

FOLLOW THE DEMOGRAPHICS

Asian eggplant shows promise in the field and in greenhouses



Don't underestimate eggplant. With increasing immigration of Asians to Canada, this category is quietly growing with local production of Chinese long and Indian round varieties. The Vineland Research and Innovation Centre is studying both field and hydroponic production of eggplant with results that pique the interest of long-time growers Jason and Shirley Su. Their son Henry came home to the Simcoe, Ontario family farm last year to learn the ABCs of eggplant. First lesson? This member of the Solanaceae family requires diligent leaf removal so that the skin isn't scratched. Photo by Glenn Lowson.

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KAREN DAVIDSON

Eggplant, a member of the nightshade family, is coming into the sun. This oft-ignored vegetable is becoming more visible in produce aisles as Canada's South Asian immigrants demand the tastes of their childhoods. Statistics Canada reports that imports of eggplant have risen 32 per cent between 2011 and 2014 and reached nearly 24,000 metric tonnes.

Those trends have encouraged long-time zucchini growers, Jason and Shirley Su, to plant 10 acres of Chinese long eggplant for the last two years at their Simcoe, Ontario farm. With origins in rural China, they are familiar with this eggplant which is sweeter than the black-skinned Sicilian varieties. There's a good chance that Chinese long and Indian round varieties will catch on because they aren't bitter and can be quickly cooked without

much preparation.

Retailers are eager to showcase locally-grown eggplant during the summer months.

With the farm's reputation well-established with retailers and future prospects looking bright, son Henry Su decided to come back to the farm in 2015. His communications degree from University of Toronto/Mississauga will never be out of place. It's his work ethic, developed through figure skating at the national pairs level, that will propel him forward.

"In my first year back at the farm, I've realized that farming has changed," says Su. "Farming today is more than physically caring for your plants. It's not just who can grow the best but it's the business connections and bringing new products forward."

Su admits that it's tough for small farms to survive, however adding Asian eggplant to their farm's roster looks like a path

“Farming today is more than physically caring for your plants. It's not just who can grow the best but it's the business connections and bringing new products forward.”

~ HENRY SU

forward. The seedlings start in a greenhouse then are transplanted into plasticulture-covered rows with drip irrigation. His first lesson? Eggplant requires a lot of labour to trim the lower leaves so that they don't scratch the delicate skin and reduce marketable yields. Labour is also needed to harvest on a daily basis.

Fortunately, Vineland Research and Innovation Centre (Vineland) is finetuning the best production systems for field eggplant that will be economically viable. As Viliam Zvalo, Vineland research scientist, vegetable production

explains, there are a number of challenges. First, eggplant is susceptible to soil-borne diseases such as Verticillium wilt and Fusarium wilt. These fungal pathogens enter through the roots and cause premature leaf drop. When the house of photosynthesis is destroyed, fruit production shuts down.

To date, fumigation has been the standard method to rid the soil of these robbers, but those practices may soon evolve to other ways of controlling disease.

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AT PRESS TIME...

Plugs for payment protection program



Hon Mark Eyking addresses the Canadian Horticultural Council delegates in Ottawa on March 10.

While Prime Minister Trudeau was in Washington for an official state visit on March 10, NDP MP Tracey Ramsey (Essex) was calling on the Liberal government to introduce a payment protection program for Canadian fresh fruit and vegetable producers, in a motion tabled in Parliament.

"Canadian produce growers have been asking the government for a payment protection program for years," said MP Ramsey. "Conservative inaction on this file has negatively impacted this important industry and I urge the Liberal government to resolve the issue by year end."

Ramsey's motion (M-49) calls on the government to

introduce payment protection for produce growers like the Perishable Agricultural Commodities Act (PACA) in the United States by September 30, 2016. It also calls on the government to negotiate with the United States to restore Canada's privileged access under PACA by December 31, 2016.

"The Windsor Essex Chamber appreciates MP Tracey Ramsey's leadership on getting PACA on the national agenda," said Matt Marchand, president and CEO of the Windsor Essex Regional Chamber of Commerce. "It's a top issue for agri-food exporters in the Windsor-Essex region and is key for us to maintain our goal of doubling agri-food exports by 2020."

"Ensuring that growers are paid for the product they grow is a fundamental requirement for sustainable communities. Currently our produce farmers do not have that protection in the marketplace and we look forward to having this issue addressed," added George Gilvesy, chair of the Ontario Greenhouse Vegetable Growers.

The same day, Hon. Mark Eyking told delegates at the Canadian Horticultural Council annual general meeting that the prime minister's delegation had been well briefed on this issue in advance of the Washington trip. As chair of the international trade committee, he was positive about movement on the file.

Non-browning potato approved in Canada

Health Canada and the Canadian Food Inspection Agency have approved J.R. Simplot Company's Innate potato for planting in Canada. It has low asparagine which means up to 70 per cent less acrylamide when cooked. And it has reduced bruising and browning which means less waste.

The potatoes have been developed through a cisgenesis process, that is using genes from the same species. In this case, the company used genes from both wild and cultivated potato species. Health Canada does not require a label indicating that Innate potatoes are genetically engineered, because nutritionally, they are the same as conventionally grown potatoes.

The U.S. Department of Agriculture approved the first generation of the Innate potato in 2014, with the Food and Drug Administration following about a year ago. It's been sold in the U.S. since last May under the White Russet brand and is available in supermarkets and for food service.

Growers are already looking towards the second generation of Innate potatoes which promise to be resistant to late blight, cutting the need for protective sprays of fungicides. Field researchers estimate that this trait may result in a 25 to 45 per cent reduction in annual fungicide applications.

NEWSMAKERS



2016 CHC Board of Directors, (L-R): Peter Swetnam (Atlantic), Adrian Huisman (Ontario) Brian Gilroy (Ontario), Alvin Keenan, first vice president (Atlantic) Keith Kuhl, president (Prairies), Bar Hayre (BC), Jocelyn St-Denis (Quebec), Ernie Van Boom (Prairies), Fred Steele (BC), Anne Fowlie, executive vice-president, Stephanie Levasseur (Quebec). Photo courtesy of Trevor Eggleton, CHC.

Delegates to the Canadian Horticultural Council have elected **Keith Kuhl**, a Winkler, Manitoba potato grower, for a fourth time to the role of president.

Committee chairs are: **Murray Porteous**, labour committee; **Mark Wales**, finance and business management committee; **Ken Forth**, trade and marketing committee; **Charles Stevens**, crop, plant protection and environment committee; **Jack Bates**, industry standards and food safety committee, **John Bareman**, potato committee; **Brian Gilroy**, apple and fruit committee; **Phil Tregunno**, tender fruit section of the apple and fruit committee; **Jack Bates**, blueberry section of the apple and fruit committee; **Bill George**, grape section of the apple and fruit committee; **Linda Delli Santi**, greenhouse committee; **André Plante**, vegetable committee.

CHC's Doug Connery Award was presented to **Claude Laniel**, one of Quebec's foremost organizers of the province's horticultural industry. He has been involved as rural economist, promoter of CanadaGAP as well as research and development.

At the Canadian Food Safety Forum, NSF-GFTC recognized Canadian companies and individuals who have contributed to providing excellence in food safety. The Holland Marsh Growers' Association took second place in the Food Safety Excellence Award category. The award was accepted by **Bridget Visser**, communications and **Jody Mott**, executive director.

Canada's Outstanding Young Farmer contest has announced apple growers **Andrew and Jennifer Lovell**, River View Orchards, Keswick Ridge, New Brunswick as 2016 winners of the Atlantic region. In Manitoba, the winners are potato and grain farmers **Jason and Laura Kehler**, Carman. The Canadian championship will be held in Niagara Falls, ON from November 29 to December 4.

At the International Fruit Tree Association (IFTA) annual conference, outstanding award recipients included: **Amy Irish-Brown**, a Michigan State extensionist for the Extension Award; **Dr. Randy Beaudry**, Researcher Award for pre-harvest maturity and post-harvest storage work at Michigan State University; **Ed Wittenbach**, Grower Award; **Ken Hall**, Industry Service Award; **Harold Thorne**, IFTA Hall of Fame.

BASF Canada presented the Cuvee Vineyard of Excellence Award to father-and-son duo **Howard and Wes Lowrey** at the Cuvee Grand Tasting in early March. The company is also hosting 10 of the top viticulture students from each of Brock University and Niagara College, giving them a chance to network with leaders from the Ontario wine industry.

The Alberta potato industry welcomes **Dmytro Yevtushenko**, Ph.D., to the position of research chair in potato science at the University of Lethbridge. The five-year appointment is funded by a consortium of association and industry partners. For more details, see page 5.

The Ontario Ministry of Agriculture, Food and Rural Affairs (OMAFRA) welcomes **Mackenzie Lespérance** as the weed management lead – horticulture crops, while **Kristin Obeid** is on maternity leave. From her base at the Harrow Research and Development Centre, she will be focusing her efforts on greenhouse trials for herbicide resistance screening, collaborative work with the University of Guelph on herbicide resistant pigweed in carrot production and other projects.



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COVER STORY

Asian eggplant shows promise in the field and in greenhouses

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Zvalo's research is focusing on a novel method of overcoming soil-borne diseases. His team has been grafting different field eggplant varieties onto tomato rootstock to produce more disease-tolerant plants. This startling idea makes sense with the knowledge that eggplant and tomatoes are botanical cousins. They both belong to the *Solanaceae* family. The practice of vegetable grafting is new to North America, but has been used in vegetable production in Asia for decades.

Tests so far have yielded mixed results in a non-fumigated field.

"The grafted plants were very healthy," says Zvalo, "but the plant is so vegetative that flowering and fruit set is delayed by three weeks. By the end of the season, yields catch up however farmers need a supply for the whole summer to fulfill their retailer contracts."

In 2016, six different rootstocks will be tested. While the colour and quality of fruit pass muster, the researchers are hoping for more timely flowering and fruit set with different rootstocks.

As Henry Su experienced, one of the key hurdles in field eggplant is protecting the skin from leaf damage. To that point, Vineland's team is staking the beds eight to ten feet apart to prevent leaves scratching the fruit during wind storms. These various trials are expected to fine-tune recommendations to farmers by 2018. That's when Zvalo hopes to be in technology transfer mode with a goal of 20 farmers across Canada.

A handful of growers in British Columbia, Manitoba, Ontario, Quebec, Prince Edward Island and Nova Scotia are keeping close tabs on Vineland's research as they experiment with their own field trials.

Just as interesting are the studies of hydroponic cultivation of Asian eggplant, both Chinese long and Indian round. Again, the

technique of grafting new varieties onto Maxifort F1, disease-resistant, tomato rootstock is proving a winner. Last year's trials were encouraging in terms of yield.

The Long Purple F1 variety, for example, yielded 85 per cent more harvest compared to its non-grafted mates. One of the secrets in eggplant growing is to keep iron levels high to maintain vibrant skin colour. Greenhouse-grown eggplant is also susceptible to the usual insect suspects: thrips, aphids and mites. Biological pest control has been proven to preserve yields.

One of the strengths of Vineland is its focus on the value chain. These new varieties must succeed not only agronomically but in terms of taste with consumers.

"Unfortunately, these greenhouse-grown eggplant varieties yielded well but did not fare well in eating tests in Sobey's test kitchen," says Zvalo.

Undaunted, Zvalo has narrowed the field to two varieties of Chinese long eggplant and added another two varieties for 2016 trials. They will be tested on different rootstocks.

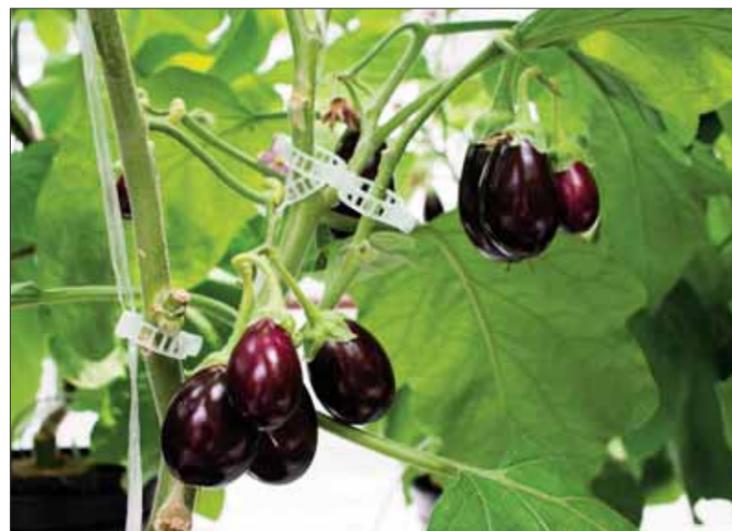
"2016 is an important year for our eggplant trials," says Zvalo. "We are looking for the best combination of rootstock and scion to produce 35-40 kg per square metre per year. These are the yields necessary for an economic tipping point."

Last year's trials were conducted during spring and fall cycles. The question is can these newer grafted varieties produce year round in a greenhouse environment that will be challenged by stressful summer-time temperatures.

So far, greenhouse growers have tracked Vineland's hydroponic eggplant research with interest. Already successful with baby peppers and cherry tomatoes, they can see potential in marketing "baby" sweet eggplant. The trio of vegetables are all members of that sunny *Solanaceae* family.



Viliam Zvalo research scientist, Vineland Research and Innovation Centre, is finetuning the economics of hydroponically grown eggplant. So far, the secret has been to graft eggplant onto Maxifort F1, disease-resistant, tomato rootstock. Indian round eggplant is shown below. Photos by Denis Cahill.



INTERNATIONAL

BELGIUM

Potato crop yields monitored by satellite

The Belgian potato processing industry is embracing the iPOT project, which collects data from the ground, from air-borne drones and from space-based satellites. The intensive research is building on impressive growth to 80,000 acres of potatoes in 2014. Now that Belgium is the world's largest exporter of frozen potato products – eclipsing the Netherlands, Canada and the U.S. – the industry must find ways to be sustainable.

By the end of the project in May 2017, researchers expect that for each potato field, it will be possible to:

- Estimate the plant phenological stage as well as the plausible harvest date;
- Estimate the risks of production or quality losses on the basis of temperatures, rainfall and soil moisture data as well as the plant crop status;
- Assess the field spatial variability
- Forecast yields all along the growing season

Source: *The Grower* research

EUROPE

Climate change affects seed breeders

Syngenta, active in breeding tomatoes, peppers, cabbage varieties and melons, is increasing efforts to respond to climate change. While factors such as yield, flavour, convenience and sustainability are important traits, the company will be focusing more intently on the cold and heat tolerance of crops.

"We are now looking to develop more robust varieties that have more flexibility," says Jérémie Chabanis, global value chain manager lead for Syngenta, based in Europe.

Warmer weather is confusing the growing season in southern Europe. The company is searching for varieties that keep well during a warm winter and dry summer. They must also be resistant to diseases that are migrating from south to north.

Source: *FreshPlaza.com*

PERU

Bi-national blueberry council established

When U.S. secretary of agriculture Tom Vilsack recently visited Lima, Peru, a parallel announcement was made about the U.S.-Peru Blueberry Council (USPBC). This is the first bi-national council for the blueberry category, including top blueberry producing, packing, exporting and importing companies in both countries.

The goal is to increase new market-access opportunities between both countries. Well-known companies are involved including: Naturipe and Driscoll's of California, North Bay Produce of Michigan, Camposol, Talsa and ProArandano of Peru.

Bi-national co-chairs are Brian Boccock, Naturipe, U.S. and Miguel Bentin, ProArandano, Peru.

The council's first order of business will be to support the development of phytosanitary initiatives at a bilateral level.

Source: *FreshPlaza.com*

UNITED STATES

Iceless Brussels sprouts debut



Mann Packing, based in Salinas, California, is launching two iceless Brussels sprouts products: shaved or trimmed. Trimmed at the stem, this new product eliminates labour for chefs or foodservice and delivers a manageable quantity with less food waste.

"We're comparing these Brussels sprouts products to what iceless green onions have done for the foodservice industry – providing a classic, iceless pack in a user friendly format without the wax carton and mess," said Gina Nucci, director of foodservice marketing at Mann's.

The shaved product delivers a blend of consistent, 1/8-inch cut leaves along with the planks of the sprouts. This format is ideal in raw salads or slaws, or in flash sauté or high-heat roast applications.

Source: *FreshPlaza.com*

CROSS COUNTRY DIGEST

BRITISH COLUMBIA

Lower prices for ugly produce strikes chord with consumers

Aware of the trend to marketing second-grade or ugly produce, BC Fresh Vegetables (dba BCfresh) has launched its own brand: Farmer's Keepers.

"This is a new opportunity for us to market produce that may not meet our own grade one standards, but is a real advantage to customers looking for a great price," says Brian Faulkner, vice-president, sales and marketing, B.C. Fresh Vegetables. Based in Delta, B.C., he says that first efforts have been with yellow and red-skinned potatoes. Ten-pound bags of Farmer's Keepers general retail in the realm of \$3.99 or less.

The positioning of the brand is to appeal to those who are savvy with ingredients and who know that the produce is nutritionally sound, except for a blemish or two. The experiment with the 2015 crop of potatoes has resulted in

many truckloads moved to market, mostly in British Columbia, but also to the prairies. With that first-season success, carrots will be next. Faulkner says there are no extra promotion dollars spent on Farmer's Keepers.

For the 60 farm families that grow for the BCFresh banner, it's a good initiative. Potato planting of early varieties started in late February in BC's Fraser Valley with first harvest expected in May. Locally grown produce is in demand every month of the year.

With no dehydration plant in close proximity to take these "seconds," the prospects of selling these potatoes are encouraging, returning more money back to the growers.

As Faulkner talks about the success of the project, he quips: "Beauty is only a peeler away."



NEW BRUNSWICK

Apple growers hit sweet spot with Outstanding Young Farmer award

First-generation apple growers Andrew and Jennifer Lovell of Keswick Ridge, New Brunswick were chosen as the 2016 Outstanding Young Farmers (OYF) for the Atlantic region at a recent awards event

in Charlottetown, PEI.

Andrew and Jennifer own and operate River View Orchards (www.seerivervieworchards.com), a diversified u-pick farm market operation that includes apples, pears, plums,

strawberries, raspberries, pumpkins and other vegetables. They host school tours, operate an agricultural fence and orchard trellis construction service, and host farm-themed birthday parties.



"It's so refreshing to see a young couple such as the Lovells getting started in a farming career," says Jack Thomson, past chair of Canada's Outstanding Young Farmers program. "Our industry depends on innovative and fresh ideas, and we must create an environment that encourages new farmers to enter the sector. Andrew and Jennifer have embraced the industry and created an educational and fun atmosphere that brings their customers closer to the farm. That's a critical connection that's important for our entire industry, and we congratulate Andrew and Jennifer on their commitment and passion for agriculture."

The Lovell's story of how they got into farming is different than many. Neither of them grew up on a farm, but Andrew had dreams of owning his own farm for years. And in 2012, their dream came true when they purchased a farm that can trace its roots to the original land grants in 1784. Andrew manages the farm operation, and Jennifer continues her work as a full-time nurse. Their goal is to grow their farm to be large enough that one day their children Robert (11) and Elsie (4) can carry on the family farm, if they choose.

