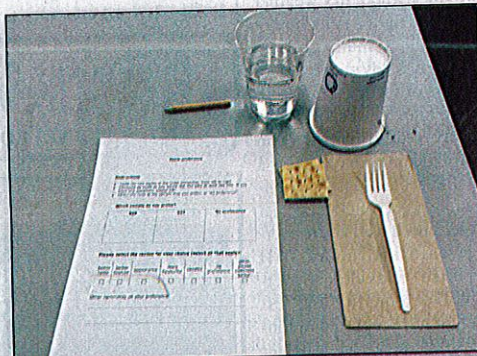
"The best marketing plan will get people to buy something once but if they don't like it, they won't



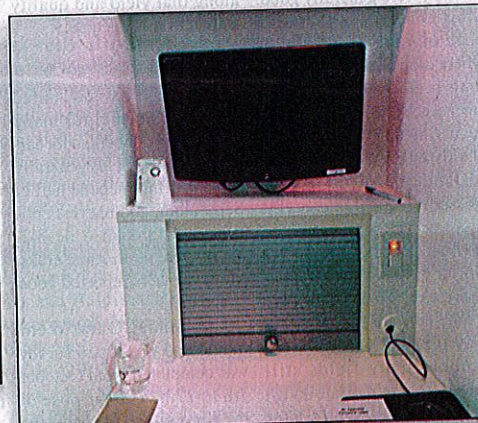
Panelists are asked about their preferences in tomato attributes



Roses lined up for consumer panel evaluation



Consumer insights testing set up



Individual consumer testing station in Vineland sensory lab

buy again, so those intrinsic characteristics like flavour and texture are really important," she said. "But we also want to know the importance of how a product is produced or labelled or how the name of a new variety impacts buying power."

Data is collected through discussions with focus groups and stakeholders, which is then validated with larger groups of consumers.

Researchers use both paired preference tests where trained panelists are asked to make a selection from only two choices and a hedonic liking test, where each sample or variety from among up to 15 options is ranked on its own merit. Panelists are asked to use words they create themselves to describe how they like or don't like a selection.

The gathered information is then used to create a preference map of what panelists like best and attributes underline what they like best and least, which lets researchers then go back to the biochemistry to determine what is causing the attributes consumers like the

best. "If we know the chemistry, we can relate that to the genetic profile of a plant and create markers in a breeding program to help us figure out which one of the 10,000 different apple trees in our test farm is the one," Bowen said.

Apple preference testing, for example, showed consumers liked crispness and juiciness, and in tomatoes, texture was found to be driving preference, Bowen added.

The consumer insights team also uses a trained sensory panel and tasting lab, where 15 trained panelists come to the Vineland campus one to three times per week to evaluate different products. Panelists are recruited locally every two years and need to be able to see and smell as well as describe sensory attributes in detail.

"We look at 18 attributes in apple for example, such as crisp, crunchy, how crunchy etc. but we can apply sensory methods to many different products," explained lab manager Amy Blake. "This year, we evaluated over 50 roses and also okra, eggplant, sweet potato, and apples."

"We can work with machines but we really need to work with people when talking about perceptions as this can't be mimicked by machines. People have a lot of psychological biases so the lab is set up to overcome this," she added.

Semi isolation booths in the lab prevent panelists from seeing each other so they don't influence someone else. All samples are delivered through a hatch and panelists rinse with crackers and water in between each sample. All measurements are recorded on a computer, and two overhead fans make sure no odours from outside come into the lab.

"We need a sensory neutral space. Our panelists know when they come what they will test but they don't know about the project," Blake explained. "They are part time Vineland staff but aren't part of any of the research teams, which helps with decreasing the bias."

A difference test is used in the sensory lab to determine whether there is a perceived difference between two products – even

though researchers know the biochemistry and volatile profiles of two tomato samples are different, for example, that doesn't necessarily translate to perceived differences.

In a tetrade test, panelists test four samples and make two groups based on similarities. This is to help determine whether a new variety tastes different from an established commercial benchmark variety; if they're not different, it's not worth going ahead with next step in the breeding program, Blake said.

Descriptive profiling is the most complex and powerful tool that gives researchers the quantitative intensity of attributes and differences in a product to see what drives liking and what drives preference. Panelists spend a lot of time talking about details and ensuring each person is evaluating the same attribute.

"Consumer insights play an important role in making everything we do meaningful and real, from acres in the field to shelf space in stores and from producer to consumer," Bowen said.