

Innovation helps floriculture attempt its bounce back

With a value of \$730 million, Ontario is the third largest producer of cut flowers, potted plants and bedding plants in North America,

BY LOIS HARRIS
Ontario Farmer

Ontario's floriculture industry has taken a big hit since the 2008 recession, losing more than a third of its businesses, but innovative researchers and growers have helped it bounce back by using a variety of fresh techniques, from bottom-up heating and robotics to hydroponics and closed-loop watering systems.

Today, the industry has 250 commercial growers with about 1,000 acres of greenhouses who employ about 7,500 people.

With a value of \$730 million, Ontario is the third largest producer of cut flowers, potted plants and bedding plants in North America, after California and Florida.

Innovation was the theme of a bus tour sponsored by Farm and Food Care Ontario that included two Niagara-area flower greenhouses and the Vineland Research and Innovation Centre in December. Wayne Brown, the Ontario Ministry of Agriculture and Food's greenhouse floriculture specialist, was the guide, and Cary Gates, pest management director at Flowers Canada, helped organize the tour.

The first stop was Maple Crest Farms, where Glen Van Hoffen runs a 213,000 square foot snapdragon and lisianthus operation with his brothers and partners Bruce and Doug. The family also owns a poultry farm, which has been in operation since 1971.

The greenhouse idea germinated in 1981, when the boys' father decided he wanted to grow snapdragons – because he liked them.

"We grow everything from seed," Van Hoffen said. "Most of the crop goes to the U.S. – New York and Pennsylvania – with some going to Quebec wholesalers – we even have some in the Montreal clock."

His greenhouse is more traditional, with snaps being planted in clay-based soil that has been amended with sand, straw and peat moss. Snapdragons also grow slower than most cut flowers – 16 to 18 weeks from start to finish. Growing happens year-round, although production increases during the summer months.

"If you want something good, you have to wait for it," said the soft-spoken Van Hoffen.

What sets some of his greenhouses apart is that heat rises up from the bottom, rather than down from overhead – a system

he installed after a nasty encounter with downy mildew that took more than year to fix.

"We don't have to spray for botrytis any more at all," he said. Botrytis is one of the most common greenhouse funguses.

To fend off pests and disease, Van Hoffen has a specialist come in weekly to monitor and recommend strategies. Among the many methods he uses is releasing hypoaspis mites (a kind of mite) into the greenhouses, which helps control fungus gnats and thrips.

Van Hoffen is a big believer in research, and it has paid off with his efficient watering system.

"About three years ago, Wayne (Brown) came in to do a water testing study – we learned a lot," he said. They wanted to know where the water was going, and what the water quality was in their ponds and drains.

A direct result of the study is that water is now collected from the greenhouse roofs in a closed-loop system that includes filtering it through cloth, sanitizing it with hydrogen peroxide, and combining it with fresh water before being put back on the crop.

THE SECOND stop on the tour was at the Vineland Research and Innovation Centre where the 50-plus participants listened as CEO Jim Brandle talked about the centre's 108-year history and its latest addition – a pre-commercial research greenhouse that will open in spring, 2015. Visitors were then treated to a talk by Wayne Brown about his research into poinsettias.

"We have 126 varieties, with 76 reds – although 80 per cent of the commercial reds are only one variety called Christmas Day," he said.

Brown has been conducting poinsettia trials for 10 years, works with researchers from Northern Carolina and the University of Florida, and at a recent open house, hosted between 75 and 80 growers who came to check out the latest innovations in growing the Christmas plant.

He also ran a poinsettia popularity contest at Vineland's public open house held this year on December 5, 2014. People voted in the as-yet-unnamed RX209 as the best red, Xmas Beauty North Pole as best white, and Princettia Dark Pink as best pink. Ice Punch rounded things out as the winner in the top novelty/overall category.

Tour participants then moved



OMAFRA floriculture specialist Wayne Brown talks about his poinsettia research trials.



Glen Van Hoffen explains how he grows snapdragons at his Maple Crest greenhouses.

on to a dark storage area where researcher John Van de Vegte demonstrated a robotic mushroom picker that he has been developing for two years.

The machine uses LED lighting and digital photography to take images of a flat of growing mushrooms. Once the operator punches in the size and dimensions needed, the robotic arm scans mushrooms, looking for a target. The perfect-sized mushroom is then picked up using a suction cup, moved to the small box everyone sees in the store, and placed delicately in the bottom. Harvesting and packing each mushroom takes six seconds, and instead of having workers pick for only 10 out of 24 hours, the robot can pick more frequently.

The robotic picker would mean a complete overhaul of the way mushrooms are currently harvested, with workers doing every-

thing by hand. A conveyor system would need to be built to bring the mushrooms to the machine. But Van de Vegte is optimistic – he's in discussions with Monaghan Mushrooms of Campbellville to test out a prototype.

"I aim for a payoff period of less than four years," said Van de Vegte, whose background is in automotive robotics. This gives him a two-year window to get the job done.

THE LAST stop was at Spring Valley Gardens, which has 10 acres of greenhouses at two locations in St. Catharines.

The Van Koeveringe family has owned and operated the business since 1979, growing a wide variety of potted plants including poinsettias, hydrangea and primula. About six years ago, they invested heavily in producing cut tulips that are grown with the latest hydroponic and robotic technology.

"We grow about 14 million cut flowers and six million potted plants," said John Van Koeveringe. "During peak planting, we put in 800,000 to 900,000 tulip bulbs per week."

But the bulbs aren't planted in soil – instead, workers place them on spikes in trays that each hold seven litres of water and fertilizer. Transfer of the flowers from the rooting room to the greenhouse is via a conveyor system that moves the trays in sequence. A computer-controlled overhead boom ensures precision watering. Once the flowers reach maturity in about three weeks' time, the trays are sent via conveyor again to a harvesting room where workers cut off the bulbs and pack the flowers.

The most recent addition is a vertical flow wetland that recycles 60,000 litres of water a day to meet the huge demands of the Spring Valley greenhouses. Built in the fall of 2013, the wetland consists of three cells covered by three metres of pea gravel through which the water percolates year-round. Testing for pathogens and nutrients shows almost nothing by the time the water gets to the third cell.

"We don't bring in water from outside," said Van Koeveringe. "It's a closed loop system with no moving parts."

The water also goes through a 150-micron filter cloth, is sanitized with hydrogen peroxide and ultraviolet light, and mixed with fresh water before being reused on the plants.

"Eighty per cent of tulip production in the Netherlands is hydroponics," Van Koeveringe said. "Its efficiency far surpasses soil-grown."

Spring Valley cut tulips can be found now in the Toronto market, and most of the production goes through wholesalers at the Ontario Food Terminal, eventually being sold as far away as Florida and Texas.