



vineland
RESEARCH & INNOVATION CENTRE

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IN THIS ISSUE

Milestone: 01
Research Programs
Moving to New Greenhouse

Improving Peach 02
Harvesting Efficiency

Feeding Diversity: 03
Bringing Chinese and
Indian Eggplant to Market

A Wireless System for 04
Smart Greenhouse Irrigation

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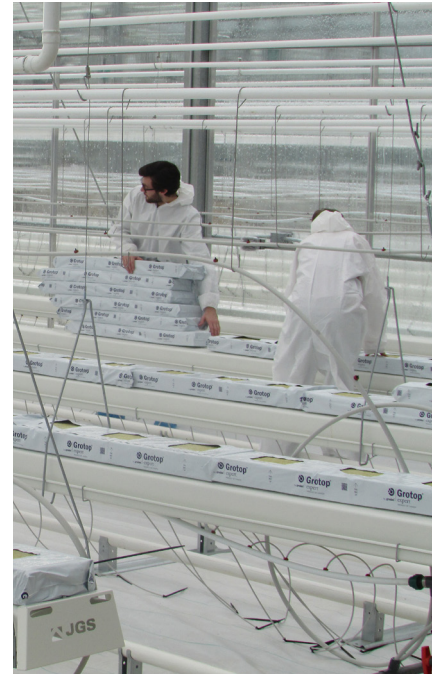
Milestone: Research Programs Moving to New Greenhouse

In December 2015, Vineland's new Greenhouse Technology Centre welcomed its first research program, Canadian greenhouse tomatoes, with additional programs making the move throughout the first three months of 2016.

The \$10 million greenhouse brings together companies, industry and researchers to foster collaboration and drive economic growth by bridging the gap between innovation and commercialization.

The new centre is unique in that there are only a few pre-commercial scale research greenhouses in North America and Vineland's greenhouse is the largest focused on horticulture research.

An open house is scheduled for Friday, June 3. More information will be posted on our website in the spring.



Move-in day, December 2015.

For more information, please contact:
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Vineland's new Greenhouse Technology Centre.



Improving Peach Harvesting Efficiency

To support the peach industry's competitiveness, Vineland Research and Innovation Centre (Vineland) and the Ontario Tender Fruit Growers have completed a peach harvesting study to improve production efficiency.

Peach harvesting is labour intensive and time consuming with harvesting expenditures representing one third of total cost of production. Labour availability is also an ongoing challenge.

To provide peach growers with the best harvest decision tool, Vineland's Dr. Bernard Goyette, Research Scientist, Postharvest Engineering and his team compared the production efficiency of three current harvesting techniques at three farms in the Niagara Region in Ontario during seven consecutive harvest cycles in 2015.

The methods included: (1) harvesting fruit into plastic totes that are palletized on a truck; (2) harvesting fruit into baskets then placing peaches into a bulk bin and; (3) harvesting fruit into baskets that are placed on a truck.

"We found the plastic tote method (1) to be the most efficient and cost-effective technique,"

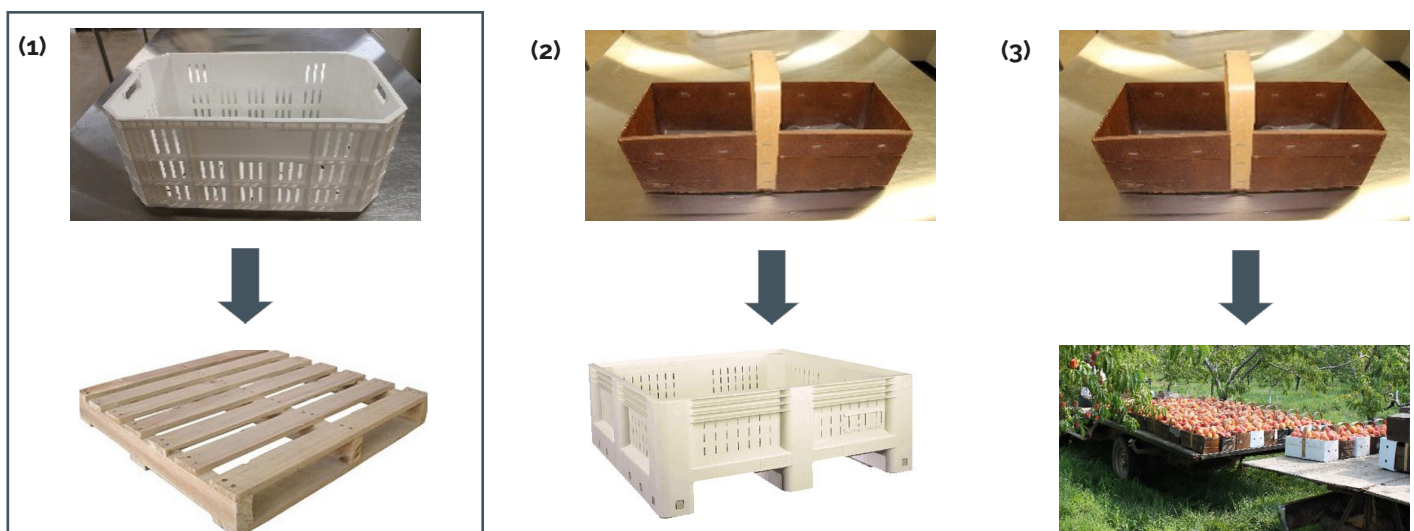
said Goyette. "It takes fruit pickers less time to harvest a kilogram of peaches making this method 40 per cent more efficient."

