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CountryGuide

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EASTERN EDITION / COUNTRY-GUIDE.CA / OCTOBER 2016

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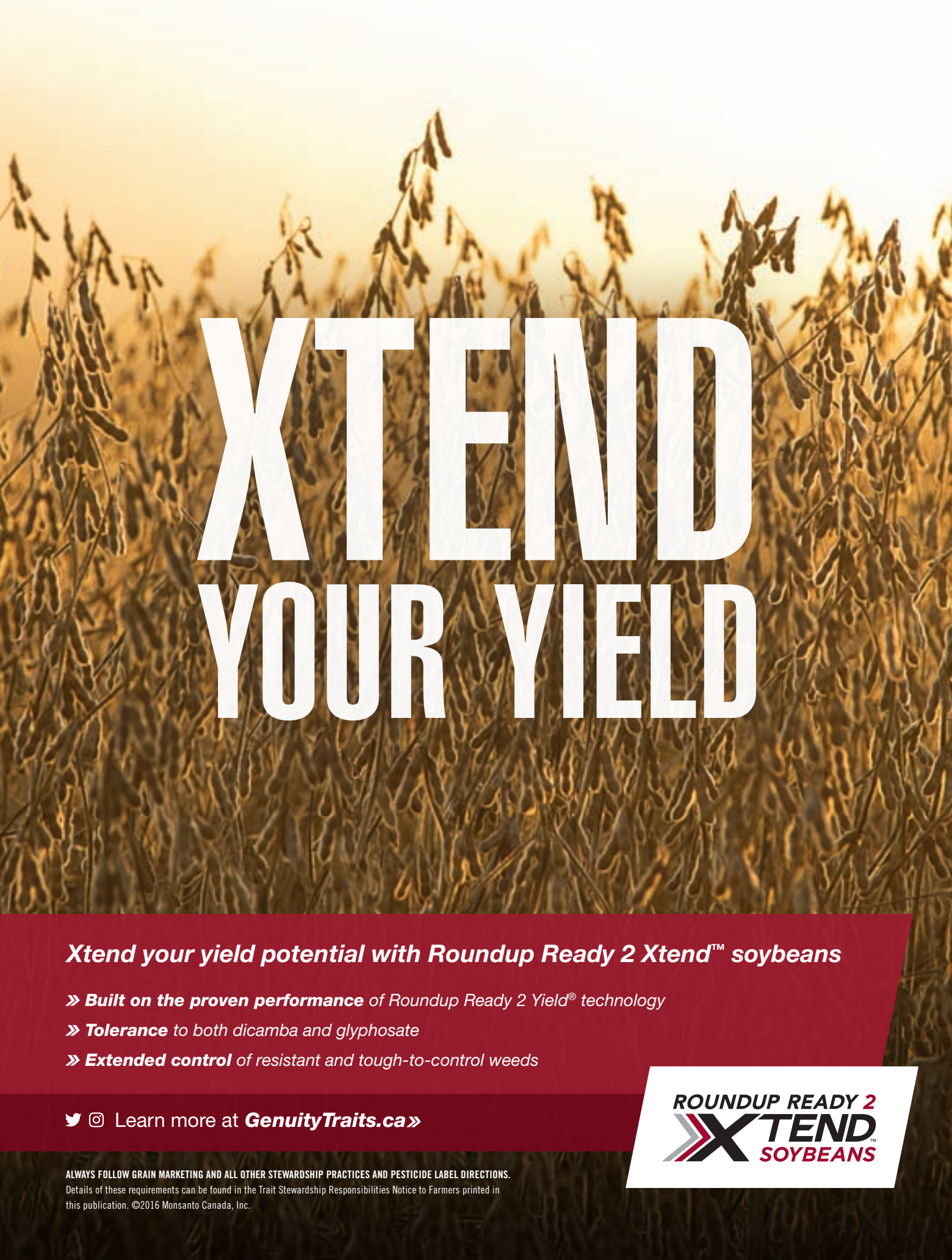

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Never too young

For the three generations of Manitoba's Ellis family, the breakthrough came when they realized their succession plan isn't an estate plan or a will. Instead, it's a tool that can open up more options for the members of their family at every stage of their lives.

This time, Ottawa must listen

If the average Canadian farmer was 40 instead of pushing 65, would we really be giving our governments such a soft ride?

Of course there have been serious political issues in Canadian agriculture in the last five years. A list is easy to rattle off, comprising everything from grain transportation in the West to trade negotiations, plus myriad other issues as well.

Even so, as an industry we have largely let ourselves take our eyes of the political ball. At least, we haven't been anywhere near as assertive as in previous decades, when stabilization programs and regulatory reform seemed to start every conversation.

Now, this will have to change.

If there's one extra job to add to your list for the winter (I'm definitely adding it to mine), it's to bone back up on national and provincial political issues, and on the lobby organizations — and their leaders — who are the farm voices that politicians and bureaucrats actually hear.

Yes, it's true that Canada's farms are healthier than they have been in over a generation, but a good deal of that is due not just to the few recent years of great prices and yields, but also to the age of our farmers. As Maggie Van Camp points out in her must-read "Plan Before You Retire," the average age of Canda's farmers is rushing toward 65.

We mustn't undervalue the courage it took that generation to get this far, but we also need to be mindful of the young farmers that we hope will replace them, and we need to recognize we are asking them to take on the job without the level of government support and protection that their parents had.

In this issue, the article "Deciding on AgriStability" examines just one aspect of this. AgriStability is key to Ottawa's farm strategy, but it is unsatisfactory at best, and it is in jeopardy. It's hardly a secret. In a recent survey by the Ontario Federation of Agriculture, 85 per cent of farmers not only said they find AgriStability confusing, they don't believe their bankers understand it either (and certainly don't consider it when evaluating loans). Similarly, in Saskatchewan, APAS has found that only 20 per cent of farmers believe AgriStability is helping them, while 35 per cent have completely dropped out.

AgriStability's margin protection is dwindling, the program is unpredictable, and it punishes diversified farms. And now, even AgriStability is at risk, in part from food processors and others who have lost their Industry Canada funding and are looking for vulnerable government sources to tap.

On top of that, Ottawa has made reform even harder. Under the Conservatives, it gagged the staff at Agriculture and Agri-Food Canada, which has proved so effective as a political strategy that the Liberals are maintaining it.

Increasingly, a coterie of people at the top make the rules that the country must accept, and too many of us in agriculture have effectively agreed to sit on the sidelines and allow the industry to be managed for us.

Am I getting it right? Are we failing our young and mid-career farmers? Let me know at tom.button@fbcpublishing.com.

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Deutz-Fahr AIMS HIGHER

With a new factory and 'global' tractor lines, the brand is determined to get your attention

BY SCOTT GARVEY / CG MACHINERY EDITOR

The Deutz-Fahr brand kicked off a three-day media event in mid-summer in Dresden, Germany, to show off not only some new tractor models, but a new factory and visitor centre as well. It's another sign it aims to become a bigger player in global tractor sales, particularly in the 300-plus horsepower market.

That new factory in Lauingen an der Donau, Germany is set to come online shortly, and the company expects to slash the wait time for filling global customer orders for tractors. At the same site, it's also building what it calls the Deutz-Fahr Arena, designed for plant visitors with a display area and training facilities, plus a museum and gift shop among other things. The arena is slated for completion in 2017.

An all-aluminum cooling package and new Electro-Visco fan keep tractor system temperatures in check.

But the real heart of the Dresden event was the brand's completely updated "Next Generation" 6 and 7 Series tractors. Designed to be what the company calls global tractor platforms, it uses a modular design concept, meaning their sub-systems can be easily interchanged during assembly to suit different world market needs.

Together, the two series offer 14 models and some 600 available option choices to meet those global differences. The company believes these 14 models along with the five models in the larger 9 Series that it introduced in 2015 will form the core of its future global tractor sales.

"These new high-end tractors are a result of the effort made in recent years towards the completion and renewal of our product offering," said Lodovico Bussolati, SDF chief executive officer in a press release. "The new 6 and 7 Series, together with the 9 Series launched last year and the new innovative factory and customer centre in Lauingen, are fundamental pillars of the Deutz-Fahr strategy for the next few years."

The 6 Series includes two chassis sizes. The smaller models get a 2,767-mm wheelbase, while their larger brothers get 2,848 mm between their axles.

All 6 and 7 Series models will pack a Deutz 6.1-litre, six-cylinder diesel under the hood that is already able to meet the EU's pending Stage V emissions standards. The company claims these engines are more fuel efficient than their predecessors, and their DEF consumption has been reduced down into the three to five per cent of fuel consumption range. Meanwhile, the new Electro-Visco fan system and all-aluminum, accessible cooling package keeps system temperatures in check.

Spanning the 156 to 226 horsepower range, the 6 Series models are available with the brand's new (ZF built) RCshift technology. These programmable transmissions offer five gears within six powershift ranges, for 30 forward 16 reverse gear options. The five gears can function in automatic, manual or semi-automatic modes, and the transmission's "intelligent" feature allows it to learn operator preferences for shifting. (Even with these capabilities, the company claims the transmission is simple to program and operate.)

In all, the 6 Series offers three different transmission choices, depending on the model. The RCshift transmissions are also available with a creeper gear that provides an incredible selection of 54 forward and 27 reverse gears. And the RCshift technology allows

PHOTOGRAPHY: DEUTZ-FAHR

6 Series machines to get down the road at high speed with reduced engine r.p.m. to save fuel. TTV models come equipped with a CVT transmission that has a speed range from 0.2 to 40 or 50 km/h.

The two 7 Series tractors, which offer 226 and 246 horsepower, are both limited to the TTV CVT transmission, which gives them a 0.2 to 60 km/h speed range, and these tractors too will run at top road speeds with reduced engine revs.

In the hydraulics department, the optional LS pump supplies a 170 l/min. flow rate on the 6 Series with up to seven spool valves (five at the rear and two in the front). The 7 Series gets a standard 120 l/min. flow rate with the option to increase that to 160. Actual flow rate and timing can be set through the in-cab monitor.

Also new is the MaxiVision cab, which the company says has reduced noise and vibration levels. The dashboard gets a five-inch InfoCentre Pro screen with tractor function readouts, and the armrest comes fitted with the MaxCom joystick. Armrests can also be fitted with the 12-inch, colour iMonitor 2.0.

To really brighten up night work a 40,000-lumen light package is available.

Underneath the cab and chassis, Deutz-Fahr offers an adaptive front axle suspension fitted with dry disc brakes. Both Series get 1,000 and 540 r.p.m. PTOs with an Eco function to reduce engine speed (and fuel consumption) while maintaining shaft speed.

New Generation 6 and 7 Series tractors should be arriving on Canadian shores early in 2017. **CG**

Above: Deutz-Fahr held a three-day event in Dresden, Germany to show off its new factory along with its "New Generation" 6 and 7 Series tractors.

Left: There are two new 7 Series models offering 226 and 246 horsepower.

Plan before you retire

Whether you're selling or if you're transferring farm assets to the next generation, tax-smart retirement takes planning... and time

BY MAGGIE VAN CAMP / CG SENIOR EDITOR

In 2011, 48 per cent of Canada's farmers were 55 years old or older. Five years earlier, the number had only been 41 per cent. If you draw a straight line, that means 55 per cent of farmers are now 55 or older. And it also means our median age is approaching 65!

Whether that's exactly how the statistics will turn out, we won't know until Ottawa publishes the results of the 2016 ag census next May. But either way, we're on the cusp of a huge wave of farmers ready to retire.

Already we've seen an upward cycle of asset liquidation and consolidation, as farms get bigger and more valuable. Following many years of average farm asset appreciation, in 2015 it was again up 6.2 per cent across Canada. This increase in land values combined with lower commodity prices has put the thought of retirement into many farmers' heads.

Plus, baby-boomer farmers often want to retire younger and do not want to keep farming until they die. Now they can afford it.

If the children have left the farm, many baby boomers are asking themselves whether they should expand, or whether they should sell.

Is it worth it to keep growing, with all the risk attached? Are you going to be at it long enough to get a payback from scaling up?

Recently, Glenn Dogterom, accountant with MNP in Lethbridge, Alta. has seen a different scene being played out on many western Canadian farms. "When someone knocks on your door waving a cheque for several million dollars, it can be a pretty easy decision to sell and retire," he says.

Although, the cheques look big enough to retire from farming while your health is solid, the challenge is to not let them get eaten up by the tax dog.

The truth is, most farmers haven't done any retirement planning. They've felt they haven't had to, because the plan was just to sock everything back into the farm and to avoid taxes by taking small draws throughout their entire careers.

But this can be costly in the end.

"Waiting until the last minute is not effective tax planning," says Dogterom.

In one example Dogterom worked on, a retiring farmer sold his farm. He had done his own tax filing for 30 years and had not used many personal deductions. It was in a sole proprietorship structure and after the dust settled from the sale, he discovered that he owed $300,000 in income taxes.

With some time and planning, there are ways and tools to help minimize the taxes on the sale of farm assets. "Tax itself isn't a bad word," says Dogterom. "We just need to use the rules the government has made available to us."

By setting up a farm asset distribution plan ahead of retirement and in case of death, you'll get better use out of the Tax Act's capital gains exemption and land-rollover provisions. "Investment planning is also part of tax planning, so use the tools available to plan for when you contribute and withdraw," says Dogterom.

Although there's no inheritance tax in Canada, procrastinating doesn't necessarily allow you to take advantage of the rollover provisions or the corporate tax advantages that are available. Besides, leaving all the decisions for the remaining spouse isn't fair and can cause additional difficulties and stress for the family.

Farm adviser Larry Batte recommends a five-step process to slow down the farm transfer, making it more predictable and tax-smart

YOUNG GENERATION SAYS, "GO!"

Larry Batte, a chartered accountant with Collins Barrow in Stratford, Ont., is seeing more farmers being pressured by their children to retire sooner — in their early 50s. He's even seeing gold-digger children trying to push their parents into transferring the farm to them right away.

To ensure everyone is treated fairly, he suggests a predetermined five-step approach that slows down the process first with a transfer of management, followed by ownership.

This way, the younger generation begins basically as labourers and then moves to management as their skills develop. Once proven capable, they can be given a small portion of growth, maybe starting with 10 per cent of the common or growth shares, in addition to their wage. A decade or more later, the final steps kick in and the successors begin to get ownership beyond the growth.

Yet fundamental control on how the company operates overall isn't transferred for many more years.

Until then, the older generation maintains voting control so the younger generation can have their say but can't make any huge changes without the parent's consent. Rarely is this control card played, but it just makes everyone feel more confident knowing it's there, says Batte.

This process also enables a slower transition into retirement, which in turn allows for tax planning, investing and communication.

It's important to sit down and explain your vision of how you want your retirement to look to your family and business partners, says Batte. Then, using trustworthy advisers, sort out the best possible options with that goal in mind.

"Get a team in place," says Batte. "A lawyer, an accountant, a financial adviser, maybe a human resource specialist, and someone to help with the soft issues. Then, as a group correlate your retirement (and succession plans) to your estate plans."

VALUE OF INCORPORATION

One useful retirement and succession tool is to set up a farm corporation structure while you are still actively farming.

First, it's a way to deal with the taxes on the future sale of inventory. Small business corporations pay about 14 per cent on the first $500,000 of income in Alberta. Dogterom says it's often better to go ahead and pay the 14 per cent, and build up tax-paid reserves. Then you won't have a massive tax bill on the sale of inventory to deal with when you go to sell the land.

For example, if you have a 250-head cow-calf operation, ahead of retirement you could roll the cattle into a farm corporation, keeping the land separate and renting it to the farm corporation. At retirement, if you keep owning the land personally and sell the cows (now in the corporation), the income from the sale of the herd will be at a much smaller tax rate than if you continued to hold them in a sole proprietorship or partnership.

Dogterom says by putting the inventory and equipment into a farm operating corporation ahead of retirement, say, for five years, you'll pay income tax in advance and will have all the inventory taxes paid up at a much lower rate than if it was taxed at sale time outside of a corporation.

"It comes down to how do you manage the cash that comes out of this sale," he says.

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Good advice? Be careful

We've all heard about con artists, ponzi schemes, pyramids and financial advice gone wrong. Their geographic isolation and large wealth at sale of a farm make retiring farmers a big juicy target for financial fraud and bad advice.

Choosing a financial professional is one of the most important retirement decisions you'll make. Not only must they be trustworthy and understand your needs, they must be competent with larger-scale funds.

Always check references and ask friends and professionals for recommendations. An online search to check for whether a particular professional has been sanctioned by regulators or industry bodies is another good idea. If advisers promise sky-high returns, if they won't give clear answers about how they're paid, or if they provide complex, jargon-filled responses to simple questions, then be very careful.

Any time you're making big financial changes you might want to consider looking around for other help, comparing fees and scope with your current provider. Other products might work better for you in this new circumstance. It's your responsibility to understand your portfolio's performance and strategy.

TIME FOR A HOLDING COMPANY

Holding companies, sometimes affectionately known as HoCo's, could also be a strategic move to reduce total tax burden.

In the past, holding companies have been used only as operating companies for non-farming types of investments. But, says Batte, "holding companies are becoming more and more popular."

The attraction is the opportunity to transfer money from the operating farm corporation to a HoCo on a tax-free basis. Also, each corporation can pay dividends, wages, make loans to its shareholders, and that can be very handy for succession or for winding down and getting funds out of a farm. For example, you might think about setting up your non-farming children as shareholders of the HoCo so they can receive dividends.

Moreover, HoCos can be set up to keep funds in the operating company "clean" or not over the threshold for government to consider it not a qualified farm or small business income. By transferring funds to a holding company you can purify the farm's corporation if it has too many passive assets. (To be considered an operating business, the non-farming assets, such as excess cash in the farm company, need to be less than 10 per cent of the value of the assets.) Keeping this status is a way to ensure you can use capital gains exemption and rollover provisions.

TAX-FREE SAVINGS ACCOUNTS

If you have extra cash flow, tax-free savings accounts (TFSA) are easy to set up at any financial institution and unlike an RRSP, can be withdrawn from without penalty. Although contributions made to a TFSA are not tax-deductible, the withdrawn funds are tax-free, so you won't get taxed on any income your investments in a TFSA earn, even upon death. "Tax Free Savings Accounts are no brainers," says Dogterom.

Originally started by Harper's former government as a way to encourage Canadians to save more, from 2009 until last year the amount we were allowed to put in a TFSA increased steadily. However, starting on January 1, 2016, the annual TFSA dollar limit for 2016 decreased from $10,000 to $5,500. From now on, instead of being accumulative, the TFSA annual room limit will be indexed to inflation and rounded to the nearest $500. If you take it out, that doesn't count as space.

However, if you contribute more than your allowable TFSA contribution room, you'll be considered to be over-contributing and will be subject to a tax equal to one per cent of the highest excess TFSA amount in the month, for each month that the excess amount remains in your account.

CONTINUED ON PAGE 12


"We provide safe, quality food to the consumer. We can be honest and transparent because there's nothing to hide."
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AGRIINVEST

Many farmers have been putting aside money for a rainy day using an AgriInvest account. For older farmers this rainy day can mean when they are slowing down, decreasing production or, in other words, retiring. Farmers can invest one per cent of allowable net sales (ANS) each year into this self-directed risk management account and receive a matching government contribution.

Although the limit on matching government contributions is $15,000 a year, you can contribute up to 100 per cent of ANS annually and up to 400 per cent of ANS in total. This is for non-supply managed production only.

"Investing in AgriInvest is a slam dunk," says Dogterom.

The government-supported part has to be taken out first and it's the taxable portion. However, farms with large turnovers, like feedlots, have large amounts they can invest and will get larger government contributions.

Unlike the old NISA, with AgriInvest there are no premium bonuses or interest rates being paid. Also, compared to NISA a smaller amount is matched by the government. Many farmers are thinking that their funds are better used to drive profitability on their own operations, says Batte. "AgriInvest is not used as much as NISA for retirement savings," he says.

PENSION PLANS

Recently some financial companies have come out with professional pension plans for farmers.

There are two different pension plan structures, the Professional Pension Plan and Individual Pension Plan. Both are owned and paid for by your corporation, with the farmer named as plan member. This is a deductible expense for the corporation and provides a tax-efficient way to take money out of the business.

Neither Batte nor Dogterom have had any farm clients interested in PPPs or IPPs. The farm must be incorporated to use a pension plan, and it's not something that can be set up easily on your own. "They're fairly sophisticated," says Dogterom.

An IPP is even more complex as it requires the incorporated person to hire an actuary, an investment manager and funds custodian. Even though the management fees and all other costs associated with the plan are tax-deductible for the incorporated business, it's still costly. These services and fiduciary oversight are already built in to a PPP.

Like an RRSP, investment into a PPP triggers a tax refund and grows tax-sheltered inside the plan. However, PPP has an advantage over an RRSP because you can put away more money in a shorter period of time, especially over 50 years of age.

For a tax-effective retirement strategy, you can set up a holding company for the pension plan and register it as a Registered Retirement Savings Plan. As many farmers haven't contributed to RRSPs, they can use up multiple years of available RRSP space. This works really well if you do it the same year farm assets are sold. The pension funds in the holding company can either be managed by a trusted investment company or be self-directed.

RRSP

Registered Retirement Savings Plans (RRSP), are about tax bracket timing and tax deferral. RRSPs are a tax deferral and should be managed around taxable income levels. For many retiring farmers, when they sell assets is when they'll have a higher income. Then they'll be paying taxes on the RRSP at the higher tax rate and for that reason, for most farmers, it's not a useful tool. "I'm not a big fan of RRSPs," says Batte.

On the plus side, RRSP contributions are tax deductible against your income. The idea is to delay the payment of tax until retirement, when you're earning less and your tax rate is lower. You can also set up a spousal RRSP and put money into it with the spouse as a benefactor but you get the tax deduction.

If you don't withdraw, RRSP savings are rolled into a Registered Retirement Income Fund (RRIF) when you're 71 years old. After that you're required to withdraw a minimum amount each year based on your age and government regulations. A RRIF is basically the "taking out" account of RRSP.

On the plus side, the initial setup costs are minimal and it's a well known, common and accepted way to save for retirement. It's also a forced savings account because you'll likely not withdraw it until you're retired.

CANADA PENSION PLAN

Canada Pension Plan is another very safe way to save for retirement, and if your farm is a sole proprietorship or partnership, you'll likely have contributed based on your earned income. If your farm is in a corporation, dividends, rent, or interest on a shareholders loan can pay you, so you wouldn't have had to pay into CPP. But if the corporation paid you a wage, you likely have contributed into CPP.

You can also voluntarily pay into the CPP plan. Basically, with this government-controlled and -managed pension program the more you put in, the more you'll get out. The maximum amount is about $950 per month, but that would require that people contributed the maximum amount to their CPP over the years, which many farmers do not.

Advice around CPP varies. Some accountants suggest paying into CPP at a minimal amount so you get the disability tax credit and CPP in case you get hurt or die.

Dogterom usually advises his 50-year-old-plus-clients to pay into a CPP plan. "It's a reasonably good plan and all you need to pay yourself is $48,000 or $50,000 a year to maximize it," he says.

If you've paid into CPP since you were 18, Batte says at 55 it maximizes and doesn't have as a significant return on investment after that point. Most of his clients don't have to rely on CPP for their retirement. "If you're counting on CPP, you've made some serious mistakes (managing your farm assets) along the way," says Batte.

RENTAL PROPERTY, ETC.

Back in Ontario, Batte says that about half of his retired clients have investments outside of their businesses, and often it's land rented back to the farm. Instead of drawing cash flow out of the business, they keep money invested in assets that are productive for their businesses.

Only about a quarter of them have off-farm investments, like rental properties in town, mutual funds and equities. However, Batte says his farmer clients between 45 and 55 years old are more likely to look for investments in other places.

The best vehicles and tools for retirement vary for every situation so make sure you consult with your team of advisers, including your accountant. They'll know the details and history of your situation and should help you not miss any options in your planning.

Sometimes people forget about investments they made years ago. For example, if you're a member of a co-operative that has been building patronage reserves, says Dogterom, you probably want to cash that fund out when you retire. Don't forget to apply for the payout for the plan. **CG**

How much is enough?

When chartered accountant Larry Batte meets with his farmer clients to discuss retirement, he gets them to fill out a personal cash-flow lifestyle worksheet. The vast majority of the folks find their estimated living expenses are at least 50 per cent short of the estimated budget needs. They forget that the farm has been paying a portion of the home's utility and vehicle expenses and often providing some food.

Paul Vaneyk, a financial adviser in Peterborough, Ont., says that a good estimate to use is a four per cent withdrawal rate to figure out how much you'll need in total nest egg to retain the principal. So if you want $50,000 a year over CPP, using that estimate, you'll require $1,250,000.

NEVER too young

As the Ellis family is learning, there's no such thing as too soon for starting the conversation about farm succession

BY SHANNON VANRAES / CG FIELD EDITOR

Lincoln Ellis has just got his first taste of combining. "He thought it was pretty interesting for the first 10 minutes, and then he realized how small the combine cab was, and that was about it," says his dad, Simon Ellis, with a chuckle.

"So it was short-lived, but you know, small steps for now. And as he gets older I'm sure he'll like it… I know I certainly have good memories riding tractors and combines."

And while it will be many seasons before one-year-old Lincoln decides whether to take the wheel at the pedigreed seed farm his parents and grandparents operate near Wawanesa, Man., it's not to soon to start thinking about succession planning.

"It's never too early, but it can be too late," says Jolene Brown, Iowa-based professional speaker, author, farmer and family business consultant.

Succession planning isn't about focusing on an end date — when parents retire and the next generation takes over. It's about anticipating everything that needs to get done to facilitate that transfer, and preparing for all the unexpected things that might crop up before then, says Brown.

"Succession planning is a process." Brown says, explaining that it isn't at all like some kind of box that you're supposed to put a check mark in, showing you've got the job all done. "It will have to be evaluated and reviewed whenever there is a major change. When someone new is brought into the business, when children are born and as they age, you'll always have to review these documents because it's a process."

It also means recognizing that calamity can strike a family at any time, and that you'd have to be ready to deal with things you may not like to even think about.

"If there is that unforeseen catastrophe, death or disability, or divorce today, what will you do?" Brown asks. "You have to have a plan in place in case something happens. If this happened today, how could the business continue and not be compromised?"

For those farming with young kids or teenagers (or other young heirs), it also means deciding what kind of legacy you want for your farm business.

"So if you've got young kids and you want your business to continue and possibly be available for their ownership or management or leadership skills, well then you have to have a plan for who is going to lead this business now," Brown says. "(The kids) are not ready, they've not been vetted, so I'm not saying they can't be owners... things can be in a trust, but I do have a problem when we transfer ownership to people who know nothing about the business."

But just because children are too young to run a business, it doesn't mean they are too young to start learning how a farm works, or that it's too early for them to start acquiring valuable skills.

"Succession planning is the transfer of labour, management and ownership. But whether or not that transfer is going to happen depends on the culture and the attitude towards agriculture that you bring to your family business," says Elaine Froese, farm family coach from Boissevain, Man., and author of *Farming's In-Law Factor*. "So you start creating attitudes that embrace farming as a business when children are very young."

That means conversations at the kitchen table about whether they want a career in farming and if they want

> **Today's revolution in succession planning starts with the recognition that succession isn't about estate planning and wills. It's about the living, and how everyone can get the most from their lives**

PHOTOGRAPHY: SANDY BLACK

For one-year-old Lincoln Ellis, climbing into a combine cab with father Simon and grandpa Warren is an introduction to a world of wonders. Of course, he won't know for years whether a farming life is right for him, but if it is, the plan will be in place to make it possible.

to be part of the family business, says Froese. It also means their spending time on the farm, helping out, or seeing what Mom and Dad are up to.

However, in many cases it's not the older generation that broaches the issue of succession, it's the younger generation — if succession planning gets discussed at all.

"I'm not sure what the numbers are on how many people actually do it," says Jennifer Wright, senior human resources adviser with the Canadian Agricultural Human Resources Council. "But I can tell you anecdotally that not nearly as many people as probably should be are doing it, at least not at the right time."