Andrew and Jennifer focus on providing high-quality fresh produce and delivering customer satisfaction. Along

with their diverse u-pick operation, they grow apples for the commercial market, and the first Fuji apples ever planted in New Brunswick. They welcomed more than a thousand school children to their farm in the past year to learn about agriculture, pick apples, take in a guided educational hike around the farm, and wander through a corn maze. They have further diversified by offering an agricultural fence and orchard trellis construction service and even host farm-themed birthday parties including wagon rides, giant sandbox, bouncy castles, kite flying and UTV rides.

Off the farm, Andrew gives back to the industry as a director of the New Brunswick Agriculture Alliance, chairs the committee that's establishing the Agricultural Coalition to provide management services for New Brunswick commodity groups, is current chair of New Brunswick Apple Growers Association and sits on the Apple Working Group of the Canadian Horticulture Council. Jennifer volunteers with church and children's activities.

Canada's Outstanding Young Farmers for 2016 will be chosen at the National Event in Niagara Falls, Ontario from November 29 – December 4, 2016.

Source: Outstanding Young Farmers news release

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CROSS COUNTRY DIGEST

ALBERTA

Potato industry funds research chair

Funded by a consortium of association and industry partners, the University of Lethbridge has appointed Dmytro Yevtushenko as research chair in potato science. “Thanks to the Potato Growers of Alberta (PGA) and the remarkable people at the University who have the vision for the potato and agriculture in Alberta, I can start this program in a relatively short time,” said Yevtushenko, who arrived in January 2016.

The PGA, McCain Foods, Lamb Weston and Cavendish Farms have invested \$1 million over five years to establish the Chair in Potato Science. Western Canada has few researchers dedicated to the potato industry and the new chair will enhance and expand the current capacity. The PGA is a non-profit potato grower organization working to increase the success of the Alberta potato growing industry, currently worth \$1 billion annually.

“Local growers and processors welcome Dr. Yevtushenko and we are eager to start working with him,” says Terence Hochstein, the PGA’s executive director. “Our membership identified a need for university-level research and education in the potato industry and we are excited to have Dr. Yevtushenko and his expertise available to us.”

Yevtushenko plans to coordinate his research programs with the needs of the local industry. His major research interests are in the areas of plant biotechnology and breeding, with focus on crop improvement and food safety using modern techniques that involve molecular biology, plant tissue culture, and genetics. While he has researched many plant species, he prefers working with potatoes. His experience working in the plant biotechnology industry has given him an appreciation for the concerns of producers. He has a broad range of research expertise, including development of potato genotypes with wide-spectrum disease resistance and large-scale production of virus-free seed potatoes in vitro. Among other projects, his research plans include improvement of tuber yields through epigenetic enhancement of current potato cultivars and speeding up the potato breeding process using innovative methods.

Yevtushenko was born in central Ukraine and attended Kiev State University, as it was then called. He wanted to be a scientist ever since he was in middle school and he arrived at university wanting to study

nature and the environment. He discovered a passion for plant biology and completed a Ph.D at the Institute of Cell Biology and Genetic Engineering in Kiev. He came to Canada for a post-doctoral fellowship at the University of Guelph. Since then, he’s worked at the University of Victoria and held various other positions.

Source: University of Lethbridge newsletter

He has a broad range of research expertise, including development of potato genotypes with wide-spectrum disease resistance and large-scale production of virus-free seed potatoes in vitro.



Dmytro Yevtushenko

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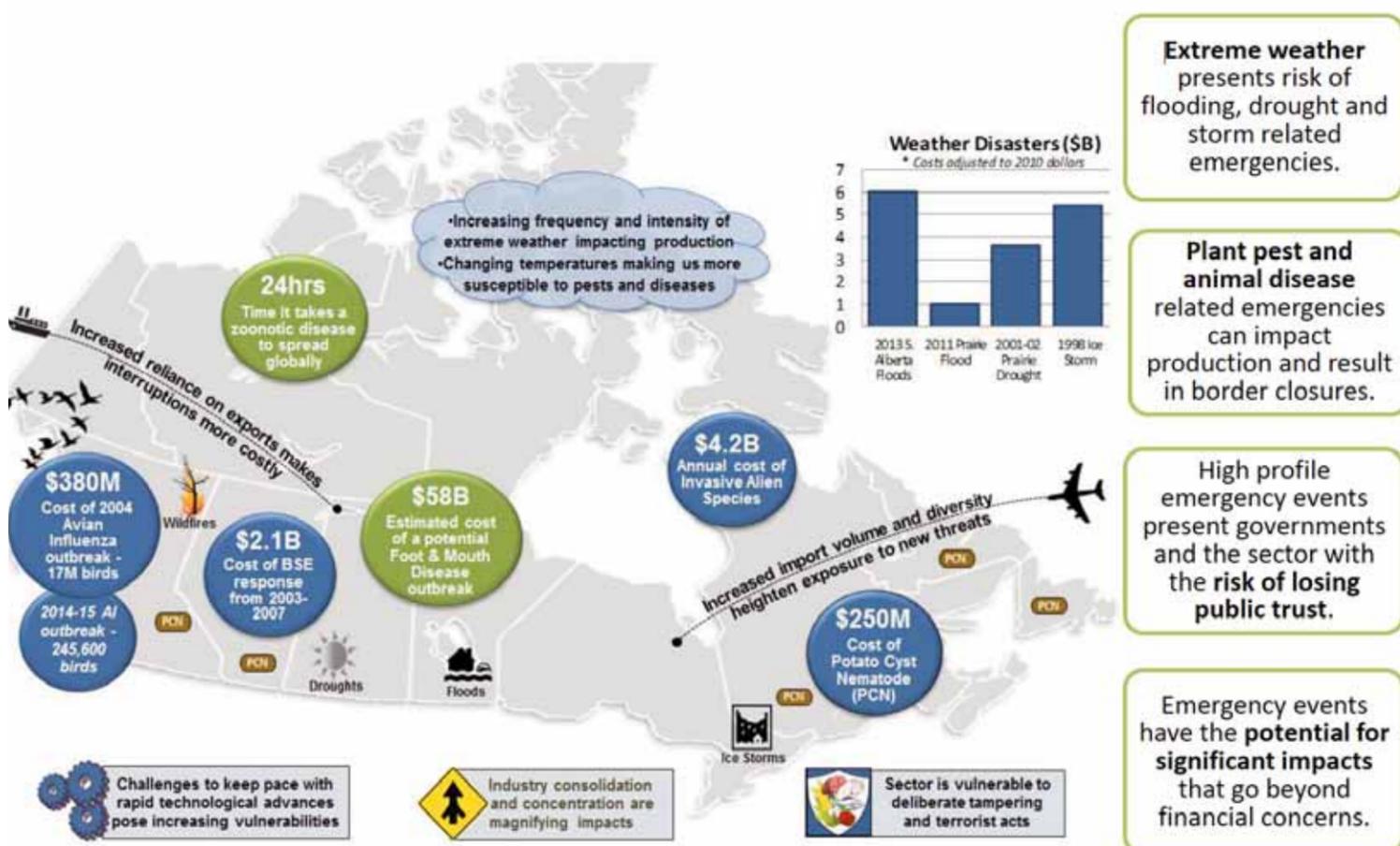
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CANADIAN HORTICULTURAL COUNCIL ANNUAL GENERAL MEETING

More than money is at stake in emergency management



Extreme weather presents risk of flooding, drought and storm related emergencies.

Plant pest and animal disease related emergencies can impact production and result in border closures.

High profile emergency events present governments and the sector with the risk of losing public trust.

Emergency events have the potential for significant impacts that go beyond financial concerns.

Source: AAFC

KAREN DAVIDSON

Any review of Canada's most recent disease outbreaks highlights that emergencies will and do happen. Emergency preparedness is now a high priority according to Deborah Lorenzin,

senior advisor, strategic initiatives division, Agriculture and Agri-Food Canada (AAFC).

"Our systems have worked well in the past, but with global trade we need to modernize and enhance plant pest and animal disease prevention to mitigate risks," says Lorenzin. "The goal

is to build sector resilience. The desired outcome is to have an agricultural sector that proactively addresses risk, adapts to changing conditions and is able to withstand and recover from emergencies."

Her presentation to the Canadian Horticultural

Council's Greenhouse Committee resonates with the sector. In 2011, Spain's greenhouse sector was devastated while it took weeks for German health officials to finger the culprit of 4,125 foodborne illnesses, 908 with hemolytic-uremic syndrome and

more than 50 deaths. The source of the *E. coli* 0104 outbreak in northern Germany was finally tracked to Egyptian-grown organic fenugreek sprouts, but not before consumers rejected raw cucumbers, tomatoes and lettuce. Early in the crisis, German officials had incorrectly blamed the origin and strain of *E. coli* to cucumbers imported from Spain. The agricultural income from Spain's Murcia region was cut by more than 11 per cent for the growing season, according to Food Safety News.

Five years hence, it's more critical than ever for Canada's greenhouse vegetable industry to have an emergency plan. Besides a value north of \$1 billion in farmgate receipts, it's the years of building a reputation for wholesome, healthy produce that's at stake. The industry is participating in AAFC's emergency preparedness.

Stakeholder consultations are now underway so that a revised framework can be presented to the federal-provincial-territorial agriculture ministers' meeting on July 20-22, 2016 in Calgary.

Emergency preparedness goes beyond the greenhouse sector to the entire produce industry. For those who wish to offer feedback, please email: AgEM-GUAg@agr.gc.ca.

Comment period extended on chlorothalonil until June 9

KAREN DAVIDSON

Canada's horticultural industry was set on its heels earlier this winter when the Pest Management Regulatory Agency (PMRA) announced the re-evaluation of a commonly used active ingredient, chlorothalonil. This is an important active ingredient in fungicides such as Bravo and Echo, widely used by potato growers and many other commodity groups to prevent foliar diseases such as late blight.

The industry's protests about the lack of forewarning have resulted in an extension on comments until June 9.

The extension was announced at the Canadian

Horticultural Council annual general meeting by Margherita Conti, director-general, value assessment, re-evaluation management directorate, PMRA. The agency will host a webinar on April 8 to outline how officials came to their conclusions.

If the re-evaluation was a surprise to growers, it was no less so for the three registrants of the active ingredient: Syngenta (Bravo), Sipcam (Echo) and Adama (Equus). The latter registrant bought the rights to the data to get a generic product registration as recently as December 2015. The re-evaluation notice means that the fungicide use would be reduced from 12 times per season to one in potatoes and eight times per season to one in tomatoes. Fungicide use would

be totally eliminated in onions, crucifer crops, sweet corn, strawberries, cranberries and blueberries.

Re-evaluation also includes uses beyond horticulture. For growers of lentils, the loss of this fungicide would impact one million acres on the prairies.

PMRA's posting of chlorothalonil -- and other actives -- on a re-evaluation list is driven in part by the Commissioner of the Environment and Sustainable Development Report on Pesticide Safety, published on January 26, 2016. The crux of the issue is worker safety.

"The Canadian horticultural industry takes worker safety seriously," says Craig Hunter, pesticide expert with the Ontario Fruit and Vegetable

Growers' Association (OFVGA). "However, the regulators are basing their decision in part on calculated dermal toxicity values rather than the actual 21-day study they had accepted as late as 2011. They did not ask the registrants for extra data such as 90- and 180-day dermal tox studies that could have provided 'real' data points."

Horticulture's concerns are broader than chlorothalonil since other active ingredients are also under review.

"If we lost even half of this list of active ingredients, it would knock out the foundation of horticulture in Canada," says Hunter.

The ongoing discussion with PMRA is about use patterns: that is, how growers use the product in the field. Concerns about worker safety can be addressed when it is understood how and when products are used in day-to-day practical settings and what worker activities actually occur in treated fields in the season.

Margherita Conti reported to the CHC gathering that PMRA will be developing a policy on the phase-out of affected pesticides by June 2016. Other policies are under review for

consulting stakeholders. She also announced a pilot approach for increased early stakeholder engagement to provide input on the use pattern for use in risk assessment.

In a question-and-answer period following Conti's presentation, several attendees commented.

"My family farms within a mile of the U.S. border," said Keith Kuhl, CHC president. "U.S. potato growers can ship into the Canadian marketplace using products containing chlorothalonil, but the prospect is that we won't be able to use these products. We have to continue to work on these issues. Otherwise, we will continue to give our trading partners advantages in the marketplace."

Conti replied that PMRA will evaluate the Canadian use pattern.

Murray Porteous, a fruit and vegetable grower from Simcoe, Ontario, explains that Bravo is used in asparagus after the harvest to keep the fern healthy and to help produce tender shoots the following spring.

CONTINUED ON PAGE 7

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CANADIAN HORTICULTURAL COUNCIL ANNUAL GENERAL MEETING

Comment period extended on chlorothalonil until June 9

CONTINUED FROM
LAST PAGE

“Although this product is just one of a few options, removing one product is like removing one in a house of cards,” he says. “Your tender plants can become infected with disease very quickly resulting in less quantity and poorer quality for the consumer.”

At the CHC meeting, Porteous addressed Conti’s presentation.

“It frustrates me when science is viewed differently in the U.S. and Canada,” Porteous said. “It undermines public confidence. It frustrates me as a farmer who can’t compete. All of this drives up costs to the producer.”

Conti replied: “Bear in mind, as we try to harmonize approaches to the science, we are constrained by the Pest Control Products Act. We have Canadian policies that the U.S. may or may not have. That being said, when we re-evaluate, we look at other jurisdictions. Through re-evaluations, you may be losing product use. PMRA does look at alternatives and how useful those alternatives might be for specific crops or pests. Let’s take the wireworm example in potatoes. PMRA worked with grower groups and provinces to come up with solutions. I believe that in the end, we worked collaboratively with stakeholders.”

In another exchange, Jonathan Atkins, representing TKI from the U.S. said, “This re-evaluation list seems like a dramatic change. This is actually a cancellation list, not a re-evaluation list.”

Margherita Conti’s presentation was followed by Tracy Shinnars-Carnelley, vice-chair of the CHC Crop Protection Advisory Committee. A national response will be developed based on surveys and input from provincial members, grower associations, CropLife Canada, registrants and all interested stakeholders.

For each commodity group, there will be an overview of: production (statistics, distribution); actual grower use; extent of use (application rates/frequency, re-entry, aerial application); use with other tank-mix products; and alternative chemical controls.

“These decisions have cumulative effects,” said Shinnars-Carnelley. “There is a cumulative impact of PMRA decisions on pest control in fruit and vegetable crops, when there are few or no options remaining to control pests.

Resistance management is increasingly becoming more prominent. Our competitiveness is decreasing with increasing divergence from the U.S.”

She counseled that pest management should be a systems approach, retaining multiple tools with rational label uses.

“Let’s consider product re-evaluations as part of a pest management system and not in isolation.”



Photo by Glenn Lowson

Surfactant technology improves pesticide performance

Select the right product to maximize input investment

Poor spray pattern with too many large droplets as a result of not using a surfactant with LEICI-TECH.

Higher percentage of correct-size droplets using LI 700 with built-in LEICI-TECH technology.

Adjuvants are increasingly recognized as a critical component of crop protection strategies. Frequently, producers will choose an adjuvant based on a recommendation from a retailer, custom applicator or crop consultant. Increasingly, however, there is reason to view adjuvants as more than another input or production cost. Selecting the right product can address specific challenges and significantly enhance the performance of herbicides, insecticides and fungicides.

An important consideration when selecting an adjuvant is the strength of the technology that the product is based on. An innovation in surfactants (one class of adjuvants) is **LEICI-TECH™** – a patented, lecithin-based technology from Loveland Products. The flagship **LEICI-TECH** product – **LI 700®** – is the complete surfactant solution for foliar products. It addresses many of the potential problems associated with pesticide performance, including uniform spraying, product retention and uptake among others.

“This advancement in surfactant technology does a lot to address many of the challenges producers face,” says Janet Porchak, UAP Canada. “Getting the most out of their crop protection investment is near the top of that list, and selecting the right surfactant can go a long way to help ensure that happens.”

More uniform spray pattern

Pesticides have the potential to drift off target when droplets are too fine. **LI 700** reduces the chance of pesticide drift by putting less stress on droplet production and allowing for fewer small droplets and a more uniform spray pattern. Droplet retention is essential to ensure the best performance of a foliar spray product. The spreading and adhesion properties of **LI 700** ensure that more spray droplets hit the target and stay there to provide more consistent performance.

For a foliar-applied pesticide such as glyphosate to be effective, it must be transferred from the leaf surface into the plant tissue. **LI 700** provides better penetration of waxy

cuticles, even when plants are under environmental stress, for quicker pesticide uptake. It also reduces evaporation – another element of ensuring the best pesticide performance.

High pH water in the spray solution can be another challenge for producers. Many pesticides undergo a chemical reaction in the spray tank when mixed with water that has a high pH level. The product can quickly break down and lose a significant amount of the active ingredient. **LI 700** works as a buffering-acidifying agent that lowers the pH of the water carrier, ensuring pesticide stability and effectiveness.

Maximum performance and crop safety

Crop producers want products that are safe on their crop and have a good environmental profile. **LI 700** is a great alternative to petroleum-based products because it is a natural derivative of soybeans. The **LEICI-TECH** technology also allows spray droplets to reach the critical micelle concentration (CMC) – the point at which maximum surface spreading is achieved – at a lower rate than conventional surfactants. The result is less disruption on the plant surface, further contributing to improved crop safety.

“If use of the wrong surfactant increases the risk of poor performance and crop injury, think of the benefits that can be realized by using the right one.”

Dr. Dan Bergman, Loveland Products Inc.

When choosing a surfactant for a specific crop protection product, first consult the pesticide label to determine if a specific surfactant is prescribed. Beyond that, select a product that delivers maximum performance and crop safety. Speak with your retailer or crop consultant to learn more about the innovative technology behind **LI 700**.



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CANADIAN HORTICULTURAL COUNCIL ANNUAL GENERAL MEETING

Labour, safety nets and crop protection top list of issues

KAREN DAVIDSON

Three themes emerged at this year's annual general meeting: the need for flexibility in accessing labour and safety nets and the importance of timely and competitive access to crop protection products. The resolutions below reflect these concerns.

The federal government's re-evaluation of chlorothalonil

sparked the greatest commentary by growers as reported on pages 6 and 7. The fact that neonicotinoids were relegated to a mere footnote is telling in terms of how quickly the crop protection file can change.

Pierre Petelle, vice-president, chemistry, Croplife Canada pointed out that mixed messages are coming from provincial and federal governments on pesticides.

"If provinces are undermining communications from the Pest

Management Regulatory Agency (PMRA), we will not succeed," said Petelle. "Some provincial governments regularly reference external sources to justify their actions. If we can't get to the point where provinces have confidence in PMRA, it will be difficult to achieve anything."

Next year's meeting is slated for March 14-16, 2017 in Winnipeg, Manitoba.



Keith Kuhl (L) greeted Hon. Lawrence MacAulay, federal minister of agriculture and agri-food, at the opening reception of the Canadian Horticultural Council Annual General Meeting.