Results suggest that the industry needs to focus on ways to improve harvest efficiency through the use of different equipment, good agronomic and postharvest handling practices and training.

This information will help producers determine the payback period to convert to plastic totes.

This project was funded in part through *Growing Forward 2 (GF2)*, a federal-provincial-territorial initiative. The Agricultural Adaptation Council assists in the delivery of *GF2* in Ontario. This project is supported by the Ontario Tender Fruit Growers, co-operating growers and the Niagara Peninsula Fruit and Vegetable Growers' Association.

To learn more about this project, please contact: Dr. Bernard Goyette, Research Scientist, Postharvest Engineering 905-562-0320 x169 bernard.goyette@vinelandresearch.com



Three harvesting methods: (1) plastic totes; (2) baskets followed by fruit placed into bin and; (3) baskets on a truck.



Feeding Diversity: Bringing Chinese and Indian Eggplant to Market

With the highest per capita immigration rate in the world, Canada's produce consumption is continually evolving. Based on Statistics Canada reported patterns of growth over the last five years, eggplant consumption – particularly exotic varieties not previously grown in Canada – is forecasted to increase 130 per cent by 2030 to 55 million kilograms. This is a market currently supplied by imports. A team at Vineland Research and Innovation Centre (Vineland) is investigating varieties with commercial potential for production in Canada to meet this growing consumer demand and replace imported produce with local.

Dr. Viliam Zvalo, Vineland's Research Scientist in Vegetable Production and his team initiated simultaneous research trials on both Chinese long and Indian round eggplant during the 2015 growing season. "We undertook a Pan-Canadian farm trial with 22 growers to identify eggplant varieties with good agronomic characteristics that meet consumer demands," said Zvalo. "We also investigated whether grafting onto different rootstocks improved disease resistance and yield."

Six Chinese and Indian eggplant varieties were evaluated for field production; Asia Beauty, Farmers' Long and Long Purple hybrids showed the best yield potential. Nine varieties of eggplant were also investigated for greenhouse production; Long Purple and Purple Comet hybrids showed the most promise.

Grafting onto tolerant tomato rootstock is an effective technique to overcome soilborne disease for field eggplant and to improve vigour and yield for greenhouse eggplant. Using a Maxifort rootstock, the Vineland team achieved an 84 per cent increase in yield for the Long Purple hybrids in a greenhouse setting. On the



Chinese long and Indian round eggplant.

other hand, when grafted onto Maxifort rootstock for field production, flowering and fruit set were delayed, which is undesirable. Farm trials on different rootstocks will be undertaken in 2016.

"We have used row covers in field production to obtain an earlier harvest," said Zvalo. "Modifications of the growing environment using row covers and black plastic mulch are necessary to grow eggplant in Canada."

This project was funded in part through *Growing Forward 2 (GF2)*, a federal-provincial-territorial initiative. The Agricultural Adaptation Council assists in the delivery of *GF2* in Ontario. And with support from the Ontario Fruit and Vegetable Growers' Association and participating growers across Canada.

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(A version of this article appeared on the Greenhouse Canada website, January 26, 2016).



A Wireless System for Smart Greenhouse Irrigation



Dr. David Gholami,
Research Scientist,
Expert Systems Specialist.

Vineland's Robotics and Automation team is working on several new research projects.

Dr. David Gholami joined Vineland only a few months ago and is leading the wireless system project for smart greenhouse irrigation.

We sat down with David to discuss this initiative.

Q. What is the purpose of the system?

"Our goal is to design and develop a smart irrigation system that continuously captures images of greenhouse plants to monitor for signs of water stress. The system can simulate the decision-making process of growers through the planification and scheduling of irrigation cycles to maximize plant yield across the greenhouse while minimizing water usage.

Smarter irrigation is important for the industry to reduce labour and water consumption. It will also improve consistency in irrigation and quality of produce."

Q. How will it work?

"The system will be comprised of two components: a sensory system and a diagnostic system. The sensory system will measure soil moisture, temperature and electrical conductivity. The diagnostic system

will process crop images for signs of stress using a combination of imaging technologies.

This approach makes our system different than others in that it helps detect water stress before it is visibly manifested. This is what precision agriculture is all about."

Q. What is the timeline of this project?

"We expect to complete the first phase of the project by the end of this year with help from collaborators such as Sunrise Greenhouses, Willy's Greenhouse and Freeman Herbs in the Niagara Region, Ontario."

Partners on this project include Peytec, National Optics Institute (INO) and Western University.

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Irrigation monitoring system in greenhouse setting
(Photo courtesy Scott Koornneef).