That is starting to change though. As farm businesses become larger, more are adopting formal business practices, Wright says. Many organizations representing or supporting farmers have also recognized a need for greater awareness around succession planning and are offering tools as well as planning sessions and speakers for their members.

Still, approaching the issue is fraught with emotional stumbling blocks surrounding death, entitlement and legacy.

"I think this can be especially difficult if it's a family situation. It can be difficult for any business, but with family it can be very hard to do," says Wright. "If you're the younger generation looking for answers for the succession of the farm… you certainly don't want to make it appear to your parents that you are trying to kind of push them out the door."

Back in Wawanesa, Ellis said he's thankful that the topic arose naturally with his parents, Warren and Karen, and siblings.

"There's quite a bit about it in farm news and at conferences right now, and we knew that I wanted to take over the farm one day," Ellis says. "And soon as I married Amanda, well then we knew that I had a partner who wanted to be involved in the farm as well. So I think it

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Emotions are as real as any part of farming, says Ellis. They must be talked about.

"The first question is: what do you want?" says Froese. "What do you want for your lifestyle? What do you want for your income stream? Where do you want to live? What kind of role do you want on this farm?"

kind of came along naturally and we're really quite fortunate that with my parents and us, we have a very good communication line."

Weekly or bi-weekly meetings also allow Ellis, Amanda and his parents to discuss any issues that arise.

"Of course, during harvest it might get dropped for a month or two and then during seeding it's probably dropped for a month or two, but it's still a fairly regular conversation," Ellis says, adding that there is so much more to succession planning than the monetary side.

"It's not only a business or a job, it's a lifestyle," he says, explaining the hardest issue for his family so far has been figuring out changes in living arrangements.

"That's actually one of the stumbling blocks that we're on currently. We don't live in the farmyard, my parents still do. But there are a lot of benefits to Amanda and myself moving into the yard because we also run a seed retail business as well. So there's benefits there."

That said, Ellis is confident those issues will be resolved through ongoing dialogue. But he notes that it's not surprising issues like this prevent some farm families from making succession plans.

"There are these huge emotional attachments to things, to the farmyard, what's been built over 30 years or 40 years," he says.

But with a 10-year farm succession plan in place with his parents and siblings, Ellis says he can confidently plan for his son, whether or not young Lincoln decides he wants a career in agriculture.

"When he was born I think we had already established shares for Amanda and myself, and moved my parents to a preferred share status to lock in the value of the farm at that time," he says. "So we kind of talked about it but it took a little bit before we really decided what to do and how to get moving for the next generation, as far as Lincoln was concerned."

Wright says that if it's difficult to get a conversation around succession going, bringing in a third-party adviser can help facilitate succession planning. They can also provide expertise around legal issues, and distance from emotional issues where it's needed.

"Even if it's coming from the person looking to retire, looking for a success plan to facilitate that retirement, sometimes having that third person involved can help people have that conversation without it becoming personal or anything like that… particularly when there is more than one child that is interested in the farm or has been identified as a possible successor," says Wright.

Ellis and his family did hire a farm consultant as they worked on some portions of the plan. He says having someone else to guide the conversation helped with communication.

"She went over everybody's goals and what our plans were as far as retirement and where we saw ourselves in two years, five years, 10 years and what values we all hold important to us," he says. "It wasn't the same for everybody. Everybody had different goals

and aspirations and values — as expected — and there was the odd surprise in there."

Froese says that getting the ball rolling on succession planning takes what she calls a driver, someone passionate about the issue who is willing to make meetings happen. It's that driver who usually makes the first move towards outside expertise.

"Because nothing is going to move or shift unless appointments are made with an outside adviser and you start having meetings where everyone has a voice at the meetings to explore what everybody wants. Because the first question is: what do you want? What do you want for your lifestyle? What do you want for your income stream? Where do you want to live? What kind of role do you want on this farm?" she says. "It's not that complicated, but farmers are highly overwhelmed because they're avoiding conflict and they don't want to have the tough conversations."

Reminding the parties involved in a farm business that succession planning is not estate planning can help move the process along as well.

"Farmers get confused that estate planning is the same thing as succession planning," Froese adds. "Estate planning is for when you're dead, succession planning is for the transition for labour, ownership and management of the business that you're in now. And so a lot of people are procrastinating because they think succession planning is about making a will — which you should have — but a will is part of your estate planning."

Brown also stresses that wills don't stand on their own where farm businesses are concerned, so buy-sell agreements are a must.

"It's essential, and you've got to know what triggers it, who has the option to buy and in what order, how will the assets be appraised, what are the interest rates — and you never enter an agreement about shared assets without a way to exit it, without a way to amend it," says Brown.

Simon Ellis says that while it's still far too early to know if his son or any future siblings will be interested in farming, he is working to be prepared for all possibilities.

But he believes it's also important that kids have the opportunity to explore life off the farm before deciding to commit to agriculture.

"As he gets that experience and knowledge, and then gets to the age where he wants to start making decisions he'll have that information for himself to be able to decide whether he wants to farm or not," says Ellis. "Hopefully he would decide to come back to the farm, but we certainly don't want to pressure him to come back because it's not an easy business to be in." **CG**

Deciding on AgriStability

AgriStability has never been popular with farmers, and there's a burgeoning lobby to get it improved. But keeping your farm enrolled still looks like the right move

BY MARIE SMITH

If you ask farmers what they think of AgriStability, chances are you'll hear grumbling, some of it pretty loud. But as farm groups gear up to negotiate with the federal government over the next round of Growing Forward programs, it's time to examine what's actually working, what's not, and what's misunderstood about the program.

What's certain is that AgriStability isn't winning any popularity contests. For instance, in a survey this spring by the Agricultural Producers Association of Saskatchewan, farmers in that province ranked AgriStability lowest among the federal government's suite of business risk programs.

Fewer than 20 per cent said AgriStability is actually benefiting their operations.

Worse, 35 per cent said they had already opted out.

"Governments have indicated that they have no desire to return to the days of ad hoc programs. But given the participation level in AgriStability, there's certainly going to be a call for that if market shock occurs," says Dennis Thiessen, a grain farmer from Steinbach, Man., who also chairs the safety nets committee of the Grain Growers of Canada.

In 2011, 88,492 producers were enrolled in AgriStability, according to the federal government. By 2013, enrolment had dropped to 74,121 (Agriculture Canada doesn't yet have numbers for 2014 or 2015).

The federal government says the drop is partly due to farm consolidation and market conditions, along with business decisions made by farmers.

Thiessen, however, points out that while participation rates in AgriStability are declining, AgriInsurance and AgriInvest participation rates are solid, even though both programs require farmers to invest considerable dollars.

That's because those programs are predictable and bankable, he says, adding "They provide peace of mind to farmers."

The feds' numbers confirm that AgriInvest has held steady. Over the same time period, enrolment went from 110,483 to 105,566 producers, a relatively small drop the feds attribute to consolidation.

Why exactly are so many producers giving AgriStability a pass? What needs to be done to fix the program? And, is withdrawing from the program in a farmer's best interest?

Country Guide spoke to farmers, accountants, and farm group leaders to find out.

YES, IT'S COMPLICATED

Norm Hall, president of the Agricultural Producers Association of Saskatchewan, says one issue is what will happen to the farmers who have left AgriStability when the bottom falls out of the market.

But he's also concerned about how well enrolled farmers will be covered.

"AgriStability is a misnomer now," says Hall. With the drop in reference margins, it's AgriDisaster, he says.

Whether or not farmers will see a payment under the program depends largely on their reference margins, calculated by subtracting allowable expenses from farm commodity sales. Under the first Growing Forward framework, reference margins were based on an Olympic average, determined by taking the last five years' reference margins, dropping the highest and lowest margins, and averaging the remaining three. Farmers received a payment once their reference margin dipped to 85 per cent of that historical average.

But when the Growing Forward programs were renegotiated in 2013, the AgriStability payment trigger was dropped to 70 per cent.

"And the other change, which turns it into a real wild card for producers, is they have this limiting of the margin," says Steve Funk, director of farm income pro-

Farm participation keeps dropping, and more farmers like Dennis Thiessen of Grain Farmers of Canada say AgriStability can no longer claim to eliminate the need for emergency federal programs when prices fall

PHOTOGRAPHY: CHRIS PROCAYLO

grams at Meyers Norris Penny (MNP). The limited margin caps the reference margin to allowable expenses included in the margin. Farmers must use whichever margin is lower — either the limited margin or the original Olympic average.

Producers confused by these rules are in good company.

While it's possible to estimate the size of the payment a farm might receive under AgriStability, it's not easily done. Many farmers and their accountants have been unable to accurately forecast payments, says Ben Le Fort, senior farm policy researcher with the Ontario Federation of Agriculture (OFA).

OFA surveyed its members, and found 85 per cent of respondents said the program is difficult to understand. Even more doubt that their bankers understand the program either, or that their bankers would give them a better borrowing arrangement for participating.

"If you have inventory adjustments or you change your production in any way, it really throws off some of the numbers," says Le Fort, who adds that not knowing what circumstances will trigger a payment and how much they might receive makes it more difficult to make long-term plans.

"Farmers understand that numbers have to be verified, and that's the nature of the program," says Thiessen. "But it's still frustrating for farmers."

And the changes to reference margins hit some farm operations harder than others.

Cranberry farmers, maple syrup pro-

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ducers, and organic farmers are a few examples of operations more likely to be limited by the rule changes because their expenses are relatively low compared to their allowable income, Funk explains.

There are also geographical divides. In Saskatchewan, for instance, farmers in the south tend to be affected more than their northern counterparts.

"North is canola-wheat country, and south is lentil-durum country. And lentils don't take fertilizer," explains Shea Ferster, business adviser with MNP in Saskatoon.

By contrast, Ferster points out, crop rotations in the south tend to be pulse-heavy. Those pulses cut fertilizer requirements, and the seed also costs less than canola. All that adds up to lower costs for southern Saskatchewan farmers, making them more likely to fall outside AgriStability's limited margin.

Another source of frustration for farmers is that AgriStability discourages diversification on the farm, says Thiessen. For example, with a mixed farm, if either the grain or livestock side drops off, the overall farm is less likely to see a payment than farms that focus on one or the other.

Indeed, Hall says their survey shows that this is how farmers see it too, with more mixed farms appearing to pull out of AgriStability, along with smaller farms.

Funk agrees that mixed farms tend to qualify less often for AgriStability than farms that aren't diversified. When they do qualify, they also might receive less benefit. But that's not to say that they'll never qualify for money, says Funk.

"We have some very large clients across the firm that are well diversified and we often see them qualify" he says.

SHOULD YOU DROP AGRISTABILITY?

"In general, producers aren't participating at the levels that they should. Some of them have gotten out of the program. And I think it's a bad decision for a lot of them," says Steve Funk of MNP.

People tend to look at the business risk management programs in isolation, Funk says. But asking whether or not a farm should enrol in AgriStability is the wrong question, he argues. Instead, farmers should ask how they can combine the available risk management programs to maximize their coverage at a reasonable cost.

Like some other advisory services, MNP's accountants can show clients how much of their margin would be protected in various scenarios, so they can compare options.

For example, if you have a 30 per cent loss, how much of that loss will be covered through AgriStability alone? Or AgriStability with crop insurance? Or Global Ag Risk Solutions (GARS) instead of the Growing Forward programs? And what happens when you switch between the conventional and limited margin?

MNP also accounts for the costs of the programs. For a typical 5,400-acre Saskatchewan farm that we used as an example, AgriStability costs totalled $1.17 per acre. That broke down to $0.62 per acre in government fees, with the balance in accounting fees (MNP puts together the application and forecasts expected benefits for clients).

That's a pretty typical cost for AgriStabilty. Ferster estimates that a 5,000-acre farm would pay between $1 and $1.50 per acre to participate in AgriStability. Fewer acres doesn't drop the accounting fee significantly, he adds, because putting together the application and forecasting the benefits takes a certain amount of time no matter the farm size.

The bottom line is that when they are used together, crop insurance and AgriStability will cover most of the losses for this farm. Ferster and Funk say they haven't seen many of their clients withdrawing from AgriStability, especially once they've learned how the different programs work together.

But are there scenarios where it makes sense to opt out of crop insurance and AgriStability and to pay into GARS instead? Ferster says he hasn't found a better answer than "it depends." Until you run the scenarios, you won't know which options are best, he says.

Typically GARS competes better for a farmer who hasn't been using crop insurance, because they're then dealing with area averages rather than the farm's average, Ferster adds.

GARS is also worth a look when AgriStability doesn't provide a lot of coverage. Funk had a client whose $900,000 margin was being capped at half a million.

"That's pretty severe limiting," says Funk. That client was pondering whether AgriStability was still worthwhile. But when Funk crunched the numbers and did some forecasting, the eligible margin was heading back to $800,000 in the near future.

"Just because you're limited one year doesn't mean you're limited to the same extent the next year," Funk says.

He also adds it's usually worth staying enrolled in the program, because dropping out and re-enrolling takes as much work or more.

As for the grain farm Funk used as an example during the interview, the limited margin would have dropped their AgriStability benefit by $6 per acre.

"Is the program still beneficial? You bet it is," says Funk.

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AgriStability and AgriInvest by the numbers

How much money have farmers contributed to AgriInvest?

In 2013, the government's contribution was cut from 1.5 per cent to one per cent of allowable net sales. Producers started cutting their contributions to the programs as a result.

	2011	2012	2013
Value of producers' AgriInvest deposits	$346,266,208	$385,396,515	$264,557,580
Value of matching government contributions	$346,266,208	$385,396,515	$264,557,580
Total AgriInvest deposits by program year	$692,532,416	$770,793,030	$529,115,160
Accumulated program account balances (calendar year)	$1,256,395,934	$1,574,099,720	$1,918,133,561

WHAT FARM GROUPS WANT

All of the farm groups contacted for this story want AgriStability strengthened rather than scrapped.

"It's a known commodity," says Agricultural Producers Association of Saskatchewan (APAS) president Norm Hall. "You don't have to guess what sort of ad hoc program is going to come out, or demand some sort of ad hoc program."

On everyone's wish list is returning payment triggers to 85 per cent of the reference margin. And everyone would like something done with the limited reference margin. OFA's Le Fort would like to scrap that cap altogether, calling it a "double whammy" that cuts the likelihood of a payment and adds complexity to the program.

"We don't mind if there's a cap. But the one that they've got with eligible expenses is the wrong one because there's unintended consequences there," Hall agrees.

Although it's difficult to change program rules midstream, the Grain Growers of Canada want the federal government to take another look at how AgriStability accounts for certain farm expenses, Thiessen says. For example, custom work, whether it's work done by or for the applicant, is a messy area.

"There are different ways of calculating that in the costs. And they don't always make sense," says Thiessen.

Hall is also keeping his eye on the big picture when it comes to business risk management programs. There are all kinds of demands on the next policy framework, including trade and research along with business risk management.

Other groups, such as food processors, are also looking to Growing Forward for dollars that they used to access under Industry Canada, Hall says, then asks: "Will the government be willing to put more money into the total of the next policy framework, or are we expected to reduce something else to fund this extra demand?"

Given the falling participation rates in AgriStability over the last 10 years, "a simple return to the 85 per cent coverage rate" may not be the best solution, says Thiessen. He suggests "a deeper dive" to figure out what the issues are in the program, and to find workable solutions to those issues.

The Grain Growers of Canada wants an advisory committee to do that deep diving. Thiessen says they want representatives from national commodity associations on the committee. Provincial associations should also be at the table to address regional gaps in the program suite, he adds.

The knocks against AgriStability are well founded, Thiessen says. The program is complex, it penalizes diversification, its margins are unrealistic, and it is too hard to predict. Added to that, lobbyists say, is the increasing risk that the funding will be syphoned off for food processors

There was also a general feeling among the farm groups that the program needs to be more user-friendly and transparent. One complication is that AgriStability works on an accrual basis, while many farms operate on a cash basis, Hall says. Timing is also an issue, he says. Farmers can see payments from AgriInvest and AgriInsurance within 60 days, he says, but AgriStability takes six months, a year, or more.

Ontario's OFA wants the government to encourage new farmers to enrol in AgriStability. The first five years are the riskiest phase, says Le Fort, so he would like program fees waived for those farmers.

Of course, AgriStability isn't the only program potentially up for revision. Even farmer-favourite AgriInvest could use a few tweaks, according to farm groups who want the government contribution bumped from one per cent of allowable net sales back up to 1.5 per cent, restoring it to 2013 levels.

"We're also asking them to encourage some investment from the program," says Le Fort. Right now, when farmers withdraw funds from AgriInvest, that money comes from the government-contributed portion, triggering taxes. Le Fort wants farmers to be able to withdraw first from their share of the contributions to avoid those taxes.

"Under our recommendation it would be more like a TFSA," he says.

"AgriInvest has been a good tool for small bumps in the road, as long as you had some good years prior to build up a bit of an account," says Thiessen. "AgriStability is for the big bumps."

And if there's one thing you can count on in agriculture, it's big bumps. Thiessen thinks the next one might be around the corner. Global stocks of wheat and coarse grains are building, causing prices to drop significantly, he says. And overall commodity prices are higher than they would be in Canada due to the weak dollar and low oil prices.

"When oil prices recover, and the dollar recovers with them, that's when we're going to see significant market shock."

And he worries that's when we'll find the programs are lacking. **CG**

SOIL CONSERVATION COUNCIL OF CANADA
CONSEIL CANADIEN DE CONSERVATION DES SOLS

The face and voice of soil conservation in Canada
Le visage et la voix de la conservation des sols au Canada

Bringing Soil to Life: Jocelyn Michon shares the secret to his consistent yield success

Montreal-area farmer Jocelyn Michon was the Soil Conservation Council of Canada's 2009 Conservation Hall of Fame inductee.

Michon stopped plowing in 1993 and started using cover crops in 2003. He found that it improved both his soil and his pocketbook. He has increased his soil organic matter from 1.5 to 3.0-4.0 percent depending on the field, and estimates that going no-till makes him an extra $100,000 a year in savings, by reducing equipment, fuel, maintenance, labour and fertilizer costs.

Michon grows 600 acres of corn, soybeans and vegetables; he can double-crop green beans after peas. He applies chicken litter into a living cover crop every six years and his mix consists of buckwheat, faba beans, oats, forage peas, phacelia, oilseed radish, flax, sun hemp, camelina, lentils, sunflower and mustard.

Last fall, he had an overwhelming mass of cover crop growth, and rolled the crop at the end of September as it flowered. By planting time the residue had all but disappeared. "It's all down here," Michon laughs as he stoops down to examine the surface of his soil, just littered with earthworm middens (plant residue and castings at the burrow entrance). I have 20 to 30 middens per square meter."

"Textbooks say that with the one tonne of earthworms I have per hectare, I could reduce my nitrogen rate by 60 units (lbs/ac)," smiles Michon. "I have actually reduced it by 63 units, so that's pretty close".

He then quotes Ray Archuleta, Conservation Agronomist at the NRCS USDA: "It's not the fertilizer, but the eco-system that feeds the plant." This has been Michon's experience over the years. He has reduced nitrogen and phosphorus applications by half, and potash by a third.

He has custom built his strip-till unit, a 'Strip Till Light', to get into residue ahead of the planter in the spring. The unit consists of shark-toothed trash whippers, coulters that go only two inches deep and tines on the back to make just a bit of dust behind the planter. He has also innovated with 'bio strip-till', in which he plants twin rows of faba beans and oilseed radish in the fall directly where the corn will grow the following year.

He plants soybeans into cereal rye in twin rows with smaller machinery and an RTK system to control his traffic, aiming to plant on the corn rows from the year before. Grain buggies stay along the alleys and out of the field. Compaction is causing serious problems for water infiltration in the area, he notes.

"Dig first and figure out what the problem is," says Michon. "If it is compaction, you might have to run a sub-soiler, use smaller equipment or grow cover crops for a few years before you can stop tillage."

Michon is a former President of *Action Semis-Direct*, a group of 100+ no till farmers in Quebec, and he works closely with Odette Menard from Quebec's agricultural ministry, who was the SCCC's 2006 Conservation Hall of Fame inductee. He encourages farmers to 'go slow and go smooth' when transitioning their systems. Although other fields in the area have suffered with too little or too much rain, Michon's uniform and consistent yields are proof that his no-till system is improving his soil.

Counting the full value of farming

After years of talking, ALUS enviro-payments are finally going mainstrean, with 722 farmers already getting cheques

BY ANGELA LOVELL

To get an idea of a farm's financial health, we check the balance sheet. It's straightforward. On the one side are liabilities like loans and outstanding bills to suppliers. On the other are assets like inventory, cash, land, buildings and equipment. Then you simply subtract the liabilities from the assets to find net shareholders' equity, or net worth of the operation.

In fact, financial institutions rely heavily on the balance sheet — rather than statements of revenue and expenses — to make lending decisions, with the upshot that the less you owe, and the more your farm assets are worth, the more you can borrow.

Of course, when you really need that loan is when self-financing is less of an option, i.e. when your debts are already substantial, and your farm equity still needs time to grow.

So wouldn't it be nice if you could talk your bank into lending you more because your management practices are bumping up the asset value of your land?

In other words, wouldn't it be great if your balance sheet could reflect the things you are doing to build soil health, sequester carbon, improve drainage/water quality, maintain grasslands or wetlands, and so much else besides?

The idea of "full-cost accounting" is far from new. But now it's gaining traction among farm groups, and even among governments and private industry.

Full-cost accounting considers the environmental and social costs and benefits of activities that are usually seen as externalities. For example, short rotations might improve a farm's near-term profitability by allowing more acres for high-priced crops, even though the practice will eventually limit your future choices and potentially hurt soil quality, thereby cutting yields no matter what you grow. There can be negative environmental impacts too, which could also devalue the asset over time.

On the other hand, management practices that build soil organic matter or that sequester carbon over the long term could either directly generate extra revenue (for example, if a price were fixed on carbon) or would increase the value of the land asset itself, increasing overall profitability and value of the farm.

The surprise, it seems, is that the environmental impacts might get on your balance sheet first.

PHOTOGRAPHY: SANDY BLACK

Studies prove that Blain Hjertaas's cattle management is sequestering 25 tonnes of CO_2 per hectare every year. Now he may get paid for it.

"It's not just a handout of cash, it's not a subsidy," says IISD researcher Darren Swanson. Instead, he says, the move to pay farmers to solve environmental problems is "an efficient way to manage resources."

THE REWARD FOR ECOSYSTEM SERVICES

In order for full-cost accounting to become an accepted practice, there has to be not only general recognition from governments and the public that the ecosystem services farmers provide are of economic value to society as a whole, but there must also be mechanisms to generate tangible revenue or other value such as tax incentives that reward farmers generating them.

Although we aren't yet seeing full-cost accounting appearing on producers' books, it's a concept that's certainly not going away any time soon, says Darren Swanson of the International Institute for Sustainable Development (IISD).

It has taken time to get even this far, admits Swanson, who in 2004 co-authored one of the first papers exploring the concept of full-cost accounting for Agriculture and Agri-Food Canada (AAFC).

"We see more studies in terms of the valuation of ecological functions and services," Swanson says. "There is considerable promise for the payment of ecosystem services, and I think it's just a matter of time for both government and the general public to become comfortable with payment for those services. It's not just a handout of cash, it's not a subsidy, it is an efficient way to manage resources and mitigate costly environmental impacts. Market-based approaches will be the future of handling some of these issues."

MARKET-BASED SOLUTIONS

Some of those market-based mechanisms are already beginning to take shape, and at the forefront is ALUS Canada, which is providing farmers and ranchers payments for the ecosystem services they produce on their land.

"Currently we are paying our farmers and ranchers per acre based on land rental rates, so we are identifying the cost to produce ecosystem services," says Bryan Gilvesy, executive director of ALUS Canada. "Our role is to go out in the world and find out what they are really worth. We are already discovering that they are worth at least the cost to produce them, and hopefully more."

The ALUS program is snowballing across Canada. Six provinces, 19 different communities, and 722 farmers and ranchers are participating in a total of 18,200 projects.

Nine of those communities joined just this year, and Nova Scotia will do a pilot project next year.

Beside the direct income derived from the program, producers are finding ALUS is adding value in other ways. "A large number of the producers in the ALUS Canada system are self-marketing their products, and they are finding added value for the products from their land because they are differentiating themselves by participating in the program," says Gilvesy.

What's important for farmers to under-

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stand is the ecosystem services they produce have potential value to corporations that are increasingly required to prove their corporate social responsibility, to report on the environmental impact of their activities, and to adopt full-cost accounting principles.

"ALUS Canada is trying to define the value of ecosystem services in the marketplace," says Gilvesy. "That's where it's heading."

From that, it is just one short step to adding some real numbers to your balance sheet.

No one is actually predicting when it will happen, but what's certain is that ALUS is determined to provide producers with more options to increase short-term income and create long-term value for their farms.

"A year or two ago the only option a farmer had to increase revenue or the value of the land was to grow more crop," says Gilvesy. "What ALUS Canada is bringing to the conversation is that, for the first time, a farmer has the choice to look at a natural area, and say I can clear it and produce more bushels of crop, or I can produce ecosystem services to create more value."

A DOLLAR VALUE FOR CARBON

The value of sequestering carbon on farms has been the subject of debate for decades but many observers feel we are now moving closer to putting a dollar value on it in the marketplace.

"The agricultural community is waking up to the fact that when they sequester carbon there are going to be markets where they will get a cheque for it," says Gilvesy. "At the same time, they're building soil organic matter (SOM), and their soil becomes more productive. So a clear relationship will develop in terms of how much SOM you have and how that increases the value of the land."

Some producers, like Saskatchewan cattle producer, Blain Hjertaas, are already preparing for the day when carbon is worth dollars in the marketplace, and he knows exactly how much he will have to sell. Hjertaas is involved in a study co-ordinated by soilcarboncoalition.org, which is measuring carbon change over 10 years at around 300 farm sites in North America, 30 of which are in Western Canada, including at Hjertaas's farm near Redvers.

Hjertaas has an intensive grazing management system which increases soil organic matter and maximizes carbon sequestration. Hjertaas calculates that his land sequesters 22,800 kilograms per hectare of CO2 annually. Other Saskatchewan cattle producers have shown even higher carbon sequestration rates — up to 48.85 tonnes per hectare a year.

"Carbon is worth a lot of money to society," says Hjertaas. "Farmers should be seeing some of that value." Now, initiatives like ALUS are making those payments more likely.

"The goal of this initiative is to prove to society that this kind of farming sequesters a lot of carbon, and that is a very valuable ecological service to all of society that I am not getting paid for," says Hjertaas. "Carbon is worth a lot of money to society, and farmers should be seeing some of that value because we can reverse carbon emissions by putting it back into the soil where it can do some good."

New research is also showing how grain farmers can create value through adapting their management systems. Dr. Stuart Grandy's team at the University of New Hampshire is providing a new understanding of how organic matter forms. The work is showing that longer, diverse rotations which include cover crops such as clover build soil microbial communities and quickly generate organic matter.

In a trial involving an organic and conventional rotations, both converted 55 per cent and 45 per cent respectively of carbon inputs into sequestered, stable, soil carbon that can remain in the ground for a very long time.

NO LAND WILL BE SOLD WITHOUT A SOIL TEST

Here's a thought experiment. If we applied full-cost accounting to the last 100 years of agricultural production, what would the environmental cost be of the loss of organic matter in our soils?

Manitoba Grazing Club co-ordinator, Michael Thiele says he'd like to know. "That loss of organic matter has affected our ability to hold water and nutrients, our ability to grow nutrient-rich food, and our ability to have a resilient system when it's hot, or cold, or dry or wet," he says. "It's hard to put a dollar value on those things. It's not just about the pounds of nitrogen, or the bushels per acre, or the pounds of beef per acre. Full-cost accounting is much more than that."

Thiele believes we're moving toward a day when land values will be determined by what's under the ground, rather than

what's on top. "I can see that in the future. No land will be bought and sold without a soil test that indicates the state of the soil biology, and the SOM and carbon content," says Thiele. "Land which has been managed to increase these things will be worth more. There's no doubt about it."