Number	Name and Status	Therefore be it resolved
2016-01	CHC Annual Appointments CARRIED	THEREFORE BE IT RESOLVED that the CHC include the appointment of a representative of organic horticulture production to the Canadian General Standards Board Committee on Organic Agriculture among its annual appointments and that the representative provide reports through the Industry Standards and Food Safety Committee.
2016-02	Employment Insurance CARRIED	THEREFORE BE IT RESOLVED that the Canadian Horticultural Council petition the Government of Canada to recognize the seasonal nature of certain economic sectors such as agriculture; and BE IT FURTHER RESOLVED that the Canadian Horticultural Council petition the Government of Canada to improve Canadian agricultural seasonal workers' access to employment insurance by cancelling the changes made in 2012 which limit the pool of local seasonal workers, and BE IT FURTHER RESOLVED that the Canadian Horticultural Council endeavor to gain the support of sectors of the Canadian economy that are experiencing the same issues, such as forestry and fishing, in support of these requests.
2016-03	The Canadian Agricultural Policy Framework – AgriStability CARRIED	THEREFORE BE IT RESOLVED that the Canadian Horticultural Council petition the Government of Canada to make it a priority to change the level of coverage offered through the AgriStability program returning it back to that of the program preceding Growing Forward 2, by: 1. Eliminating the measures limiting the reference margins within the AgriStability program, and exploring alternative approaches to limit payments in cases of producers who earn a profit, while also ensuring allowable expenses are covered for producers with negative margins; 2. Re-establishing the previous limit that triggers the AgriStability program, so that payments are made when margins for the program year fall below 85% of the producer's historical reference margins.
2016-04	The Canadian Agricultural Policy Framework - AgriInvest CARRIED AS AMENDED	THEREFORE BE IT RESOLVED that the Canadian Horticultural Council petition the Government of Canada to: 1. Increase the AgriInvest basic maximum contribution rate for matching contributions to 4.5% of allowable net sales on eligible commodities and eliminate the caps on government payments; and 2. Provide more flexibility for agricultural producers with regard to withdrawing funds accumulated through the AgriInvest program for funds earmarked for a series of preapproved and proactive investment programs that mitigate financial and production risks, and 3. To allow for the producers to first withdraw their own contributions before withdrawing government funds.
2016-05	The Canadian Agricultural Policy Framework – AgriRecovery CARRIED	THEREFORE BE IT RESOLVED that the Canadian Horticultural Council petition the Government of Canada to clearly define the measures available through the AgriRecovery program, such as measures aimed at providing aid in response to natural disasters, and differentiate them from other risk management programs of businesses in order to prevent payments made further to a disaster from being diminished/recovered from another program.
2016-06	Registration of Pest Control Products CARRIED	THEREFORE BE IT RESOLVED that the Canadian Horticultural Council petition the Government of Canada to increase the Pest Management Regulatory Agency's and the Pest Management Centre's human, financial and material resources in order to meet the evolving contextual needs of industry, and BE IT FURTHER RESOLVED that the Canadian Horticultural Council petition the Pest Management Regulatory Agency to accelerate the registration process for alternative pest control products.
2016-07	Temporary Foreign Worker Program: Seasonal Agricultural Worker Program TABLED TO THE LABOUR COMMITTEE EXECUTIVE	THEREFORE, BE IT RESOLVED that the Canadian Horticultural Council petition the Government of Canada to: • Review the concept of related services within the Seasonal Agricultural Worker Program (SAWP) employment contract to allow Canadian employers to benefit from daily deductions for ancillary services, • Reduce the administrative burden for businesses that have previously already submitted a request as part of Temporary Foreign Worker Programs (e.g., housing inspections valid for 12 months, reduced number of forms and information requested, fast tracking for businesses who have made no changes for five years and obtained a positive Labour Market Impact Assessment in a year, etc.).
2016-08	Temporary Foreign Worker Program: Seasonal Agricultural Worker Program – Dates TABLED TO THE LABOUR COMMITTEE EXECUTIVE	THEREFORE, BE IT RESOLVED that the Canadian Horticultural Council petition the Government of Canada to modify the Seasonal Agricultural Worker Program (SAWP) so that employers are permitted to hire these workers between December 15 and December 31.
2016-09	Temporary Foreign Worker Program – Agricultural Stream CARRIED	THEREFORE, BE IT RESOLVED that the Canadian Horticultural Council petition the Government of Canada to: • Modify the Temporary Foreign Worker Program (TFWP) Agricultural Stream to eliminate the 48-month cumulative time limit for working in Canada; • The TFWP Agricultural Stream provide for a work permit allowing them to transfer quickly and easily between employers within a season; • Eliminate the TFWP 10% limit for processing facilities whose operations are directly related to seasonal agricultural production; • Prioritizing the processing of these files be made a priority throughout Canada in order to reduce delays and avoid the issues experienced in 2014 and 2015; and • Reduce the administrative burden for businesses that have previously already submitted a request as part of Temporary Foreign Worker Programs (e.g., housing inspections valid for 12 months, reduced number of forms and information requested, fast tracking for businesses who have made no changes in the past five years and obtained a positive Labour Market Impact Assessment in a year, etc.), and BE IT FURTHER RESOLVED that the Canadian Horticultural Council immediately apply pressure on the new government due to the urgency of the situation.
2016-10	Canadian Fruit and Vegetable Breeding Programs CARRIED	THEREFORE BE IT RESOLVED that Canadian Horticultural Council lobby the Government of Canada to provide 100% funding to fruit and vegetable breeding programs.

CANADIAN HORTICULTURAL COUNCIL ANNUAL GENERAL MEETING

Labour, safety nets and crop protection top list of issues

Number	Name and Status	Therefore be it resolved
2016-11	Policy Statement Respecting Production Practices CARRIED	THEREFORE BE IT RESOLVED that the Canadian Horticultural Council amends its standing policy statement respecting production practices to include “Government of Canada approved production practices”, and as such that the standing policy statement shall now be the following: The Canadian Horticultural Council supports all Government of Canada approved production methods which will support the future viability and sustainability of horticulture production.
2016-12	Impact of Weight Limits for the Transport of Fruits and Vegetables within Canada CARRIED	THEREFORE BE IT RESOLVED that the Canadian Horticultural Council work with appropriate federal and provincial departments to harmonize weight limits for the transport of fruits and vegetables to the highest level established within Canada.
2016-13	Analysis of Weight Limits for Transport of Fresh Fruits and Vegetables within Canada and in the United States TABLED TO THE BOARD OF DIRECTORS	THEREFORE BE IT RESOLVED that the Canadian Horticultural Council work with the Regulatory Cooperation Council, Agriculture and Agri-Food Canada and Transport Canada to document the differences in weight limits for trucks transporting fruits and vegetables within Canada and in the United States, and to identify means of addressing the differences to support harmonizing weight limits to the highest level established within either country and to enable more efficient transportation on both sides of the border.
2016-14	National Clean Plant Network CARRIED	THEREFORE BE IT RESOLVED that the Canadian Horticultural Council request that the Canadian Food Inspection Agency develop and implement a program similar to the National Clean Plant Network (NCPN) in the United States.
2016-15	Spotted Wing Drosophila CARRIED AS AMENDED	THEREFORE BE IT RESOLVED that the Canadian Horticultural Council ensure that the Pest Management Regulatory Agency acts so that all conditional registrations be converted as soon as possible to full registrations to assure the availability of these insecticides for Spotted Wing Drosophila for the 2016 use season; and BE IT FURTHER RESOLVED that the Canadian Horticultural Council ensure that the Agriculture and Agri-food Canada’s Pest Management Centre (PMC) continue to provide research into the management of Spotted Wing Drosophila, an extremely damaging pest, leading to the registration of both chemical and non-chemical methods, and BE IT FURTHER RESOLVED that the CHC work with the Pest Management Regulatory Agency and the BC Blueberry Council to ensure the emergency registration of bifenthrin for use in the 2016 growing season.
2016-16	Cyclamen Mite Management CARRIED	THEREFORE BE IT RESOLVED that the Canadian Horticultural Council work closely with Agriculture and Agri-Food Canada’s Pest Management Centre to ensure that research is conducted leading to the registration of additional products to manage cyclamen mite.
2016-17	Improved Weather Prediction Mechanisms for Horticultural Producers CARRIED	THEREFORE BE IT RESOLVED that the Canadian Horticultural Council lobby all appropriate federal government departments to ensure that weather models are kept updated, and the accuracy of weather prediction is continually improved so as to ensure horticulture producers in Ontario and across Canada are able to make the best management decisions based on predicted weather.
2016-18	Request for Third Party Mediator to Moderate Canadian Partners in Quality Program (C-PIQ) Appeals CARRIED	THEREFORE BE IT RESOLVED that the Canadian Horticultural Council lobby the Canadian Food Inspection Agency to implement an independent third party mediator to handle appeals for Canadian Partners in Quality Program (C-PIQ) clients.
LR2016-19	Labour Market Impact Assessments (LMIA) CARRIED AS AMENDED	THEREFORE BE IT RESOLVED that the CHC work with Employment and Social Development Canada (ESDC) to streamline the Seasonal Agriculture Worker Program (SAWP) by using existing Labour Market Impact Assessment (LMIA) approvals to enable an accelerated authorization process for replacing employees.
LR2016-20	Temporary Foreign Worker Program – Agricultural Stream Annual Meetings CARRIED	THEREFORE BE IT RESOLVED that CHC request that the Canadian government establishes an annual meeting of the Agricultural Stream of the Temporary Foreign Worker Program to which would be invited federal departments, including Service Canada, Employment and Social Development, and Citizenship and Immigration, and the CHC to enable ongoing dialogue on the application of the program to ensure better management.
LR2016-21	Increasing Canadian Horticultural Council Lobbying Capacity CARRIED AS AMENDED	THEREFORE BE IT RESOLVED that the Canadian Horticultural Council allocate specific resources for lobbying resources.
LR2016-22	National Rural Health Strategy CARRIED AS AMENDED	THEREFORE BE IT RESOLVED that the Canadian Horticultural Council include in Standing Policy a National Rural Health Strategy that will consider the unique factors and challenges of rural life and also address the emerging needs of rural life – including but not limited to: <ul style="list-style-type: none"> • Definition of rural areas; • Demographic trends; • Per capita government resources; • Emerging technology; • Emerging professional development of health practitioners; • Special accreditation and compensation for rural health practitioners; and • Special needs of rural areas.

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ONTARIO FRUIT AND VEGETABLE GROWERS' ASSOCIATION

Board briefs



A news conference was held in Ottawa on March 10 to draw attention to the need for a PACA-like trust for Canadian fruit and vegetable growers. (L-R): Jason Verkaik, chair, Ontario Fruit and Vegetable Growers' Association; Ruth Ellen Brosseau, NDP MP and ag critic, (Berthier-Maskinongé); Tracey Ramsey, NDP MP (Essex); Ken Forth, chair, CHC trade and marketing committee; George Gilvesy, chair, Ontario Greenhouse Vegetable Growers.

The Ontario Fruit and Vegetable Growers' Association (OFVGA) Board of Directors met on Thursday, March 17, 2016. Topics ranged from an overview of the Canadian Horticultural Council's (CHC) Annual General Meeting (AGM), an update on obtaining a PACA-like trust for Canadian growers, and responses to the Waste Free Ontario discussion and Cap and Trade regulations.

Canadian Horticultural Council (CHC) – Adrian Huisman

The CHC Annual General Meeting (AGM) took place on March 8-9. President's Reception went over well and had excellent attendance by Members of Parliament.

A two per cent increase in

membership fees for FY 2017 was approved.

The CHC bylaw dictating the maximum length of the president's term was extended to four consecutive years from three. Keith Kuhl was re-elected as president and will be hosting the next CHC AGM in Manitoba.

A lobbying firm will be hired by April 1, 2016 to act as the new government relation's agency on behalf of CHC.

All resolutions submitted by OFVGA at the CHC AGM were approved.

Labour Section – Ken Forth

At the Canadian Horticultural Council (CHC) AGM, the NDP held a press conference requesting that the Liberals institute a PACA-like trust for Canadian

growers. OFVGA chair Jason Verkaik, OFVGA director George Gilvesy and labour section chair Ken Forth, took part.

Seasonal agricultural workers are anticipated to be arriving on time this spring.

Research Section – Harold Schooley

Ontario Agri-Food Technologies held their AGM on March 3, 2016 with a total of 16 speakers focused on the challenges that entrepreneurs face getting new products to market. Of particular interest was R&D into the use of nano-particles for targeting drugs directly to cancer cells (by Guelph-based Mirexus). Surprisingly the source of nanoparticles for this work is sweet corn. Forty per cent of the

dry weight of processed sweet corn is nano-particles.

The keynote speaker at the OAFI meeting was Bruce Campbell, president and CEO of the Independent Electricity System Operator (IESO). Its job is to operate the electrical system, plan for medium and long-term electricity needs, oversee the wholesale electricity market, and develop conservation programs. Some interesting facts he presented include:

- There are 21 electricity regions in Ontario
- Every five minutes IESO forecasts electricity demand day and night. They must balance this supply and demand to direct generators to supply electricity or connect with large users to ask them to cut back on usage.
- They oversee the wholesale electricity market selling excess power.

Research chair, Harold Schooley and Dr. Tania Humphrey from Vineland Research and Innovation Centre (VRIC) met with the Research and the Business Development Branches of OMAFRA, to discuss research priorities. It was agreed that field vegetables would be divided into three further categories: bulb and root vegetables; leafy vegetable and crucifers; and fruiting vegetables. Asparagus has been folded into the root vegetables group.

Property Section – Brian Gilroy

OFVGA has submitted its response to the Waste Free Ontario discussion paper. This submission is now available online at the OFVGA website.

Safety Nets Section – Mark Wales

There is a Ontario Agricultural Commodity Council (OACC) Technical Committee meeting planned for April 4, 2016; statistics to wrap up the 2015 year are expected to be shared.

Crop Protection Section – Charles Stevens

Chlorothalonil (Bravo, Echo), a fungicide used in many horticultural crops including potatoes, tomatoes, fruit crops and others, is currently being re-evaluated by the Pest Management Regulatory Agency (PMRA) and a 60-day extension to public consultation has been granted. A webinar has been arranged by PMRA for April 8, 2016 to address issues surrounding its re-evaluation. Within the last month, ferbam, thiram, ziram and methomyl have all come up for re-evaluation; OFVGA plans to respond and comment on each, as well as the Canadian Horticultural Council (CHC). By the end of March it is expected that iprodione (Rovral) and Captan will be added to the re-evaluation list.

From March 21 to 24, the annual PMC Minor Use Priority setting meeting is taking place in Quebec. Craig Hunter of OFVGA is chairing the meeting. PMC and PMRA will be encouraged to register new products to replace old chemistries. This includes making sure PMRA knows how these chemistries are being used on the farm.

LETTER TO THE EDITOR

Greenhouse customers can reduce lighting electrical costs

I wanted to respond to a quote about lighting costs for greenhouses that was on page 3 of the March issue of The Grower. As a consultant who actively works with greenhouse customers to develop and help execute a strategy to reduce their energy costs, I would like all greenhouse customers to know that there are many options (not just one) that may be available to reduce the suggested cost of \$1,000 dollars per acre per day for operating lights.

Actual customer costs assessed by 360 Energy per acre per day include commodity, transmission and distribution for the most volatile electrical markets in Canada: Alberta and Ontario. In our experience, \$200 to \$400 per acre per day are examples of costs of greenhouse operators who operate HID lights for more than 1,800 hours/year – specifically, during the winter - for operations of six acres and greater.

Since energy costs and incentives are always changing, greenhouse operators should be constantly improving their energy knowledge so that they fully understand the energy marketplace, including any possible programming opportunities that they may be able to tap to help reduce their annual energy spend without negatively impacting their production.

David Arkell
360 Energy Inc.
Ancaster, ON

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THE ONTARIO PRODUCE MARKETING ASSOCIATION

CANADIAN PRODUCE MARKETING ASSOCIATION CONVENTION & TRADESHOW APRIL 12 - 14

Fresh faces to attend Passion for Produce Program

KAREN DAVIDSON

How do you get into the produce industry? It takes a certain individual who craves a fast pace and the risks inherent in handling living, breathing products.

That's why the Passion for Produce program is so important at the Canadian Produce Marketing Association (CPMA) convention and trade show in Calgary. The program provides an opportunity to accelerate professional development through a unique mentoring experience.

"It's always a pleasure to meet the rising stars in our industry who join us for the Passion for Produce Program," said Ron Lemaire, president, CPMA. "Passion for Produce takes place in a fun and relaxed setting where participants receive mentoring, meet produce industry leaders through networking events, and increase the scope of their knowledge by meeting different exhibitors on the trade show floor. We're thrilled to have 15 participants joining us in Calgary."

One of them is Matthew Towe. He is the distribution manager for the Calgary office of Peak of the Market. With a background in non-perishable distribution, he joined Peak of the Market in October 2015.

"I have always heard that if I wanted to improve my skills that the produce industry was the place to be," says Towe. "We handle more than 100 varieties of vegetables from broccoli to potatoes. How to handle the produce items properly is important for quality."

Several months in the position, Towe understands that efficiency is important but "don't start change for the sake of change, until you understand the whole system. It's a process and we work together."

He's joined by another westerner: Eric Niu, a buyer for Fresh Direct Produce in Vancouver. Previously he was a produce manager for one of the city's national retailers, but left for the opportunity to become a wholesale produce buyer.

"I am so energized by produce," Niu says. "Produce is changing all the time, with the seasons, with quality and pricing. Now I feel more like a supplier, making sure that what I buy is good for the company and good for the consumer."

As an immigrant to Canada from Taiwan in 1996, Niu represents the growing demographic of new Canadians. His unique background gives him insight into what to buy. Chinese vegetables represent the biggest commodity in his category. He's also noticing an uptick in exotic

fruits such as figs, mangoes, papaya and passion fruit.

He expects that his trip to CPMA's Passion for Produce program will open his eyes to a diverse group in the value chain, from retailers to wholesalers to growers.

Other participants include:

- Adrianna Herrera, The Oppenheimer Group
- Ashley Beck, Krown Produce
- Cameron Sungail, The Guimarra Companies
- Carsten Hickey, Thomas Fresh Inc.

- Chris Moore, Loblaw Companies
- Don Han, Star Produce Ltd
- Jessica Elenko, Bolthouse Farms Inc.
- Josh Mastronardi, Red Sun Farms
- Julie Lefort, Quebec Produce Marketing Association/Les Serres Lefort
- Kristina Goodall, NFI Canada
- Melissa Mossuto, Walmart Canada Corp.
- Michael Hiltz, Sliced FC Ltd.
- Tim Carruesco, Markon Cooperative Inc.

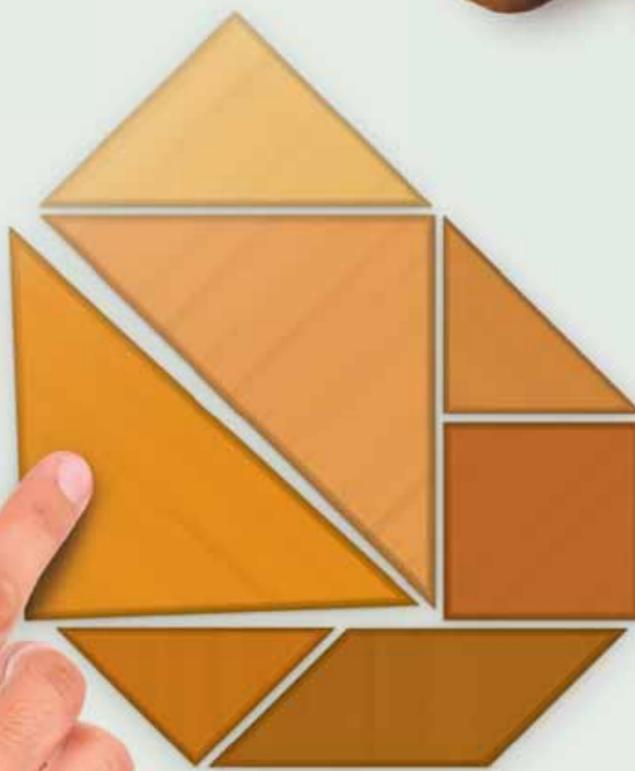


Matthew Towe



Eric Niu

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Water push and pull: essential for success



JOHN KELLY
EXECUTIVE VP, OFVGA

The Ontario government has recently released its budget, and the Government of Canada will follow suit shortly. For sure, one thing that is common between the two budgets is the focus on the environment, carbon and impact of industry on many aspects of the environment. Water quality and the impact of agriculture on water usage and release are certainly in their crosshairs. The recent announcements on the Great Lakes Water Protection Act and the implications of readily available phosphorus accentuating algal blooms in Lake Erie are strong messages to agriculture. Access to high quality and large quantities of water is fundamental to fruit and vegetable production, and its management is also essential to maintaining and enhancing sustainability of our horticultural operations.

