Focus on water

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Bradford Times

Ontario's farmers do more than grow crops and raise livestock. They are also stewards of the land – and increasingly, find themselves responsible for the environmental health of both land and water.

Water was the focus of the AgKnowledge Forum, an annual session organized by local farming associations and Nottawasaga Futures.

Water is needed not only for irrigation, but to wash harvested crops before processing. Soil, dissolved phosphorus and other nutrients in waste wash water have created issues both for the environment, and for farmers.

Speakers at the forum provided an update of a new Water Project undertaken by the Holland Marsh Growers' Association (HMGA), as well as the latest Ministry of Environment requirements.

Charles Lalonde told participants that the HMGA has been investigating a range of technologies for soil removal and wash water treatment. It has been a collaborative effort, involving growers – who have provided test sites and financial support, as well as engineering firms and ministry experts.

"We're all working together," he said, to come up with solutions that will reduce the risk to the environment, while dealing with the challenges posed by the Holland Marsh's unique muck soils.

This is the final year of the multi-year project, "but the most important... It involves implementation," Lalonde said, warning that new "technology requires attention and optimization." The complex systems needed to meet ministry standards require "a Mr. Fix-it on the farms... It takes people on the ground, at the plant, every day," who are experienced in IT, computers, and electrical.

Paul Plotz, Ministry of Environment issues/projects co-ordinator, Barrie cffice, provided background on the issue of nutrient loading in the Lake Simcoe watershed - not just by farming operations, but also by industrial, commercial and residential.

The Ontario government enacted the Lake Simcoe Protection Plan, to reduce phosphorus inputs and improve water quality in Lake Simcoe. The LSPP has been so successful, that there are now plans to extend the regulations to the Great Lakes basin – widening the impact on farming operations, Plotz acknowledged. The goal is to ensure that all wastewater, whether from treatment plants or vegetable processing operations, is treated before being discharged into the environment.

Plotz described a vegetable processing plant in the Bradford area that in 2010 was discharging orange water. Testing discovered "pretty serious loading of nutrients" in the water, which triggered a review of operations by the MOE.

Untreated wash water was found to be high in suspended solids, organic matter, biological oxygen demand (BOD), and nutrients, including nitrogen, potassium, and phosphorus – on occasion, "several times higher than levels that can kill aquatic life," Plotz said. Phosphorus levels of up to 19.4 mg/L were measured – when the ministry objective is 0.01 mg/L.

They were "big numbers," one reason why the MOE initially focused on the farming and vegetable processing sectors. One facility was found to be releasing 7.5 kg of phosphorus daily into the Lake Simcoe watershed – more than the amount released by the wastewater treatment plants of Bradford West Gwillimbury and Innisfil combined.

As a result, the province introduced stringent new standards, requiring Environmental Compliance Approvals for surface and some subsurface discharge of washwater. While there was success in reducing Phosphorus inputs into Lake Simcoe, the approach was adversarial.

That approach has now changed, Plotz said, to co-operation. "You are our clients, and we're here to help you solve a problem. That's an important difference.

"In a nutshell, our approach has been not to overwork the solutions," but to promote "simple, cost-effective, easy-to-maintain" options – including the use of lagoons and recycling - and to encourage a voluntary approach to improvements.

As long as there is progress towards compliance with provincial policy and standards, the MOE won't be taking "a heavy-handed approach," he said. "If a facility can show they're moving forward, there's no need for any further action on our behalf."

The muck soil of the Holland Marsh poses a particular challenge, when it comes to wash water. Muck is "really amazing stuff to grow on," said Bridget Visser, communications officer with the HMGA. "Very input-and-labour-intensive. It's also high in yields," especially for root crops, bulk crops and leafy greens. But the soil itself can form a colloidal suspension in water, that is difficult to remove.

"The muck does not settle. That is the crux of the problem," Visser said. "Muck has a tendency to float."

The Holland Marsh Water Project has looked at a range of technologies and options to remove not only large solids, but also the lighter muck and dissolved nutrients from wash water.

Hydrosieving and drum filters were found to be less effective, creating additional steps in the process; geotubes, and the use of flocculants and coagulants in settling ponds were the most effective at removing both solids, and phosphorus.

"The goal is to give people a starting point" for implementation, Visser said. "The big challenge is the cost. None of this is going to be free."

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Speaker Bridget Visser, at the AgKnowledge Forum held at the Club at Bond Head on Feb. 4.

She noted that environmental costs have traditionally fallen on the farmers. "It's been looked on as the cost of doing business."

"Who bears the cost? The farmers do," said Jamie Reaume, chair of the Water Project. And although farming associations like HMGA are looking for the most cost-efficient methods, and some means of cost recovery, farmers "will bear the cost for now, because that's what the consumer wants.... There is no return on investment in environment. We're getting hit on so many levels."

Extending stringent water protection regulations to the Great Lakes and tributaries will mean that thousands of additional farming operations will be impacted, he said.

Ian Smith, of Smith Gardens in Keswick, provided a case study. Smith Gardens produces carrots, onions, beets and parsnips on muck soils – and initially, Smith said, the Ministry of Environment took a combative stance regarding wash water discharge. "It was a mystery what we were supposed to do, and where we could go for help."

Through trial and error, the farm discovered "muck doesn't settle out of water. We have to settle the water out of muck," resulting in the construction of an extensive treatment system to extract debris, dirt and nutrients.

The system dewaters the washwater, channeling it into outdoor aerating holding ponds to reduce biological oxygen demand, and then bioreactors before it is treated, indoors, using coagulants, settling tanks, flocculants and filtration.

The result is "remarkably clean water" that can be reused, but, Smith said, "This is an expensive process. It's not cheap and it's not easy."

The system also takes up "a lot of real estate," measuring 30' by 60', and has required the farm to hire dedicated staff to monitor and operate. The cost? Two million dollars.

Smith told the forum that he has seen no return on that investment. "It's driven up costs. It's cost us clients... We've gone from being vegetable producers to being producers of clean water."

Smith added, "There is considerable cost. It's one family farm. It's a big chunk for us to bite off." As a fourth generation farmer, he accepts that farmers are stewards of the land. "We do want to protect it, but at some point, you do put a farm out of business."