Maintaining grasslands and forages is another ecosystem service that various groups and governments are seeking to valuate. A 2012 report — The National Forage and Grassland Assessment — concluded the economic value of forage crops in Canada was $5.09 billion, and that forages underpin our dairy and beef industries, which together contribute $11 billion in direct value to Canadian farmers and generate over $50 billion in economic activity.

Provincial studies in Alberta and Saskatchewan estimated the value of indirect benefits, such as environmental enhancements, could be worth at least as much as the direct benefits.

"If you take into account some of the initial estimates that have been made on the value of ecological goods and services provided by forages and grasslands, it is as much or more than the farm gate value of the forages," says Henry Nelson, vice-chair of the Manitoba Forage and Grasslands Association (MFGA) and co-chair of the Canadian Forage & Grassland Association (CFGA) environment committee.

"If we were being paid so much a tonne for the carbon we sequester, these forages and grasslands would be worth double — around $10 billion to $12 billion. It demonstrates that forages and grasslands are a significant contributor to our economy," Nelson says. "But they're not a cash return, because those returns come back through livestock sales and dairy products that we sell."

Forages are being left out of the picture with the economic system we have in place today, and Nelson says that is probably a big factor in why we are losing so many of them, which is creating more negative externalities that will eventually have to be accounted for by society one way or another.

"It will cost us due to flooding and droughts because the land doesn't have the capacity to hold water, and our infrastructure can't handle the volumes," Nelson says. "Then we are spending a lot of money through AgriRecovery and other programs to assist farmers."

Nelson adds that forage groups are working to document these grassland values and to get that information out to the general public so they understand the value of maintaining these natural resources.

"We want to do the analysis to show that although it seems more attractive to work these crops up, this is what it is actually costing us," Nelson says. "Then we want to look at some policy alternatives and market instruments that will help to reduce the loss of grasslands. But it's got to be programs that are revenue based." It squares with Gilvesy's thinking. "Dollars are the only metric we have," he says. "As corporations do more full-cost accounting and understand their landscape impact, they are looking for solutions to mitigate them, and ALUS is representing the farmers of Canada as an obvious answer to help support them to achieve those goals." **CG**

Who's doing the books?

On your family farm, is it time to transfer the books from Mom to the next generation? These seven steps will help you put things right

BY MAGGIE VAN CAMP / CG SENIOR EDITOR

Sometimes it's a job that gets assigned by default. After all, how many farmers really want to volunteer for a job that involves sitting at a desk entering data, paying bills and sending out invoices?

Sometimes, too, there can be an older generation that doesn't want change. Managing the farm books is their last bastion of control, or it may be the ultimate test of how much they trust their successors.

And on many farms, there may be a different kind of inertia. Life is already busy, so if the older generation has been doing a good job, why change?

On more of today's farms too, there's a new question that's getting asked as well. Why does the new daughter-in-law have to be the person who takes over? Would she be more valuable contributing in other ways? Is there someone else who has the skills?

Regardless, on almost any farm, the person who keeps the books can find themselves in a difficult position, particularly if the farm is multi-generational. It's definitely a job where emotions can unexpectedly flare up, which means the person doing the books needs good communication skills for steering through. Sometimes too, of course, cash management is a friction point during succession.

Long-time farmer and farm financial adviser Len Davies knows the quandaries well, having often dealt with clients who admit to him, "We know we should transfer the business but if we do, we'll feel of no use any longer."

In Davies' experience, when the founder finds something on the farm that only he or she is responsible for (and the successor is okay with that arrangement) then letting go of integral jobs is easier.

Traditionally, too, the job of doing the farm books has been the responsibility of farm women. For some mothers, in fact, it's their only remaining connection to the business, and they will not willingly let it go.

"This is hard to deal with since the dads can still hop on the tractor and do something else, but a mom who gives up bookkeeping is giving up her link to the farm," says Davies. "It has to be handled carefully."

Paul Reeds is a regional program lead for the Ontario Soil and Crop Improvement Association and when he conducts Growing Your Farm Profits (GYFP) workshops, he hears lots of similar comments about Mom or Dad not turning over the books.

"In a transition, there's sometimes a worry from the senior generation that they will no longer have a place in the new farm business," says Reeds. "So they hang on to tasks."

On the other hand, says Brenda Stefanson, Saskatchewan Agriculture's regional farm business management specialist in Watrous, for some it's a lack of trust. They think no one else can do the job as well. "It comes down to how much the mom and dad trust whoever is going to take over. Sometimes if that person is a daughter-in-law, there are some trust issues and some power struggles within the family."

"There is no one solution," says Margaret May, also a regional program lead for OSCIA. "Every farm family will do something a bit different, and as long as it works, it's all good."

Here are seven ways that might help kick-start the transfer of the farm books to the next generation:

CONTINUED ON PAGE 30

Control of the books doesn't have to be a question that holds the farm back. Instead, it can help you tackle the big issues that will fit the farm for the years ahead – as long as it's approached with honesty and foresight

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CFFO Response to Bill C-246 "Modernizing Animal Protections Act"

By Suzanne Armstrong

This federal private member's bill, sponsored by MP Nathaniel Erskine-Smith, representative from Beaches-East York, Toronto, has raised concerns among farmers. In response, the CFFO has written a letter to all Ontario MPs, as well as the federal agriculture minister Lawrence MacAuley, letting them know that we oppose the bill.

The changes proposed in Bill C-246 are wide ranging in the situations they attempt to address. The summary of the bill emphasizes the proposed changes are made in order "to prohibit the practice of shark finning" and "prohibit the importation of shark fins that are not attached to the rest of the shark carcass." While the CFFO does not object to these stated goals of the bill, other aspects are of significant concern to our organization. Our primary concern is about the proposed changes to the criminal code which may imply that animals have the rights of persons.

The CFFO strongly opposes Bill C-246's proposed changes to the Criminal Code regarding "Offences Against Animals." We argue that these sections should remain with Part XI of the Criminal Code, Willful and Forbidden Acts in Respect of Certain Property, clearly indicating that domestic animals

are the property of their owners, and do not enjoy the rights of persons or rights similar to those of persons. Furthermore, the proposed restrictions on the methods and situations in which an animal may be put down are too broad, and will have far-reaching negative effects if passed as proposed in the bill. In light of our serious concerns about the implications of proposed changes to the criminal code through Bill C-246, we are not in support of this bill.

The CFFO is a strong advocate for good stewardship in farming, and for us stewardship includes good care for animals. In scripture we read that, "The righteous care for the needs of their animals" (Proverbs 12:10, NIV). Of primary concern within farming is care for domestic farm animals, but farmers are also concerned about the welfare of animals in general. The laws in Canada are already strong in their protection of animals from abuse. Furthermore, codes of practice for the care and handling of each type of farm animal are in place across Canada. While the legal cases that have raised concern about the criminal code primarily deal with domestic animals, the bill does not clearly differentiate the species which would be more strongly protected by these changes.

We have already received responses from several MPs to our letter expressing our concerns about the bill. As MPs get back to business this fall, we expect we may hear more on this bill, and on the broader issue of animal welfare.

We want to thank our sponsors FCC, Beef Farmers of Ontario, Alpine, FBC, Jaylor, Grand Valley Fortifiers, Grain Farmers of Ontario and Meester Insurance on their amazing support. Without them we wouldn't have been able to give back to the young farmers in these three districts. Overall these were amazing events of fellowship, great food and entertainment. We look forward to planning similar events for 2017 celebrating farmers of today.

1. JUST ASK

Harmony on the home front is often better if everyone is honest about which roles are ones they still want to embrace, and which tasks they would rather not do. So why not ask?

The parent may be just waiting for the chance for someone to offer to take over. Sometimes all it takes to stimulate the transfer is just talking and asking about how the transfer would free up some time to do many of the things they've always wanted to do.

"My guess is she (Mom) can find lots of things to do to occupy her time!" says May.

Often it's just out of kindness and wanting to help out that the job of bookkeeping falls to the domain of the mother. "Mom does not believe the next generation has time to do the books too. To her, the others are already so busy," says May.

In other cases, controlling the books can also mean controlling the cheque book and farm expenses. Maybe the older generation is embarrassed, or doesn't want to have to ask the next generation for personal draws. Setting out a schedule of draws or paying them outright can quickly solve that issue.

2. TRAIN SOMEONE ELSE

Often, the reluctance to change comes for a concern over competency, particularly when the ones taking over are just starting to learn. On many farms, Mom has done a great job on the books for decades and the next generation does not have the skill… yet.

Training or supervising their replacement is often the stepping stone to a smooth transition and retirement out of specific jobs. "I have seen moms actively training the replacement with good results," says Stefanson.

Also, asking the older generation to be the backup and adviser sometimes provides assurance, which will go a long way to resolving this barrier, says Reeds.

3. GO ELECTRONIC

In some cases, bringing in new computer technology and accounting software is a surefire way to get the older generation to back away and let the younger generation handle it.

Who-does-what transitions often happen when a change is made in the system. Investing in a new computer and immediately sending someone for training might kick-start the changeover.

Before you take this step, though, talk to your accountant to ensure the new format of the books works for them. Sometimes they have a certain program they prefer.

Note that after completing the GYFP workshop, you can get funding to cover half the cost of courses to train the new bookkeeper and to cover half of the cost of new software programs.

"Sometimes the older generation wants to pass the record-keeping duties on, but there are no takers," says Reeds. "There's no system and no one wants to pick up the shoebox full of invoices."

4. SHIFT FROM TAX FILING TO FINANCIAL MANAGEMENT

Record keeping can be seen as a boring or thankless task or worse, and the person is blamed when the business is not doing well. Moving from a tax-filing mindset to financial management might up the motivation to transfer.

"Record keeping, cost-of-production tracking and projections should be seen as an exciting way for the whole farm management team to forecast the farm business's future and test 'what if' scenarios for better business success," says Reeds.

The incoming management might also want to change accountants, or at least get another opinion. This will sometimes instigate a change in how the farm's expenses and income are recorded and how that data is utilized.

Getting a farm financial assessment to generate a snapshot of the business and perhaps evaluate cost of production might also spur the transfer of bookkeeping duties.

"Talk, talk, talk about the kind of information you want to get out of the books," says May.

5. MOVE THE OFFICE

Changing the office location to the next generation's farm or at least out of the house might be the turning point to making this transition. Sometimes convenience is a factor, and setting up a new farm office can really help create more efficient systems (or at least it forces you to get the filing done).

It's also a clear message of change. But be careful to fully discuss this move well before you plan to do it. "Incoming management should take over the books when all of the management team decides it's a good time," says May.

6. HIRE A BOOKKEEPER

"If the expertise is not available within the family, then it may be something that should be hired out," says May.

It's like all of the other jobs on the farm. The person needs to like it, as well as have an aptitude for it, in order to make it work.

Some farm families are unaware or closed to outside help. However, in most areas, great farm record keeping, accounting and business planning assistance is available, says Reeds.

Most farm families who have opened themselves up to outside assistance find that it's not a cost, but a net benefit. "They receive professional cost-of-production and business analysis and tax strategies, and best of all it is done on a timely basis so the information is useful," says Reeds.

7. BIT BY BIT

In some cases, Mom is good at the books and enjoys doing them, and it works well to have her continue. This might be a good arrangement during the preliminary transition so the next generation can take on more management of the operation without taking on the books too.

Then Mom gradually decreases how much she does and the next generation moves into the role. Some families even set a schedule to transfer the duties, says May.

Sometimes the work is broken down into chunks. By starting with payroll or the cropping sector, the new person slowly moves into the role and the change is incremental so doesn't threaten the older one or overwhelm the younger one. **CG**

Building Up the Soil in Your Fields

by Angela Lovell, Ag Canada

New research is showing that it is possible to make new, nutrient rich, productive soil on your farm without waiting for eons, simply by changing your crop rotation and management.

Research, led by Dr. Stuart Grandy at the University of New Hampshire, is revising our conventional understanding of how soil organic matter (SOM) is formed, suggesting that the process is a lot quicker and easier than we thought.

"We used to think that SOM was made up of the leftover bits from decomposition left behind by microbes, so whatever plant materials microbes did not break down fully became SOM," says Grandy. But in recent years we have realized that most SOM is made up of microbial residues. That creates a very different perspective on how SOM is formed and how to manage it. What we are looking at now is cultivating microbial communities that have characteristics that contribute to building SOM."

"It's a new understanding of how soil is built," says Michael Thiele, Manitoba Grazing Club Coordinator. "It means our ability to build soil is much faster than what we had traditionally thought it to be. We used to think that soil is built on a glacial scale, so a very long timeframe, but if microbes form the basis of soil formation, as they live and die, expand and contract, we can build soil in a much shorter period of time."

"What becomes really important in determining how much soil organic matter (SOM) we are going to build in a system, is not the amount of lignin going into the soil, it's all about the function of the microbial community," said Grandy.

"Our model is arguing that all SOM is derived from the microbes themselves; the bodies of the microbes (necromass) which contain simple compounds, carbohydrates, nitrogen-bearing compounds such as amino acids, proteins, and lipids. These products of microbial biomass are not inherently resistant to decomposition — they just stick to clay minerals and it's that association between the clay and the residue that protects the microbial fragments and turns them into long term, stable SOM."

Plant inputs are still very important to SOM formation. Not because they are contributing directly, as was once thought, but because they influence and shape the microbial communities that ultimately become SOM. Grandy demonstrated this in a field experiment where he compared an organic and conventional rotation. Grandy found that the microbial growth rate and efficiency in the organic system was higher than in the conventional system, and there was more soil carbon present, even though there was less biomass input and more tillage in the organic system. Based on conventional wisdom about SOM formation, this seems counterintuitive.

"We typically expect that carbon inputs are associated with soil carbon, so the higher the carbon inputs from crop residue, the higher the soil carbon should be," says Grandy. "We also expect that increases in tillage reduce SOM especially in sandy type soils like those in the experimental fields, and yet we are seeing an increase in SOM."

The reason was the quality and timing of the carbon inputs. "A clover cover crop is a really important component of the rotation in the organic system," says Grandy. "It diversifies the carbon inputs, changes the timing of those inputs, and increases the inputs of carbon that have a low C to N ratio. Basically, the microbial growth rate and efficiency increases with high quality carbon inputs like clover residue. The rotation that included a clover cover crop had a microbial community that more efficiently converted inputs into SOM."

Grandy's research opens up opportunities to rejuvenate depleted soils and build stable, long lasting SOM quickly.

"Diversifying our crop rotations and including cover crops is especially important for promoting these microbial communities that are going to facilitate SOM formation," he says.

The potential exists for any farming system, whether it's organic, conventional or no-till to encourage microbial communities that will build SOM efficiently. "Building healthy soils with adequate SOM depends upon building a diverse and efficient microbial community and the best way to do that is by diversifying the kinds of plant and animal inputs that are going into soils through perennials, inter-cropping, cover crops, or increasing rotation lengths," says Grandy. "From a SOM perspective the key is promoting more efficient, diverse and larger microbial communities. There is a lot of promise here to develop."

Read the remainder of this article with more about Grundy's incredible research findings on the effect of intensive grazing management on microbial soil communities at www.ifao.com.

How healthy is your farm?

These examples show how standardized financial statements can be a powerful source of insight into your operational management

Three articles in this space over the last year focused on the management information to be obtained from standardized farm accounting statements. This month, we illustrate it here with two farm examples, concentrating on the operating (profit and loss) statement.

The organization of our operating statements is based on three principles:

1. Revenue should be only from farming operations. Crop insurance payments count, but other government payments and revenue generated from non-farming activities go at the end under "Other Income."
2. Managing operations is different than managing capital, so the costs of each should be evaluated separately. We regard leasing or rental costs as costs of capital and include them with depreciation/amortization and interest.
3. All farm operations have three categories of cost:
   - Raw and intermediate products that are converted into final products: seed, fertilizer, feed, chemicals, medicines (and crop insurance premiums). These are Cost of Goods Sold (COGS).
   - Direct operating costs (DOC) of machinery and equipment, transportation, and operating labour.
   - Operating overheads (OH), including management and office salaries, general utilities, banking charges, professional fees, and property taxes.

Our CTEAM participants often express frustration that they don't understand how well they are doing. Their accounting statements focus on taxes... not on information to evaluate or help improve their management

Our CTEAM participants often express frustration that they don't understand how well they are doing. Their accounting statements focus on taxes, no two statements are alike, and/or they focus on government programs, not on information to help evaluate or improve their management.

The table on page 34 contains actual formats for two farms (the numbers are not from any actual farm). The first column summarizes the operating statements each received, and illustrates the problem.

In Farm A's operating statement, costs are organized into seed and seedlings, allowable and non-allowable expenses. The latter two reflect definitions in government programs but have nothing to do with management. This format also doesn't separate capital and operations, and bears no resemblance to the cost categories above. Also, the farm owner has an agricultural business in addition to the farm that is included with farm revenue.

On the surface, it would appear that Farm A is relatively profitable with Earnings before Taxes (EBT) of $600,000 on sales of $3.4 million.

Farm B's operating statement is closer in line with the principles outlined above: "Other Expenses" toward the end is essentially amortization and interest i.e. capital expense. Farm B seems less profitable with EBT of only $200,000 on sales of $3.2 million.

The second column has the two farms' data rearranged in our standardized format.

FARM A

The non-farm income, as well as some government payments, are taken off the top line with its business costs, and the net is in the "Other" category. So "Sales" represent revenue ($2.7 mil.) of the farming operation. Deducting COGS (seed, fertilizer and chemicals) gives Gross Margin of $1.7 mil. Top farms expect gross margin of at least 65 per cent of sales, therefore COGS should be under 35 per cent. At 63 per cent and 37 per cent, Farm A has problems with some or all of: yields are not high enough; selling prices are too low; or crop inputs cost too much.

Direct Operating Costs for Farm A are 26 per cent of sales, again higher than the benchmark of 15-20 per cent. Subtracting DOC from Gross Margin gives Contribution Margin of $37 per cent, under the 45-50 per cent we would normally expect. This suggests that machinery and/or labour costs are also too high.

Overhead costs are 11 per cent of sales, within the 10-15 per cent benchmark. Subtracting Overheads from the Contribution Margin gives Earnings before Interest, Taxes, Depreciation/Amortization (EBITDA), which should be 35 per cent or more of sales. Farm A's 26 per

CONTINUED ON PAGE 34

CANADIAN ASSOCIATION OF FARM ADVISORS

The Canadian Association of Farm Advisors (CAFA) Inc. is a national, non-profit professional umbrella organization dedicated to assisting farm families and businesses by increasing the skills of farm advisors and consultants.

www.cafanet.com

CAFA's Farm Tax Update: Key takeaways from the 2015 Session

BY LIZ ROBERTSON, M.A., CAFA EXECUTIVE DIRECTOR

Almost a year ago, 200 farm advisors from across Canada participated in CAFA's premier Farm Tax Update in Guelph, Ont. or joined via AgriWebinar.

The day kicked-off with Jim Snyder, Agriculture Director, BDO Canada as master of ceremonies. Jim's knowledge and passion for farm business is evident in everything he says and does. He kept the content-rich day on time, with humour and deftly connected every presentation to real examples.

The first speakers were Wayne Ryan, CEO of Allied Associates LLP and Stephen Van Den Hengel, Partner, Famme & Co. Professional Corporation reviewing annual compliance and farm tax planning. Next, AJ Whitehead, Senior Tax Manager with DJB Chartered Professional Accountants walked everyone through the minefield of divorce on the farm. Participants then had a chance to network over a brief coffee break.

The second morning segment dealt with business structures from both a legal perspective, presented by Robin-Lee Norris, Partner, Miller Thomson Lawyers and an accounting perspective, presented by Tom

Blonde, Partner, Collins Barrow, Chartered Professional Accountants. Next, John Mill, LL.M. explained the uses of Inter-vivos trusts on farms.

At lunch, the table discussions were enthusiastic and positive: finally, a first-class farm-focused professional development event and a central venue to make connections with other preeminent farm advisors.

After lunch the program continued with leading tax and legal information including a segment on gifting jointly presented by Jed Chinneck of Chinneck's Law Professional Corporation and Kevin Butler of Skrypnyk Group Professional Corporation. Although a serious topic, Jed and Kevin had the room chuckling a few times. Kurt Oelschlagel, Partner, BDO Canada LLP, ably managed to explain the very complex tax issue when splitting up a family farm and Section 55 in under 45 minutes.

The final segment of the day included George Sinker, George E. Sinker Law Office on tax issues on the sale of a farm and Michelle Dekens, The Ross Firm Professional Corporation on Wills and Robert Fuller, Partner, Brimage Law Group wrapping up with Estates.

CAFA's Farm Tax Update fulfilled a real need for professionals dealing with farm families and businesses. It brought them up-to-date with new CRA legislation and regulatory procedures and provided a unique farm-focused in-person networking forum that connected them to a much broader pool of resources. This leading event is offered exclusively by CAFA, Canada's only national network of farm advisors.

A comment from the 2015 Tax Update was, "Good stuff. Keep this going!", and we shall! Make sure you check out CAFA's 2016 Farm Tax Update being held in Guelph, ON, Thursday, November 17 at The Delta and via Agriweinar. Learn more at www.cafanet.ca or contact Liz Robertson, CAFA Executive Director at 1-877-474-2871 or info@cafanet.com.

FARM TAX UPDATE

Thursday, November 17, The Delta, Guelph
7:30-8:30 am: Registration & Breakfast
Program starts 8:30 am, Lunch 12-1 pm | Program adjourns 4:30 pm.

Toll free: 1-877-474-2871
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cent is well below top farms. Farm A's operations generate $700,000 on sales of $2.7 mil. At 35 per cent, it would generate almost another $250,000.

Space doesn't allow showing the balance sheet, but A has a lot of debt: interest is $200,000 while depreciation and rental payments are $700,000, leaving a negative net contribution from the farming operation. A's side business, government payments and other investments provide the profits.

The Current and Debt/EBITDA ratios show A's financial tightness. At 1.2, the current ratio is less than the normal 1.5-2.0 range, meaning current assets barely cover current obligations. Debt/EBITDA means that if A used operating earnings from the farm to pay nothing but loan principal, (no interest, taxes, new investment, land or machinery rental, or owners), nothing else could be paid or purchased for 8.13 years. This is a highly leveraged position. Adding $250,000 to EBITDA would bring these ratios to 1.5 for current, and 4.8 for Debt/EBITDA.

FARM B

Farm B's financials required less adjustment to get to the standardized statement. A small amount of government payments went to "Other Income." Seed, fertilizer, chemicals and crop insurance payments were aggregated into COGS, resulting in costs of 29 per cent of sales and Gross Margin of 71 per cent, well above the 65 per cent benchmark.

Direct Operating Costs at just under 25 per cent are above the benchmark range and Overheads at 13 per cent are in the range. Farm B needs to concenrate on reducing some combination of machinery operating or labour expense.

FARM A ($ MIL)					
	Standardized				Ratios
Sales Commod	$2.8	(+)	Commod	$2.7	
Contract	0.4	(-)	COGs	1.0	COGS % = 37%
Other	0.2	(=)	GM	$1.7	GM % = 63%
Total	$3.4	(-)	DOC	0.7	DOC % = 26%
Costs		(=)	CM	$1.0	CM % = 37%
Seed and seedlings	$0.3	(-)	OH	0.3	OH % =11%
Allowable	$1.1	(=)	EBITDA	$0.7	Op Eff = 26%
Non-allowable	$1.7	(-)	Interest	0.2	
Total	$3.1	(=)	EBIT	$0.5	
Other income	$0.3	(-)	Capital	0.7	
EBT	$0.6	(-)	Net farm	-$0.2	Current = 1.2:1
		(+)	Other	0.8	Debt/EBITDA = 8.13
		(=)	Net EBT	$0.6	
FARM B					
Sales Commod	$3.25	(+)	Commod	$3.15	
Cost of production	2.4	(-)	COGS	0.9	COGS per cent = 29%
Gross margin	$0.85	(=)	GM	$2.25	GM per cent = 71%
Admin	0.35	(-)	DOC	0.75	DOC = 24%
Operating earnings	$0.50	(=)	CM	$1.5	CM per cent = 48%
Other expenses	0.25	(-)	OH	0.4	OH = 13%
EBT	$0.25	(=)	EBITDA	$1.1	Op Eff = 35%
		(-)	Interest	.05	
		(=)	EBIT	$1.05	Current = $4.5:1
		(-)	Capital	0.9	Debt/EBITDA = 1.6:1
		(=)	Net farm	$0.15	
		(+)	Other	0.1	
		(=)	Net EBT	$0.25	

At 35 per cent, Operating Efficiency is at the standard. Focus on Direct Expenses would improve it further.

Farm B has an interesting balance sheet. It has only a little bank debt. The remainder is family debt for which no interest is required. However, it rents a large portion of its land and a little of its machinery, to the tune of $900,000 annually. This cost sticks out like a sore thumb, taking up most of its operating income. Management needs to reduce this cost.

Because of the healthy operating earnings and the structure of the balance sheet, both the Current and Debt/EBITDA ratios are very healthy, suggesting one potential way to reduce the rental cost is to consider a larger ownership position.

CONCLUSION

These two examples show the management information that can be gleaned from standardized financial statements from which benchmarks can be gleaned. In their raw form, the examples provided little of value, but the standardized format allows the identification both of issues, and what needs focus.

Farm A has problems with both operational management: too little revenue is generated from the expenses on plant material and direct operating costs, probably because of too much labour cost. On its own the farm faces restricted strategic options because of its low returns relative to debt.

Farm B has relatively good operational management, but needs to improve capital management and reduce its direct operating expenses. Its balance sheet provides flexibility to deal with this.

Those who use this approach quickly see its value in evaluating and making better management decisions. **CG**

Larry Martin is a principal in Agri-Food Management Excellence, which runs the Canadian Total Excellence in Agricultural Management (CTEAM) program. **www.agrifoodtraining.com**

October 2016

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Building on 255 years

On this Nova Scotia farm, the ninth generation takes a decidedly modern approach to soybeans

By Ralph Pearce, CG Production Editor

Two and half centuries is a long time for a family to be farming. But brothers Craig and Brian Newcombe are leveraging the latest cropping techniques and business smarts to build the farm for the 10th generation of Newcombes.

Part of the ninth generation of Cornwallis Farms near Port Williams, N.S., the Newcombes manage a large and diverse operation including 1,700 acres, 65 dairy cows, 120,000 broilers and 20,000 layers, a grain handling facility and a feed mill.

The Newcombes began farming in the Annapolis Valley in 1761, making it one of the oldest farms in Canada. (Although Brian says a few older farms are still operating in Quebec.)

Brian looks after the cropping and dairy divisions while Craig oversees the poultry operation as well as the feed mill. They also employ six full-time staff along with some summer students.

With dairy and poultry, self-sufficiency is important to the sustainability of their farm, so they try to grow and process much of their own feed. It's also why Brian uses two separate rotations. One is a straight grain rotation, with corn-corn-soybeans-winter wheat, and the other is the same rotation with an alfalfa-grass blend for five years, after which it comes out into the straight grain rotation.

"We try to grow as much as we can," says Brian Newcombe, adding that includes all of the forages. "We also have our own soybean extruder on-farm, so that cuts down on the amount of protein we have to bring in. We used to have to buy a lot of soy meal and now, with this extruder, that replaces a large portion of that, although we still have to bring in some canola meal and some other proteins."

They grow brown mid-rib (BMR) corn hybrids for silage, as well as conventional corn as feed for the chickens. They mix their own grain rations for both the dairy and poultry operations.

The farm itself is located on what is known as the "floor" of the Annapolis

Continued on page 4

(l to r) Craig, Brian and one of the next generation of Newcombes, Craig's son David

Valley, flanked by the North Mountain and South Mountain, with the river flats east of Port Williams running into Minas Basin. The mix of topography provides a unique microclimate which allows for a diversity of agriculture in a fairly small area. Row crops, fruits and vegetables grow well in the Valley, and it's a very important agricultural district in the Maritimes.