No matter what horticultural crop is grown, the reliance on “readily-available” water does make a significant impact on production and essentially profitability at the farm level. Where this water comes from can vary from naturally sourced rainfall, rivers and lakes, dugouts and ditches, wells and technologies which conserve and re-use water. Canada is

blessed with an abundance of water, but this also means that this resource should be carefully managed. New and evolving technologies which positively impact the efficiency of water usage must be developed and ways to reduce runoff and consequent negative impacts on the environment must be avoided.

In horticulture, we are addressing the need for water, how the water is used, and how the water eventually leaves the farm including in the products derived from the plant, through transpiration and evaporation, or through exits from the farm through runoff and drainage. No matter what the route of entry and exit, if it involves the use of human-made technology and intervention, one can be assured that there will be some regulatory pressure associated with it.

The Permit To Take Water program conducted by the Ontario Fruit & Vegetable Growers' Association (OFVGA) assists growers with meeting the input needs of water irrigation. Growers should know that if they take more than 50,000 L of water per day from wells or watercourses, they are required by the provincial Ministry of the Environment and Climate Change to have a permit to take water. Similarly, as more regulations come into force for how water leaves the farm, growers will need to be aware of the importance of adhering to the rules. George Shearer, water specialist, at the OFVGA is an expert in this realm and can assist growers with these issues.

Agriculture can be a fickle business. In 2015, there were tremendous impacts of water on production in the Holland Marsh. And it was not only from a lack of water! May came in dry, and farmers were irrigating



Excess water was pumped off fields of the Holland Marsh in June 2015. Photo courtesy of Jason Verkaik.

onto their land. By the time June had come around, fields were flooded and water was being pumped off the land. A few years ago when the price of corn was high, irrigation systems in Norfolk County in Ontario that were normally reserved for horticultural crops were being used for corn.

Technology is being used to address the need for water. Precision agricultural technologies will promote fertigation being driven by sensors for specific plant nutrition in fields or in closed water systems found in greenhouses leading to the most efficient use of fertilizer. Ontario apple and grape growers are investigating ways to focus on automating and adapting existing soil moisture monitoring systems using new information (including ideal irrigation trigger,

permanent wilting point and field capacity) to assist in determining the timing and need for irrigation application.

Linda Delli Santi, executive director of the British Columbia Greenhouse Growers' Association, reported last year to the Canadian Water Summit about the new technologies being used by greenhouses to capture rain water, use of hydroponics and fertigation, and the reutilization of a combination of fresh water and recycled, clean water. Low volume micro-irrigation systems, like those provided by Vanden Bussche Irrigation, improve efficiency because they require less energy and water. The technique of aquaponics, the combination of aquaculture and greenhouse production, is also being employed in Ontario. Not only do all these make environmen-

tal sense, they also can impact the profitability of the operation.

The provision of water to agricultural operations can be expensive. When there are new pieces of legislation that affect the grower's ability to use this necessary input, the costs of production are almost always increased. The use of water in Canada is a privilege and is becoming increasingly scrutinized. The horticulture sector will do its part to conserve and efficiently use this resource but the government must recognize that these added costs through legislation continue to erode the profitability and sustainability of fruit and vegetable farmers. Farmers are excellent stewards of their lands because they recognize that without it, they could be out of business. This is also the case for water.

WEATHER VANE



Early spring, dry spring? It's time to double-check that irrigation equipment is ready to go. Last year, these newly planted fruit trees in the Niagara peninsula benefited from extra moisture. Photo by Denis Cahill.

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THE GROWER

PERSPECTIVE



Value, or values: What will drive consumers to buy your produce?



OWEN ROBERTS
U OF GUELPH

and economy, say the researchers. These traits matter a lot, and consumers overwhelmingly find them in conventionally produced food.

But in some cases, instead of sharing the spotlight with value, they're sharing it with values.

The duo developed this line of thinking a few years ago, when they looked at the difference between organic produce and its conventional counterpart.

They found consumers were basing their buying decisions on the production process. What mattered was that the products were organic. Traits such as appearance were not the ultimate driver.

More and more, the same goes for crop production. A genetically modified crop might look no different than its conventional counterpart. But people shun it because of the way it's produced, owing to the stigma around GMOs.

In fact, the genetically modified version might even look better than its traditionally produced counterpart. The modified version may have

been outfitted with traits to ward off bugs or tolerate herbicides. As a result, it's matured without being ravaged by insects and stunted by weeds.

Still, some consumers gravitate towards less visually attractive versions of the same crop, because they value non-GMOs...even if they don't know why.

In certain livestock situations, the difference might be even less obvious.

For example, two identical products such as eggs can, and do, come from very different housing systems. Some consumers will choose the eggs from hens allowed to roam about more freely than others, because they think the hens are more content than those in cages.

That makes animal welfare a part of consumers' buying decisions, even though, once again, many people believe the difference in the end product from these systems is negligible.

But even though the differences may appear slight, the cost to consumers for such

choices is significant.

The researchers say society should be aware of them when it signs onto wholesale changes in production practices, which it's already doing.

For example, driven by consumer demand, the Egg Farmers of Canada say conventional cage housing will cease to exist in 20 years. Up to 65 per cent of the hens here will be housed in non-traditional housing within the next eight years. That sounds like a long time, but it's a big change.

What will replace traditional cages? Some say no cages. Let them run free. Others call for "enriched" housing, with more space and opportunities for nesting, perching and scratching than with conventional cages, but still able to provide hens with health and hygiene benefits.

This switch in production tactics opens the doors to explain why farmers are making the change. And that's an explanation that should come from farmers, not self-interest groups. Farmers are uniquely positioned to explain what's



Orangeline Farms, Leamington, promotes its year-round production of peppers under their Zing! Healthy Foods brand. Those interested can follow #BigZing on social media. When it comes to these peppers, what will consumers' buying decisions be based on.

going on inside their own barns and in their fields, and talk about the impact of certain production processes.

Farmers are the ones who produce products from processes. It's time to hear from them, to balance the information out there about what they produce, and to make informed choices.

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Early spring, dry spring?

BRUCE KELLY

Hmmm. Another warm dry March – I remember one of those in 2012.

I remember the “backward” spring of 2012. An unseasonably warm March where bees emerged early with nothing to eat, and a late frost devastated flowering crops. Then it got dry. Remember the news clippings back to July of 2012?

“A catastrophic freeze earlier this year has apparently wiped out about 80 per cent of the apple crop in Ontario. Now the drought is exacerbating the issue.”

Weeks of drought have turned much of Ontario’s prime agricultural land into a dust bowl. And it is corn farmers, especially in the southwest and eastern parts of the province, who have been the hardest hit.” ~ CBC News, July 2012

It’s hard to predict future weather and I hold little stead in long term forecasts; the Old Farmers Almanac had called for March 2016 to be two degrees below normal, but that is wrong by all accounts. However, I do hold more confidence in the major weather patterns and ocean temperature impacts, such as the undeniable fact that this year’s El Nino pattern held the jetstream northwards. This winter, Ontario looked straight south for its weather patterns as

warm damp air from the Gulf of Mexico flowed up through Kentucky and Tennessee bringing “new water” to the Great Lakes basin.

The Weather Network is predicting that “across the Great Lakes region, we expect a trend towards drier than normal weather, especially during late spring. While there will be sufficient moisture to start the growing season, this trend towards warm and dry weather could be cause for concern for agriculture as we head towards summer.” They go on to say that, “it is still too early to know whether this summer will be remembered as truly hot and dry, or just warmer than the past few summers.”

When I mentioned the 2012 growing season to Simon French of Cookstown Greens recently, his eyes widened, he looked at me and said “I did not get much sleep that summer [...] I’m getting too old for this.”

We have gotten off pretty easy the last three summers as far as irrigation goes, only needing to water a few times each year for most crops, but we can never tell what will happen this year. On some farms there may have been a complete staff turnover since 2012, and the more experienced among us may have to give a refresher

course or two on what it really means to irrigate when Mother Nature does not co-operate.

Long nights staffing irrigation systems, running pumps hard, hauling diesel to the pump yet again, burned out motors and bearings – yep, I remember the summer of 2012. Never before have so many stared at a rain gauge after any sort of passing shower, and never before has that 1/8 inch mattered so much. And the question on my mind every morning?

“Did the pond level bounce up at all?”

I know many growers made significant changes to their farms after 2012, converting many beds to drip, with greater use of mulch and cover crops, enlarging ponds and storages and taking better advantage of systems to re-capture water within the system. As we look toward what might be a long hard irrigation season, it behooves us to wander through the shed and review our inventories of pipe and replacement parts and their condition. Meet with your suppliers to review your needs. Has the farm grown, crops or layouts changed since 2012? Has your equipment inventory kept up with changes to the farm?

Find out whether there is access to enough equipment if you really need to water hard – take a look at Katie Gibb’s irrigation assessments article entitled “Splish Splash I Was Takin a Bath Until I Optimized My Irrigation System” on B3 – and carefully measure your water application patterns to determine if you are getting an even distribution across the field. You might have gotten



AAFC Drought Map, showing abnormally dry conditions (Feb 29) across much of Southern Ontario

away with a non-uniform coverage pattern in recent wet years, but in a dry year, uneven coverage can leave some areas dry and your crop quantity and quality might suffer when the irrigation system is providing the majority of the crop’s water needs.

Let’s hope our recent warm winter is not the start of a major trend and that we have a “normal summer,” but as an industry that needs water every

week, we better be prepared when Mother Nature needs a little helping hand.

Cheers to a good growing season.

If you have any comments on this story or any Farm & Food Care projects, please contact Bruce@farmfoodcare.org or (519) 837-1326 x292.

Bruce Kelly is environmental program manager, Farm & Food Care Ontario.

COMING EVENTS 2016

- | | |
|--------------|--|
| April 2 | Garlic Growers of Ontario Annual General Meeting, OMAFRA office, Woodstock, ON |
| April 5 | PEI Wild Blueberry Growers’ Association Annual General Meeting, Charlottetown, PE |
| April 12-13 | 65th Annual Muck Vegetable Growers’ Conference and Trade Show, Bradford Community Centre, Bradford, ON |
| April 12-14 | Canadian Produce Marketing Association 91st Annual Convention and Trade Show, Calgary, AB |
| April 13 | Farm & Food Care Annual Conference, Teatro Conference and Event Centre, Milton, ON |
| April 22 | Earth Day |
| May 18 | Canadian Association of Farm Advisors’ Farm Succession Update Conference, Ajax, ON |
| June 3 | Vineland Research and Innovation Centre Greenhouse Open House, Vineland, ON |
| June 8 | Ontario Agri-Food Education Inc. Annual General Meeting, Country Heritage Park, Milton, ON |
| July 18 – 21 | International Fruit Tree Association Regional Study Tour, Rochester to Geneva, NY |
| August 3 | Controlled Atmosphere Clinic, Grand Rapids, MI |
| August 17 | Peak of the Market Family Fun Day, Winnipeg, MB |
| Aug 18-20 | Quebec Produce Marketing Association Annual Convention, Montreal, QC |
| Sept 13 - 15 | Canada’s Outdoor Farm Show, Woodstock, ON |
| Oct 5, 6 | Canadian Greenhouse Conference, Scotiabank Conference Centre, Niagara Falls, ON |
| Oct 14-16 | Produce Marketing Association Fresh Summit Conference and Expo, Orlando, FL |
| Nov 4-13 | Royal Agricultural Winter Fair, Direct Energy Centre, Toronto, ON |
| Nov 21-23 | 50th Annual Alberta Potato Conference and Trade Show, Fairmont Banff Springs Hotel, Banff, AB |

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RETAIL NAVIGATOR

More items sold on temporary price reduction than ever



PETER CHAPMAN

Sales are the number one priority for your customers. They have to keep driving traffic to their stores or the economics just don't work. It is very important for suppliers to be engaged with driving sales and supporting their customers. We are training the consumer to shop for items on temporary price reduction more and more. You need to understand the impact on your items and how to manage this trend.

Are you playing the game?

We know the number of items on sale, in store special or any other form of temporary price reduction continues to increase. Retailers must keep the traffic coming into the store and the front page of the weekly flyer is still the most effective tool they have. Investments in loyalty programs, the shopping experience and new offerings are there but when they need volume, retailers revert to item and price.

Ads need to be a part of your business plan. The better prepared your business is, the more effective they can be to drive your sales at a reasonable cost. It is unfortunate because we are training the consumer to buy on special more than ever. Walmart has even moved away from their famous every day low price strategy in Canada to offer deep discounts on the front page of their ad.

Be prepared

It is very important to track the ads in your category. You should understand how often the items go on sale and what the level of discount is. This includes all spaces in the ad. We focus on the front page but there are many more items inside that deliver important sales and more margin to retailers and suppliers.

There is a great app called Flipp that can make this process easy for you. Select the stores you want to follow and each week you simply search for the items you want to track. In just a few minutes you can see all the ads.

If you are selling to national

chains it is beneficial to look at the other regions as well. You might see something in another region that would be good for you.

When you review the ads, look for ideas such as bundling items or multiple pricing that might work for your products. Often this will be an opportunity to promote items that would not warrant the space on their own or allow for a slightly higher retail.

Develop your promotion plan

Often suppliers think they need to wait for retailers to request an ad. If you subscribe to this philosophy you will only be on sale when they want it, not when it works best for both. You need to be proactive and develop a promotion plan to present to the category manager. You might not get everything you want when you want it but it is better to lead the discussion. Often they are busy and especially for inside items a suggestion will end up getting the space.

The best place to start your plan is with last year. What happened and when? If there were successful ads, slot them in again. You should also review your ad tracking to see when they advertised your competitor's products. These might be opportunities for you. Consider the best time for your business and the item -- does it fit with the retailer's plan?

One important number to understand in planning ads is what retailers refer to as the "X factor." This is the multiplier on ad relative to regular weekly movement. For example if the item sells an average of 1,000 cases per week and this increases to 5,000 cases on ad, the X factor is 5. This is very important for ordering ad inventory. Predicting ad inventory is one of the toughest challenges for you and the retailer. Too little results in out of stocks with lost sales and unhappy consumers, too much is excess inventory that costs money and takes up space. You should spend time looking at ad volume to ensure you can predict the volume as accurately as possible. In your promotion plan consider all blocks in the ads. Two inside spaces can deliver as much volume as a back page slot, with more margin.

When you have an ad

When your item is planned for an ad you should do three things:

1. Make sure you have the appropriate level of inventory
2. Go to the stores to check the execution
3. Follow up after the ad to

assess what worked and what could be done better. Once you understand the place in the ad and the level of discount you should have an estimate of sales. Review this with the retailer to ensure you are both thinking of similar numbers. If you are not close you need to do more work to get close.

You need to have the inventory available that the retailer has planned for the ad. If you do not, then the sooner you let them know the better. Do not wait or you will cause them more grief. You should also have some safety stock, depending on the lead times and shelf life of your item. This is more realistic for some items than others. When you get the purchase order for the ad stock, review it to make sure it is in line with your estimates. The communication between category managers and buyer is not always perfect.

The week the item is in the ad you should visit stores whenever possible. You will be judged based on the sales from the ad. If the stores do not ex-



ecute you need to know so you can communicate to the retailers. If you see issues early on there is time to react. Do not assume everything works properly. I have seen many examples where an item does not ship from the warehouse because a flag in the system is wrong or there is an issue with the item number. You improve your value to the customer if you are the eyes and ears for them.

Following the ad, it is good to assess the level of sales relative to the projections and some consideration for the good and the bad. If possible, what would you change next time? Perhaps

more safety stock or a different booking process for stores to have more input into inventory going to them? There are many things that can impact the performance of an ad. The better prepared you are to talk to your customer the better the experience will be the next time. If you are prepared for ads, they can be a boost to your business that does not break the bank. If you have other ideas for developing a promotion plan or if you have any questions please give me a call at (902) 489-2900 or send me an email at pchapman@gpsbusiness.ca.

Peter Chapman is a retail consultant, professional speaker and the author of A la cart-A suppliers' guide to retailers' priorities. Peter is based in Halifax NS, where he is the principal at GPS Business Solutions. Peter works with producers and processors to help them navigate through the retail environment with the ultimate goal to get more of their items in the shopping cart. pchapman@gpsbusiness.ca.

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POTATO PRODUCTION

Think twice before buying potato seed out of province

KAREN DAVIDSON

To date, the genome of the potato has not been sequenced because it's so complex genetically. Chinese researchers are close to solving the puzzle, but until then, the potato must be vegetatively propagated. As an autotetraploid, that makes the spud very susceptible to diseases.

For these reasons, Neil Gudmestad, seed potato pathologist, North Dakota State University, advises care in bringing seed potatoes to your farm. In fact, he would not recommend sourcing seed out of province.

"There are more than 150 diseases of potato globally, 40 of which are economically important," Gudmestad told his audience at the Ontario Potato Conference. "All can be carried either on or in the seed tuber."

Types of Seed-Borne Pathogen

Type 1 – pathogen carried in the soil adhering to the surface of the potato tuber, Eg. Any soil-borne pathogen such as cyst nematodes, pink rot and Verticillium wilt pathogens

Type 2 – pathogen carried in seed coat or in periderm (skin) of potato tuber
Eg. Silver scurf and black dot pathogens

Type 3 – pathogen in seed endosperm or vascular system of propagule tuber
Ex. Ring rot bacterium, *Dickeya* sp

Type 4 – pathogen carried systemically in seed embryo or in all internal tissues of tuber
Eg. All potato viruses – PVY, PLRV, potato "Mop top" virus

Here's how regulatory agencies treat these pathogens. Type 1 and 2 are either not regulated or if they are regarded as an invasive pathogen – then controlled by quarantine by the Animal and Plant Health Inspection Service (APHIS) or the Canadian Food Inspection Agency (CFIA). Type 3 and 4 pathogens are most commonly regulated through seed certification regulations, occasionally by quarantines.

Gudmestad understands there are valid reasons to buy out of province, most commonly to access newer varieties. But the risks are huge of either importing a major disease problem, or worse yet, importing a pathogen that can do irreparable harm to your farm. Some of these risks include: powdery scab, bacterial ring rot, cyst nematodes, new strains of potato mop-top virus or *Dickeya*. Questions remain how APHIS and the CFIA will regulate these new strains of pathogens.

"I personally recommend that potato growers avoid, if at all possible, buying seed from out of province," says Gudmestad. "If you must buy seed, remember to get a North American Plant Health Certificate in advance of purchase. Ask questions about diseases such as *Dickeya*, that are not specifically addressed on the certificate."

"The risks that you will 'buy' a problem that does not exist in your province are higher than you think in this day and age," he continues. "When in doubt, request a post-harvest test or evaluation by a qualified lab."

In answering questions from the audience, he indicated that growers should ask for results on sample sizes of at least 400 tubers. "That's a good statistical sample size that gives you some assurance you're down to 0.5 per cent probability of a disease."

Warming seed positively affects emergence and marketable yield

July 21, 2014

Seedlot # 3



Warm

How seed is handled can make a difference in emergence as well as marketable yield.

Cold

That's the conclusion of New Brunswick's Potato Industry Transformation Initiative and a

Seedlot # 6



Warm

recent report by Loretta Mikitzel. She's a potato physiologist with the New Brunswick Department

Cold

of Agriculture, Aquaculture and Fisheries who spoke at the Ontario Potato Conference.

After two years of trials, there was a positive difference of 21 cwt per acre when seedlots were warmed before planting, especially in less than ideal conditions. With climate change, that's a difference worth noting. There was more rapid and uniform emergence, higher yields and greater value. Some seedlots don't benefit from warming, Mikitzel warns, so know the condition of your seedlot in late spring.

In trials conducted in 2014 and 2015, seedlots were received in early March and stored at 4°C. The seed was evaluated for physiological age by sprouting tubers in the dark at 18°C.

For the stored warm treatment, in early May, half of each seedlot was cut into seed pieces, treated with Maxim and stored at 7-10°C until planting. For the stored cold treatment, half of each seedlot was stored at 4°C until late May then cut and treated, and stored at 10° until planting. Planting occurred in processing fields on June 2 (2014)

and May 25 (2015).

Differences in seedlot emergence were visually apparent.

A seedlot warming demonstration was conducted at the McCain Research Farm, Greenfield, New Brunswick, in 2015. It was evident that the Russet Burbank variety benefited from precutting and warming when stored at 10°C for 26 to 33 days before planting. The Innovator variety was shown to perform best when pre-cut and stored at 10°C for 19-33 days before planting.

Mikitzel concluded that the highest yields and crop value were achieved with pre-cut seed. The lowest yields and crop value were recorded when seed was held at 4°C until planting, and warmed for only six days before planting.

"Don't have the tubers sweat," she reminded growers when warming tubers. "Warm gradually over a week or so."

She confirmed that if warmed seed was planted into cold soil, growers would have a rot problem.

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Test seed potatoes for
Dickeya

Here is some additional information to supplement the March 2016 article of Tracy Shinnars-Carnelley, "Bacterial soft rot: new name, new pathogen, new problem?" It is sourced from Amy Charkowski's presentation at the 2016 Ontario Potato Conference held in Guelph on March 1. She is a seed potato researcher with the University of Wisconsin-Madison.

Dickeya dianthicola, the new blackleg pathogen has the ability to remain dormant in tubers when temperatures are low e.g. at harvest time and in seed storages. Infected tubers look healthy at

planting, but the disease develops when soil temperature increases. Seed tubers may rot in the soil (poor emergence) or infected plants emerge, which eventually die but also can spread the disease to neighbouring plants.

The point is that growers should have the seed tested for *Dickeya* because if the disease is dormant, tubers would look fine at planting but there could be serious losses.

Charkowski's presentation on *Dickeya* is available at the University of Wisconsin-Madison website.



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fig. 4

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LABOUR

New research finds vacant jobs in agriculture cost producers \$1.5 billion



Photo by Glenn Lowson

New figures released by the Canadian Agricultural Human Resource Council (CAHRC) illustrate the increasing challenges that labour constraints are having on Canada's agriculture and agri-food sector.

According to CAHRC, annual farm cash receipt losses to Canadian producers due to unfilled vacancies are \$1.5 billion, or three per cent of the industry's total value in sales and production. This finding is

part of new Labour Market Information (LMI) research, which was released during the 'Growing the AgriWorkforce Summit' in Winnipeg. These losses reflect a myriad of missed opportunities for producers, resulting from delayed and increased lost production, added costs, or forced changes in plans to expand or upgrade facilities.

The LMI research also revealed that primary agriculture still has the highest

industry job vacancy rate of any industry at seven per cent. The research was based on 2014 figures.

The Canadian Federation of Agriculture (CFA) recognizes the urgent need to find solutions for agricultural labour constraints and has worked with CAHRC on this project since its inception.

"These new findings from CAHRC clearly highlight the need for a long-term strategy

that will address the challenges Canadian producers are facing due to labour issues," says CFA President Ron Bonnett. "The CFA thanks CAHRC for undertaking this important research and will be reviewing the information extensively to determine the appropriate next steps for establishing collaborative solutions between industry and government."

The current gap between labour demand and the domestic workforce is 59,000 and projections indicate that by 2025, the Canadian agri-workforce could be short workers for 114,000 jobs. In response, industry efforts have been encouraging young people and workers from other sectors to get into agriculture as a career. Despite extensive efforts gaps still exist and there still will be a large void in the future.

"The situation is critical now and will only get worse unless it is effectively addressed," explains Portia MacDonald-Dewhirst, CAHRC executive director.

CAHRC's research indicates that while agricultural labour shortage is critical today, it will be even more so 10 years from now, with dire consequences for

business viability, industry sustainability and future growth. This has the potential to affect food security for Canadian consumers, as well as export potential for Canada's entire agri-food industry.

Furthermore, given that the agri-food sector contributes nearly \$107 billion annually to the country's gross domestic product and provides one in eight Canadian jobs, the troubling trends identified in CAHRC's research are not limited to just agriculture, and could have significant implications throughout the Canadian economy.

The LMI research was derived from surveys, interviews and focus groups conducted with 1,034 representatives of Canadian agricultural organizations, employees, and employers - 813 of whom were primary producers.

More information on this research can be found at www.cahrc-ccrha.ca. The LMI research was funded by the Employment and Social Development Canada (ESDC) Sectoral Initiatives Program.

Source: Canadian Federation of Agriculture news release

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ONvegetables



Ontario Ministry of Agriculture, Food and Rural Affairs

New options for controlling powdery mildew in pumpkins and squash

ELAINE RODDY

Much has changed in the world of powdery mildew control. Five years ago, we had three products from which to choose (two conventional and one organic). Today the cucurbit powdery mildew control list contains 15 different active ingredients (10 conventional and five organic.) The conventional products come from five different chemical groups, which is excellent news for product rotation.

It is nice to have these many options, but sometimes decisions can be overwhelming. Optimum powdery mildew control is a combination of variety selection, fungicide timing and fungicide selection.

Consider using powdery mildew-tolerant varieties to reduce disease pressure in the crop. In heterozygous varieties, the resistance comes from one parent. These varieties are powdery mildew-tolerant, but will still develop symptoms under heavy pest pressure. Homozygous resistance comes from both parents. These plants show a higher level of resistance.

Whether using regular, tolerant or resistant varieties, scouting is the key to effectively managing this disease. As soon as the disease is identified in the crop, apply the most effective fungicide products first. Disease management is not a case where you want to “save the best for last.” Follow up applications may be required on seven to 10 day intervals, depending on when the disease arrives in Ontario and the weather conditions during fruit-sizing and ripening.

The control threshold for powdery mildew is one disease lesion per 50 leaves. Lesions initially develop on the lower leaf surface or petioles of older leaves. Fungicide sprays will not be effective once the disease is established in the crop and the lesions are readily apparent on the upper leaf surfaces. Not only is it ineffective, spraying after the disease is established in the crop also increases the risk of developing fungicide resistance.

Cheryl Trueman, a vegetable pest management researcher at the University of Guelph's Ridgetown Campus, has been conducting downy mildew efficacy trials since 2009. In

these trials, several products consistently provided good control of powdery mildew. These products are powdery mildew targeted, and have a single site mode of action. To prevent the development of resistance, it is essential to always rotate between different fungicide groups and/or tank mix with a broad spectrum fungicide.

Powdery Mildew Targeted Fungicides Showing Consistent Control in the Ridgetown Field Trials:

Group 13
Quintec (quinoxifen)
Group 7¹
Fontelis (penthiopyrad)
Group U8
Vivando (metrafenone)

¹ Note: Aprovia, Sercadis and Pristine are also group 7 fungicides, however they were not tested in the Ridgetown Campus trials.

Several group 3 fungicides are labelled for powdery mildew in cucurbits including: Inspire (difenoconazole), Proline (prothioconazole) and Quadris Top (azoxystrobin/difenoconazole). The efficacy data for these products is not as strong as the ones listed above, however they

Scouting protocol for all cucurbit diseases:

- In fields less than 10 acres in size, inspect a minimum of 100 plants
- Inspect 200 (10 at 20 locations) in larger fields.
- Look at upper and lower leaf surfaces and leaf petioles.
- Be sure to include field edges and low lying areas.
- Don't underestimate the impact of dew.
- Know the period of activity and environmental conditions for each disease.
- Start scouting well in advance of the typical period of activity.



Figure 1. PM lesion on lower leaf surface. One leaf in 50 = time to spray!

may be useful for product rotation. Fungicides containing chlorothalonil (Bravo ZN and Echo) provided a similar level of powdery mildew control.

Research in Ontario and other jurisdictions indicates that the group 11 (QoI) fungicides no longer control powdery mildew. However, they may provide control of other cucurbit diseases such as anthracnose and alternaria.

The powdery mildew

targeted fungicides listed above will not provide control of other foliar cucurbit diseases unless tank-mixed or alternated with a broad spectrum fungicide such as chlorothalonil (Bravo ZN, Echo) or mancozeb (Dithane, Manzate, Penncozeb). These broad spectrum fungicides are also valuable for resistance management.

Elaine Roddy is vegetable crops specialist, OMAFRA.

Interested in monitoring for brown marmorated stink bug? Traps are available

HANNAH FRASER

Brown marmorated stink bug is an invasive pest that has made its way to Ontario. In the U.S., it has caused economic injury in many agricultural crops, including tree fruit and vegetables. Our surveys over the last few years as well as confirmed homeowner finds indicate that it is established in many parts of southern Ontario. Early field detection is important in limiting economic injury. In addition to regular

scouting on your farm, traps for monitoring both nymphs and adults are available. These can help you to identify locally established populations and take necessary action.

We have a limited number of traps and associated supplies available for use by interested growers and consultants this year.

If interested in participating, you will be required to:

- Set up the trap(s) (instructional video provided)
- Check trap(s) weekly

- Collect any insects in the trap
- Take a digital picture of any suspects
- Keep suspects, send in your pictures via email

Traps should be set up by June and taken down in September. They are easy to use, and are a good compliment to field monitoring.

For more information on BMSB, visit ontario.ca/stinkbug.

Hannah Fraser is entomology program lead – horticulture, OMAFRA



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Workshop	Date & Time	Location	Workshop Leader	Materials needed
Introduction to IPM	April 28 8:30 a.m. – 4:00 p.m.	Conference Rm 1, 2 and 3 1st Floor, 1 Stone Rd. West, Guelph	Denise Beaton	Handouts provided Lunch on your own Pay parking (\$12/day)
Tomatoes & Peppers	April 29 8:30 a.m. - 1:00 p.m.	PSC 003 Pestell Building (lower level), Ridgetown Campus.	Janice LeBoeuf	Handouts provided See Resources for Vegetable Crop Scouts Lunch on your own
Apples	May 4 9:00 a.m. - 3:00 p.m.	Auditorium, Simcoe OMAFRA Resource Centre	Kristy Grigg-McGuffin	Handouts provided If possible, bring OMAFRA Publications 360 & 310 (available for purchase as well) Lunch on your own
Lettuce, Celery, Onions, Carrots	May 9 10:00 a.m. - 2:00 p.m.	Conference Rm 3 1st Floor, 1 Stone Rd. West, Guelph	Mike Celetti	Handouts provided See Resources for Vegetable Crop Scouts Lunch on your own Pay parking (\$12/day)
Tender Fruit and Grape	May 9 9:00 a.m. - 1:00 p.m.	Rittenhouse Hall, Vineland OMAFRA Resource Centre	Wendy McFadden- Smith	Bring a laptop with WiFi capability Lunch on your own
Cole Crops	May 12 10:00 a.m. - 2:00 p.m.	Conference Rm 3 1st Floor, 1 Stone Rd. West, Guelph	Mike Celetti	Handouts provided See Resources for Vegetable Crop Scouts Lunch on your own Pay parking (\$12/day)
Strawberry and Raspberry	May 18 8:00 a.m. - 4:30 p.m.	Auditorium, Simcoe OMAFRA Resource Centre	Pam Fisher	Require OMAFRA Publication 360, Guide to Fruit Production (\$20) Lunch on your own
Blueberry	June 1 3:30 p.m. - 9:30 p.m.	Auditorium, Simcoe OMAFRA Resource Centre	Pam Fisher	Require OMAFRA Publication 360, Guide to Fruit Production (\$20) Dinner is provided (\$20)
Sweet corn, Peas and Beans	May 11 9:00 am - noon	Room 102 Rudy Brown Rural Development Centre Ridgetown Campus	Elaine Roddy	Lunch on your own
Cucurbit Crops	May 11 1:00 pm to 4:00 pm	Room 102 Rudy Brown Rural Development Centre Ridgetown Campus	Elaine Roddy	Lunch on your own
Asparagus	<i>field session available upon request</i>		Elaine Roddy	
Hops	April 8 1:00 p.m. – 3:30 p.m.	Large Boardroom, Woodstock OMAFRA Resource Centre	Melanie Filotas	Handouts provided
Ginseng IN-FIELD	June 17 1:00 p.m. - 3:30 p.m. (Rain date: June 20 from 1:00 p.m. - 3:30 p.m.)	C&R Atkinson Farms Ltd. 228 Charlotteville Rd. 1, St. Williams	Sean Westerveld, Melanie Filotas	

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BITS AND BITES

Program to strengthen best merchandising practices for greenhouse vegetables in the U.S.

The Ontario Greenhouse Vegetable Growers (OGVG) has announced funding from Growing Forward 2 (GF2) for up to \$172,000 over the next two years to implement a Retail Educational Merchandising Program for the U.S. market.

The goals of this project are to educate U.S. retailers on best merchandising practices, develop and strengthen supply chain relationships, and ultimately increase Ontario greenhouse vegetable sales in the U.S. marketplace.

“Our government is happy to support organizations like the Ontario Greenhouse Vegetable Growers through Growing Forward 2 to reach new

markets, and promote Ontario’s high quality and delicious produce at home and abroad. By working with industry organizations we can expand opportunities for Ontario products in foreign markets and build a larger, stronger agri-food sector here in Ontario,” said Jeff Leal, Ontario Minister of Agriculture, Food and Rural Affairs.

“The greenhouse vegetable sector is an important part of Canadian agriculture. The Government of Canada is pleased to support this program to increase sales and continue to grow the agri-food sector,” said Lawrence MacAulay, federal Minister of Agriculture and

Agri-Food.

OGVG general manager Rick Seguin notes: “The demands for retail education have multiplied and OGVG is committed to the development of an educational program for the U.S. marketplace. With rapid changing supply chain demands, OGVG’s education program will offer additional product knowledge and allow OGVG to expand on established and create new relationships to increase the overall demand of Ontario greenhouse vegetables.”

Source: Ontario Greenhouse Vegetable Growers’ news release



Colio Estate Wines makes purchase of local craft cidery

Colio Estate Wines has purchased Provincial Beverages of Canada Inc., located in Thornbury Village, Ontario, a leading producer of award-winning, premium, Ontario craft ciders and beer. The deal will enhance Colio Estate Wines portfolio through winning entries in the fast growing Ontario craft cider and beer categories.

Colio plans to invest in the existing century-old historic facility located in Thornbury Village to create a unique retail

and hospitality experience capitalizing on the beautiful views of Georgian Bay and the Blue Mountains.

“Our Company has kept a keen eye on the development of the local craft beer and cider category. This opportunity allowed us to gain a significant entry with one of the leading producers of high quality craft beer and cider in Ontario,” stated Jim Clark, president of Colio Estate Wines.

In the more immediate term, Colio plans to move the existing

Brewery located in Nobleton to the Thornbury Village site, amalgamating the cidery and brewery production under the banner of Thornbury Village Brewery and Cidery. Plans are underway to open distinct cider and brewery retail stores at this location. Retaining key beer and cider sales and production expertise will ensure the continued growth and success of the Thornbury family of brands.

Source: Canada Newswire



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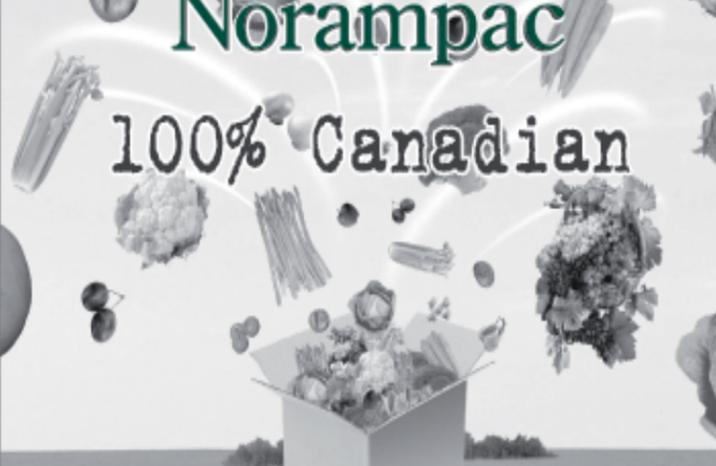
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MINOR USE

Reminder to apple growers: last year to use diazinon

Health Canada's Pest Management Regulatory Agency (PMRA) conducted a re-evaluation of diazinon uses in Canada and determined that most uses could no longer be supported due to health and environmental risk concerns. Through consultation with stakeholders, critical uses of diazinon that had no alternative control strategies were identified for longer-term phase-out to provide more time to develop a risk management plan. In June 2013, PMRA communicated the phase-out dates for diazinon products and the mitigation measures

required to further protect workers and the environment, which can be found in their consultation document titled REV2013-01, Diazinon Risk Management Plan.

How will this phase-out affect Canadian apple growers?

In apples, the last date of use for both registered diazinon products, Diazinon 50 WSP (PCP #29976) and Diazinon 500 E (PCP #11889) is December 31, 2016.

Alternative options for diazinon are available for most

apple pests. However, alternative products may be limited based on the number of different chemical groups to rotate between for resistance management and/or certain alternatives may not provide as effective or consistent control as diazinon for some insect pests (e.g., mullein bug, woolly apple aphid).

With relatively few alternative options for some pests, it is important to take the following steps to avoid development of insecticide resistance:

- For pests with discrete generations (ie., mullein bug, apple

maggot, scale, leafcurling midge), do not use insecticides from the same group for more than one generation. Within a generation, if more than one spray is required, use a product from the same chemical group.

- For pests with rapidly building and overlapping generations (ie. aphids), do not use products containing the same chemical group in consecutive applications.

For a chart on alternatives for some pests commonly controlled by diazinon, see <http://ow.ly/ZGlcN>

Source: OMAFRA Orchard Network newsletter



Photo by Glenn Lawson

New FRAC group created for Fracture fungicide

The U.S.-based Fungicide Resistance Action Committee (FRAC) has assigned Fracture fungicide from FMC to a newly created FRAC Group. When FMC launched Fracture fungicide in 2015, the broad spectrum, biological fungicide formulated with ProBLAD technology had such a unique mode of action that it could not be classified by current FRAC Group codes.