At the Newcombe farm, they work with variable soils, from heavy marsh clays that are protected by a series of dykes, to clay-loams and everything in between. As if the soil types aren't challenging enough, the ground tends to be rolling hills (except for the marsh clays) meaning erosion can be a problem.

To help mitigate any erosion, the Newcombes began no tilling in 1993, when Brian returned from college. Today, most of their wheat and soybeans are under no till and they strip till their corn.

"And that's all good, but there's a step further that we can take it, and what we've started to do now is to bring in cover crops to the rotations, to try to build that soil diversity and organic matter, and create some of our own nitrogen," Newcombe says.

In the past couple of growing seasons, the Newcombes used eight- to 10-way mixes of cover crops. In 2016, Brian started seeding corn into standing green cover crops (then killing off the cover crop), a move that's being tried by more growers across Eastern Canada. He's also made a connection with some of those growers, including Dean Glennie from the Niagara region.

"It's challenging to manage that, but if it works the way you want it to work, it's really quite exciting," says Newcombe, who was awarded Canada's Outstanding Young Farmer in 2003. "If you want to change your soil structure and improve it, that's the fastest way to do that. Eventually, once you have that system built up, you can really start to cut back on your inputs, getting away with fewer sprays and chemical fertilizers, and once you get that soil biology working for you, you can do some amazing things."

To help continue with learning and networking, Newcombe also attends the National No-Till Conference in the U.S., every year. He says it's a great place to connect with other progressive farmers and listen to top-notch speakers on the subject. The other thing that's important when trying to reduce tillage and improve soil health is not to allow yourself to be swayed or influenced by those who say, "it can't be done that way."

"You know it can work, it's just a matter of finding a way to make it work on your operation with your own climate," says Newcombe. "We're a little more challenged in Canada than they are in the U.S. Midwest where they have a longer growing season and they can get cover crops in usually, but here we have to be a little more creative to get covers in before winter hits."

When it comes to no-till farming, the Newcombes were one of the first in the area to try the practice. There weren't

> "We've started to bring in cover crops, to build that soil diversity and organic matter."
>
> — Brian Newcombe, Cornwallis Farms

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many other farmers they could consult at that time, so they had to learn as they went along, finding the technologies available and adapting them to their situation.

"Once we were into no till, then we got into cover cropping and planting grain, and that's all innovative," says Newcombe. "There is information out there, but there isn't a lot of local input to figure out how it works. You just have to figure out how to make it work on your own operation."

They have invested heavily in upgrading the technology used on their farm, including RTK guidance, yield monitors, variable-rate seeding capabilities, GreenSeeker technology and variable-rate fertilizer. Newcombe says they've also added swath control on their planters and their sprayers, along with a hydraulic downforce sensor on their new corn planter. Additionally, they're using yield monitor data to map the various zones in their fields and manage accordingly.

Asked how things have changed in the years since he won the Young Farmers award in 2003, Newcombe says the technology has certainly changed. He's doing things now that he wouldn't have dreamed possible 13 years ago. The outlook on farming has changed considerably, as well.

> "You know it can work, it's a matter of finding a way to make it work on your operation with your own climate."
>
> — Brian Newcombe, Cornwallis Farms

"Margins are getting tighter so you have to start looking at where you put your investment dollars, the equipment you want to invest in and what kind of inputs you want or cut back on," says Newcombe. "Or you can grow your own inputs, whether it's cover crops or green manures and get organic matter to help supplement the costs. You have to watch those dollars you're investing and make sure you invest them wisely."

In the Maritimes he has seen more farmers in the region adapting to more corn and soybeans in their rotations, and many are constructing their own grain-handling facilities and feed mills. Farmers in the Maritimes are more likely to feed what they grow to their own livestock or poultry. There isn't a lot of processing available in the region.

Newcombe acknowledges there's a rich diversity across much of the three provinces, particularly in the Annapolis Valley, where they can grow most of the same crops as southern Ontario.

"There are other areas of Nova Scotia that just don't have the microclimate and heat that we do in the Valley," he says. "You don't realize how diverse our cropping is, depending on what area of the Maritimes you're talking about. But our soils and climate here are as good as anything in Quebec or Ontario." **SG**

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Grow soybeans like corn

Increasing your management intensity with extra attention to weeds, pests, uniformity and canopy closure

By Ralph Pearce, CG Production Editor

Proponents of big yields often make the same observation. Whether it's in corn with American record holders Francis Childs or Herman Warsaw, or it's in soybeans, with Dr. Gary Ablett at Ridgetown Campus once pegging our potential soybean yield at 250 bu./ac., the talk always turns to "attention to detail."

Yet what confounds Eric Richter is that so many growers pay more attention to their corn crops than they do their soybeans. It's also why changing the management mindset on soybeans has become a focal point in his recent work with growers.

Richter is a sales agronomist with Syngenta, and *Country Guide* has written previously about his approach. For this *Soybean Guide*, we talked to him to explore five more parameters that continue to confound many growers.

Overall, Richter contends there is a lack of intensity when it comes to growing soybeans. Not necessarily intensity in terms of higher levels of inputs, but in terms of the intensity of management skill applied to soybean production, including scouting and awareness of what's happening in the crop.

Indeed, Richter is convinced soybeans are actually the more challenging crop to grow. Yet he also feels many growers are skeptical that anything they do will reliably boost their yields.

"Growers might ask why they're pouring good money after bad, and that's unfortunate," says Richter, who's brought much of what he learned working in forages into the soybean sector. "The 'good money after bad' scenario becomes a self-fulfilling prophecy."

Where some insist that corn yields have outpaced soybeans, Richter states that research data from tests under a high-management system where genetic potential is assessed indicates soybean yields are increasing at roughly the same percentage rate as corn.

Yet those same practices aren't always employed at the farm level. Theoretical yield for corn is 500+ bu./ac., with an on-farm provincial average of 170 bu./ac., meaning the crop actually achieves more than 30 per cent of its theoretical yield.

In soybeans, if the theoretical maximum is 250+ bu./ac., actual yields of 45 to 48 bushels are less than 20 per cent.

HIGH, MEDIUM AND LOW

Something else that isn't well understood is how to shift management to a high-, medium- and low-zone approach. Even though a precision agriculture system can help a grower manage a field in increments of feet or inches, Richter maintains it's easier to keep things simple. That means recognizing that each field will have areas that are high-producing potential, medium potential and low, mainly due to soil factors such as organic matter levels, water-holding capacity, cation exchange capacity (CEC), and other parameters that will determine inherent productivity potential.

Within that overview Richter addresses four key components of improving soybean yields through intensive management: weed management, canopy closure, disease management and uniformity of stand. Each can have different subheadings and influences, but make no mistake: each has taken on greater importance in this "just enough" era in managing soybeans.

Have soybeans become the crop that's regarded as being able to take care of itself? It's capable of fixing its own nitrogen and has a reputation for yield consistency (hardiness). (For example, how soybeans can suffer a 40 per cent loss of a stand and still reach a 90 per cent of yield index.)

But Richter says, "that this belief is part of the problem.

"I say it over and over again: the ability of a soybean plant to tolerate stress and still deliver a harvestable crop is amazing," he says. "With soybeans at 45 bu./ac., it pays the bills but there's not much left over. Is that where we want our growers to be, or growing the best crop possible? Well, 45 isn't anywhere close to that."

In order to push production levels, growers need to shift their focus from bushels per acre to impact on yield as a percentage. Richter cites a five per cent response, and positions it within that high-, medium/middle- and low-zone approach, where highs are 75 to 80 bu./ac., mid-yield zones are 55 to 60 and the lows are about 40 bu./ac.

This means a five per cent increase is 4.0 bu./ac. in the high zone, 3.0 bu./ac. in the middle and 2.0 bu./ac. in the low management zone. From the low to high zone is a 100 per cent difference, and in Richter's book, that yield increase is extra money in a grower's pocket.

WEED MANAGEMENT — THE EASY TARGET?

When Dr. Clarence Swanton introduced the concept of the critical weed-free period in corn in the early 2000s, the effect was incredible. Seed companies lauded the research and growers slowly began to follow Swanton's lead, at least where spring planting and weed management strategies were concerned. When Swanton updated his work in 2014, it provided further insight into the way weeds can affect corn, even while the seed is still below surface.

At the same time, there's been less of a focus on the critical weed-free period in soybeans, even though the soybean plant's shorter stature is liable to be affected to a greater extent during the vegetative period. It can be argued that if a corn seedling is affected by an emerged weed seedling of the same height, it's likely a similar situation for a soybean seedling.

To Richter, the manner in which weeds interact with corn or soybeans during the grain-fill period is radically different. In most cases, he says, advisers recommend

Canopy closure leads to better weed management, uniformity of stand and ultimately better yield.

"The biggest challenge for those growers is to close canopy and build a large enough plant factory."

— Eric Richter, Syngenta

and growers try to control weeds in corn during that critical weed-free period, so the corn plant experiences its massive growth spurt and it will often canopy over any late-season weeds so they won't significantly affect yield.

"I would say that's not true with soybeans," adds Richter. "If we have those weeds that break through the canopy and tower above our soybean crop during the bean-fill period, they're impacting yield in a very negative way."

In fact, Richter and his colleagues with Syngenta have been recommending to many growers that to manage weeds in their corn crops, they should consider a two-pass system, where they're doing an application as a pre-plant incorporated (PPI) followed by an in-crop post application. In soybeans, more growers who are using herbicide-tolerant varieties are also using a herbicide with residual activity with their burn-down. He believes that to be a positive step in terms of managing more of the weed species in the field.

In this way, weed management relates closely to canopy closure, an event during the growing season which Richter insists must occur early in order to maximize yield and full genetic potential of the soybean crop. In 2016, many growers made a switch in row width — from 15 inch to 30 inch. The move was expected to help reduce the severity of white mould, which has become an issue for more farmers in southern Ontario in the past two or three years, and is now a perennial headache in eastern Ontario. What growers didn't count on was the early-season drought across much of the province. In many cases, that shift to 30-inch rows cost them, not only in yield, but in terms of weed management, where failure to close the canopy led to weed escapes and the potential for those added flushes to set seed and contribute to the soil weed-seed bank for subsequent years. Although it's impossible to predict drought, the decision to widen rows will likely have an impact on weed management well into 2017.

This is also where canopy closure is often underestimated: it encompasses at least three different parameters — and likely more — in its breakdown. Row width (and the favoured "W" pattern across a field), plant type (thin or bushy), and seeding rate are all closely related to canopy closure and its impact on yield. Richter cites 15-inch rows as the most popular choice across much of Eastern Canada. A small percentage of provincial area is planted on heavier clay and lower organic matter sands, necessitating 7.5-inch widths. The balance of the soybean acreage — spread across the province, including eastern Ontario — employs 30-inch row widths. In many cases, this row-width strategy is twofold: first to maximize planting equipment efficiency and also perhaps as a means of mitigating the effects of white mould.

"For years we have said as an industry that as long as you have 'X' thousand plants per acre, you won't have to do a replant, and that number's been approximately 100,000," says Richter, adding that he's been part of that chorus. "What I've learned recently is that statement has misled many growers. On those heavy clays and low-organic sands — where they are typically planting with 7.5s and 15s, if they're counting and getting an average of 100,000 plants and not replanting, they take a huge yield hit because the crop will not close canopy quickly enough, if at all. The biggest challenge for those growers is to close canopy and build a large enough plant factory."

A unique way to assess canopy development is the "W" canopy. At 7.5 inches, it's unlikely a grower can see that "W" at field level. The crop tends to be too thick and there isn't that trough-like character to the profile, which often leads to lodging, particularly if the crop is seeded too heavily.

In 15-inch rows, as well as 18s, 20s and 30s, the "W" should be apparent, and Richter states that's a good thing to see. For the majority of soybean growers, medium-row width — 15s to 20s — will optimize yield. It will close canopy and with the right population, will maximize yield. With 30s, he says, it takes a very special situation with healthy soils in a high production zone to make that row width work.

"We often say that soybean is the first crop to truly show that you have a major soil health problem," says Richter. "Your yield flatlines and you just can't seem to move yields forward, even if you put more fertilizer on. These are key indicators that growers are suffering with poor soil health."

Another factor within canopy closure is plant type. Here the concern is the different plant types for soybeans, from slender or thin-line plants to full-bush, wide-row beans. There are also height classes but it's usually more of the branching characteristics that are cited in canopy closure.

"If we're trying to control white mould with 30-inch rows and keeping population to about 150,000, and yet plant without knowing that we're planting a variety that's

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more to the slender side, the odds are we won't canopy," says Richter. "And yes the odds are we probably won't have much white mould, and your yield will be okay. But the slender plant type in a 30-inch row won't maximize yields."

Finally, on canopy closure, the adage "seeding rate trumps row width" is another important factor, particularly for growers planting in narrow to medium row widths. In comparing 7.5s to 30s, seeding rate may not entirely trump row width, but within 7.5, 15, 18 and 20 inch, the impact that population can have — from the W-shaped canopy, optimizing the leaf area and finding "the sweet spot" — seeding rate is really the one that does it.

There is a part of the discussion that surrounds planting date, and in most cases, that does have an impact, where the earlier it's planted, generally, the more orderly emergence can take place, then canopy closure and moving in a positive direction towards the reproductive stages. If you plant early with 30-inch rows and use a slender plant type, it likely won't matter, because canopy closure is going to be a big challenge with that plant type.

"Look at what we've learned from the double-cropping practice, where canopy closure at R1 is not possible in medium to wide row configurations," says Richter. "Even 15s won't see a canopy closure at R1, so in a double-cropping year, 7.5s must be the row width."

BETTER PEST CONTROL

In spite of all that's known about pests and diseases, it is shocking to contemplate the impact of soybean cyst nematode (SCN). In fall 2015, Syngenta started a Clariva PN promotional travelling road show to get growers to bring soil samples, do a quick test to determine the presence of SCN, and if it was present, to send that sample on to A&L Canada Laboratories for confirmation of SCN races.

There are two primary sources of resistance in the fight against SCN: PI 88788 and PI 548402 (the "Peking" gene). PI 88788 is the primary source of resistance in roughly 95 per cent of soybean varieties in North America. The Peking source accounts for most of the remaining five per cent with a third source — PI 437654 (Hartwick or CystX as they're known) unavailable in any commercial varieties currently in use.

That near-total reliance on a single source of resistance is creating potential increased susceptibility when the same variety is planted back to back to back in the same field, or in tighter rotations with just corn and soybeans.

Dry conditions created many challenges for growers in 2016, particularly with weed management.

"As a result, with poor genetic rotation and overall tight cropping rotations, we're encouraging the cyst to adapt and select for the races that are not currently controlled with the genetics in use," says Richter, also pointing out that it's difficult to shift resistance sources. "The challenge that we have is that SCN resistance sources have a strong correlation between gene sources and yield. When SCN-resistant varieties were first introduced in the 1990s, those varieties had a yield lag."

There are still fields in Ontario that have no detectable levels of SCN and the onus is on those growers to keep things that way. At the same time, there are now fields across much of western Ontario with high rates, some of which have only been detected in the past two years. Yet these fields have shown signs of having been host to the pest for up to 10 years.

That's the issue with SCN: many farmers deny they have it, in spite of symptoms and the available tools to deal with the pest, including different varieties and new seed treatments. And that's why Richter believes his company's SCN road show is such a positive move — it takes the identification process right up to the farmer's front door.

UNIFORMITY OF STAND

Last on the list is uniformity of stand, which is closely linked to the "picket-fence" stand, a common term in corn production. In soybeans, it's still important and is a favourite topic of Richter's.

In cornfields, agronomists, advisers and dealers have used the picket-fence image to highlight the uniformity-of-stand concept. In particular, there are three important aspects: diameter (of the stalk), the spacing between stalks, and ear placement and size. The diameter provides an indication of emergence, intra-row spacing is an indication of uniform seed spacing and the ear placement and size provide some idea of uniformity of plant growth. It's best if the ears are all located along the same plane within the row. The best cornfields have a uniform appearance.

In soybeans, there hasn't been that same emphasis on uniformity of emergence or spacing. Again, if a grower is happy with 45 bu./ac. yield, picket-fence stand (or its counterpart in soybeans) likely won't matter. The industry standard response has been, "As long as you have at least 100,000 or it's roughly uniform, don't worry about it."

Yet Richter is focused on picket fencing in soybeans. While it's true soybeans have a tremendous compensatory power, he says, if soybeans aren't emerging at the same time, you get into that "runt of the litter" syndrome, and that leads to lost yield.

What's truly surprising is that other industries have adopted the uniformity-of-stand principle as an important factor in performance and production. Richter points out that the horticulture sector and forest industry have acknowledged the value of uniform emergence and stands. Syngenta has documented this effect using what's known as micro counts measuring in one-foot increments. For example, in spite of an average of 150,000 plants per acre, final population in some growers' soybean fields, it's been determined that in some places within those fields, the populations can vary from 220,000 in some parts to less than 150,000 in others.

"Where do we see this? With growers who use drills or planters with bean cups, or those with the wrong plate," says Richter. "These are where the uniformity of stand and the uniformity of spacing can be compromised in soybeans." **SG**

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Get them in early

If done right, planting soybeans early can boost yields

By Helen Lammers-Helps

When farmers first began growing soybeans north of the border, the general recommendation was to wait until the May long weekend to plant. The advice was always to plant soybeans in your best field on the best day, and even then to cross your fingers.

Since then research has consistently shown a yield benefit for earlier planting.

But that still leaves the question: What is the magic date for optimum yield? What factors come into play? And what are the risks?

We asked four agronomists to weigh in on optimum planting dates and management strategies for soybeans.

Horst Bohner, soybean specialist for the Ontario Agriculture Ministry, says it's very clear from his trial work that early planting is a good management strategy. Most recently, a multi-site trial with locations across Ontario carried out in conjunction with Monsanto from 2010 to 2012, showed a yield gain of 4.1 bushels per acre when longer-maturity soybean varieties were planted in an early planting window compared to adapted soybean varieties planted in a normal window. In the study, the normal planting window was May 6 to May 20 and the early planting window was April 15 to May 5.

According to a three-year trial across multiple locations by OMAFRA's Horst Bohner, early planting can boost yield by as much as 4.1 bu./ac.

Ken Currah, a London, Ont.-based agronomist with Pride Seeds says research at Michigan State University has also pointed to an early planting advantage. Over a five-year period there, entries in a soybean high-yield competition showed a yield loss of 0.4 bushels per acre per day for planting after May 7. On average the winning entry was planted on May 4, some 13 days before the lowest-yielding entry in the competition.

This makes sense when considering the physiology of soybeans. The goal is to get as much vegetative growth as possible by the summer solstice, explains Currah. The more nodes, the more flowers and pods will be available to fill, and hence the more yield potential, he explains.

Bohner agrees. "Ideally you want to get to the fifth or sixth trifoliate before flowering."

While many larger-acreage farmers are now planting corn and soybeans simultaneously, Adam Pfeffer, a Monsanto technology development representative based in southwestern Ontario who worked with Bohner on the soybean planting date trial, isn't sure farmers have got the message about switching to a longer-season bean variety.

As a result, farmers are missing out on potential yield, says Pfeffer. If you aren't coupling a longer-season variety with the earlier planting, the soybeans will mature too early and you'll miss out on some yield, he explains.

Currah says some farmers are conservative with maturity dates because they are concerned that soybeans won't be ready on time in the fall, especially if they are following the beans with winter wheat. However, Ontario research shows that increasing the days to maturity by three days only delayed harvest by one day.

Unlike corn, soybeans are photosensitive, says Currah. "This means the beans sense day length and they shut themselves down," he says. By comparison, corn is linear and needs a predetermined number of heat units to mature.

The early planting strategy only applies if the ground is fit and if it's a reasonable planting window. While it's impossible to nail down an exact date, Bohner says as a general rule, in southwestern Ontario, the early window would be the last week of April and first week of May.

"I don't suggest planting on the fifth or 10th of April," Bohner says.

And while time constraints are an issue as growers try to cover more acres, it's critical to wait until the soil is ready. This can be a particular problem for no-till growers when planting soybeans following corn. With corn yields climbing 20 to 30 per cent in recent years, there is also more corn residue and as a result soils tend to be wetter in the spring, especially clay soils, says Pfeffer. "There's a lot of frustration with cornstalks. Many farmers are still trying to figure out a residue management system," he says.

This delay has prompted some farmers to till following a corn crop. The yield boost from planting early can offset the extra cost of tillage, says Paul Sullivan, an agronomist in eastern Ontario who sees a similar advantage for early planting in his part of the province. "Farmers see a 10-bushel difference between planting May 1 and June 1," he says.

Sullivan agrees that soil conditions are important for successful early planting of soybeans, but he adds that often conditions are actually better earlier in the season. "If the soil dries out, it's hard to get the seed in the ground or, if it rains, the soil often doesn't dry out well again," he says.

Currah says planting before the soil is fit is more trouble than it's worth. This is especially true with a short crop rotation where soybeans are grown more often and disease pressure is higher.

Part of being fit is having a minimum soil temperature of 55 F, Bohner cautions.

"Soybeans don't do much until the soil is at least 60 F," agrees Currah. The crop is also very prone to cold shock, especially if there is a cold rain in the first few days after planting.

Soybeans take up 60 per cent of their weight in water, which is double the rate of corn, he explains. "The temperature of that first water that the seed imbibes is really critical," he says.

Ideally, flowering should occur at the fifth to sixth trifoliate.

Bohner says he witnessed this effect in 2016 when soybeans, which were planted before a cold rain in mid-May that was followed by a cold spell, needed to be replanted.

Early planting of soybeans is not without risk, especially the risk of frost damage. However, the window for frost damage is not the same as for corn, says Currah. Soybeans tend to be more frost-damage prone in the early days after emerging from the soil but less susceptible as the second and third trifoliate appear, whereas corn is more frost tolerant early on before the growing point emerges.

For success with early-planted soybeans, following good management practices is critical. Seed treatments are a must, says Bohner. His research showed the average yield gain from using a seed treatment was 1.2 bushels per acre across all planting dates and sites.

Planting depth is another important consideration. When planting early into moister, colder soils, Bohner recommends using a shallower planting depth. When planting later in the season into warmer, drier soils, he recommends using a deeper planting depth.

Farmers can see a boost in yield at no extra charge, if they plant soybeans early and follow recommended management techniques. However, this practice does come with risks and farmers should be prepared to potentially have to replant. **SG**


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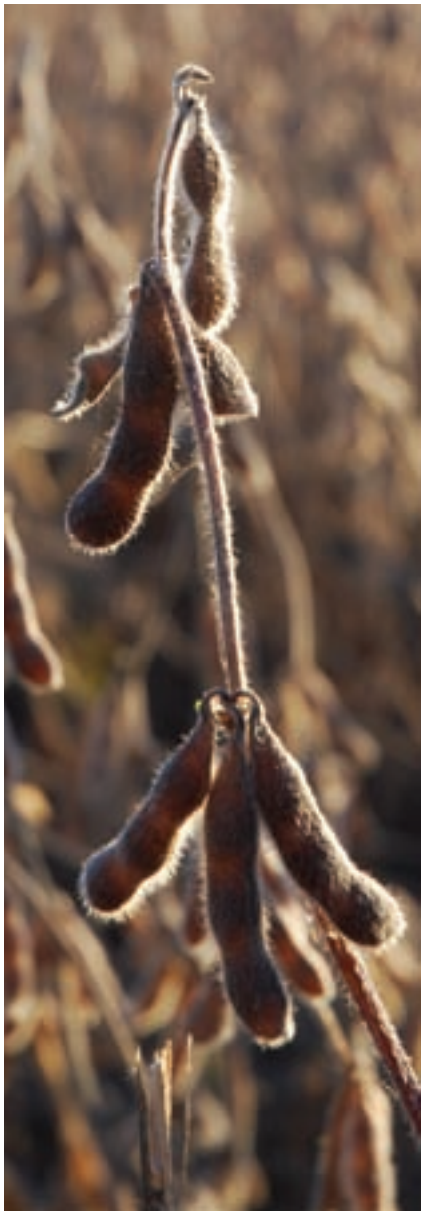
Disease packages join newer herbicide-resistance technologies at the top of the value list

What's new in soybean varieties for 2017?

By Ralph Pearce, CG Production Editor



Last year, the big news in soybean varieties could be summed up in one technological term: Xtend, which became part of the fall lineup for many of the seed companies. Canada's Outdoor Farm Show was abuzz with talk about Xtend, with demonstration plots aplenty, and all sorts of signage promoting the new system's platform, Roundup Ready 2 Xtend.

If there was one slight drawback, it was that many of the varieties that were promoted came with an asterisk denoting pending registration.

This fall is different. Xtend is obviously still a force in the industry, but many of the companies are focused this year on disease and pest packages, including soybean cyst nematode (SCN) and white mould, both of which are garnering increasing attention in parts of eastern Ontario.

Management of soybeans is getting more attention, and today's varieties must compete on technology, disease resistance, agronomics and plant characteristics.

In all, 10 companies are participating in our list of new technologies and new varieties for the 2017 growing season, featuring more than 75 new arrivals (some are varieties with very limited release in 2016). And you know the drill. Don't take our word for it. It's important to discuss your seed and cropping decisions with your dealer, agronomist or seed company representative.

BAYER CROPSCIENCE

LibertyLink — Using the LibertyLink soybean system helps manage glyphosate-resistant weeds. By rotating to the LibertyLink soybean system, the company says you get high-performing genetics coupled with powerful, non-selective weed control on glyphosate-resistant and tough-to-manage weeds, along with effective resistance management, since Liberty is the only herbicide with a Group 10 mode of action.

Balance GT — The Balance GT Soybean Performance System was developed through collaboration between MS Technologies and Bayer CropScience. Created using high-yielding, elite soybean genetics, Balance GT promises exceptional performance coupled with outstanding weed control.

Balance GT soybeans are tolerant to both glyphosate and isoxaflutole, the active ingredient in new Balance Bean herbicide. These two chemistries will ensure protection against a variety of weeds, with exceptional performance against both broadleaf weeds and grasses, including difficult-to-manage weeds such as eastern black nightshade, waterhemp and ragweed. Glyphosate can be used to combat weeds on contact while Balance Bean herbicide, with its unique reactivation feature, will continue to provide control from application through canopy closure.

Balance GT soybeans will be the first step in a foundational system that will grow to include a triple-stacked herbicide-tolerant soybean, providing tolerance to glyphosate, Balance Bean and Liberty (glufosinate).

COUNTRY FARM SEEDS

CFO7LL is a LibertyLink variety for the 2600 CHU region and the maturity group (MG) of 0.5. The LibertyLink technology provides a novel mode of weed control, plus excellent early-season emergence and vigour, with very good lodging and standability, a good disease package.

CF2707Xt is a Roundup Ready 2 Xtend soybean variety suited to 2700 CHU regions. This is new technology from Country Farm Seeds and a great fit for all soil types, with excellent standability and outstanding phytophthora resistance.

CF3172Xt is another Roundup Ready 2 Xtend soybean variety, this one for the 3175 CHU areas and with a maturity group rating of 2.4. Again, this provides growers with the convenience of the Roundup Ready and Xtend system along with good early-season vigour, good phytophthora field tolerance and a tall, robust and bushy plant style.

CF3207Xt is the third of four new Roundup Ready 2 Xtend varieties. It's suited to the 3200 CHU zone with a maturity group rating of 2.5, plus excellent emergence and standability, great disease resistance including phytophthora and brown stem rot. It grows to a medium plant height with a slender profile for narrow rows.

CF3256Xt is a Roundup Ready 2 Xtend varieity with an MG rating of 2.7. It is suited to the 3250 CHU area and offers a great disease package, including SCN protection, plus good early-season vigour. It also provides high yields on clay-type soils.

DEKALB

22-61RY is suited to all soil types and row widths and it has excellent emergence and very good standability. This variety has a very good phytophthora root rot tolerance and aggressive growth, making it a great fit for tougher growing conditions.