FRAC codes are created by the committee to group fungicide active ingredients by modes and sites of action to prolong the effectiveness of at-risk fungicides and to limit crop losses should resistance occur. The FRAC codes also help growers and crop advisors identify which products to rotate to maintain effective disease control and minimize resistance development.

The committee recently added the new FRAC Group M12 for Fracture fungicide and its active ingredient, the lupine extract called BLAD. Like other M group classifications, Fracture fungicide has "multi-site contact activity" and is considered a low risk for development of resistance, according to the FRAC publication.

Fracture fungicide is labeled for the prevention and control of powdery mildew, botrytis and brown rot blossom blight. It is a patented fungicide labeled for use in Canada on grapes, strawberries and tomatoes. With a one-day pre-harvest interval and a four-hour re-entry interval, Fracture fungicide can be applied up to five times per season, providing growers with a flexible management tool that offers quick, reliable disease control that meets or exceeds established standards.

To learn more about Fracture fungicide visit: fmccrop.ca/products/fracture/

Source: FMC news release



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*AgCelence benefits refer to products that contain the active ingredient pyraclostrobin.

Always read and follow label directions.

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MINOR USE

Lontrel herbicide label expanded for management of weeds on turnips

JIM CHAPUT

The Pest Management Regulatory Agency (PMRA) recently announced the approval of an URMULE registration for Lontrel herbicide for control of weeds on turnips in Canada. Lontrel herbicide was already labeled for use on a range of crops for weed control in Canada. Although rutabagas were already labeled on the Lontrel herbicide label, turnips were not...and these two crops are different despite what many people believe. www.differencebetween.net/object/difference-between-turnip-and-rutabaga/

This minor use project was

submitted by Ontario in 2014 as a result of minor use priorities established by growers and extension personnel.

The following is provided as an abbreviated, general outline only. Users should consult the complete label before using Lontrel herbicide.

Lontrel herbicide is toxic to non-target terrestrial plants. Do not apply this product or allow drift to other crops or non-target areas. Do not contaminate off-target areas or aquatic habitats when spraying or when cleaning and rinsing spray equipment or containers.

The use of this chemical may result in contamination of groundwater particularly in areas where soils are permeable

Crop	Target	Rate (L/ha)	Applications	Pre-harvest interval (days)
Turnips	Labeled weeds	0.42 – 0.56	1 (One) as a post-emergent spray	30 (turnip roots), 15 (turnip greens)

and/or the depth to the water table is shallow.

Follow all other precautions and directions for use on the Lontrel label carefully.

For a copy of the new minor use label contact your local crop specialist, regional supply outlet or visit the PMRA label site www.hc-sc.gc.ca/cps-spc/pest/registrant-titulaire/tools-outils/label-etiq-eng.php

Jim Chaput is OMAFRA's minor use coordinator based in Guelph.



Entrust and Success insecticide for control of spotted wing drosophila on stone fruit



The Pest Management Regulatory Agency (PMRA) recently announced the approval of URMULE registrations for Entrust and Success insecticide (spinosad) for control of spotted wing drosophila (SWD) on stone fruit (crop group 12-09), which includes apricots, cherries, nectarines, peaches, plums and plumcots in Canada. Entrust and Success insecticide were already labeled for use on a number of crops in Canada for control of insects.

These minor use projects were submitted by British Columbia in collaboration with other provinces in 2014 as a result of minor use priorities established by growers and extension personnel.

The following is provided as an abbreviated, general outline only. Users should be making pest management decisions within a robust IPM program and should consult the

Crop	Target	Rate ENTRUST (mL/ha)	Rate SUCCESS (mL/ha)	Applications	PHI (days)
Stone fruit (CG 12-09)	Spotted winged drosophila (SWD)	364	182	Maximum of 3	1 (peach, nectarine) 3 (apricot, cherry, prune,

complete label before using Entrust or Success insecticides.

Entrust and Success insecticide are highly toxic to bees exposed to direct treatment, drift or residues on flowering crops or weeds. Do not apply this product to flowering crops or weeds when bees are present. Entrust and

Success insecticide are highly toxic to aquatic invertebrates and harmful to parasitoids and predatory mites. Do not apply this product or allow drift to other crops or non-target areas. Do not contaminate off-target areas or aquatic habitats when spraying or when cleaning and rinsing spray equipment or

containers. Follow all other precautions and directions for use on the Entrust and Success labels carefully.

For a copy of the new minor use label contact your local crop specialist, regional supply outlet or visit the PMRA label site www.hc-sc.gc.ca

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MINOR USE

New fungicide for late blight, downy mildew

Syngenta's new fungicide Orondis Ultra is labelled for protecting potatoes against late blight for up to 21 days, however it's also a good fit for preventing downy mildew in cucurbits, onions and leafy vegetables.

Downy mildew is proving more problematic every year, especially in cucumbers. The disease does not overwinter in Canada, but is reintroduced each year by spores that are carried on winds from the southern United States. It's not a disease controlled by crop rotation. Every year, it's a blank slate on what disease pressure may develop. Some growers follow the disease tracking website from North Carolina University, while most rely on OMAFRA warnings. Once Ohio and Michigan have reports of downy mildew, then Ontario and Quebec growers must step up their protection program.

"It's shocking to the industry how quickly disease resistance has grown right across North America to new fungicides," says Jim Anderson, Syngenta's agronomic service representative for eastern Canada. "Orondis Ultra is unique in that it can work on these water molds – oomycetes – that infect leaves, and has no cross resistance to other products."

As Anderson explains, this new product is unique in that it is a true systemic. That means the active ingredient -- oxathiapiprolin – moves through the xylem up into new growth, providing up to two weeks of protection in the new developing leaves. The product is very active at low rates.

The company is co-packing Orondis Ultra with mandipropamid, the same active found in the fungicide Revus. One case will treat 50 acres. This is a stewardship program to help prevent resistant strains by using two modes of action.

Here's how Anderson recommends product use.

- Both parts of the boxed product should be added to the tank, Orondis Ultra A first followed by Orondis Ultra B for mixing order
- For cucumbers, add a broad spectrum protectant such as BravoZn
- Use Orondis Ultra as a preventative product not a rescue
- Use the product no more than in one-third of the entire season's spray program
- Never use Orondis Ultra back to back – use at least two other modes of action before returning to Orondis Ultra

This product is best used as a preventative once disease is reported in nearby states. Second plantings at this time can benefit from band spraying for lower cost. Move to broadcast spraying once the canopy is in place.

The label has pre-harvest interval of zero days and re-entry interval of 12 hours. Always consult the label before use. For more information, go to www.syngenta.ca.

Photos right: The first picture shows downy mildew, with typical angular yellow, necrotic spots on the leaf, usually on the lower leaves first. The lower leaf surface shows the downy appearance in the morning, especially with dew.

The second shot shows cucumber in the front row severely affected with downy mildew while the row of squash behind is unaffected with downy mildew, but showing signs of the white powdery look of powdery mildew. Pumpkins, squash and zucchini have more problems with powdery mildew. Photos courtesy of Jim Anderson.



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MINOR USE



CRAIG'S COMMENTS

Trust and consequences

CRAIG HUNTER
OFVGA

beside you, who is so large that they take half your seat space too, has given you an anxiety attack." When you carefully place your coat and small compliant-size carry-on in the over-head rack, they come along later and crunch it all up or move it to accommodate an over-sized non-compliant sized bag to accommodate a late passenger. So much for Ms./Mr. nice person! Trust? Do you think you can fly that one past me?

The banks come a close second place. Even though banking is a service industry, they have precious little front line staff left to perform service. It seems that the machine is expected to do everything a teller once did, except to explain things, be able to react to an uncommon need, and to keep the customer a happy customer. You can imagine the response when the machine did not do as was asked, and the attendant's response after a 10 minute (timed) wait was 'oh, it does that sometimes-please get in line (another 10 minutes) and a teller can help you!' The silent scream almost escaped my lips. Then there is the come-on of a (slightly) higher interest rate if you open a new account. The fine (extremely fine so seniors, who may actually have money to open a new account, cannot read it) print says the higher rate is only for three months, and there is a penalty (costly) if you close the account prematurely or drop the balance below a (relatively) high amount. The best one is where they do not tell you they are going to secure your line of credit by attaching a collateral lien on your home. This changes your insurance cost (in my case by \$300) which is the only way I would have ever known they had done it! Trust? Humbug!

Human resource 'specialists' are high on the list too. They are trained to say 'we cannot do that' and repeat it over and over



again. It is so tragic that they actually believe they cannot do (anything). It is hilarious to see how quickly they can jump an anointed staffer through the hoops of progression because of whom their patron saint(e) is, and all the while someone else gets to cover for their work or lack thereof. The worst thing one can do is to be the best at what they do. That person will never get progression because "Who can we ever get to do their job?" comes into play. Compare that to the person who never blots their copy book and always gives dutiful allegiance to their boss. The proverbial ass-kisser never does anything controversial (and maybe never accomplishes anything of value either) but gets pushed or pulled through the ranks nonetheless! The H.R. staff can manipulate anyone anywhere if they are directed to do so. The key to the opening phrase is what is left off the end of the sentence: 'unless someone important to our future tells us to do so.' Trust? Whom do you think is sponsoring me?

We all hear the ads that wheedle and cajole the public to buy something they hadn't realized up until then could be so important to their beauty, health, prosperity,

attractiveness, wealth, success and that they will be amongst the first to get it! People actually get conned every day by these approaches. It can be via the television, radio, social media, newspapers or curse of curses the telemarketer. The real go-getters even come door to door, usually selling natural gas contracts (at inflated prices) to unsuspecting homeowners. All of these approaches have things in common. Over promise, under deliver, and be impossible to find later. Optimism just drips from them as they give their spiel. They are optimistic they have a live one (you) and ever optimistic that you will never meet them again after a sale. (That is why sales people are parachuted into neighbourhoods far from home) The ads for weight-loss equipment start in earnest right after Christmas over-indulgence time. Duct cleaning just before spring and fall temperature changes, gas guys after cold winters when bills skyrocket, and the window guys are now year-round. Cell-phone plans get lots of air-time and even offer to pay (part) of the cost of changing from another service provider. The small (read tiny) print (they got the idea from the banks) states the new rate is

only for three months and then you pay through the teeth for three or four years to come! (How else do they pay for those up-front benefits?) Beware of what you are signing. Trust? Who are you kidding?

Politicians? Used car salesmen? Do I have to say more? Trust? Ever heard the word in the same sentence as those guys?

So who can you trust? It depends on the day and the subject. I have a good friend I would trust on almost anything except which restaurant to favour. 'The food is not that spicy' from him means it will only burn out my mouth in two minutes and not instantaneously. Then there is my curling buddy who says the ice interval time is 2.95 seconds and when that is what you throw and it comes up short the response is 'well, the ice was a bit slower on that track!' Then there is the pal who says he likes what I write, only for me to find that page of *The Grower* at the bottom of the birdcage. "The birds can so read it!"

Trust is a valuable thing, hard to earn, and quick to fly away never to return. Cherish it, never take it for granted, and be healthily skeptic always!

Trust me.



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MINOR USE

New blockbuster BASF fungicide in advanced development phase



At BASF world headquarters in Germany, the company is reporting a promising pipeline of new crop protection products. In 2015 alone, BASF spent €514 million on research and development in the crop protection division.

In the fungicide area, BASF plans to launch a new blockbuster compound to global farmers starting in 2019. Already at an advanced phase of development, the new fungicide has demonstrated outstanding biological performance and is expected to become a key tool for effective disease control. Extensive research on this proprietary compound shows a high potential for broad-spectrum activity against a wide range of pathogens in many crops, including specialty crops.

BASF's insecticide portfolio is also expanding with two new compounds increasing the number of tools for insect control and resistance management by the end of the decade. The compounds show strong commercial potential and

are the result of successful collaboration with other partners. The active ingredient broflanilide brings a new mode of action that has demonstrated excellent levels of control for chewing pests – the biggest insecticide market segment – for use in row and specialty crops as well as the professional pest management market.

The other novel active ingredient, Inscalis, is effective against piercing-sucking insects, providing long-lasting control of aphids, whiteflies, and certain leafhoppers, psyllids and scales for use in specialty crops and other crop species. Both products will be launched in several markets across the globe.

“We have been very successful in translating ideas and challenges into best-in-class products and services for growers across the globe,” said Markus Heldt, president of BASF's Crop Protection division. “Innovation remains a crucial component of agriculture today. It is a dynamic market, with ever-changing needs and new challenges, and

we are happy that we can contribute with new solutions and technologies,” Heldt added.

“For us, innovation goes beyond the discovery of new molecules and agrochemical compounds,” said Heldt. “We are investing in areas such as IT, formulation technologies, biological crop protection and new business models as well.” In 2015, Functional Crop Care, the business area in BASF that offers solutions for healthier plants and higher yields to supplement conventional crop protection, launched Limus nitrogen management.

Limus is a patented product that helps crops maintain optimal nitrogen availability through the most critical growth stages of plant development, which leads to more consistent yields. Other solutions from the Functional Crop Care segment are in the market introduction phase.

BASF's track record in successfully commercializing new products has proven to be a key growth pillar for the

Crop Protection unit. Recently, more than 40 per cent of the business sales were generated by products launched in the past five years.

“BASF continues to invest significant resources in order to help our Canadian customers produce the highest quality fruits and vegetables,” says Scott Hodgins, brand manager, horticulture and specialty products. “As an example, in the last five years alone, we have introduced four new active ingredients and eight new products to the Canadian horticulture market. At the same time, we continue to support the development of additional crop protection solutions through cooperation with the minor use system.”

Worldwide, BASF Crop Protection will continue to invest approximately nine per cent of its sales in R&D.

Source: BASF news release



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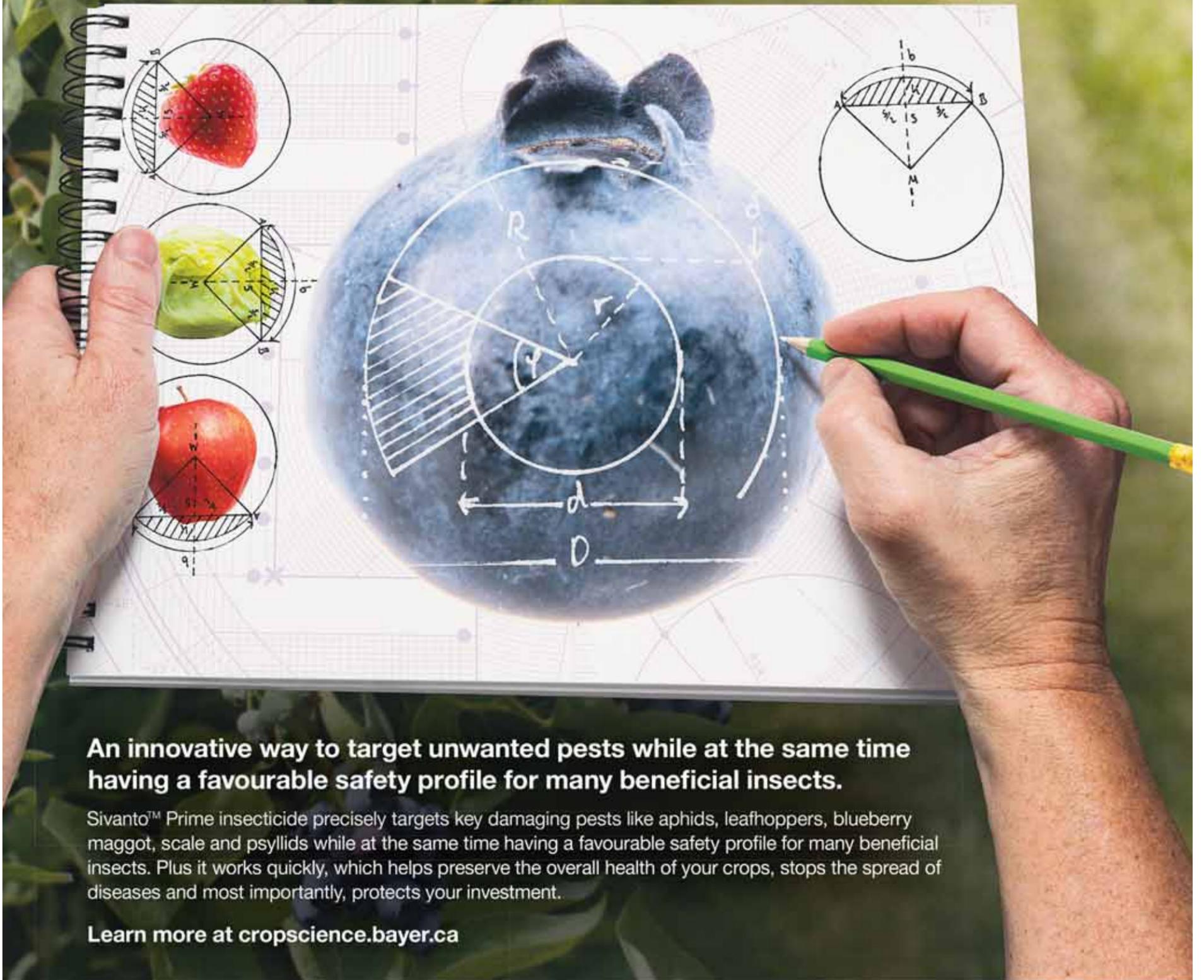
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WATER MANAGEMENT AND IRRIGATION

Managing water in droplets, mist and ice



Blueberry and strawberry nursery grower Dusty Zamecnik checks the water level on one of several ponds at EZ Grow Farms Ltd., near Langton, Ontario. The farm is part of the Grand River Watershed Node, a project of the Canadian Water Network. Photos by Glenn Lowson.

KAREN DAVIDSON

Living the land, living the water. That's how every grower operates, totally dependent on what is offered up by the weather gods.

Marshalling these resources gets a little easier with technology as Dusty Zamecnik points out at EZ Grow Farms Ltd., near Langton, Ontario. The Zamecnik family farm is located in what's called the Grand River Watershed Node, part of the Canadian Water Network project. As the largest watershed in southern Ontario, the Grand River drains into Lake Erie through some of the most intensively farmed land in the province.

"Farmers work together in this area ensuring we all have enough water," says Zamecnik.

Water management is challenged by population growth – almost one million

“
We're getting more precise on where we're putting water. It's the diesel for pumps and the time for managing that costs.

~ DUSTY ZAMECNIK

”
inhabitants in the area and climate change. Local farmers can attest to severe frosts and more frequent droughts in recent years. The project researchers are monitoring and measuring quantity and quality of water, recording a baseline of data that can show when there are stressors in the watershed.

Wise water use may come as

early as the upcoming full moons: April 22 and May 21. Those dates are critical for protecting 30 acres of blueberries from frost. It's just the start of a long season of getting water to plants in the right form at the right time.

There are three systems protecting blueberries and a strawberry nursery: overhead

sprinklers/retracting water guns and drip irrigation for blueberries and misting emitters for the strawberry nursery.

"These are not new technologies but how they are used is important in saving time and labour," says Zamecnik.

Overhead sprinklers, for example, are no guarantee against frost but they can also be used later in the season when temperatures go higher than 30°C. At that point, sugars flow back from the berries into the plant, adversely affecting the flavour. Cooling blueberry plants with water can maintain brix levels in the fruit.

Years ago, eight-inch underground irrigation pipes were laid five feet below the blueberry fields. This makes it easy to hook drip irrigation into hydrants strategically located throughout the fields.