DKB005-52 is a medium-height variety with excellent standability, white mould tolerance and phytophthora root rot tolerance. It is well suited to all soil types and row widths and is resistant to SCN.

DKB008-81 offers a strong agronomic package and excellent standability. Well suited to all row widths and soil types, this variety has excellent white mould tolerance and very good phytophthora root rot field tolerance.

DKB01-11 is a medium-height variety with excellent emergence and standability. This variety grows well in all soil types and row widths and even likes high-fertility situations. It is resistant to SCN and has very good tolerance to white mould and very good field tolerance to phytophthora root rot.

DKB04-41 has very good emergence and excellent standability. Not only is it well suited to all soil types and row widths, but it also has a strong disease package with excellent white mould tolerance and phytophthora root rot field tolerance.

DKB06-61 offers farmers SCN resistance, very good field tolerance to phytophthora root rot and very good tolerance to white mould. It is better suited to heaver soil types and no-till systems, and has excellent emergence and very good standability.

DKB09-91 is a tall variety that grows well in wider rows and lower populations. It has excellent emergence and very good standability, plus a very strong disease package with resistance to SCN and excellent field tolerance to phytophthora root rot.

DKB10-01 is a variety with a very strong disease package. Namely, it is resistant to SCN, has the Rps 3a resistance gene and a strong field tolerance to phytophthora root rot and very good white mould tolerance. This variety has very good emergence, seedling vigour and standability. And it works well with no till and tougher growing conditions.

DKB14-41 comes with a very strong trait package, including SCN, brown stem rot, and sudden death syndrome (SDS) resistance. This variety has excellent white mould tolerance and very good phytophthora root rot field tolerance. It has excellent emergence and very good standability and is well suited to all soil types and agronomic systems.

DKB20-01 offers farmers SCN resistance, excellent field tolerance to phytophthora root rot and SDS and very good white mould tolerance. This variety is suited to all soil types and row widths.

DKB21-11 is a medium-height, branchy variety with very good emergence, seedling vigour and standability. This variety is well suited to all soil types and row widths and is resistant to SCN, with a good package for SDS and phytophthora root rot.

DKB22-21 is a variety that is resistant to SCN and has very good field tolerance to phytophthora root rot. It is also moderately resistant to SDS and has excellent white mould tolerance and can be grown in all soil types and row widths, having excellent emergence and standability

DKB24-41 works well on heavier soils and in no-till systems. This variety has very good emergence and standability with a strong disease package, being moderately resistant to SDS, resistant to SCN and very strong against phytophthora root rot.

DKB26-61 is a tall variety with excellent no-till adaptability. It's suited to all soil types and row widths and has excellent emergence. This variety has an excellent disease package, with the Peking resistance source for SCN and very good white mould and phytophthora root rot field tolerance.

Continued on page 18

DKB28-81 excels in all soil types, tillage systems and crop rotations. Its very strong defensive trait package includes SCN, SDS and brown stem rot resistance. This variety also has excellent white mould tolerance and very good phytophthora root rot tolerance.

DKB32-21 is a full-season variety that yields very well in no-till situations. This is a tall variety, well suited to all row widths and soil types, with a good disease package and resistance to SCN.

DOW SEEDS

DS0067Z1 is a new 2450 CHU variety with Roundup Ready 2 Yield technology. Strong emergence and good resistance to phytophthora root rot combine to provide good stand establishment, with medium-short plant height, medium canopy and a black hilum. Trials show excellent yields for an early variety.

DS032R1 is another of Dow Seeds' nine varieties with Roundup Ready 2 Yield technology. Its hallmark is an early soybean (2625 CHU) with very good emergence and excellent lodging tolerance and good phytophthora tolerance via the Rps1k source.

DS038A1 is a Roundup Ready 2 Yield soybean variety, also suitable for the 2625 CHU area. This variety offers an excellent disease tolerance package, including SCN resistance and very good Rps1c source phytophthora resistance.

DS064Y1 is suited to the 2700 CHU region, and is another of the Roundup Ready 2 Yield soybeans. It also provides resistance to SCN and other diseases, with consistent yields across all environments. Of the Roundup Ready 2 Yield varieties from Dow, this brown hilum variety has the highest rating against brown stem rot — an 8.5.

DS124U1 is Dow's Roundup Ready 2 Yield variety suited for the 2850 CHU region. This is an extremely attractive line with good disease tolerance and Rps1c resistance to phytophthora. It is also adaptable to all soil types.

DS177P1 is a Roundup Ready 2 Yield variety best suited to the 2975 CHU region, with tolerance to SCN plus Rps1k source tolerance to phytophthora. Also on its list of attributes are excellent emergence and lodging tolerance, with an overall strong agronomic package.

DS215Y1 is for the 3050 CHU area and with Roundup Ready 2 Yield technology. It also has Rps1c resistance to phytophthora and a 7.5 rating on white mould, plus strong resistance to SCN. It's an attractive short plant with good lodging resistance and excellent yields in high-yielding environments.

DS244N1 is a Roundup Ready 2 Yield soybean variety bred for the 3175 CHU region. It features good emergence and standability, as well as a good disease package, including resistance to SCN. It is an excellent performer on lighter, well-drained soils.

DS268V1 is a Roundup Ready 2 Yield variety that scores an 8 rating on white mould, performs well against SCN, and carries the Rps1k source for phytophthora. Among its features are dominant yield performance and an 8.0 on brown stem rot.

DUPONT PIONEER

P005T13R (R) is a very early variety rated at 2400 CHU, with very good field emergence and harvest standability. It contains multi-race phytophthora resistance via the Rps1c gene, and grows to a shorter plant with a moderate canopy.

P08T96R (R) is a new glyphosate tolerant, 2725 CHU variety that combines top-end yield performance with strong agronomics, along with medium white mould tolerance and multi-race phytophthora resistance via the Rps1c gene. Highly suitable for no-till seeding. The company says this is a variety to watch.

P09T29X (RR2X) is a new early Genuity Roundup Ready 2 Xtend variety rated at 2750 heat units with very good field emergence and above-average harvest standability. It contains multi-race phytophthora resistance via the Rps1c gene plus built-in SCN resistance.

P10T41X (RR2X) is a new early Genuity Roundup Ready 2 Xtend variety rated at 2750 heat units, with built-in SCN resistance and multi-race phytophthora resistance via the Rps1c gene. It has very good field emergence and above-average harvest standability.

P10T48R (R) is a high-performing variety with solid agronomics rated at 2775 heat units. It is glyphosate tolerant with very good field emergence and above-average harvest standability. Also, it offers multi-race phytophthora resistance via the Rps1c gene in a shorter plant height with a moderate canopy width.

P19T39R2 (RR2Y) is a new 3000 CHU variety with the Genuity Roundup Ready 2 Yield trait and built-in SCN resistance (P188788). Average white mould tolerance. This is a taller variety with a wide canopy and would be an excellent companion variety to Pioneer brand P19T01R.

P22T24X (RR2X) is a new early Genuity Roundup Ready 2 Xtend variety rated at 3075 heat units. It has built-in SCN plus multi-race phytophthora resistance via the Rps1k gene. With very good field emergence and harvest standability, this is a good option to help growers manage glyphosate-resistant weeds.

P24T84X (RR2X) is another new early Genuity Roundup Ready 2 Xtend variety rated at 3125 CHU. Bringing very good field emergence and harvest standability, it contains multi-race phytophthora resistance via the Rps1c gene plus built-in SCN resistance.

P28T62R (R) is a full-season glyphosate-tolerant variety rated at 3225 CHU, with sound agronomics. It also has an excellent disease resistance package including built-in SCN resistance (Peking source) and multi-race phytophthora resistance (Rps1k and 3a). Also noteworthy is its exceptional field emergence, making it suitable for early planting.

P28T71X (RR2X) is a new Genuity Roundup Ready 2 Xtend variety with very good field emergence and above-average harvest standability. It contains multi-race phytophthora resistance via the Rps1c gene along with built-in SCN resistance.

P31T52X (RR2X) is a full-season Genuity Roundup Ready 2 Xtend variety with multi-race phytophthora resistance via the Rps1c gene and built-in SCN resistance. Very good field emergence and above-average harvest standability.

P33T19X (RR2X) is a full-season Genuity Roundup Ready 2 Xtend variety rated at 3350 CHU. It contains multi-race phytophthora resistance via the Rps1k gene along with built-in SCN resistance. The variety also offers very good field emergence and exceptional harvest standability.

ELITE SEEDS

2017 is a year of introductions for Elite. Three early varieties are introduced in the wake of Akras R2. They are Lono R2, Podaga R2 and Hydra R2. Lono R2 will bring top yield potential for the very early zones, while Podaga R2 has yield stability and finally Hydra R2 will impress with its record-setting yield potential. Kultana R2 brings strong root health to the maturity Group 1 zone. Four new Xtend varieties also make their debut and are certain to impress with their superior weed-control system and top yield potential.

MAIZEX SEEDS

RX Kodiak, rated for 2700 CHU/0.6 RM, are Roundup Ready 2 Xtend soybean seedlings that have impressive vigour with excellent early-season disease tolerance. Plants are medium plant height and they branch well, making them suitable for narrow and wide rows. RX Kodiak has resistance to SCN and average tolerance to white mould. These soybeans have proven to perform well in reduced tillage scenarios.

RR2 Atlas, a Genuity Roundup Ready 2 Yield variety, suited for 2750 CHU/0.7 RM, comes with industry-leading disease tolerance and aggressive seedling vigour combined with phytophthora field tolerance. They establish early and close the canopy well. Plants have medium height and a semi-branched canopy ideal for all row widths. They are also resistant to SCN and have very good tolerance to white mould.

RX Pinnacle, rated for 2975CHU/1.6RM, is a Roundup Ready 2 Xtend variety with defensive traits ideal for stress. This variety also offers very good field phytophthora tolerance, leading to seedling vigour and above-average stands under tough conditions. Plants are medium to tall with a semi-branched canopy ideal for narrow and wide row widths. RX Pinnacle has resistance to SCN and above-average tolerance to white mould. Position on heavier soil types for optimum performance.

RX Velocity is suited for 3150 CHU/2.3 RM. These Roundup Ready 2 Xtend soybeans give broadly adapted performance, in a medium to tall plant height with a branched canopy that is ideal for all row widths. Plants have resistance to SCN and very good field tolerance to phytophthora. At harvest, plants have excellent standability for ease of harvest. Can be positioned on all soil types.

RX Stamina is a Roundup Ready 2 Xtend variety, rated for 3150 CHU/2.4 RM, with very good disease tolerance for heavier soil types. Seedlings have aggressive growth habit to quickly close rows. RX Stamina has resistance to SCN, SDS and excellent field tolerance to phytophthora. Plants are medium height with semi-branched stature. This variety should be planted in heavier soil types for optimum performance.

RX Aspire, rated for 3200 CHU/2.7 RM, is another Roundup Ready 2 Xtend soybean. It gives dependable performance with defensive traits and medium to tall plant height with branched architecture. Plants have very good tolerance to phytophthora and resistance to SCN. Plants have excellent standability and late-season appearance. It should also be planted on heavier soil types for optimum performance.

RX Ballistic Roundup Ready 2 Xtend soybeans, rated for 3225 CHU/2.8 RM, offer robust performance under tough conditions. Seedlings have exceptional vigour with an aggressive growth habit which closes rows quickly. Plants are slender and tall. They also have very good tolerance to SDS and resistance to SCN. This variety does well in narrow rows on heavier soil types.

PRIDE SEEDS

PS 00095 R2* for the late 000 maturity group with the Roundup Ready 2 Yield trait presents an opportunity for very short-season growing areas. Best performance on narrow row widths with above-average IDC rating. Excellent late-season standability for ease of harvest. Ideally suited for 2150 to 2300 CHUs. Excellent white mould resistance and good field tolerance to phytophthora root rot. *Pending registration.

0077 XRN is a new Roundup Ready 2 Xtend soybean variety adapted for Eastern Canada, ideally suited for 2250 to 2500 CHU, with value-added SCN and phytophthora Rps1k root rot protection. Besides tolerance to dicamba and glyphosate herbicides, this variety has excellent agronomic and defensive traits to help maximize productivity. Exceptional emergence and early vigour should also be noted.

PS 0333 XRN is a Roundup Ready 2 Xtend soybean variety ideally suited to the 2500 to 2700 CHU areas. It also has SCN and Rps1c/1k phytophthora root rot

Continued on page 20

protection, has tolerance to dicamba and glyphosate herbicides and can adapt to all row widths. Excellent performance on clay soils and in no till have been shown with this new variety.

PS 0555 XRN is a Roundup Ready 2 Xtend soybean ideally suited to the mid 0 maturity market and 2550 to 2800 CHU areas. With value-added SCN and Rps1c phytophthora root rot protection and tolerance to dicamba and glyphosate herbicides, it has top clustering and unique orange/tawny pubescence.

PS 0610 NLL is an introductory LibertyLink variety ideally suited for 2600 to 2800 CHUs. It offers impressive yield expression for mid MG 0 maturity plus very good white mould resistance. Strong early vigour with bushy fill-the-row plants also have SCN and Rps1k phytophthora root rot protection. It offers a non-selective alternative to glyphosate-tolerant systems.

PS 1222 XRN is a new Roundup Ready 2 Xtend soybean variety for early MG I with high yield performance and strong defensive package for the 2650 to 3000 CHU areas. It offers protection to SCN, has the strong Rps3a phytophthora root rot gene and provides tolerance to dicamba and glyphosate herbicides.

PS 1304 NR2 is an impressive Roundup Ready 2 Yield trait introduction as an early MG I with high yield performance and strong defensive package for the 2700 to 3000 CHU areas. It has protection to SCN and has strong field resistance for phytophthora root rot. This variety shows strong emergence and early-seedling vigour with bushy fill-the-row plant type. It performs well in no till and heavy-residue soils.

PS 1666 XRN is an impressive Roundup Ready 2 Xtend soybean variety ideally suited for the mid maturity group I for the 2800 to 3000 CHU zone. With SCN and white mould resistance all in one package, it also has Rps1c phytophthora root rot gene. This variety has good emergence and early-seedling vigour as well as tolerance to dicamba and glyphosate herbicides.

PS 1710 NLL* is an introductory LibertyLink variety ideally suited for 2800 to 3000 CHU. It has impressive yield expression for early MG I maturity, plus excellent standability and very good white mould resistance. Strong early vigour with bushy fill-the-row plant type. It's a non-selective alternative to glyphosate-tolerant systems. *Pending registration.

PS 2020 XRN is a new Roundup Ready 2 Xtend Soybean variety for early MG II that combines high yield potential with good agronomic characteristics in the 2900 to 3100 CHU areas. With protection to SCN and phytophthora root rot, very strong emergence and early-seedling vigour, this is a new dicamba and glyphosate-tolerant variety.

PS 2444 XRN is a high-yielding Roundup Ready 2 Xtend Soybean variety, ideally suited to mid MG II for the 2950 to 3200 CHU zone. It offers protection to SCN and phytophthora root rot, SDS resistance and provides tolerance to dicamba and glyphosate herbicides. Avoid fields with history of severe white mould pressure with this one.

PS 2555 XRN, a Roundup Ready 2 Xtend variety, is ideally suited as a mid MG II with solid agronomic traits for the 3050 to 3300 CHU areas. It protects against SCN and phytophthora root rot and provides tolerance to dicamba and glyphosate herbicides, along with strong emergence and early-seedling vigour.

PS 2666 XRN is an impressive high-yielding Roundup Ready 2 Xtend soybean variety for mid MG II with solid agronomic traits for the 3100 to 3300 CHU areas. With built-in protection against SCN and phytophthora root rot and providing tolerance to dicamba and glyphosate herbicides, these plants are taller and excel on clay soils and feature outstanding emergence and early-season vigour.

PS 2777 XRN, with tolerance to dicamba and glyphosate, is a Roundup Ready 2 Xtend soybean variety for later MG II with solid agronomic traits for the 3100 to 3300 CHU areas. It also has exceptional standability and protection from SCN and phytophthora root rot.

SECAN

SeCan is launching six new Roundup Ready 2 Xtend soybean varieties, adding to its complete lineup of Genuity Roundup Ready 2 Yield and conventional soybean genetics. Named after cars, Excursion R2X, Expedition R2X, Expo R2X, Flex R2X, Explorer R2X and Express R2X are now available, SeCan says, "to drive growers' weed control and yields forward in 2017."

Ranging in maturity from 2650 to 3175 CHU, these varieties combine dicamba tolerance with the yield potential, agronomic characteristics, and glyphosate tolerance that growers have come to expect from Roundup Ready varieties. The Roundup Ready 2 Xtend trait delivers an additional mode of action to manage early-season and glyphosate-resistant weeds.

SYNGENTA

S10-S1, rated for 2800 CHU, is a medium-height plant variety that brings top-end yield potential to a variety of environments within the 1.0 maturity zone. It boasts a solid agronomic package to help guard against in-season stress. S10-S1 has uniquely stacked Rps1k and Rps3a genes that deliver excellent protection against phytophthora, and also provide strong protection against SCN, iron deficiency chlorosis (IDC) and white mould.

S14-A6 is a medium-short 2850 CHU variety and fits well between the 1.0 and 2.0 maturity zones, offering exceptional yield potential with broad adaptability in a variety of soil types. This variety emerges very strong at the start of the season and has excellent field appearance. S14-A6 also features a solid, built-in SCN package and dependable phytophthora root rot tolerance. **SG**

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Dry weather weed control in IP soybeans

Weed control in IP soybeans is always a challenge. This year, it was nearly impossible… but not on all farms

By Amy Petherick

Good weed control in Eastern Canada's identity-preserved soybean fields this year appears to be just as patchy as the spring and summer rains, particularly in southern Ontario and parts of Quebec. Even Roundup Ready beans were slow to canopy in between rescue rains and required more in-season attention than usual.

Then, as crops headed toward harvest, the concern grew even bigger.

"A lot of the chemistries are water activated, so they didn't activate to a large degree, or they activated late," says Neil Batchelor, who covers central and southwestern Ontario for Sevita International. "Your old friends, lamb's quarters, ragweed, and sow thistle, they're all out there."

But most worrisome in IP beans, of course, is Eastern black nightshade. "Nightshade that never got picked up to begin with could be fairly advanced. It likes to hide. It really takes that good, earnest scouting program to identify it and get it taken care of," Batchelor says.

Farther east on the Ontario-Quebec border, where Andrew Hodges farms and works for Ceresco, the abundance of lamb's quarters is troubling. It seems to him that too much Pinnacle was sold this year to make sense of what he's seeing in the field. "It was dry, so the plant shuts down and doesn't absorb as well. Maybe when they sprayed it was too hot?" he muses. "Or is it because of resistance?"

On average, Hodges estimates farmers in this region probably applied 2-1/2 passes of herbicide control. Where producers were chasing grasses, they may have gone over with as many as five passes. "On a year like this, I would say grass is harder to control," he says.

Still farther east, Hodges' colleagues tell him Quebec farmers saw the same issues all the way to Saint-Hyacinthe. In the spring, Eragon seemed to work tremendously, but in the fall, it didn't seem to be holding on against horsetail and does a very poor job on large grass. "I used Fierce on my own soybeans this year and the only issue I had was ragweed escapes on tilled ground," says Hodges. "On no-tilled ground, I had no escapes." Trying to get a handle on escapes with Reflex, and a whole lot of water, seemed to be the best thing to do on the tilled ground.

The only IP bean growers who also tilled and still got away with minimum field passes this year seem to be farming on Prince Edward Island, where IP production has been on the rise for the last five years. Harry VandenBroek, of Atlantic Soy Corp in Belle River, says cold weather in June and early July held the crop back at first, but the beans do appear to have capitalized on timely rains. Even though triazine-resistant weeds have found their way to the Island, most growers appear to have had good success using a pre-emergent program this year.

However, VandenBroek credits the weed control to more than fortunate weather conditions. Many of the weed control products he recalls farmers relying on when he worked in Ontario, such as Pursuit, aren't options for potato growers because of long-lasting soil residues. So farmers on the Island have become avid about crop rotation, growing their beans after potatoes, which often follow hay crops originally underseeded to cereals.

"When they're following potatoes, they have pretty good grass control," VandenBroek explains. Many growers will then apply a product like Valtera, strictly for pre-emerge broadleaf control. If for some reason they do have to go to a post-emerge, they're most likely to use Basagran + Pinnacle + Assure. "There are some issues here with mustard and goldenrod," he says.

Where perennial weeds are a recurring issue, and the predominant practice is conventional or minimum tillage as it is

Eastern black nightshade is a weed that seems to hide well, and requires diligent scouting.

> "It's critical to just about follow the combine with the sprayer, and maybe put a bit of a cocktail together like Roundup + Banvel + 2,4-D to get perennial weeds under control."
>
> — Barry Gordon of AgVise

in P.E.I., Barry Gordon of AgVise, an independent crop consulting company based near Hensall, Ont., strongly recommends controlling weeds in the fall. Gordon scouts for farmers who both till and no till a lot of IP beans and he's seeing a lot of perennial sow thistle this year.

"We aren't going to do any good spraying Roundup on a frozen sow thistle plant," Gordon says, "so I think that it's critical to just about follow the combine with the sprayer, and maybe put a bit of a cocktail together like Roundup + Banvel + 2,4-D to get perennial weeds under control."

In a no-till scenario, come back in the spring a week before planting with Roundup and even consider including a broadleaf program, Gordon suggests. "Sometimes when you put that on a week before you plant, there is a better opportunity to get moisture to activate it than there is after you plant."

When it comes to achieving good weed control, Gordon says it's been his experience that both no till and any kind of tillage can be a challenge. Getting those perennial weeds out before bringing in a plow can make a big difference, and sometimes he'll see better control in those fields. "This year my guys who were on conventional tillage and who incorporated their herbicide into soil moisture seemed to have better control," Gordon observes. "We had some great success with incorporating Boundary and Broadstrike; the only disadvantage is we can't put Authority in when we incorporate."

Having said that, Gordon has seen better weed control in a no-till system than conventional tillage many times before. "Conventional tillage will let the soil dry out, and if you don't get a rain, it takes more water to activate fluffy ground than when you have solid ground," he says.

Another critical piece of advice in 2016 was to scout 18 to 24 days after planting, no matter how dry it was in the region. "That's when we seem to have an opportunity to get weeds under control, when they are small and actively growing," Gordon explains. "If I wait until I see a green patch in a field for escapes, I'm too late."

Gordon says the cost of poor scouting during this time period is often an infestation of lamb's quarters because, once they grow beyond an inch-and-a-half tall, it's a real scramble to get any kind of effective cleanup program.

Scout early, scout often (meaning at least once a week), and seriously consider a third-party agronomy service for IP fields, advises Batchelor. "It's pretty rare that those kinds of services don't pay for themselves," he comments. The professional advisers know which pattern weeds to flag early, allowing the opportunity to head off really prolific ones like ragweed and fleabane, for example. Later on, if they find a little volunteer corn coming up, "well, you pay the grandkids 25 cents an ear," he chuckles.

Batchelor supports many of the same pearls of wisdom put forward by other agronomists, particularly the importance of adhering to crop rotation and chemistry rotation plans, but he also believes IP bean farmers would be wise to make use of multi-species cover crops as well.

"It makes sense to me in terms of the more variable root structures you have in the soil, and as a strong capture of a greater variety of nutrients that can be retained in the top eight inches," Batchelor explains. "There is a lot more work to be done on it, but I can hardly wait to see what comes of that." Instead of new chemistry, for him it's easier to get excited about the potential contributions that cover crops can make to weed suppression. "Look at the 'new' chemistries that are coming out. Dicamba? How long has Dicamba been around? 2,4-D?"

Gordon, who started his career in the chemistry business, is equally dismayed by the apparent lack of progress in the IP market. But he's not surprised either. "It's almost like a new family of chemistry has to come on to the marketplace," he says. "But there isn't significant volume to offer a payback for the manufacturing company to bring it out."

The fact is trying to control a broadleaf in a broadleaf crop will always be challenging using a chemical product, Gordon says. "We don't have strong products as there are in say, wheat or corn. We never have, probably never will." **SG**

A place for community data

"Mining data isn't a substitute for doing actual research," warns a seed company scientist

By Ralph Pearce, CG Production Editor

Among the positives of using community or on-farm data, says Karon Cowan, there's the opportunity to learn from one's own farm data that's appealing.

In the past five years, precision agriculture systems have begun providing an exciting opportunity to collect and pool data on factors ranging from yields to soil quality and beyond. Each data set offers greater insight into the characteristics of a field and its variability, or to its potential response to different treatments and management practices.

To get a sense of the power of this technology, just talk to dealers and systems specialists and see how they integrate it in almost every decision.

Yet to paraphrase the old saying, with great potential comes great responsibility. Just because a yield monitor or other GPS-based data-gathering system *can* produce huge stacks of numbers doesn't mean that the numbers will actually be useful, or that they will open up any "quick-fix" capability.

It takes years of theorizing, researching and correlating data to fine tune management practices or to suggest changes to those practices. Farmers know what it's like to engage in their own fact-finding process on their farms, tweaking and adjusting various aspects of their field management before making significant changes. Now, most advisers, retailers and company agronomists make the same recommendations, saying the long-term, total systems approach is best.

It's why replicated data or multi-year results are more valuable than one-year data.

It's against this backdrop that a trend is taking shape. In spite of advice to the contrary, more farmers are engaging in the use of so-called "community data." It's an amalgamation of results which is often inconclusive yet is used to change on-farm practices, in spite of any clear support to do so.

Last March, Dr. Mark Jeschke, agronomy information manager with DuPont Pioneer in Johnston, Iowa, published an article with a cautionary tone regarding the use of community data (see "Further reading" for website). The piece focuses on the effect of community data versus trial data in decisions on corn-seeding rates only, and lists four shortfalls of community data while citing only one benefit to the practice.

CLARIFICATION

One thing that has to be made clear right from the start is the definition of community data. As Jeschke notes, he is not talking about on-farm trials where there are comparisons set up on a farm and across numerous locations, compiling data from those settings. That type of information gathering is very valuable, and companies perform those all the time.

In this context,"community data" means pulling in normal production data, where there aren't any comparisons set up ahead of time. It's where growers or dealers are mining what could be superficial data from the yield monitor, creating breakouts and recommendations based solely on that data in order to identify trends or differences in treatments.

"It was GPS and yield monitoring in the mid-1990s that really opened the door to this, to where you're able to collect spatial data on fields for the first time, really," says Jeschke. "What we're seeing now — and this has been a long time coming — are improvements in that data handling and transfer capabilities that make aggregating data much more seamless than it has been in the past… it's really starting to open up some possibilities to pull together large data sets in a way that we haven't been able to before."

Jeschke doesn't want to sound like a naysayer when it comes to gathering community data and extracting value. Possibilities are starting to open up in that field, and there are positive things a grower can do with that information. It can be useful in identifying trends or generating hypotheses or pointing researchers in a new direction. But on its own, the use of community data can be misleading, unless it involves some degree of standardization of conditions in fields, in-season treatments or ground-truthing.

As always, the more and better the information that's part of the pool of data, the more reliable it may be. Otherwise, it's not recommended that growers try to draw any concrete conclusions just from mining data without the proper controls and parameters from the outset.

Using it to identify trends can yield some definite value, provided it's measured against the appropriate context of actual research data or other information to ensure someone isn't basing a recommendation on incomplete interpretation.

SUPERFICIAL RESULTS

Jeschke mentions a recent visit to a farm show where a farm network business had seeding rate data on display, citing a Pioneer hybrid among others, and he says it points to community data's limitations.

"You have a large number of acres covering a range of different seeding rates," he explains. "The fields planted to 30,000 seeds per acre are likely an entirely separate set of fields from those planted at 35,000 seeds per acre. The data sets have been pulled together and you don't have any head-to-head comparisons of those two seeding rates; you only have one set of fields planted at 30,000 and another set of fields at 35,000. So it's that fundamental limitation as to what conclusions you

can draw from that data, because you're not actually comparing those two seeding rates from the data you have. Also, you have no information as to whether or not the seeding rates used in any of the fields were actually the optimal rates for those environments."

Another example he cites involved one of his agronomists, who ran a series of research trials with 30 locations, half of which were treated with a fungicide and half were not. What can be determined from the data concerning the value of a foliar fungicide? Not much, says Jeschke, because it involves two separate sets of locations. The fungicide-treated locations were quite a bit higher yielding but they might have just been higher-yielding fields from the outset.

"It gives you something to start with but you can't really draw any conclusions from that," says Jeschke. "If you scale that up from 30 locations to 300, you have a lot more data, but you still haven't overcome that underlying problem where you don't have any head-to-head comparisons in the same environment."

Instead, in the case of Jeschke's agronomist, she had these locations where there was a tremendous difference between treated and non-treated fields, and that provides an opportunity to extrapolate other possible conclusions based on actual conditions. For instance, that particular year, northern leaf blight was a considerable problem, so there was a higher-than-average probability of seeing a yield benefit from foliar fungicides. And actual plant research trials in that area also showed a higher benefit.

"You can use that bit of information, and you can't draw any conclusions from it by itself, but putting it in a context of things that you know, it adds one facet to the overall story," says Jeschke. "But mining data isn't a substitute for doing actual research."

The overall concern is that there is a lot more data available, together with more players in the industry offering data services and trying to make sense of that information. It's an underlying trend that's also coinciding with a decline in university and even industry-based research investment in crop management (one of his motivators in writing the article).

"You have new players coming into the marketplace that are pulling together data — and we're seeing this already — and presenting it in ways where the inferences they're trying to draw from the data you can't fundamentally draw the way they're trying to do it," says Jeschke.

MORE INFORMATION IS BETTER THAN LESS

As much as she agrees with Jeschke's statements concerning the need for standardization and a better understanding of scientific principles in research, Karon Cowan believes there is an overriding positive spin to community data: learning. As president of AgTech GIS, she's more familiar with the term "on-farm research," adding that it's been part of a trend she's noticed that promotes growers gathering and networking, or companies trying to aggregate data on behalf of participating growers.

"In a lot of cases, I don't know whether 'research' is even the right word but it's a learning opportunity, for certain," says Cowan, adding that "research" sounds better than "shared data" or "aggregated data." "The great thing about growers or groups of growers wanting to collaborate is just that — that they do want to learn and they do want to collaborate, and they do want to learn from each other. I think they're also very curious about 'where do I stack up?' So there are three things: one, we want to collaborate; two, we want to learn, and three, we're curious. Those are all the good things to come out of this — they're positive as are the effects."

Where the problems arise, she says, is when growers gather this information and then use it as a measurement. If you're going to call it research and have it truly be a yardstick, you have to define your yardstick. When data comes in and it's not calibrated or it's unbalanced or not set up according to some rigorous research standards, then it's not a very good yardstick.

Again, those three traits — to collaborate, to learn and to be curious — are all extremely positive things. And Cowan agrees it's hard to allow one thing (a lack of standards or proper calibration) to weaken or discourage another (collaboration or curiosity).

When aggregating data, the first thing is to share the methodology to see if the results can actually be considered together. If they can't, don't do it.

KNOW FROM THE START

Cowan often encourages growers who are considering sharing data to define their goals together, set up the parameters and try to follow — as best they can — established research practices, ensuring all participants are following the same protocols. That includes pre-documenting as much as possible, such as soil types in the areas of the research, a base-level fertility, so there are as many common footprints or at least those differences are known as underlying information before the seed is planted or the ground is treated. Then they should track in-season conditions and treatments as well, such as plant growth stages, fertilizer application timing and amounts, and herbicides, pesticides and fungicides. Again, the more information that's included with the final data, the more useful it becomes.

Ultimately, the fewer exceptions to the rules, the more meaningful that information becomes, both as an opportunity to share, and for taking that information forward and using it to improve management practices and crop performance.

Good data can come from less-stringent conditions, but participants must define what it is they're going after. Only then can they decide whether it was successful, based on what they were trying to accomplish. It may be done according to research standards but it may satisfy their curiosity and what they're hoping to learn. Separate research-grade from curiosity-grade research and it still has value because it's collaborative.

Cowan also believes there's a mindset that causes many people to get stuck — and that includes the variety and hybrid trials currently available. Growers are curious about that data, and companies and dealers are doing a lot of that work. But there are other things they could be collaborating on, including tillage practices or new types of fertilizer.

"They have to document, they have to plan, they have to know what it is they're trying to achieve," says Cowan. "They have to replicate it and they have to be able to know enough other things to know about where those plots are placed to rule out the anomalies in the data." **SG**

FURTHER READING

(www.pioneer.com/CMRoot/Pioneer/US/Non_Searchable/agronomy/crop focus_pdf/community_data_vs_trial_data_corn_seeding_rate.pdf)

A year to be watchful

Global soybean supplies are up, but demand is surging too. Any production hiccups could see new market spikes

By Philip Shaw

Soybeans continue to amaze. While 40 and 50 years ago they were relegated to the deep southwest of Ontario, now they are grown increasingly across Canada. When you drive from Windsor, Ont., toward Quebec City, soybean fields dominate the landscape, while acreage climbs in the Prairie provinces as well.

Simply put, soybeans are challenging the production limits imposed by Canada's climate and topography. The crop's future seems very bright.

The acreage statistics in Canada are particularly striking in Western Canada. For instance, according to Statistics Canada 1.86 million acres of soybeans were grown in Manitoba and Saskatchewan in 2016. This breaks down to 1.625 million acres in Manitoba and 235,000 acres in Saskatchewan.

This means soybean acreage in Manitoba has more than doubled over the last four years, while Statistics Canada just started measuring soybean acres in Saskatchewan in 2013.

Incredible as it would have seemed just a few years ago, we are now looking at the very real likelihood that soybean production in Western Canada is on a path to outstripping production in the east.

However, in 2016 we are still a long way from that.

In Ontario, 2016 soybean production area is set at 2.715 million acres, with Quebec production area set at 803,100 acres. These production acreage figures are actually down from 2014 levels and will likely remain static for the foreseeable future. There is limited acreage to expand in Ontario and Quebec, and usually there is a trade-off with corn acres every year. However, you never know where new technology will take you. Soybean productivity is always an ongoing challenge.

Weather in 2016 has been disappointing in the East, with an extended drought in Ontario. Statistics Canada is predicting a yield of 41.6 bushels per acre in Ontario, 45.4 bushels per acre in Quebec and 35 bushels per acre in Manitoba. These yield estimates are all down from 2015. However, these estimates are from the July report on principal crops. August and September rains may have improved that picture.

Production is one thing, and marketing the crop is another. A year ago nearby soybean futures were approximately $8.70 a bushel. However, as of mid-September this year, nearby soybean futures were trading at about $9.80 a bushel. This is similar to September 2014 when the nearby soybean futures were $9.85 a bushel.

Admittedly, this is a far cry from the record soybean futures price high of $17.89 hit in 2012. Those prices have been cut over the last few years as farmers around the world have ramped up soybean production.

As the 2016 harvest continues, there is much for Canadian soybean growers to consider. How will prices move over the next six months? Will geopolitical events around the world affect the soybean market in a positive or a negative way? How will the Canadian dollar continue to impact the pricing of soybeans? How will the South American soybean production economy influence the outlook for Canadian producers this winter?

For Canadian soybean farmers, futures trading at the Chicago Mercantile Exchange forms the foundation for the prices received in Canada. The nearby futures price plus a basis evaluation converted into Canadian dollars gives us our Canadian cash price at various locations throughout Canada. These futures prices are traded at Chicago and are affected largely by the big soybean production areas in the U.S. and in South America.

Currently, the very large crop grown this year in the U.S. has affected soybean futures. According to the USDA in its August report, American farmers are expected to produce 48.9 bushels per acre of soybeans on 83 million acres in 2016. This is record production (4.060 million bushels, or 149.2 MMT) and it is weighing on soybean futures market prices.

This production number may be changed in successive USDA reports going into the January 2017 final report, but there is little question that we are dealing with a very large American soybean crop.

When considering soybean prices, one should always think about the geographic duality of the soybean market. For instance, South America soybean planting begins in October, with harvest generally taking place March to May. Of course, it is almost the opposite in the northern hemisphere. This means that there two cycles annually when major production areas are at risk, and prices respond accordingly.

For Canadian soybean producers this is always relevant. Keeping an eye on developments in these regions is always very important.

Last year's 2015-16 South American soybean production was less than expected, but still very large. Brazil produced 96.5 MMT of soybeans while Argentina produced another 56.5 MMT. The USDA has projected for the 2016-17 season Brazilian production at 103 MMT with Argentina coming in at 57 MMT. This will add to supply concerns.

Supply has been onerous, but it has been tempered to a large extent by seemingly insatiable demand growth. This is part of the reason why, even with growing production, soybean prices remain higher than last year.

World demand last year was 300.90 MMT of soybeans; this year it is estimated at 317.20 MMT, and next year's demand is projected at 329.28 MMT, according to USDA numbers.

Simply put, demand is growing for soybeans and production has been challenged to keep pace. China remains the world's largest importer of soybeans, at 95.5 MMT this year, compared to 87.20 MMT last year, and a projected 101.20 MMT next year.

This means that despite current soft futures prices, the market remains dynamic; any production blip around the world this winter will likely send prices higher.

The Canadian dollar remains a distinct advantage for Canadian soybean farmers. In many ways it has been the whole story for grain prices in Canada over the last two years. With the loonie hovering around the 76 to 77 U.S. cents level in early September, basis levels were in the plus $2.40 range with cash prices at $12.20 bushel. This is based on a soybean futures value of $9.80 a bushel.

If the loonie were at par with the U.S. dollar, cash prices in Ontario would be substantially less than the futures prices. As the loonie moves up or down, cash prices to Canadian producers are greatly affected. The soybean basis is a direct conversion of foreign exchange to the end-users.

In Ontario and Quebec, soybeans are exported as well as crushed at domestic plants. In P.E.I., the soybean basis is calculated based on the distance to the processor in Quebec or the cost to ship through Halifax. In Manitoba, soybeans are either exported offshore or sent south to U.S. crushers. There is always a significant non-GMO market in Ontario and Quebec that ebbs and flows each year with appropriate premiums. These soybeans go to end-users in Asia for human consumption.

Of course, farmers want to know whether soybean prices will be $12, $13, or even $14 in the near future, or whether the market will slide instead, hitting $11 followed by $10, $9 and $8 in the months to come.

Nobody knows for sure, but the Canadian dollar will remain a key factor for soybean prices this fall. The big U.S. crop being harvested will surely continue to weigh on futures prices.

South American planting starting in October will also be a key driver in soybean price direction. The current soybean futures market is inverted, meaning the market is giving a premium for soybean sold now versus outward months. For those wanting to take advantage of that, selling soybeans now and replacing with an options call strategy may be another avenue.

The challenge for Canadian soybean producers will be to measure all of these market factors. Canadian soybeans in 2016 have had their weather-related production issues. However, even with burdensome supplies worldwide, cash market conditions in Canada are favourable. Daily market intelligence will remain key. **SG**


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PG. 38 As it hits its 40th anniversary, is SeCan actually making a difference in the quality of crop genetics?

PG. 42 Lower phosphorus in Lake Erie proves farmers are committed to environmental quality.

Another big hurdle

With MRLs, the problems begin when a test used for regulating trade gets treated as a verdict on food safety

BY RALPH PEARCE / CG PRODUCTION EDITOR

Part of the challenge in dealing with this issue is the perception that it relates to food safety, which is incorrect.

In the past 25 years, agriculture has seen a full gamut of new programs from environmental farm plans to neonicotinoid-use restrictions in Ontario. Some are relatively farm-friendly, some less so.

Like them or hate them, they're all meant to be in the name of sustainability, traceability and food safety and security, which are under the watchful gaze of an increasingly urban population.

Now add one more set of guidelines to that list: maximum residue limits (MRLs). Unlike the others, which are imposed at the farm level, MRLs are creating confusion on an international stage and have garnered more attention in light of recent trade agreements. In spite of the potential benefits of the Trans-Pacific Partnership (TPP) and the Comprehensive Economics and Trade Agreement (CETA), there is also the opportunity for trade disruptions from MRL-based disputes.

There are two primary issues. One is the establishment of tolerance levels for registered chemistries, and the other is the backlog of registrations before Codex Alimentarius, a combined agency of the World Health Organization and the United Nations' Food and Agriculture Organization (FAO).

> **"When we look at the issue in terms of actual trade impacts, it's not that significant."**
>
> *Pierre Petelle, CropLife Canada*

The first issue brings into play the science of detection, which has become finer and finer over the past 30 years, so we can often measure in parts per trillion today, not just parts per million.

Despite that evolution, however, many of the countries Canada trades with still apply strict zero tolerances, making trade standards unpredictable and a stumbling block in trade relations.

The second component involves Codex and its near-

CONTINUED ON PAGE 36

four-year backlog, which can also create significant barriers to trade. In that four-year period, countries might be trading commodities based on mutually agreed standards, yet Codex could establish a different MRL, thereby putting their inventories at risk.

It's also worth noting that the maximum residue limits play a larger role in trade relations and negotiations on the horticultural side of agriculture. Pulses are also affected, and there's a greater potential for disagreements with some cereal and canola crops.

IT'S ABOUT TRADE, NOT SAFETY

"When we look at the issue in terms of actual trade impacts, it's not that significant," says Pierre Petelle, vice-president of CropLife Canada. "We're not seeing a lot of interventions internationally in terms of ships being turned around or stopped. That said, there have been some cases, and there is growing concern about some export markets' willingness to defer to Codex, for example, or other established MRLs, and wanting to establish their own."

Petelle points to MRL discrepancies in wheat and canola over the past 12 to 18 months, which suggest that no crop is immune.

What's needed most is to find a balance between trade risks and having a dialogue that assesses actual food safety. Unfortunately, that doesn't happen as a general rule of thumb, but case by case and crop by crop. To maximize the value of this process the dialogue must include the chemistry developer right from the outset. That approach is favoured over a "do nothing" default, and for very good reason.

"If we take a position of 'Don't use these products — period — until all of the export markets are fully established with MRLs,' we could have a tremendously negative impact on innovation and new chemistries coming to Canada," notes Petelle. He refers to that as an "innovation chill" to be avoided not just because of the money invested by chemical companies but because of the potential impact on growers' access to new technology.

Says Petelle: "It's finding that balance between managing the risk on the export side and not stifling innovation and growers' access to new solutions."

Petelle acknowledges that MRLs can and have been used as a non-tariff trade barrier, and it's possible this will continue, with some countries rejecting a boatload initially and then offering to buy it later, but at a reduced price.

Meanwhile, the reputation of Canadian agriculture is called into question.

Petelle also says the confusion created by the misperception of MRLs as a food safety issue is one of the biggest challenges facing agriculture. He cites one case where media backlash and public misunderstanding hindered efforts to modernize or harmonize the establishment of MRLs with another country such as the U.S., yet it had nothing to do with food safety.

TRADE AND EXPORT DEPENDENT

Chris Davison agrees this MRL confusion puts Canada's export-dependent agriculture at risk. As such, there's a need to pursue MRLs and import tolerances as they are required, and to reduce trade barriers for growers and exporters. That's accomplished through the efforts of developers and registrants of products, as well as the collaborative efforts of grower groups, government agencies and other stakeholders within the value chain.

"A second factor is that we're obviously operating in a very complex trade and regulatory environment," says Davison, head of corporate communications for Syngenta Canada. "With MRLs specifically, this is illustrated by the fact that not all countries set MRLs at the same

The notion that MRLs affect only horticulture crops or IP soybeans and other pulses ignores the impact on herbicides and fungicides available to cash croppers.

> **We could have a tremendously negative impact on innovation and new chemistries coming to Canada."**
>
> *Pierre Petelle, CropLife Canada*

time — or at all. So we continue to work with a variety of stakeholders to establish and harmonize MRLs wherever possible."

One factor in that scenario is the changing landscape in which MRLs are being established or modified around the world. Another is the fact that a pesticide may have a different registered use pattern in different parts of the world due to differences in geography and climate, plus dietary and cultural preferences that might determine the crops that can be produced.

"To build on it even more, the definition of a residue for a given pesticide may differ among countries, and there are also different methodologies for calculating MRLs," says Davison. "The bottom line coming out of that is that MRLs for the same pesticide and commodity combination may differ among countries and regions, ultimately resulting in a barrier to trade. But the message has to be reiterated that MRLs are standards intended to facilitate international trade in agricultural commodities — full stop."

WHAT'S NEEDED?

The call to action now is to work towards harmonization for MRLs. Davison believes more harmonization is possible, but it's going to require the participation of all stakeholders. It's not a matter of saying one sector or one crop is more important than another; it comes back to that trade component, where Canada is so reliant on trade and "getting along" with other partners.

"Where maybe it gets some more attention in different markets is that Canada is dependent on export markets, and different crops have different export markets," says Davison. "Some of them have a lot more markets that are smaller, some have bigger markets, but fewer. So it's not that one is more important, just that not all crops go to the same markets."

From Petelle's perspective, discussions must continue, and the companies that develop the chemistries and technologies must be at the table. There, they can provide the detailed, science-based information on the chemistry's application, its active ingredients, how it breaks down and the methodologies for detection and in what parts of the plant it can be detected.

Petelle also says government must participate too: "The Canadian government can play a key role in this process, both from a harmonization and technical level, and from a trade level trying to get some recognition early on in trade discussions, whether they're bilateral or multilateral."

The government could also be a little more strategic and perhaps better co-ordinated, although Petelle believes there's sufficient support from Agriculture and Agri-Food Canada as well as Foreign Affairs. And he praises the efforts of the Pest Management Regulatory Agency on the technical side. Yet questions remain about who's representing whom at the international level.

There is also the issue of the federal government dropping its subscription to an international database that provided organizations such as the Ontario Fruit and Vegetable Growers Association and Pulse Canada with up-to-date MRL tolerances in different countries. That occurred in mid-2014. In the spring of 2015, the MRL working group (under Pulse Canada's lead) pooled some of its own funds and purchased a subscription to a database that provides all MRLs from every country that has such standards. It also offers market intelligence about proposed changes, unpublished changes or speculative information from all of the participating countries.

The other fly in the ointment is the backlog within Codex's harmonization process. Some of the hurdles include funding or human resource gaps within the agency's structure. Solving those issues will not be quick or easy.

But Codex needs to make other changes too, Petelle says. "For example, many countries got involved in global joint reviews of chemistries several years ago. You had Canada, U.S. and Australia as the countries — and then sometimes a new country could be part of that, and they would review the dossier together and one country would have the lead."

Yet trying to get Codex to recognize the co-operative work of agencies that negotiate with such openness is often the difficult part.

"Recognizing that there are efficiencies to be gained from acting more like a peer review of existing work, rather than starting from scratch with the raw data every time — that would demonstrate some forward movement and recognition of the same people," says Petelle.

It wouldn't make Codex into a rubber stamp. The agency would still do a thorough peer review, and it would be done at a point that's well advanced instead of opening up the raw data every single time.

And there are some signs of progress: Petelle notes there's an MRL calculator at the Organization for Economic Co-operation and Development (OECD) level.

But agriculture says more can and should be done. **CG**

SeCan at 40

Born in 1976, is SeCan living up to its promise to deliver better, more cost-effective genetics by supporting public research?

BY RALPH PEARCE / CG PRODUCTION EDITOR

In the days leading up to 1976, new public sector seed varieties were few and far between, as Ray Askin recalls things. Askin, who grows seed at Portage la Prairie and is today's president of the Manitoba Seed Growers Association also remembers it as a time marred by disorganization.

"SeCan gave a structured format for seed producers, and funds returned to plant breeders through royalties encouraged more varieties to be produced," Askin says of the breakthrough when the Canadian Seed Trade Association succeeded in getting SeCan off the ground that year.

Askin remains a strong supporter. SeCan, he says, is a better system for commercial growers, seed growers and end-users. "SeCan has grown through the years," Askin says. "It is an affordable, efficient organization to distribute new varieties to farmers."

But SeCan has also evolved along the way. Staffa, Ont. seed grower Lorne Fell, who has been involved for 39 of SeCan's 40 years, recalls there were about 35 directors at the start, including grower, trade and government representatives. There were also ongoing debates, with plant breeders pushing for a larger share. Public breeders also released varieties for exclusive sale by larger private sector interests, leaving farmers without an opportunity to get the new varieties other than growing under contract with one of the bigger companies.

About 15 years after its inception, SeCan whittled down the number of directors, including the government representative.

SeCan's portfolio has changed too. Askin says cereals are an important part of the western Canadian offerings from SeCan, although in earlier years, canola, peas and forages were big sellers as well, and in recent years, soybeans have also become a vital component of the company's portfolio, particularly in Eastern Canada.

During that period, SeCan has continued returning money back to public sector breeding and research, with more than $97 million in funding, according to Fell, based on sales of more than 480 varieties in 27 crops.

"It provides competition in the marketplace, as well," says Fell, whose son Roger is one of the principals with Rosebank Seed Farms near Staffa, Ont. "It's been a changing world in the last 40 years, and SeCan seems to have done a pretty good job of keeping up and getting ahead of these new developments."

Insiders say much of its longevity is due to SeCan's success in cultivating a strong internal culture, based on co-operation and collaboration. It's always difficult to quantify, but the point was independently raised by every source that *Country Guide* talked to for this story.

There's also a recognition that, somehow, a balance needs to be maintained among industry stakeholders and members, particularly in addressing the changing landscape going forward.

SCORING BIG — OAC BAYFIELD

Perhaps SeCan's greatest success story was born in 1985 when plant breeders Jack Tanner and Wally Beversdorf at the University of Guelph made the cross that led to OAC Bayfield, eventually registered as a new soybean variety in 1993 and launched for commercial sales in 1995.

Bayfield's longevity is almost mythic, still in demand after 10 years on the market. And since then, its genetics have been bred into two more generations: OAC Champion, OAC Wallace and OAC Kent as the first progeny, and OAC Lakeview and OAC Heritage as the second.

In fact, though, OAC Bayfield seed is still being sold to companies in Russia, putting it solidly into its third decade of production and sales.

Since its release, approximately 45,000 tonnes of OAC Bayfield seed have been sold, with a value of more than $1.2 million to the soybean research program at the University of Guelph.

PRESENT AND FUTURE

Through all those years, the SeCan brand witnessed extraordinary change in the ag sector, especially in the past 10 years. This goes beyond the advent of biotech traits and technologies; the profile of agriculture is changing how farmers do their job, and is also changing not only the way they grow their crops, but the end uses that they sell them for.

Everything about agriculture today is so much more complicated than even a few years ago.

Asked to identify the biggest challenges facing agriculture today, Rick Van Laecke simply says, "Everything."

Van Laecke is in his second year as a director with SeCan and has been a member for 10 years, right from the beginnings of his own company, Horizon Seeds, based in Courtland, Ont., and he points to farm challenges including seed and input costs, the availability of new technologies, breeding for biotic or abiotic stresses, enhanced traits demanded by end-users.

"It's all of these and more," Van Laecke says, and growers are challenged to understand all of this new information, which means SeCan — as well as the rest of the industry — has a significant role to provide information and value in the seed in that context.

Although he works on Horizon's own corn brand with breeding and development, Van Laecke rates his association with SeCan as a priority.

"We're happy with the product line coming from SeCan right now, and if you can't improve it, why change it?" says Van Laecke, who likes what he sees from the company. "It's a unique opportunity, as an independent seed company with a corn brand, to be able to be a member and access this product line and all the support you get out of SeCan — it's a great fit.

"To me, working with SeCan brings the face of trust," says Van Laecke. "We're providing the source of seed that in most cases, was actually grown by the member and supported by the member — the member knows that seed. And because they can go to a neighbour or a customer or a relation and say, 'I've grown this and it's good' — I think that's what SeCan brings to the grower — it's that confidence."

Van Laecke also sees another fundamental difference that SeCan has turned into an advantage. Each year, the large seed companies turn out as many as a dozen new corn hybrids and the same number of soybean varieties as their strategy for growing market share.

But the public sector has been able to put a greater share of its focus on enhancing stress tolerance and disease and pest resistance.

The need to recoup funding isn't as driven in the public sector as in the private, Van Laecke believes, and he sees that as a huge plus, both for SeCan and its grower customers.

"As a spinoff," he adds, "the public sector breeding programs and the money they generate are educating tomorrow's ag professionals, the vast majority of whom will end up in the private sector," he says. "But they're educated by funds from that public sector."

> **"Farmers need to be aware of the way the markets are changing."**
>
> *Reuben Stone, Valley Bio*

EXPANDING SECAN'S REACH

When SeCan first arrived, its focus was almost exclusively on cereals and other traditionally Western Canada crops. Then it began branching into other crops and other regions, including soybeans for Eastern Canada. That expansion has also created opportunities in areas where they were limited in the past.

Reuben Stone, a new SeCan member, manages Valley Bio, a diverse seed operation in Cobden, Ont., northeast of Ottawa. Like Van Laecke, Stone says the value that SeCan has provided, both to his own operation and to his customers, is undeniable.

"We're new entrants into this industry, and we have access to a lot of this material, with a lot of mentorship and a lot of support around us in the organization," Stone says. "That's pretty important in an industry that's becoming top heavy. SeCan has such a broad base."

Stone, who operates Valley Bio with his wife, Keanan, notes their connection to SeCan also brings a much closer relationship to research. Valley Bio's primary crop is industrial hemp and his relationship with SeCan allows him to diversify his offerings to area growers, including soybeans and cereal crops. From that relationship, there's the opportunity to talk directly with researchers and gain an understanding of why a variety is appropriate. They tailor the genetics to specific needs of the members and their grower customers, and Stone says that makes it the closest relationship a commercial grower can have to actual seed development.

It's also worth a tip of the cap, he says, to the staff at SeCan for what he calls "a small team" to be able to pull together what they do on a daily or weekly basis. But the challenge remains to stay competitive and within reach of what the private sector companies are doing — and to do this in an era where government funding can be reduced or challenged with little notice.

Add to that the pace of change in the technology, where the technical innovation involved in the equipment used to mark DNA requires more investment, as well as the acumen and awareness needed to make the most efficient use of it.

There's also a considerable alteration in the overall relationship that agriculture has with the general public, says Stone. And that's something that more growers must prepare themselves for, in terms of changing not just their practices but their mindsets as well.

"The Canadian Wheat Board and the changes we've seen there, the potential for changes to the quota system in dairy and poultry — farmers need to be aware of the way the markets are changing and that we're producing food-grade items or industrial items, and what are the end uses?" poses Stone. "When we look at the climate stresses that we have, just this year, a lot of it's related to production practices on farm — irrigation, no till, organic matter in the soil — all have a big bearing. What can the seed trade bring to that? It could be a lot, and maybe not all in terms of traits but in different crop types. And that's seed trade's challenge as well." **CG**

SEED TREATMENT IN A DIFFERENT CLASS

A new mode of action could help confound several pests in eastern Canadian corn

BY RALPH PEARCE / CG PRODUCTION EDITOR

Corn growers across Eastern Canada looking for help against early-season insect pests such as wireworms, black cutworms and armyworms will likely have a new option for the 2017 growing season. The timing may be ideal, considering the frustration over new regulations governing the use of neonicotinoid-based seed treatments, which will further tighten for the coming growing season.

The Pest Management Regulatory Agency finalized the registration for Lumivia this past June. It's a new non-Class 12 seed treatment, marketed by DuPont Crop Protection and accompanied by high expectations for protection against early-season insect pests.

Lumivia is a first for Canada, featuring the active ingredient chlorantraniliprole (Rynaxypyr), a Group 28 anthranilic diamide insecticide. Lumivia offers protection from wireworms and suppression of seed corn maggot, in addition to control of black cutworms and armyworms. DuPont is also hoping to add grubs (both European chafer and June and Japanese beetle) to the label within the next year.

(Note PMRA standards say an insecticide must reduce a pest population by 80 per cent or more in order to claim control.)

Chlorantraniliprole (Rynaxypyr) offers protection from wireworms and suppression of seed corn maggot, plus control of black cutworms and armyworms.