For every pump that's used, there is a filter station to make sure there is no algae or dirt

particles building in the lines. All blueberry bushes receive filtered water.

"We're getting more precise on where we're putting water," says Zamecnik. "It's the diesel for pumps and the time for managing that costs."

Drip irrigation is used not only in the blueberry fields but also in the strawberry nursery for more precise watering. It doubles for fertigation in the strawberry nursery with a 10 to 12-inch band over the strawberry plants. A solar-powered panel charges the battery for a computer that times watering to the minute.

Drip tape is a major cost, especially when it has to be removed every year for field preparation. In single-year applications, that is for bareroot strawberry ground, Zamecnik uses six- to eight-millimetre thick drip tape.

CONTINUED ON PAGE 7

WATER MANAGEMENT AND IRRIGATION

Invest in a water meter

REBECCA SHORTT

Water quantity is a hot topic these days. Measuring and recording water use can help to demonstrate how and where the agricultural industry is using water. Efficient and productive water use is beneficial both from an environmental and from a production perspective. Agricultural water use drives productivity, growing this important sector of Ontario.

The single most important piece of equipment that you can invest in is a water meter. Also, keep daily records of your water usage. Whether you're using water for irrigation or product washing, knowing how much you are actually using is the most important piece in understanding where you can find efficiencies.

Efficient water use can have several positive spin-off benefits: energy savings, lower nutrient run-off and reduction of greenhouse gas emissions. The environmental benefits are not the only reason to improve water use efficiency. In fact, improving water use efficiency can have a significant impact on reducing water supply costs, reducing wastewater management costs and improving production efficiencies (i.e. increasing fruit and vegetable size by providing moisture when the plants need it). In addition, using water efficiently can help growers adapt to changing climatic conditions.

Some of the new approaches the Ministry of Agriculture, Food and Rural Affairs (OMAFRA) is working on with growers are soil moisture monitoring with wireless automated access. Not only can we see when the soil is drying out and it may be time to irrigate, but also how effective rainfall or irrigations were at replenishing water in the root zone (Figure 1).

OMAFRA is collaborating with the University of Guelph in developing the use of satellites for soil moisture mapping. The potato, grape and tree fruit growers have worked with Weather INnovations to provide maps of daily vapotranspiration (ET) that can be used for irrigation scheduling (www.onpotatoes.com and www.vineinnovations.com).

A series of water quantity and quality grower demonstration projects were funded through Growing Forward 2 in 2013-2014. Reports and videos of these projects can be found on the Farm & Food Care Ontario website at www.farmfoodcare.org/environment.

All of OMAFRA's irrigation resources can be found on our irrigation web page (www.omafra.gov.on.ca/english/engineer/irrigation.htm), including our series of videos on irrigation system assessments and soil moisture monitoring. The mainstream media has produced a glut of articles about the drought and challenges facing California and the western United States. One of the chal-

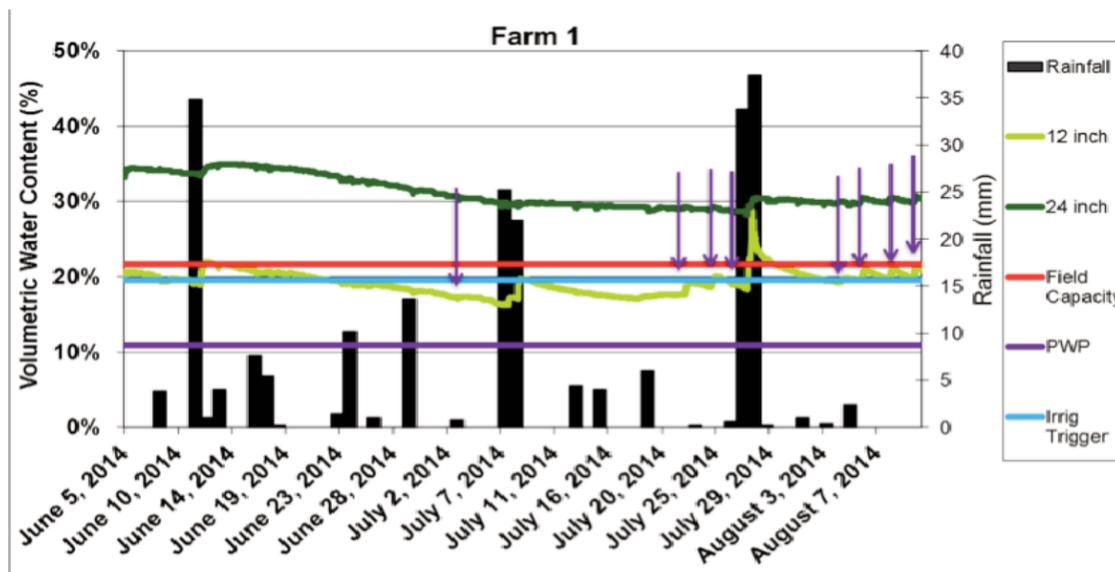


Figure 1. Soil moisture fluctuation with rainfall and irrigations (purple arrows). Probes at 12" and 24" below surface. PWP means the Permanent Wilting Point.

lenges in Ontario is the need for more water infrastructure for farming, such as more water supplies, better access to water and storage. Numerous studies have demonstrated that there is potential for greater agricultural water use in Ontario, leading to greater agricultural productivity. This will benefit our rural areas and the economy.

Ontario is not facing the same water challenges as California, but we need to stand behind our water use practices. Demonstration of our efficient and productive water use is crucial.

Rebecca Shortt is an engineer, water quantity for the Ontario Ministry of Agriculture, Food and Rural Affairs.



Water meter, monitoring flow in drip irrigation system.



Rebecca Shortt (OMAFRA) measuring Evapotranspiration (ET) with an Atmometer.



Two technologies being compared to wirelessly transmit soil moisture, rainfall and other weather data.

A program designed to help Ontario farmers with water taking permit needs



Mr. Shearer's mandate is to provide surface water taking permit and impact study services to agricultural water takers throughout the Province of Ontario. The purpose for the development of this position at the OFVGA was to lessen the confusion and costs to farmers of the required water taking permit process and subsequent studies.

Mr. Shearer will assess clients' needs in terms of support required in order to successfully complete their PTTW application as well as to assist clients to assess best options for water taking given cost and regulatory constraints.

George Shearer **W**ater Specialist

Ontario Fruit and Vegetable Growers Association
 p: 519-763-6160 ext. 219 c: 519-222-3272 f: 519-763-6604
 water@ofvga.org

WATER MANAGEMENT AND IRRIGATION

Splish splash, I was takin' a bath until I optimized my irrigation system

KATIE GIBB

Back in September 2015, Bruce Kelly of Farm & Food Care Ontario wrote an article for **The Grower** about getting wet while helping evaluate how evenly an irrigation system applied water to a vegetable field. The process involved collecting and measuring water in buckets in a grid pattern in the field for a period of time, measuring the flow rate and pressure at each sprinkler nozzle, and recording the type and condition of sprinkler nozzles used and riser pipe heights.

We found that the irrigation water application or distribution uniformity was not very even; in fact, it was only 25 per cent efficient. The target is 80 to 100 per cent.

What does 25 per cent mean? Well, when you finish applying what you think is one inch of water over the field, it means that some areas are only getting one-quarter of an inch of water because of virtually no overlap in water coverage. The other way of looking at it is that if you apply one inch of water to the poor overlap areas, other portions of the field will get four inches of water elsewhere.

Either those poor beets have their tongues hanging out or they are building an ark depending on which neighbourhood they ended up in. What it means to the grower is a potential variation in quality and quantity of product across the field.

Once you know that the application is uneven, ask why and what can be done to make sure the crop has the same amount to drink.

The spacing between laterals along with nozzle pressures, flow rates, conditions, and types help tell us why. In this case, moving the laterals closer together by about 20 feet improves overlap and raises the distribution uniformity to 75 per cent. Further improvement to bring the system to at least 80 per cent efficiency can be achieved by dealing with the nozzles.

The nozzle pressure dropped slightly along the lateral, but it was not significant. Variations in nozzle flow rates were not related to pressure or distance from the main. The nozzles were in reasonably good condition. The big factor was the variation in the types of nozzles used and the height of the standpipes. Most of the sprinkler heads were single nozzles; however, 18 per cent of the sprinklers had double nozzles. None of the nozzles was plugged, but one was turning slowly and one was leaking. The lateral was leaking at a standpipe connection in one area. Most of the risers were twelve inches high, but 18 per cent were 20 inches. The farm has a nozzle



Bucket grid layout to collect irrigation water to determine irrigation application efficiency

replacement program. This assessment highlighted that they are doing the right thing by standardizing the nozzles and replacing old or failed units. It also placed focus on standardizing the riser heights; after all, how can you get consistent application if your equipment varies?

What did we all learn?

- 1. The uneven application of irrigation water was not obvious to the eye.** You needed to conduct the assessment to make what was happening visible.
- 2. Discuss the results with the grower or owner or operator to get feedback.** We recommended moving the laterals closer by about three beds or 20 feet. This simple recommendation was not practical for the operation. In the end, it was decided that moving the laterals closer by thirteen feet was more practical.
- 3. The poor overlap has two potential implications: produce that is under-watered, or, produce that is over-watered** if you want to ensure the dry areas get enough water. Either way, there may be implications to time to market, product quality and/or consistency, or crop input requirements. Over-watering means additional pump run time, which costs you unnecessary money.
- 4. Continue with the nozzle replacement program.** The assessment drew attention to the impact the variation in nozzle types and their condition has on how even irrigation water is applied to a field. Standardization of nozzles and riser heights will help move this system from 75 per cent to at least 80 per cent distribution uniformity efficiency.

Figure 1: Uneven distribution across the field with little overlap in the centre at the dip. 25% application efficiency.

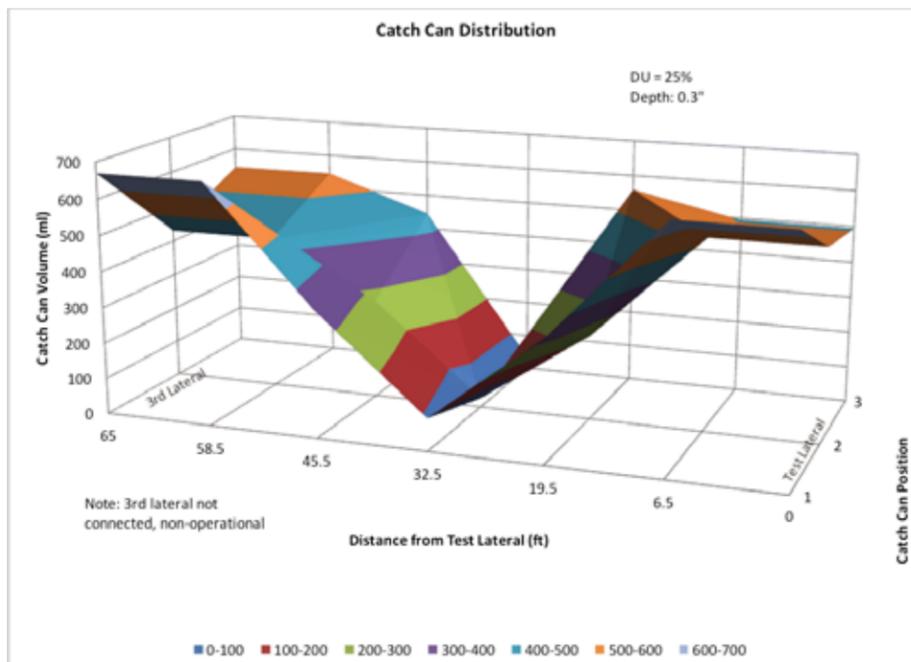
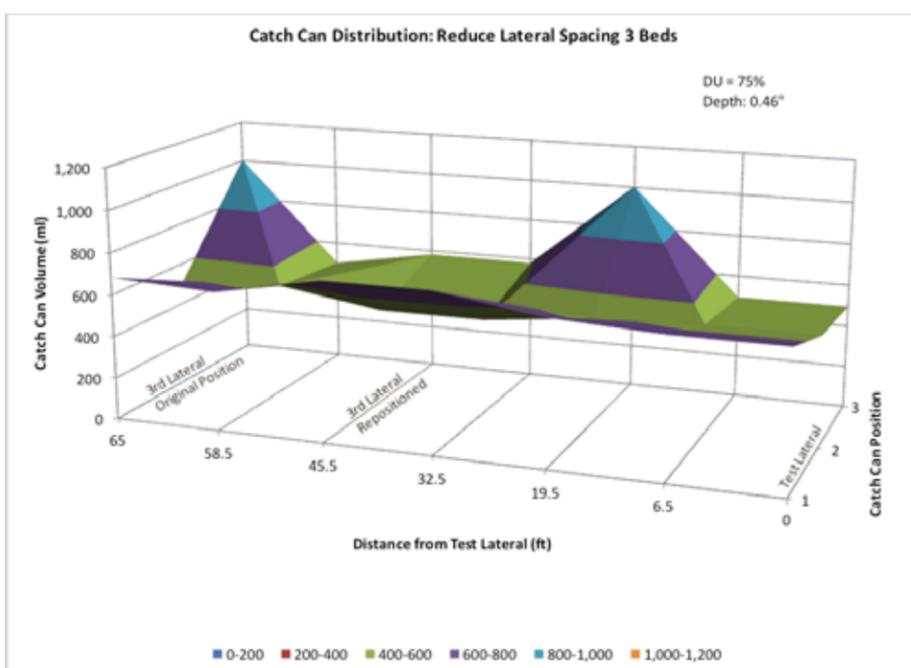


Figure 2: Efficiency improved to 75% by moving the lateral 20' closer. The dip is gone.



5. **Irrigate when the air is still**, typically early evening, early morning, or at night, to prevent the water from evaporating before it hits the ground or being blown to the neighbour's weed-filled hedgerow.

6. **Install a flow meter at the pump** to measure how much water is being applied to the field or farm. A flow meter is a tool to help identify leaks, blockages, variations in the application rates for different crops (you might find out that some crops are too expensive to grow), or variations in operator application rates. By benchmarking your water use, you can identify issues or tweak your system. It is the old adage, information is knowledge.

7. If you have an irrigation pond, you are on time-of-use rates, and **if you use an electric pump, fill the pond at night to take advantage of the cheapest electricity rates.**

8. **Many of the recommendations are low cost** and easy to implement or incorporate into your operation and maintenance program.

For more information on the project, or if you are interested in a water assessment, please contact either Katie Gibb, Phoenix Solutions katie.gibb@phoenix-solutions.ca or Bruce Kelly at Farm & Food Care Ontario bruce@farmfood-care.org.

Katie Gibb is project manager for Phoenix Solutions.

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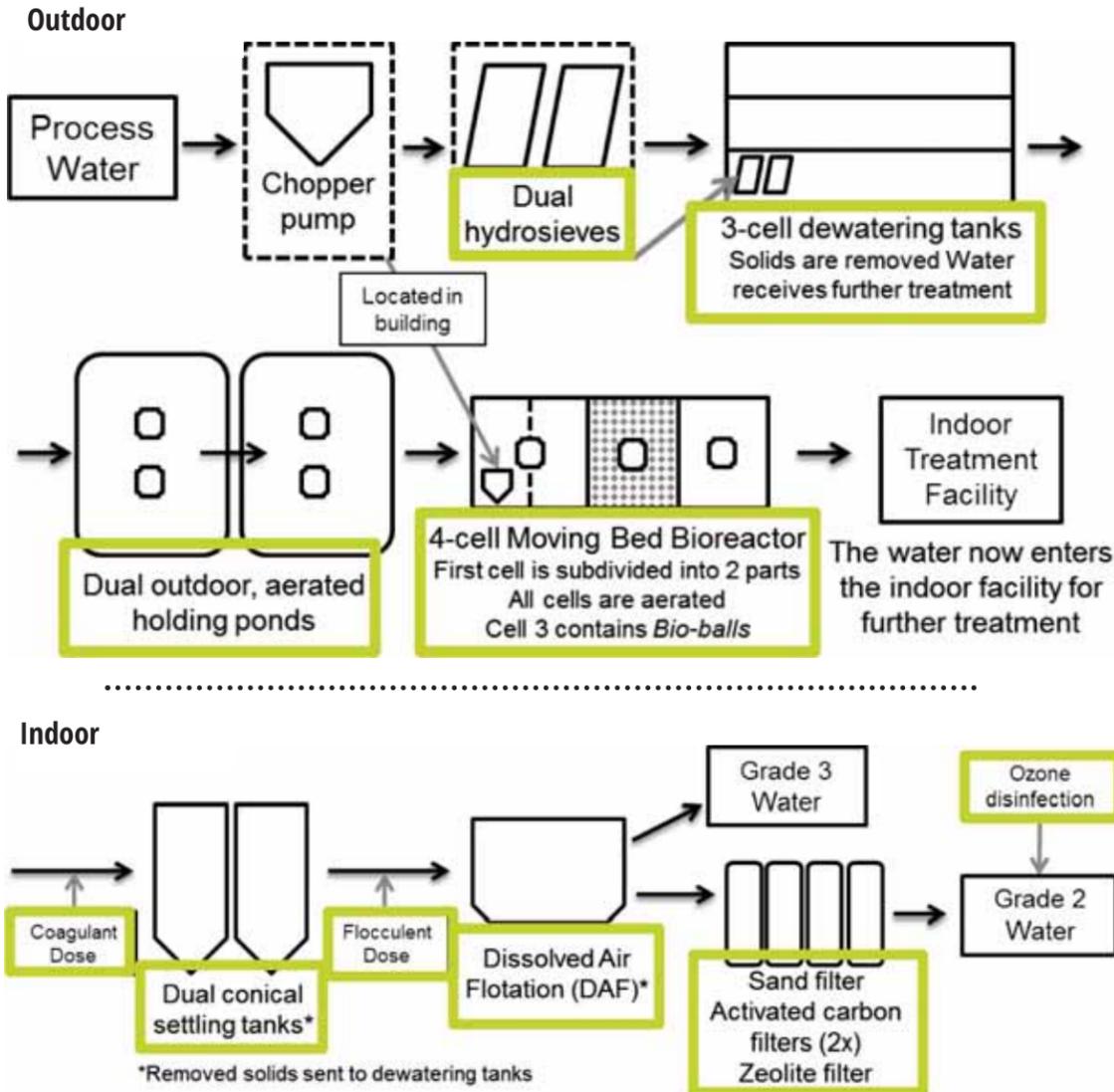
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WATER MANAGEMENT AND IRRIGATION

Hard truths don't soften the costs of managing wastewater

Wastewater treatment system



KAREN DAVIDSON

For Ontario's Holland Marsh growers, nothing is easy about the layers of provincial environmental regulations and complexity of removing muck soils from root crops.

As soon as vegetables such as carrots, beets and parsnips go through a washing facility, they are subject to compliance requirements by the Ministry of Environment and Climate Change (MOECC). Muck soils and sandy soils react differently and therefore washing challenges are different. The wastewater is considered industrial waste.

After two years of water projects funded by the Lake Simcoe-Southeastern Georgian Bay Clean-Up Fund, several lessons are bubbling to the surface.

Soil is not a nutrient and needs to come out first in the water management process, says Charles Lalonde, project manager for the Holland Marsh Growers' Association Water Project. You can't approach soil suspended in water.