PHOTOS COURTESY: DUPONT PIONEER

HOW LUMIVIA WORKS

Chlorantraniliprole acts on insect muscle fibres (specifically, on the ryanodine receptors in those fibres) causing depletion of calcium ions. That depletion prevents contraction of the muscle fibres, leading to paralysis that in turn stops the insects from feeding, which eventually becomes the cause of death.

Based on research into its protective capability, Lumivia has been determined to translocate from the treated seed and into the roots to above-ground parts of the plant, from germination through to the V5 stage of crop development. The highest concentrations are found in the seed and mesocotyl, than the seminal roots and the radical, and higher accumulations are also found at the margin and apex of the leaves.

Researchers and co-operators have been testing Lumivia and the company says they have reported excellent broad-spectrum pest protection and efficacy against key pests that can affect corn, and very good early-season vigour.

"We've been talking with those folks and have had them out in the field, and they're pleased to see a new seed treatment with a new mode of action," says Kristin Hacault, seed treatment sales and marketing leader for Canada at DuPont Crop Protection and DuPont Pioneer. "We've seen really positive results from growers and industry personnel."

The other benefit to Lumivia is it has a minimal impact on beneficial insects or pollinators when applied according to label directions and in keeping with best management practices (BMPs) for seed treatment stewardship. It also boasts a very high rating for seed safety.

Lumivia has been in the development and registration pipeline for about seven years. The anthranilic diamides were first developed predominantly for use as foliar

insecticides in 2006. At the time, they were heralded as an important discovery, necessary to stem the development of insect resistance.

"The formulation that we're using as a seed treatment is very specific, and the target pests on which Lumivia is active have not really been exposed to this chemistry in the past," says Hacault. She adds there is much less of a concern regarding resistance at this point. "However, we would still recommend that growers follow proper integrated pest management (IPM) practices and product stewardship to stem any development of resistance, regardless of the product they're using."

It's also not intended to be used as a stand-alone. Instead, it is to be mixed with a fungicide treatment to give protection against seed and soil-borne pathogens as well as insects.

NON-FARMING CONCERNS

Some industry stakeholders have raised concerns that the registration and marketing of non-Class 12 chemistries may be misinterpreted by those outside of farming. One suggestion in particular referred to the "coincidental" registration of such seed treatments at roughly the same time as the restrictions on neonic-based seed treatments.

The concern is that agriculture is sending the wrong signal, implying the industry had options to neonics in their pockets all along, and only moved them along when the neonic controversy erupted.

Hacault says nothing could be further from the truth, largely because of the time required, not just for registering a new insecticide or herbicide, but in the near-10-year period needed to develop any active ingredient.

"Because product development is such a lengthy process, we started developing this active as a seed treatment long before things (relating to neonic seed treatments) were going on in Ontario," she says. "The intent was to always bring Lumivia to the marketplace as a seed treatment. It's been a seed treatment in the U.S. for a couple of years so it's relatively new. But the bottom line is that we can't sell and commercialize a product until we have the registration, and that's happened this year."

Hacault says Lumivia will be available as a seed treatment for 2017 for use in combination with fungicides. It's recommended growers check with their dealers regarding availability of the seed treatment and fungicides they can use for next year's growing season. **CG**

SUCCESS
on Great Lakes phosphorus

Strong farm participation in GLASI programs shows agriculture is serious about environmental health

BY RALPH PEARCE / CG PRODUCTION EDITOR

Great Lakes pollution has become a critical issue in the past five years. In 2011, parts of Lake Erie were mired in a serious algal bloom, prompting the International Joint Commission (IJC) to establish Lake Erie Ecosystem Priority (LEEP).

The IJC issued a report in February 2014 identifying agriculture as the leading contributor to the pollution problem, and calling for stricter measures to monitor and reduce phosphorus levels entering the lake.

Other reports pointed at hog farming in the Maumee River basin in northwestern Ohio as the greatest contributor to Lake Erie pollution, although others have blamed cities including London, Ont. for its release of nutrients.

Yet proponents of change in farming practices say it doesn't help anyone to point fingers. Instead, they insist that agriculture needs to get itself ahead of the curve to avoid unrealistic or punitive regulations.

ENTER GLASI

In February 2015, the Great Lakes Agricultural Stewardship Initiative (GLASI) was launched at the annual meeting of the Ontario Soil and Crop Improvement Association (OSCIA). There was little fanfare and some aspects had to be finalized before it could be completely rolled out for producers.

The area of eligibility for GLASI covers those regions of southern Ontario with the capacity to affect water quality in Lake Erie.

The program was developed and is now funded jointly through Agriculture and Agri-Food Canada (AAFC) and the Ontario Ministry of Agriculture, Food and Rural Affairs (OMAFRA). The money comes from the federal Growing Forward 2 initiative and is delivered by OSCIA. It also has two distinct components: the Farmland Health Check-Up and the Farmland Health Incentive Program (FHIP). GLASI is a multi-layered program, with intakes to fund dust deflectors and upgrades for custom manure applicators.

The Farmland Health Check-Up pertains primarily to soil and pollinator health. A workbook is included in the program, and a farmer and a participating Certified Crop Advisor (CCA) can work together to conduct an in-depth review of select fields based on soil types, nutrient levels, risk of erosion and land management practices, among other aspects. Once the review is complete, Check-Up identifies what are known as Farmland Health Challenges and makes recommendations on best management practices (BMPs) to improve overall farm health.

The Farmland Health Incentive Program was introduced just before the 2015 edition of Canada's Outdoor Farm Show, and offers financial support to implement specific BMPs. In particular, it supports those with the greatest potential to impact the landscape, including improving soil health and reducing phosphorus loss from the edges of fields. Its coverage area extends from Windsor to Tobermory, down through Halton and along the lakeshore to Fort Erie, essentially encompassing all waterways affecting Lake Erie. The combined effect of these projects is supposed to improve the health of the Great Lakes, and in particular, Lake Erie.

To participate in FHIP, a farmer must have a peer-reviewed third edition Environmental Farm Plan or a verified complete fourth edition EFP conducted in the past five years.

In terms of available funding, a lot depends on the needs assessed by Check-Up and the Farmland Health Improvement recommendations. If it's defined as a high priority, 60 per cent cost sharing is available up to a cap of $25,000 per project. "Recommended" measures are eli-

gible for 50 per cent cost share up to a cap of $15,000 and "general" BMPs could earn 35 per cent cost share up to a cap of $10,000 per project. There are also limitations on what is eligible for funding (e.g. red clover is not eligible under cover crops; anything that can be harvest for seed is ineligible, and has been for years).

"Part of what the Farmland Health Check-Up does is help producers realize the benefits of doing it."

— Margaret May, OSCIA

POPULAR PROGRAM

Not surprisingly, the winter of 2015-16 turned out to be a busy one for Margaret May, who teaches environmental workshops for farmers. Most years, she might expect 20 or 25 growers. Last winter, meetings were packed with 50 to 80 people.

The timing of the rollout of both programs meant there was little time to put them into place and have them ready for the 2016 growing season. By the time the Farmland Health Check-Up was introduced early in the summer of 2015, we were just heading into harvest. Once December arrived, May and her counterparts with OSCIA were off and running, spreading the news about the program's directives and opportunities.

"The program's been very well responded to — demand has greatly outstripped the funding available, which is disappointing, but it's a reality," says May, regional program lead with the OSCIA for much of southern Ontario.

In spite of early cost sharing that was relatively limited, the program quickly took off. May concedes that costs are always an issue, and that this seemed to be an initial stumbling block.

"That tide is starting to turn," says May, noting there have been considerable cost-share opportunities for farmers to generate five-year crop plans based on a

CONTINUED ON PAGE 44

There have been considerable cost-share opportunities for farmers to generate five-year crop plans based on a series of soil tests

series of soil tests. "Those are both eligible under Growing Forward 2 and under GLASI, so there are some opportunities to get those kinds of things subsidized. And part of what the Farmland Health Check-Up does is help producers realize the benefits of doing it."

The program has proved so popular that its applications had to be turned down when the Farmland Health Check-Up had reached its full budgetary allocation. That occurred in late spring 2016 and was noted on the OSCIA website. May confirms that the program will be available for 2017, but questions remain regarding what the cost-share opportunities will look like (the budget for the FHIP 2017 is already set). At this point, May is still encouraging growers to go ahead with the process of consulting with their CCAs, not only to learn more about their own farms, but as a means of enhancing their relationships with them. Another benefit to the program is the listing of CCAs who are trained and certified to conduct the checkups; it was a rather short list at the start but has expanded considerably since.

"We're still encouraging people to go ahead with that process," says May. "You're still going to have to have a Farmland Health Check-Up and an Environmental Farm Plan done to access those dollars. Some didn't see the benefit to keeping the environmental farm plan current. Now they're seeing that they have to keep doing it every five years, so if nothing else, they've had a look at their business again, and it gets them ready if there are programs announced on relatively short notice."

In early 2016, once tangible components were deemed eligible for cost share, particularly with regards to equipment, the response was significant, and more farmers realized they needed to get their EFPs up to date. At the same time, one thing May urges producers to consider is a "take it slow" approach with this initiative: avoid doing 200 or 300 acres at a time. Instead, try a little bit to see if it works. She adds that there are local Soil & Crop chapters that are engaged in some projects in an effort to collect data and get more information as a resource.

BE READY

In addition to an updated environmental farm plan, producers also need to be fully prepared when meeting with a CCA.

"The time spent with the CCA is covered under the cost of the program, so it's two or three hours, sitting at the table with your soil test, with your cropping history, with your yields, with your herbicide program," says May. "You can't walk into this without being prepared — you have to have some information ready."

It's not just cover crops or manure applications that are part of the program. Some growers are asking about erosion control or planting trees. Others are learning more about taking a parcel of less productive land out of production, planting grass or pollinator habitats, all in an effort to make the land a producer *does* farm more productive and profitable.

"No one is going to access all of those components through the Farmland Health Check-Up, because you just can't do that," says May. "You decide which ones are going to work for you and you go there."

SOIL HEALTH THE KEY

Chad Anderson keeps repeating the same two words: soil health. Whether it's through their fertility programs, cover crops, or soil analysis, he says more producers are reconsidering the importance of healthy soils, and that this is why they understand the need to preserve water quality.

"There's a big appetite today in agricultural circles to improve soil health, and the program focuses on this component and draws people in," says Anderson, an independent CCA from Brigden, Ont., south of Sarnia.

Anderson was part of a small group of CCAs who took part in the pilot to test the original Farmland Health Check-Up, with revisions made based on their feedback. "People want to explore different options, whether it's from a nutrient management perspective or introducing new cover crops."

Anderson — like May — has heard little opposition to GLASI and its components. He believes farmers have always been good stewards of the land and that they're always interested in improving how they farm.

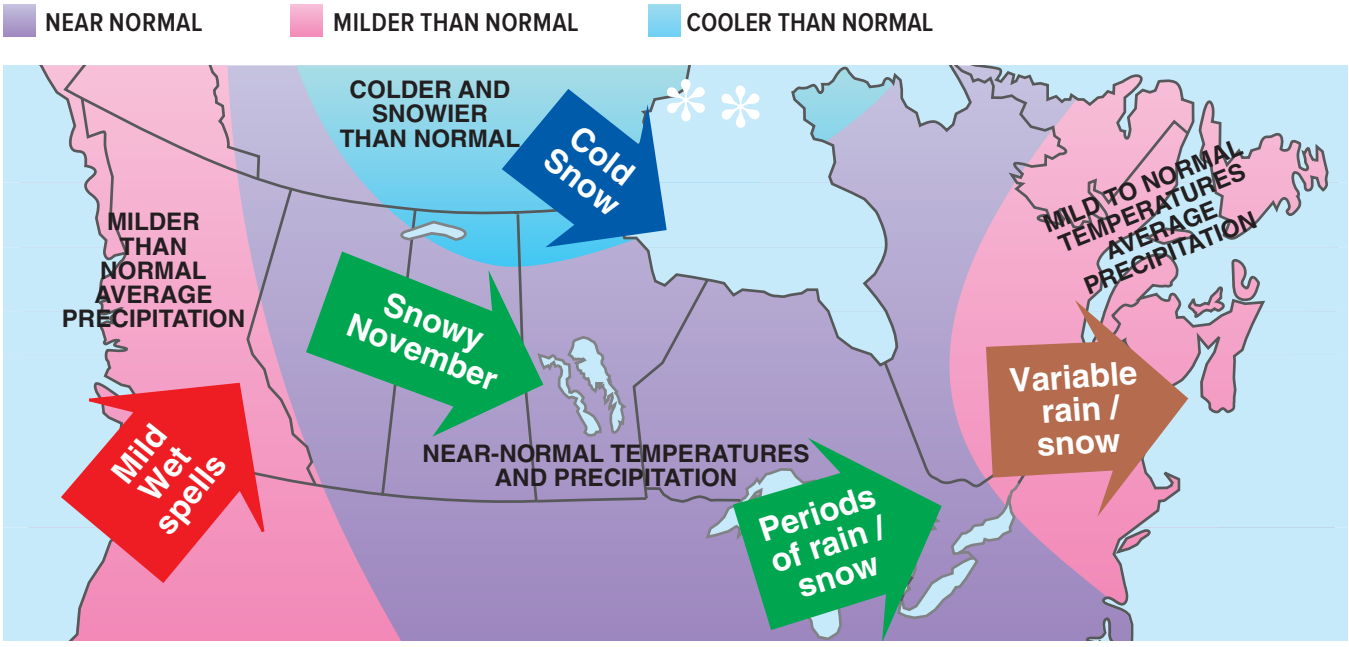
"It allows a person to look at their farm from a different perspective," Anderson says of GLASI. "Instead of focusing on yield and the bottom line, it makes you think more about how you farm and what impact that has long term. The analysis is done with recommendations made by the CCA and helps give some direction and actions, rather than just chatting about it."

In his dealings with producers participating in GLASI and the Farmland Health Check-Up, Anderson has found it's less about "getting your own environmental house in order" and than in enhancing soil quality.

"There is nothing else like the (Farmland Health) Check-Up in the world," he says, noting the EFP was created and developed in Ontario by people with great wisdom and foresight. "The Farmland Check-Up follows closely in the EFP's shoes, and I fully expect one day to see this adapted in other parts of the country as well as in other countries." **CG**

ADDITIONAL INFORMATION:

- ontariosoilcrop.org
- agrimarketing.com/s/104499
- ijc.org
- lfpress.com



Ontario

- **Oct. 6-22:** Fair skies on many days with seasonable to mild temperatures but expect rain or heavier showers on two or three occasions. Blustery at times. Frosty nights in all but southernmost regions. Some wet snow in the north.
- **Oct. 23-29:** Occasionally unsettled with gusty winds and periodic rain. Fluctuating temperatures leaning to the mild side in southern regions but with a frost threat on one or two nights. Wet snow and frost in the north.
- **Oct. 30-Nov. 5:** Weather systems bring occasional rain, possibly heavy in places on two or three days this week. Occasionally windy. Seasonable to mild but with frost pockets in the south. Intermittent heavy snow in the north with frost.
- **Nov. 6-12:** Cooler air advances southward bringing occasional rain to southern regions and heavier snow to central and northern regions. Chance of snow and frost in southernmost areas. Windy from time to time.

Quebec

- **Oct. 16-22:** Seasonable to mild on many days under blustery winds at times. Fair apart from rain on a couple of days. Nighttime frost in a few areas, especially central and north. Some wet snow north.
- **Oct. 23-29:** Changeable weather as fair skies alternate with rain. Chance of heavy rain in places turning to snow in far northern regions. Temperatures fluctuate from mild to cool under occasional windy conditions.
- **Oct. 30-Nov. 5:** Unsettled as disturbances move through, bringing rain and brisk winds to southern areas and snow to the north. Precipitation possibly heavy in places. Temperatures vary but average a bit above normal.
- **Nov. 6-12:** Fair with average temperatures but colder air makes its way southward bringing heavier snow to many areas. Snow mixed with rain south. Frosty nights. Windy most of the week.

Atlantic provinces

- **Oct. 16-22:** Pleasant on several days this week but occasional rain and brisk winds on a couple of days. Temperatures near to or above normal although frost threatens inland and northern localities on one or two nights.
- **Oct. 23-29:** Generally fair but expect a couple of rainy days, chance heavy in places. Rain changes to snow with frost in the north and in Labrador. Windy most days. Temperatures vary but trend to the mild side. Frost pockets inland.
- **Oct. 30-Nov. 5:** Windy conditions prevail as disturbances move by and bring rain to several areas on two or three occasions. Chance of heavy rain changing to snow in northern regions. Mostly mild, but frost pockets inland.
- **Nov. 6-12:** Seasonable to colder with strong winds on many days this week. Fair days will interchange with some heavier rain, changing to snow in the north. Frost on most nights except in coastal areas.

National highlights

October 16 to November 12, 2016

Milder-than-usual temperatures are expected to prolong pleasant weather in British Columbia and also in eastern Quebec and Atlantic Canada where, apart from a couple of unsettled, wet spells, near-normal precipitation can be anticipated. For the rest of the country, however, cold and snow are poised to press southward out of the Arctic. Some of these inclement conditions will reach the Prairies and northern Ontario and western Quebec by early November, and then plunge even farther south as the month progresses. Despite these outbreaks, however, overall temperatures and precipitation in these areas should average close to normal during this period.

Prepared by meteorologist Larry Romaniuk of Weatherite Services. Forecasts should be 80 per cent accurate for your area; expect variations by a day or two due to changeable speed of weather systems.

#PEST PATROL

with Mike Cowbrough, OMAFRA

What is the best strategy for managing perennial sow thistle?

With lateral roots that go as deep as two metres and seed production approaching 10,000 per plant, perennial sow thistle is extremely difficult to eradicate. Its impact can be minimized, however. Management that reduces top growth will lower seed production and root mass over time.

But be forewarned. If you decide to take a year off because it seems like you have the species under control, it can very quickly recover and return to its original level of domination. Below is a game plan for a corn, soybean and wheat crop rotation.

TIMING OF HERBICIDE APPLICATIONS: In timing studies, auxin-inhibiting herbicides (e.g. Lontrel 360, 2,4-D and dicamba) demonstrated higher levels of control and greater reductions in root mass when applied to larger rosettes (>nine leaves) and plants approaching the early-bud stage than on smaller (two- to four-leaf) rosettes.

INFLUENCE OF TILLAGE: Timing of tillage operations at the seven- to nine-leaf rosette stage is optimal. This reduces the reproductive capabilities of the root. To manage perennial sow thistle through tillage only requires tilling several times throughout the season since new vegetative shoots will almost certainly emerge.

RATE OF GLYPHOSATE: If growing glyphosate-tolerant (Roundup Ready) corn or soybean, glyphosate is the most effective herbicide at controlling top growth of perennial sow thistle with the higher labelled rate giving more consistent control (Table 1).

CORN: Marksman, Peak and Distinct (Figure 1) have been the most effective herbicides at controlling top growth of perennial sow thistle when at the nine-leaf or greater-rosette stage at the time of application.

SOYBEAN: Many post-emergent herbicide options in non-GMO or "conventional" soybean have proven to be inconsistent in their effectiveness at controlling perennial sow thistle top growth. Classic (Figure 2) or FirstRate have been the most consistent at suppressing top growth, although the level of control won't blow you away.

WINTER WHEAT: Several herbicides are good at controlling top growth of perennial sow thistle (Figure 3), but vegetative shoots can continue to emerge from underground rhizomes well into June, i.e. after most herbicides can be applied safely. Although delaying herbicide applications until as late as possible (flag leaf) may seem like a good strategy to control as many emerged shoots as possible, the approach is flawed due to greater risk of crop injury. For this reason, some farmers prefer either to control perennial sow thistle with glyphosate prior to planting winter wheat or utilize pre-harvest applications.

AFTER WHEAT HARVEST: Fall herbicide applications are beneficial in reducing root mass and delaying emergence the following spring but one should still expect to see perennial sow thistle the following season. Glyphosate alone has proven to be as good as any herbicide applied in the fall but some prefer to tank mix with 2,4-D. **CG**

FIGURE 1: Control after an application of Distinct in corn.

FIGURE 2: Yellowing and stunting of sow thistle 10 days after an application of Classic (left) compared to an unsprayed strip (right).

FIGURE 3: Control at two weeks after an application of Pixxaro in winter wheat.

Table 1. Control of perennial sow thistle rosettes with 9 or more leaves in the spring when glyphosate has been applied at two different rates

Product	Product rate/acre	Avg. control (%) (6-8 weeks after application)	Range in control (%)	# of trials
Glyphosate 360 g/l	2 l/ac.	93	87-96	4
Glyphosate 360 g/l	1 l/ac.	79	68-99	4

Have a question you want answered?

#PestPatrol on twitter.com @cowbrough
or email Mike at **mike.cowbrough@ontario.ca**.

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Bayer SeedGrowth™

For Manitoba vegetable grower Rolland Jeffries, Kelly Beaulieu's company can create a market for vegetables that used to get rejected because of size or blemishes.

Picking up business

New food-processing technologies are creating a new era of opportunities, including for crops that just get plowed under today

BY REBECA KUROPATWA

Today, over a third of horticultural products are left to rot in the field. But Beaulieu sees a profit opportunity, and is looking at pulses next.

Behind the scenes in Canada's food-processing industry, countless entrepreneurs are conjuring up new business opportunities by making more efficient use of our crops, including through improved processing and the use of previously wasted portions stock.

Watching over and assisting many of these developers is Roberta Irving, who is in charge of business development at the Portage la Prairie Food Development Centre.

With her comprehensive background as a dietitian, plus her sales and marketing experience in food production and the food industry, Irving has been the go-to person in the field for the past six years.

Although it has clients from across North America and the world, the centre is part of Manitoba Agriculture and its primary mandate is to help farmers and food companies develop new uses and markets for the province's commodities.

"It's interesting because of trends," says Irving. "We'll see ebbs and flows."

SMALL COMPANY PREPARES FOR MAJOR GROWTH

The Manitoba company Canadian Prairie Garden Puree Products Inc. (CGP), is gearing up for a major growth spurt, with the introduction of some further specialized equipment that will allow it to process pulses.

The company is led by its founder and chief operating office, Kelly Beaulieu, an agronomist by trade with a background in R&D and agriculture.

Beaulieu started with the fact that from 30 to 60 per cent of the vegetables grown in Manitoba get discarded in the field — a reality that did not sit well with her.

"The reason for this was that they were visually imperfect — the wrong size, had a little blemish, discoloured, or just something really insignificant to the quality of the product itself," says Beaulieu. "Farmers are forced by the retail market to sort that product into only blemish-free ones — the perfect-size ones."

But this means that a third to almost two-thirds of their crops get plowed down

PHOTOGRAPHY: SANDY BLACK

or fed to cattle, with little if any return to the inputs and effort that the farmer put into growing them.

Beaulieu felt producers would jump at a secondary revenue stream for this "imperfect" product. She began by looking into setting up a quick-freeze plant that could be used around the world, providing a market option for crops conceivably worth billions of dollars.

But Beaulieu found that the freeze concept was impractical, so she continued her research, which eventually led her to focus on steam infusion technology, developed specifically for processing purées and pulse crops.

"We have a game changer in the industry, because of this development," says Beaulieu.

"In Manitoba, something like nine million pounds of carrots are discarded in the field. But that can now change. We can now peel them, clean them up, remove blemishes with the steam peeler, put them through a grinder and our steam infusion cooking process, and — in nine seconds — they are fully cooked to sterile.

"From the time the product is cleaned and put into our system, it's approximately two minutes of time in our equipment. Then, it goes into our pouch — a bag-in-box pouch that is flexible — so, it replaces tin cans and the like. The purée and the pouch are shelf stable. It will last and retain qualities and nutrients for two years at room temperature. That's the product that we've developed."

Thanks to the rapid cooking and cooling, the technology retains all the freshness and nutritional qualities.

Recently, Beaulieu and company have begun working with protein-rich pulse crops, says Beaulieu. "Our equipment is well suited to process pulses, and also does things like hummus starters. So, a hummus manufacturer could buy our drums of hummus starter, the chickpea purée, and it's ready to use.

"Our competitors in the industry for that product have to bring in product from offshore. It comes in big tin cans, so they have to open every tin can and discard the can. It's packed in brine, so it's salty. Then, they have to grind and work with that product.

"The alternative is our product. With that, all they need to do is slit the bag open, then it's immediately usable. The bag is even recyclable."

Now, CGP also has a navy bean product that is being put into a myriad different formats, Beaulieu says. "This is a great way for CGP to provide some value-added products instead of selling raw foods right here in Manitoba."

There is no shortage of potential end-users for the products — from any large kitchen to food manufacturers — with 33 different types of CGP purées. The majority of the purées is vegetables and pulses, but the company also works with saskatoons.

BUYING FROM LOCAL FARMERS

"We like to buy local, as there is a lot of variety here, a lot of opportunity, and it's better for the environment to package something where it's grown," says Beaulieu. "We have this in mind with everything we do — reducing the environmental footprint of our plant."

While CGP has bought products from Ontario and a few from the U.S., the vast majority of what the company processes is grown locally.

With a current capacity of about 27 million kgs annually, the plant runs at

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"We have a game changer in the industry because of this technology," says agronomist turned entrepreneur, Kelly Beaulieu. Starting with vegetables like carrots, her company is now targeting major pulse crops

about 3,400 kg per hour, despite a footprint of less than 7,000 sq. ft. and low water and power needs.

"That was one of the things I put into place when I built the plant," says Beaulieu. "It had to meet environmentally friendly standards. I wanted to decrease our waste, to look at it from a level of not only how farmers could reduce their waste streams, but also at the consumer level. If people are buying a frozen product, five to seven per cent of that product is immediately wasted in the plant… Not in our plant. With our product, there's no waste."

Beaulieu sees huge need for the technology ahead. "Our product removes the seasonality supply of freshness and nutrition," she says. "In 2050, we're going to have something like 9.5 billion people on the planet. We have to find the means to better utilize the food resources we currently have. Technology advancements in food processing are going to be one of the methods that will give us the opportunity to utilize and better distribute all the food we already have."

Growers are very interested in working with CGP, as the company offers another revenue stream for product they would normally discard or have very low opportunity to sell.

"We actually have been holding back on what we can pack, because we have too many farmers coming to us," says Beaulieu. "But, I don't discourage the farmers. We want them all when we open the second plant. Our dream has always been to have several of these plants and to utilize all the waste product out there."

Vaccuum-packaging produced and quality-assurance tested to strict standards gives food processors easy ways to use crops that used to be left to rot in the field.

CLEAN LABELS

But the big trend now is what's called the clean label. For instance, the centre has done intensive work on the use of flax to replace gum-type binders, taking advantage of the adhesive strength of flax, and there's work underway to replace nitrates with celery powder.

For example, four years ago, energy bars were really popular, and Irving says the centre helped clients develop products for that market. Some were pulse based. Others were pea and lentil based.

"These developers are always asking for clean labels, and they want this because that's what consumers want," Irving says.

"Consumers are looking for labels they can easily read and know what all the ingredients are."

The challenge is that while to consumers this might seem a simple — you might almost say a "natural" — process, it can actually be incredibly complex.

Each ingredient in their favourite products is there for a critical function, Irving points out. And, without these critical ingredients, the product simply would not taste, feel or store the same.

Thus the hunt is on to find better replacements, which might be better because, for instance, an ingredient might contribute to more than one function, in the way that salt, for instance, is both a preservative and a taste enhancer, and sugar can be both a sweetener and a binder.

"For the last couple of years now, we've been doing more with plant proteins or plant fibres," says Irving. "There's really an appetite for plant-based products, as some people are trying to go more without meat. Historically, if you had a non-dairy product or you wanted a meat substitute, there were very poor ingredients out there as substitutes. But now, because of new technologies, plant proteins are really front and centre, being used as ingredients to create really good-tasting products."

In the non-dairy category, almond milk is an example of a product that probably wouldn't have been commercial in any sort of big way until now. And, in the meat substitute category, the U.S.-based company, Impossible Foods, is using a technology of plant proteins to create meat substitutes."