"Technology requires attention and optimization," says Lalonde. "You can't buy a new piece of equipment and leave it alone. It needs to be optimized."

What growers have found in installing new equipment is that it demands a new category of maintenance. In many cases, this means licensed electricians, plumbers and information technology (IT) personnel. These new systems require people on the ground at the plant who can deal with electronics.

The location of water treatment within your operations is often a challenge. When installing new systems, consider how they will be monitored.

"It's not like you have employees walking by every few minutes to see if equipment is functioning," says Lalonde. "It can be a challenge to work in areas that are far from washing activities."

"We're now dealing with a complex regulatory system, involving MOECC staff who are also searching for beneficial solutions," says Lalonde. "Don't try for a home run."

With 16 growers active on several project sites, these are the lessons learned so far. The project goals are to:

- reduce risks to environment from vegetable washwater discharge
- evaluate technologies to treat washwater from vegetables grown on muck soils
- build capacity in the industry to supply

They are testing technolo-

gies to reduce total suspended solids, reduce phosphorus and reduce biological oxygen demand (BOD). The latter is the ultimate gauge of effectiveness of wastewater treatment. By definition, it is the amount of dissolved oxygen needed (i.e., demanded) by aerobic biological organisms to break down organic material present in a given water sample at certain temperature over a specific time period.

As Paul Plotz, MOECC reports, "Muck soils are our most complex issue, but we are having some success."

"Don't create a problem and then you don't need to manage the problem," he says. "Don't create more washwater than you need."

Technology requires attention and optimization. You can't buy a new piece of equipment and leave it alone. It needs to be optimized.

~ CHARLES LALONDE

With existing facilities, MOECC looks for abatement plans that lead toward full compliance. With expanding facilities, MOECC expects compliance with the expanded portion. With new facilities, MOECC expects full compliance. He says there is a measurable reduction in phosphorus loading to Lake Simcoe.

All of these lessons have been learned and paid for by Smith Gardens, Keswick, Ontario. Three years after running afoul of MOECC, they have invested \$2 million in a state-of-the-art wastewater treatment system. With 450 acres of carrots to wash and package, they put an end to any further disputes so they can grow their business and export to the U.S.

The new system allows them to recycle 70 per cent of their water, says Paul Smith. The remainder is lost to attrition. This is a significant savings with 60,000 gallons of water used per day.

Ian Smith shared the flow charts above that outline their new wastewater treatment system.

"We are about 10 years ahead of our peers in dealing with washwater, and as such, consider ourselves one of the most sustainable operations in the country."

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WATER MANAGEMENT AND IRRIGATION

Monitoring and improving water efficiency

GEORGE SHEARER

Recently I have been involved in a lot of projects that require a significant amount of monitoring in order to secure Permits To Take Water under the Ontario Water Resources Act (OWRA). It seems that the Ontario Ministry of the Environment and Climate Change's (MOECC) new direction for water management is geared towards a long-term commitment to data collection and analysis. Gone are the days when if you applied for a permit then you pretty much got one with very little requirement to do anything beyond the initial assessment to gain the permit.

Every water-taking permit issued in Ontario comes with the standard clause that requires you to log your usage of the water and report this information to the Water Taking and Reporting division of the MOECC. For what purpose I couldn't tell you and I worked at the MOECC for a number of years. It seems to be more of an exercise in making sure that you

follow the rules more than a legislated way to collect valuable information that could be used to better manage the resource.

Now a days, it seems that every issued permit has some form of extra monitoring requirement such as installation of staff gauges in streams or level loggers for wells. It seems that the MOECC has no concept of the cost of these requirements or the extra time involved but there is a benefit. The benefit is long-term sustainable access to a very valuable water supply.

Water on the farm can mean the difference of making a profit or just making a living. It is no doubt that irrigation can increase crop yields considerably and in times such as 2007, considered a drought year, it can be the difference between life and death. Understanding your water supply and its limitations can make for more informed decisions around your operation. If water is the limiting factor on your farm then you need to be able to squeeze every drop out of your source and use it as efficiently as possible.



Equipment such as piezometers and moisture meters can allow you to better understand how water is best managed and distributed. Using soil mapping of the farm and understanding the different characteristics of the soils can allow for efficient distribution of water and nutrients to areas of

most need through the development of irrigation zones.

As the farming landscape changes from many small localized farms with limited acreage to large industrial farms with many, many acres, it's important to understand the different environments within the farm unit. Plan accordingly to maximize the efficient use and distribution of the limited supply of water rather than going for

increases to water permits which might not be available. Utilizing more efficient, modernized irrigation systems can provide a significant amount of information and will not only conserve our resource but will save you money by only irrigating areas that need it cutting on fuel cost, equipment maintenance and time.

Investing in flow meters can make your life easier when it comes to reporting and can also give you information on your actual water needs rather than relying on estimates based on your irrigation equipment specs. You may find that you have more water available than you thought which can lead to more informed management of your property and what it's capable of supporting.

Understanding the needs of the crop in relation to the soils and water needs is the first step in becoming more efficient. This coupled with detailed knowledge of the water source can go a long way to ensuring your operation's long-term sustainability. So even though it may seem incredibly onerous when MOECC issues your permit and you see what is required of you, realize that the information you are collecting for them is really for you and use it to your benefit. After all, you are paying for it.

George Shearer is water specialist, Ontario Fruit and Vegetable Growers' Association.



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WATER MANAGEMENT AND IRRIGATION

Trend to more controlled and precise water management

KAREN DAVIDSON

In the last decade, there's been a steady movement to more controlled and precise water management. No one has seen that trend more clearly than Ray MacKenzie, design and sales, for Vanden Bussche Irrigation, Delhi, Ontario.

In a March 22 presentation to the Ontario Hazelnut Association, he outlined some of the benefits and machinery used in drip irrigation. Graphically he showed the different watering patterns of overhead or flood irrigation vs sprinkler vs drip. When using drip irrigation only the water which has been used by the plant in the previous day or two is added to the soil resulting in a more balanced mix of air, water and nutrients in the soil.

Additionally, since the water is applied only to the active root zone, a lot of water can be saved. Most crops in Ontario will use approximately one inch of water a week when in full production. This equates to more than 27,000 US gallons per acre. The amount that is saved comes from the wasted water which is in the form of overspray, wind drift, evaporation, run off and watering areas between rows (think apple orchards) etc with overhead systems. This could be up to 50 per cent savings on some systems.

The newer technology has the benefits of distributing smaller amounts of water, more frequently

and offering the flexibility of fertigation. A healthier plant environment also allows for better nutrient uptake and less disease pressure. Growers like the lower pumping costs and less weed pressure, in addition to more flexible irrigation timing.

"The newest crop to take advantage of drip irrigation is haskaps," says MacKenzie. "Along with drip irrigation is an increased need for frost protection. We're installing more sprinklers and row covers."

Row covers range from 20 grams to 40 grams in weight. The heavier weights are used to protect strawberries, especially the day-neutral varieties.

Some apple growers are going back to sprinklers for frost protection, while using the drip method to irrigate. Both aluminum and PVC pipe can be used here with common spacings from 40 to 60 feet. Sprinklers are increasingly made from plastic instead of brass and are normally placed above the tree canopy.

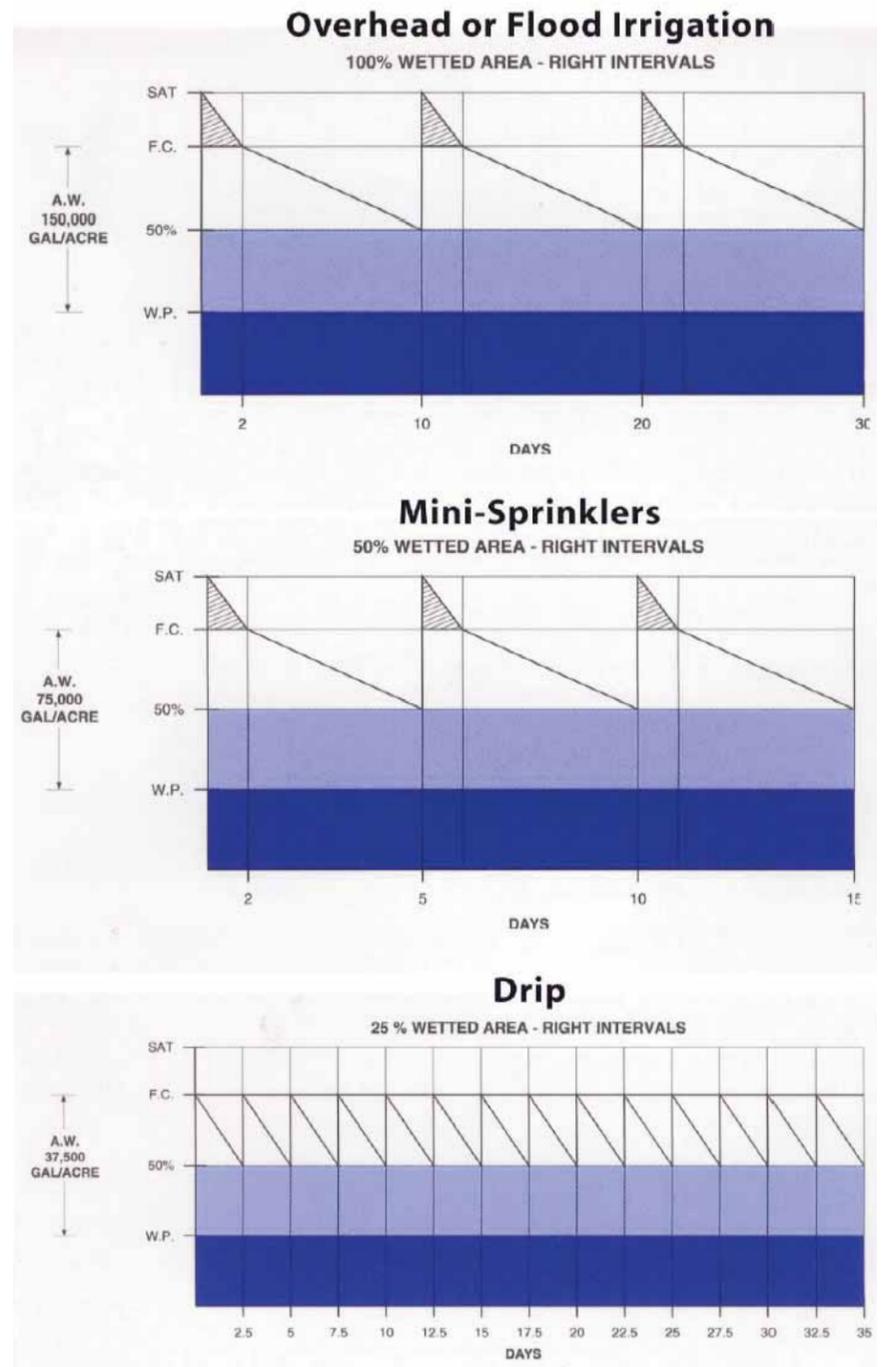
Another area of increased interest is flow meters, not only for the purpose of tracking water volume for government reports but for better management

decisions. Today, flow meters can be equipped with transmitters so that real-time data flows back to the home computer.

Soil moisture monitoring helps to evaluate when to start the taps flowing in the first place. Automated systems are preferred as water volumes and soil moisture are tracked hourly and statistics can be compared at precisely the same time every day and stored for future reference. Starting at \$4,000, this equipment may not be affordable for every operation in which case manual readings can be very useful, but must be done at the same time, mid-morning, every day. However, it's a sign of the times in terms of how seriously growers are investing in water management.

Automated diesel systems -- similar to electric pumps with variable frequency drives -- are proving popular. As water demands increase, the pump will speed up or slow down. These systems will keep pressure constant, regardless of demand and can start and stop the unit based on time or demand.

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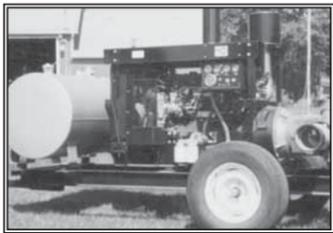
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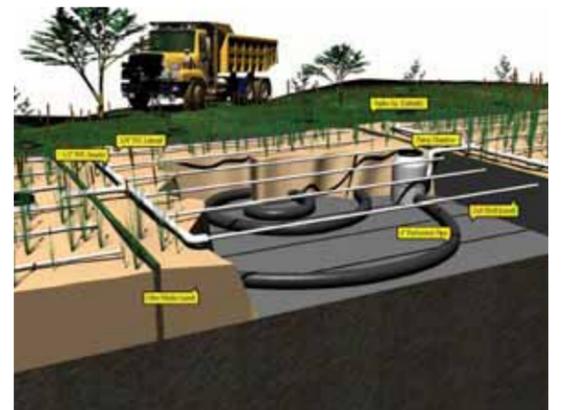
AQUA Treatment Technologies Inc. designs and installs the 'AQUA Wetland System' (AWS) for tertiary treatment of many types of waste water including sanitary sewage, landfill leachate, dairy farm & abattoir wastewater, greenhouse irrigation leachate water & mushroom farm leachate water (i.e. manure pile leachate) and high strength winery washwater.

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The AWS has been approved for use by the Ontario Ministry of Environment through over 40 Environmental Compliance Approvals. Recently the Region of Niagara began approving the AWS for treatment of 'small flow' winery washwater i.e. < 10,000 liters per day. Other agencies who have issued approvals include Health Canada, USEPA and OMAFRA. Recent projects include:

- 1) treatment & re-use of greenhouse irrigation leach water at greenhouses in Niagara & Haldimand
- 2) treatment of winery wastewater at Greenlane Estates Winery & numerous other in Niagara
- 3) treatment of landfill leachate at sites in Pembroke, Niagara and Alabama

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CONTINUED FROM
PAGE 1

It's flimsy and relatively easy to puncture with a hoe or cultivator, but easy to fix. At the end of the growing season, about November, the hundreds of metres of tape are rolled up, bagged and sent to a recycling facility.

"As we are seeing the effectiveness and gains from this drip tape, we are looking at reusable tape in our program," says Zamecnik. "With tape that's 15- or 20-millimetres thick, it's more expensive but we hope the cost can be stretched over a few seasons to justify the practice."

In the blueberry fields, 25-millimeter drip tape is used because it needs to endure everything from tractors and winds to pruning and winter weather.

"We look to have this on the ground for 20 years before replacing our blueberry field with new drip tape."

Water management is also key for the strawberry nursery. Misting emitters are used to water strawberry plugs, sensitive to drying out. To ensure quality of the water, tests are conducted every other week. If a disease spot shows up on strawberries, then the question must be asked about the source. Is it disease resulting from a clogged filter? Could it be over-watering which leaches fertilizer below the root zone? Frequent water tests help to trace the source.

The strawberry nursery business is on a growth trajectory with negotiated rights to the greenhouses that used to belong to the Delhi Tobacco Research Station. When the federal station was closed several years ago, it was sold to private buyers. Now those greenhouses will be used to generate disease- and virus-free plants from nuclear stock. The resulting plants will be grown out in the nursery and then sold to strawberry clients in the southern U.S. Here again, the high-grade water available at the station is an advantage since it is produced from reverse osmosis.

After the bareroot strawberry plants are grown out and put into plugs at the farm, they are graded and readied for shipment. They are placed into double-waxed boxes with a slice of ice to provide some humidity and moisture for the trip. These boxes have vents so that any water can drain onto the field. By conducting this chore in the field, the Zamecnik's avoid any washwater issues that might

otherwise be encountered in a covered facility.

It total, the farm has three permits to take water. The paperwork is the easy part. Today, water management is squeezing the resource into tinier components and metering them one drop at a time.

Photo right: Dusty Zamecnik offers an overview of the strawberry nursery.



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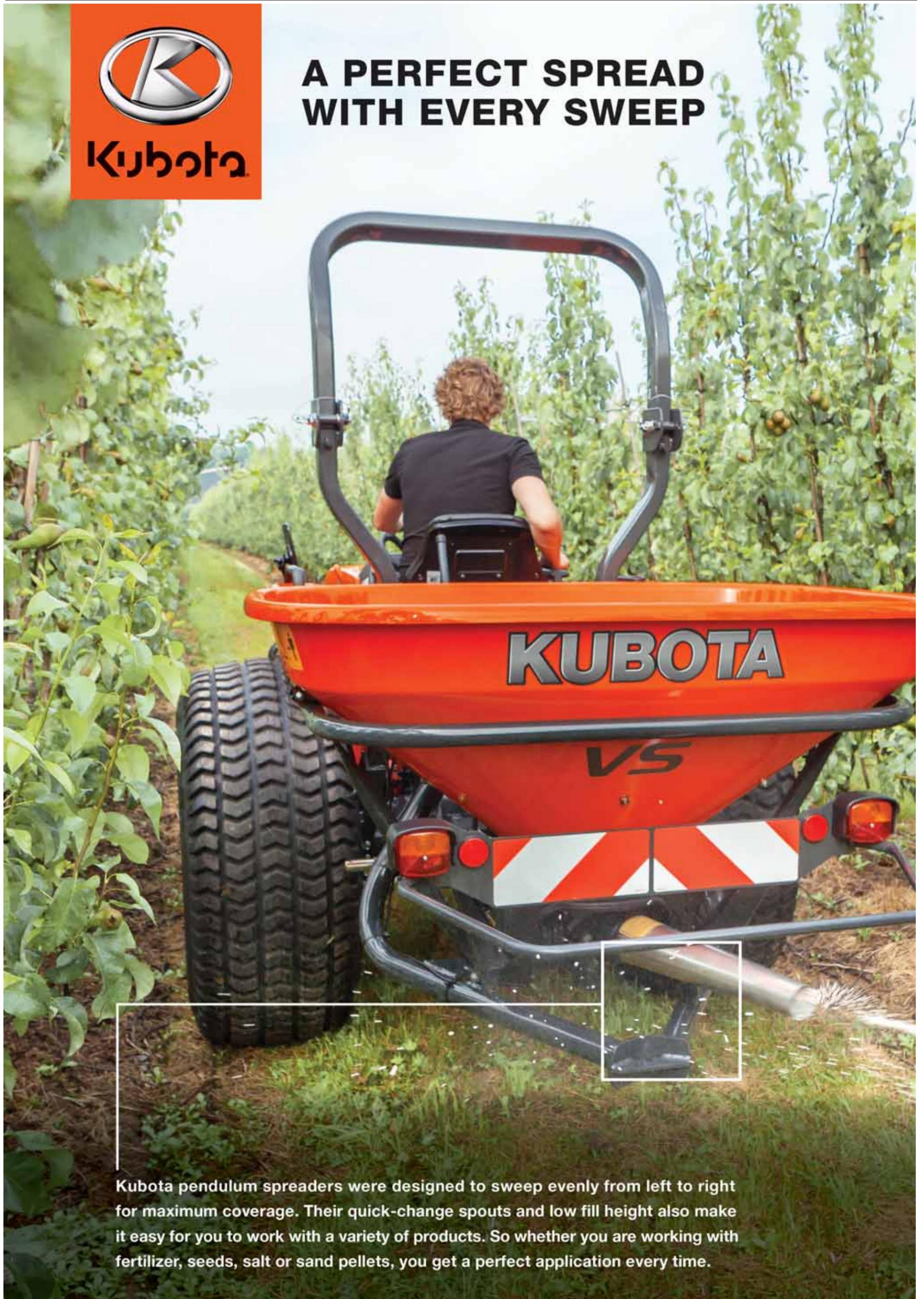
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