Already, Impossible Foods has created a plant-based burger that acts and tastes like an authentic beef burger, including the "plant blood," mouth feel, and sizzle you would get from a regular burger, which means their business target can be the huge audience of meat lovers, not the smaller audience of purist vegans.

Closer to home, Irving is working with

Now, because of new technologies, plant proteins are really front and centre," says the development centre's Roberta Irving, adding crops are being used "as ingredients to create really good-tasting products." For more farmers, that's expected to produce more opportunities to launch new enterprises

Canadian pioneers in this new field, such as Manitoba Starch. "It gets clean potato water from McCain here in Portage la Prairie and extracts the starch," explains Irving. "There is this huge trend looking at using waste products in the processing industry."

Another company Irving has worked with is Shape Foods out of Brandon, Man., which has developed a way to make shelf-safe flax oil. "It's developed a processing technology so its product has a 24-month shelf life, which is unheard of in the industry," says Irving. "If you don't open it, it would be shelf stable for 24 months. If you open it, you put it in the fridge."

Pulses are getting attention too. "Historically, using pulses in the food industry has been difficult because of their strong smell and taste," Irving says. "But lately there's been more technologies developed through extraction — like taking the fibre out of peas, beans, and lentils, and using it in breads. It can even be used as a coating for chicken nuggets. We did a study here and were able to replace 50 per cent of the white flour in a chicken nugget coating with pulse flour."

There are even bonus benefits to using pulse flour, Irving says, such as better colour, faster browning, less fat needed for cooking, and better crunch.

There are all kinds of good reasons to use pulses in other products and, with the possibility of using extraction processes, the possibilities may well be endless.

"You're starting to see more pulses going into breads, because you can still put them in and have a light, airy texture, which is what people want in bread," says Irving.

On the horizon, Irving envisions further use of supercritical food extraction to extract proteins and other ingredients from produce such as spinach, kale, and locally grown fruit, like sea buckthorn, some of which could be sold to high-value markets, like the cosmetic industry. **CG**

The SLOW DEATH of THE GREEN REVOLUTION

Even as the negative impacts of the great Green Revolution pile up, there is hope

BY NICOLAS MESLY

It saved one billion people from starvation. It won a Nobel peace prize for its founder, and it transformed India, all by discovering new varieties of high-yield rice and wheat, and new ways of growing them.

Yet today, 50 years later, the Green Revolution is sputtering. Those high-yield crops have touched off ecological disasters, and the countries that were saved from hunger are now struggling with dietary deficiencies.

But perhaps the revolution will get a second chance, if developing countries change their agriculture policies.

"The next Green Revolution has to preserve our natural resources," says Dr. Rajan Aggarwal, soil and water specialist at the Agriculture University of Punjab (PAU). "We have achieved yields of wheat and rice of six tonnes per hectare, but at the cost of our water table."

It takes eight hours driving north from India's capital, New Delhi, to reach Ludhiana. The city is home to the world-famous Agriculture University of Punjab (PAU), often called the Mother of the Green Revolution.

The university is linked into an international group of plant breeders and agronomists called the Consultative Group for International Agricultural Research (CGIAR). Together, starting in the 1960s, they produced a kind of space race of their own, doubling and tripling the yields of wheat and rice in developing countries, based on work at research centres in Mexico, U.S., India, Pakistan and Philippines.

Eventually known as the Green Revolution, this scientific effort was largely financed by the American government and by private foundations such as the Rockefeller Fondation. But there was never any doubt that it was political too. During the years of war in Viet Nam, the West did not want to see India topple into communism and into the arms of China.

Despite all those good intentions, after two generations, the problems are becoming clear.

Those high-yielding cereal varieties can only produce their yields if they're matched with dangerously high fertilizer rates and unsustainable quantities of water.

As a consequence of the revolution, more than 12 million pumps now suck up so much underground water during the region's paddy season, they effectively make Punjab the world's largest artificial lake.

Haridenyat Gill is investing C$100,000 in a modern greenhouse to produce organic vegetables. He admits that it is hard to wean himself from the highly subsidized wheat and rice production.

Water is vital not only to agriculture production. It is a source of intense conflict in India between farmers, between farmers and cities, between states and between its neighbouring countries such as Pakistan and Bangladesh.

India subsidizes the manufacturers of nitrogen fertilizers so they can offer lower prices to farmers. Farmers don't like the system, but fear that if they lobby for reform, the government will simply use it as an excuse to cut ag spending.

In the photo are some of the 8,000 farmers who buy their seeds at the Faridkot agriculture fair, near the Pakistan border. The varieties are developed by the breeders at the Agriculture University of Punjab (PAU). These farmers could buy Bt cotton — the only GMO allowed in India — but Sukhjit Sing, a farmer interviewed at the fair, says it isn't really an option, since it costs 200 times more than non-GMO seed.

At the start of the revolution, Dr. Aggarwal tells me. the water table was 10 metres down. Today it is a perilous 30 metres.

Unless something changes, the outlook is bleak. Rice cannot be grown without water.

For Aggarwal and his colleagues, it has set off a push to grow earlier varieties of basmati rice that would mature in 100 days, down from 130 to 140 days for conventional rice varieties. The change would save a substantial quantity of water.

Plus, for about C$27,000, farmers can buy a laser-guided grader to level their fields, cutting their water needs by 15 to 25 per cent. The effect, the researchers say, has been "miraculous" and already, a third of the state's paddy acreage has been levelled with the locally made machine.

Irrigation technology is evolving too, with more farmers turning to drip systems.

The numbers, however, quickly get very large. The university's ultimate goal is to reduce water consumption so that monsoons will recharge the aquifers, but with 40 per cent of the Punjab's arable land being irrigated, an even more radical change may be needed.

According to former PAU dean Dr. S.S. Johl, the Green Revolution achieved its goals by transforming the Punjab into a rice producer. Until then, its big crop was wheat.

Now Johl, an internationally known and respected agro-economist, is denouncing government subsidies that make rice production possible by encouraging what he calls "the pillage of underground water." Producers don't pay for the water, he points out, and they also get heavy subsidies for urea and diesel, as well as having guaranteed prices for wheat and rice.

The result, Johl says, is an artificial economy with insane competition to build bigger and faster pumps.

EXCESS NITROGEN

Last March, I drove the road from Ludhiana to Bathinda and on to Punjab's capital, Chandigarh, with wheat fields changing from green to gold. In three weeks, thousands of combines would harvest the precious grain.

But as I drove by, I regularly saw huge circles of flattened wheat, as if herds of elephants had slept in the fields. In Canada, this would be a sign of severe rain or hail, but I'm told that nothing of the sort has happened here.

"The lodging is due to overapplication of urea," explains Sukhdev Singh Bhangu, marketing manager for the Indian Farmers Fertiliser Cooperative (IFFCO).

The Green Revolution wheats were bred with short straw to resist bad weather, but excess nitrogen can overpower that dwarfing trait, so the stalk can become too weak to hold the head.

Again, if we were talking about Canada, the concern would be grain quality, and how to get those heads into the combine. Here in India, however, the problem is rats, plus birds too. A lot of the crop will be lost before the farmer can get to it.

IFFCO controls a quarter of India's fertilizer market, Bhangu tells me, and the giant co-op does try to edu-

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Now, the government subsidizes the cost of urea. Instead, farmers would like to be paid the subsidies directly, so they can decide how best to invest

India quick facts

- India population will outnumber China in 2050, reaching 1.3 billion.
- India has almost as much cultivated land as the U.S.
- India has more than 120 million farmers. Three-quarters own less than one hectare.
- Agriculture accounts for 17.4 per cent of the country's GDP.

India, an agriculture powerhouse

- India is the world's largest dairy, lentil and spice producer.
- India is the world's second-largest producer of wheat, rice, cotton, sugar cane, aquaculture, goat and sheep meat, and fruits and vegetables.
- India is the second-largest exporter of beef after Brazil.

(Source: FSUSDA, World Bank)

cate its 50 million members on urea rates. But the fertilizer is so heavily subsidized by New Delhi, it costs less than salt.

Narendra Modi, India's acting prime minister, has tried to re-structure the subsidies. Instead of giving the money to the fertilizer companies so they can lower their prices, he wants to give the money directly to farmers, who can then choose whether to spend the funds on fertilizer or on other farm expenses.

You might think farmers would jump at this. Instead, they're nervous about whether they'd ever actually see the money.

"I am against it. I prefer that the subsidy stays with the manufacturers because I don't want to wait a month or more before being reimbursed by the government," says Haridenyat Gill, a grain producer I met on his farm near Lidhuana.

Just back from Israel, the 36-year-old entrepreneur was building a brand new greenhouse to produce organic cucumbers and tomatoes under drip irrigation.

Gill is investing C$100,000 in this project, and he says he knows this means he is taking a huge risk to produce these perishable products. But, with the subsidies he gets for the cereal side of his operation, it's a reasonable risk, he says. Without them, the risk would simply be too great.

Yet the problem runs deeper. In this climate, the decades of big, urea-driven crops have burned the soil's organic matter and depleted other nutrients all over the country. In fact, India now returns even less grain per unit of applied nitrogen than China, getting only half the yield bump that farmers in North America would see.

This is why, last February, Narendra Modi launched a vast program called the National Soil Card, with 2,000 dealerships being equipped with soil labs in the next three years.

Under the plan, each producer will get an individualized soil card, showing their need for nitrogen, phosphorus, potash and micronutrients, together with a ranking of the soil's organic matter.

"It is a win-win situation as producers will use less urea and help soil health recovery, and the government will save huge amounts of subsidies," says P.K. Joshi, director South Asia, International Food Policy Research Institute (IFPRI), based in Delhi.

Some 140 million soil cards have already been issued by the Ministry of Agriculture of India.

A SUSTAINABLE REVOLUTION?

"Just testing soil is not enough! We need to figure out ways to improve soil fertility without excessive dependence on chemicals," says Vibha Varshney, editor of the magazine *Down to Earth* published by the Centre for Science and Technology, in Delhi.

Crop rotation, building up organic matter, and growing nitrogen-fixing crops are some of the ways to do this, Varshney says.

In other words, in order to preserve the gains of the Green Revolution, it's time for farmers to ease up on their use of the revolution's biggest successes.That won't be easy, says Varshney, who says it will take government policy to get farmers to put more of their land into lentil crops, which he calls the all-time champions in the field of ecology and climate change.

Easy on water, lentil crops would regenerate the soil with fixed nitrogen and diminish the use of urea.

Even though India is already the world's largest lentil producer, the droughts of 2014 and 2015 cut production. This was good news for Canada, which supplies 40 per cent of India's lentil imports.

But Indian soils need lentils, and so does India's population, especially since lentils are rich in iron and would help solve the iron deficiency in the national diet that has been exacerbated by the Green Revolution.

"This sustainable or second Green Revolution must also consider the food deficiency of India's population. Nearly 90 per cent of pregnant Indian women suffer from anemia," says A. Kishore, director of sustainable agriculture and climate change, IFPRI.

Will Narendra Modi's government push these changes? How far will it go? How fast? And how much of the Green Revolution's benefits will still be left?

It remains to be seen. **CG**

We've been misinformed

Put this eight-page debunking handbook on the top of your reading list, and let's stop making consumer misinformation worse

BY GERALD PILGER

What works on your farm

Dr. Jason Lusk is a food and agricultural economist at Oklahoma State University, and he researches what we eat and why we eat it.

Lusk is concerned about the disparity between the beliefs of farmers and researchers versus the general public. He believes the problem is that two trends have emerged at the same time. First, North Americans have become less trusting of institutions. Second, there is a much greater diversity of information available to consumers, so people seek out what they want to hear rather than facts.

Lusk says there used to be a shared assumption that the experts have all the knowledge, so if the experts simply presented consumers with the information, then everything would come out right. But today, he says, that is not nearly as effective.

Instead, Lusk applauds farmers who actually engage consumers in conversations on a one-to-one basis about food safety and environmental concerns over modern farming practices.

Lusk urges farmers to listen to the concerns of consumers and respond by explaining how you actually address those concerns on your farm. For example, if in a conversation a consumer says, "I am concerned about… " the farmer's response should be, "I am concerned about that too, and this is how we handle that on our farm… "

This response can apply to any issue from environmental concerns, to GMOs, to antibiotic resistance, to pesticide use.

Lusk says while science is important, it is not always persuasive. Responding to consumer concerns by quoting the latest scientific journal to justify a farming practice likely will not work. Instead, farmers should tell their own story and focus on why you do what you do.

The good news is that farmers are finally recognizing the damage that misinformation is doing to our industry, and we are responding to it.

The bad news is that the way we respond may actually be increasing consumer opposition rather than alleviating it. We've been misinformed about fighting misinformation.

Agriculture is not the only industry to be threatened by misinformation. It is merely the latest, so it is important to look at how misinformation has affected others and how they have responded.

A good case study is the controversy about vaccinations and autism. The claim that vaccinations cause autism was first made about 18 years ago based on a single study of just 12 children in the U.K. Further clinical studies refuted the correlation, the medical journal that published the original study retracted it, and the doctor involved in the study lost his licence to practise medicine.

Yet today an estimated one-third of U.S. parents believe that vaccines are linked to autism, which is why measles, once nearly eradicated, have returned.

In this case, the response to misinformation has been totally ineffective.

There are a number of reasons why people cling to misinformation and why they do not want to give up their opinions, even when those opinions are scientifically discredited.

First, no one likes being wrong, so people will seek out information (i.e. misinformation) which proves they have been right all along. This is "confirmation bias."

Also, it is often easier to get misinformation that reinforces your beliefs than it is to search out the truth about an issue or practice. This is particularly true if the misinformation is delivered by social media you subscribe to or by a public figure such as an actor or politician, and it is especially easy to fall for individuals who portray themselves as informed outsiders who are willing to challenge the corrupted establishment or corporate system, which they claim is only interested in profits, not the consumer.

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Getting it right

A useful summary of the strategies that can be used on your farm can be found in a 2012 news release from the University of Michigan entitled "New study analyzes why people are resistant to correcting misinformation, offers solutions":

- Focus on the facts you want to highlight, rather than the myths.
- Make sure that the information you want people to take away is simple and brief.
- Consider your audience and the beliefs they are likely to hold.
- Strengthen your message through repetition.
- Provide people with a narrative that replaces the gap left by false information.

Colorado State University has also published a fact sheet entitled Nutrition Misinformation: How to Identify Fraud and Misleading Claims. It lists the top 10 red flags for misleading claims in nutrition.

1. Recommendations that promise a quick fix.
2. Dire warnings of danger from a single product or regimen.
3. Claims that sound too good to be true.
4. Simplistic conclusions drawn from a complex study.
5. Recommendations based on a single study.
6. Dramatic statements that are refuted by reputable scientific organizations.
7. Lists of "good" and "bad" foods.
8. "Spinning" information from another product to match the producer's claims.
9. Stating that research is "currently underway," indicating that there is no current research.
10. Non-science-based testimonials supporting the product, often from celebrities or highly satisfied customers.

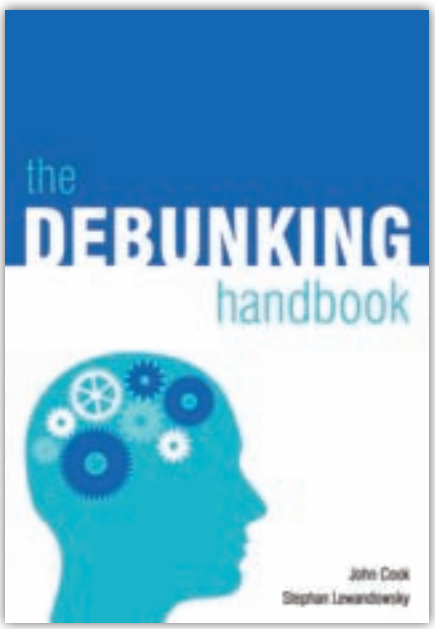
Here's why to worry about how you correct those anti-farm myths. If a falsehood is repeated just three times, up to 40 per cent of people will remember it and believe it to be true

It adds up to this. Confirmation bias can rarely be overturned with facts, data or evidence. People will simply discount all the evidence that disproves the misinformation they are using as the basis of their world view, and they will embrace any "information" they have found or heard that supports their world view and beliefs.

Research has actually studied the conundrum that this produces. Our efforts to use verified facts, research and data to set the record straight can actually cause people to deepen their belief in the misinformation that we are trying to attack.

This is known as the "backfire effect."

Then it gets worse. Once the misinformation is firmly entrenched, we tend to look at and treat those holding such beliefs as idiots or a radical fringe, and this polarization further divides and encourages those who believe in the misinformation to spread their misbeliefs, thereby greatly reducing the chances of correcting the misinformation in the future.



Another trap we fall into when attempting to refute misinformation is by repeating that misinformation when we try to refute it. Every time misinformation is repeated, there is the possibility you are introducing that misinformation to people unaware of the misinformation in the first place.

Research has found if a falsehood is repeated just three times, up to 40 per cent of people will remember it and believe it to be true.

Possibly the step which most people ignore in fighting misinformation is to provide any alternative to the misinformation.

THE DEBUNKING HANDBOOK

Dr. Stephan Lewandowsky, University of Bristol, U.K., says providing a narrative is a critical step. "It is not enough to debunk the myths, you need to provide an alternative that will fill the gap if misinformation is to be accepted as untrue. Explain the false information and the agenda of those pushing it. The most effective way to reduce the effect of misinformation is to provide an alternative explanation for the events covered by the misinformation."

According to Lewandowsky, the other critical step is: "beware of a person's world view. For example, understand that those opposed to GMOs have natural, environmental, and purity goals. You cannot attack these values. Instead you have to deal with the science behind GMO."

In the case of GMOs, given the resulting increased use of glyphosate, and now the development of glyphosate-resistant weeds, Lewandowsky suggests farmers acknowledge that GMO crops have resulted in excessive use of glyphosate which has resulted in development of glyphosate resistance. He says a GMO supporter who begins a conversation with someone opposed to GMO by conceding this point will improve trustworthiness of the GMO proponent and make the person opposed to GMO more willing to reconsider their GMO position.

When asked who are the best to address misinformation about GMOs, Lewandowsky replied: "Those who people trust. Not Monsanto! Instead it should be independent university scientists who are not funded by corporate interests. It should be farmers who use GMO technology."

Lewandowsky says farmers who address a misinformation issue like GMO should

focus on discrediting misinformation with friends and family first. He recommends talking to those who are on the fence about an issue like GMOs rather than those firmly opposed to the technology. "There is very little to be gained by trying to change the position of hardcore believers in misinformation."

However, Lewandowsky says it is very important to expose those hardcore believers and the reasons they have for promoting misinformation. Are they promoting misinformation for personal financial gain, for the fame, or perhaps for political reasons?

Lewandowsky has written *The Debunking Handbook*, an eight-page guide to why people believe misinformation and how best to debunk misinformation. He opens with:

"Debunking myths is problematic. Unless great care is taken, any effort to debunk misinformation can inadvertently reinforce the very myths one seeks to correct. To avoid these "backfire effects," an effective debunking requires three major elements.

First, the refutation must focus on core facts rather than the myth to avoid the misinformation becoming more familiar. Second, any mention of a myth should be preceded by explicit warnings to notify the reader that the upcoming information is false. Finally, the refutation should include an alternative explanation that accounts for important qualities in the original misinformation."

The Debunking Handbook should be read by everyone interested in challenging the misinformation that plagues the agricultural industry. It is online at www.skepticalscience.com/docs/Debunking_Handbook.pdf. **CG**

A backstage pass

Join me on this tour of engineering facilities with a group of senior managers actually willing to talk about product design

BY SCOTT GARVEY / CG MACHINERY EDITOR

When I walked through the front door at SeedMaster's Regina manufacturing plant, Cory Beaujot, the company's marketing and communications manager was waiting for me. I had been invited to the factory to meet senior management and hear about the new technology the brand is introducing for its 2017 model year seed drills.

They had made one other enticing offer to get me there. I was going to get a chance to walk through the company R&D shop to see what their engineers are working on.

I've been through a few R&D shops at various machinery manufacturers over the years, and it's always fascinating to see the birth of technologies that eventually appear on new equipment.

The trouble is, the companies usually hide the really interesting stuff first.

Or I might get invited into a shop to see something that is about to make a splash in the market, but only on the condition I keep quiet about it until the company kicks off its big product launch.

Sometimes I even have to surrender my camera before putting on the standard issue safety glasses and heading out the back door of the office area into the plant.

But this day at SeedMaster, things were quite different. Armed with my camera, I was allowed to look at the products under development and the testing procedures used to evaluate them. And company management was willing to talk about the results from testing their new systems — and those from competitors.

Before setting foot in the R&D shop, however, I was taken upstairs to the engineering offices to meet Daniel Michaluk, one of the engineers working on refinements to the brand's new UltrPro II on-frame seed metering system. Sitting at his desk, he gave me an overview, using the CAD image on his computer.

"We're into the final development stages of getting this product into the market," he said as he rotated the image on the screen. "It's gone through a few iterations already, and we're at a stage where we're pretty happy with how it's performing. We've done a lot of field testing and we're doing some bench testing to finalize some of the roller shapes."

As we spoke, a 3D printer was humming away behind us, creating one of those rollers so it could be taken to the R&D shop for evaluation.

"With these new meter developments, we've made the meter suit the grain," added Norbert Beaujot, company president, as he showed me one of the prototype meter rollers hot off the printer. Using a printer to create prototypes for testing saves the company the expense of paying for injection moulds before finalizing a design.

And metering is big. In fact, Beaujot thinks all seeding equipment manufacturers will be focusing on metering going forward. "It doesn't take much to be throwing away $15 per acre on seed," he said.

"One of the toughest things in the air drill or any seeding or fertilizer application business is that the input companies will come up with a new product, and they test it in a plot seeder to make sure it actually works," added Trent Meyer, director of sales and marketing. "We don't get a heads-up that next spring there's a new product that meters differently… we get the first call when it can't be metered."

"We went right back to the basics," said Norbert about the new metering system. "We had limitations before in the quantity of product we could put through

Engineer Daniel Michaluk shows an original engineering design on computer for a new metering system the company has just introduced.

Company president Norbert Beaujot, explains the workings of a mock-up of a new metering system inside the R&D shop.

Inside the R&D shop the performance of a variety of distribution towers is evaluated.

Seed metering is expected to become a key competitive issue for seed manufacturers, says SeedMaster president Norbert Beaujot. "It doesn't take much to be throwing away $15 per acre on seed."

the venturi system. We designed it right from scratch so we could put the bigger peas and beans through it at high rates."

With so many senior managers walking with me, I couldn't help but try to get an insight into some of their design decisions. Why, for example, were they one of the air drill brands sticking with hydraulic meter drives rather than moving to electric?

"We've been using hydraulics because it's dependable and very precise," explained Norbert. "We've looked at electrics a bit, but there's been struggles out there with electrics. So until we see a clear view of that going forward, the farmer doesn't need any more complexity at seeding time. The hydraulic system we use has been very, very reliable."

Added Trent, "The thing with hydraulics is we've finally just got a fleet of tractors out there that can handle the flow that we need for our drills to be effective and run properly. Now, to ask tractor manufacturers to supply power to 30-, 40- or 50-drive motors really creates another limitation, rather than basing it on the hydraulics and sticking with what we know."

"When you think about it, you're using an engine to create hydraulic power; you're using that hydraulic power to run a generator to create electricity to run a meter," Norbet added.

"You lose (efficiency) every time (power flow changes types)," said Daniel.

Down in the R&D shop, the first setup we walked past was a test rig used to evaluate distribution towers. What engineers learned from testing a cross-section of towers currently used on drills in the market played a key role in development of the new "tunable" type the company just introduced for its Nova air carts.

"(With the test rig) we can vary the speed and control the airflow through there and set up any kind of manifold system you want and run a test for so many minutes," Daniel said, as he explained how it worked. "We can play with all the different variables you can think of, see where variation is occurring. We can tweak it a little and isolate that variable when we're doing catch tests."

"The thing we found, though, with everybody's towers, is they're so unpredictable," explained Norbert, as he walked up to one of the test stands and moved one of the seed tubes up and down. "If this hose happens to go up a little bit, it will get less seed going through it than the one beside it going down. So many of those things you just can't control. It's great that it's nice and flexible, but it changes the metering characteristics in a big way.

"We were holding the hoses higher or lower and tilting the manifolds 10 degrees and analyzing it," he continued, explaining the various testing processes. "If you're working a sidehill, you get less uphill than downhill. All these things add up."

"We tested our own product in the same way," said Trent. "Now that we have that precise knowledge we can do something about it."

"With the growing acres of farms and the increased price of seed," added Cory, "why leave anything to chance? Why not try and refine it as much as possible?"

All of that takes time, though. Getting a product like the company's tunable distribution towers or its new UltraPro II metering system from Daniel's computer screen, through testing in the R&D shop and finally to a market-ready feature takes time.

"It's always hard to define: where does R&D stop and where does true production start?" Norbert said. "It takes about a year. It often starts with filing for patents."

"Conceptually, some of the main ideas tend to come out fairly quickly at the patenting stage," Daniel added.

After a new feature passes muster in the R&D shop, it's sent off for field trials. Much of that occurs at the company's own test farm a couple of hours down the highway from the plant.

"It's a huge part (of the R&D process), Norbert said. "You need the farm for testing and trying things. We want to see parts of it through a seeding season so we can say it's market ready."

The farm is also a place to analyze drill performance and brainstorm new ideas.

"A lot of ideas tend to come out right after seeding," he added. "Because, it's at seeding you're finding problems and you're more likely to come up with solutions."

"Even if it's not a problem, how can we do better?" added Trent.

"All that innovation starts on the farm," echoed Cory. "Like being able to look back and wonder how accurate our specific manifolds were. It's a constant evolution of things. You need to always be challenging yourself.

"Nothing is ever perfect. If you think it's perfect, you're moving backwards." **CG**

If the roller-coaster goes on too long

If it sometimes feels like your roller-coaster never really stops, maybe you suffer from cyclothymia, a mild version of bipolar disorder.

You wouldn't be alone. I have met dozens of producers who have this disorder, and who come to see it as the source of their misfortunes. Obviously, they consult me when they're "down" because, on the most beautiful days, well, everything is great (from their point of view).

If the person is lucky enough to be surrounded by people who love them and understand the situation, the damage can be mitigated. For example, a partner may be there to prevent them from making mood-driven decisions that they would later regret. Often, however, the partner becomes exhausted acting as the buffer.

Cyclothymia is a mood disorder characterized by periods of mild elation and mild depression that are not related to life circumstances. "He just woke up this morning feeling down and doesn't want to invest anymore," a partner might say. "Yesterday, he did not understand why I did not agree to invest in the new project. He can cycle through these emotions even in the same day. I often think he has two personalities."

In fact, this instability of mood is a mild form of bipolar disorder (formerly known as manic depressive disorder). Although less severe, cyclothymia can significantly impact a person's relationships and finances. Extreme and unexpected mood disturbances prevent the individual from functioning normally. In "up" periods, it's like the person is wearing rose-tinted glasses. Everything is great. In low periods, however, they can feel quite depressed and unable to accomplish their tasks.

Between one and two per cent of the population suffer from manic-depressive disorder. However, if we include all mood disorders (severe and mild), this represents six to eight per cent of the population. But it's also important to know that we find mood disorders represented even more highly among entrepreneurs and managers.

People suffering from cyclothymia would not be diagnosed with bipolar disorder because their condition is not as severe. However, their symptoms will gradually harm them and those around them.

SYMPTOMS:

THE LOWS

- Difficulty making decisions, problems concentrating, and poor memory recall.
- Guilt, self-criticism, low self-esteem, pessimism, and self-destructive thinking.
- Constant sadness, apathy, hopelessness, helplessness and irritability.
- Quick temper, poor judgment and lack of motivation.
- Social withdrawal, appetite change and lack of sexual desire.
- Self-neglect, fatigue, insomnia, and sleepiness or too much sleep.

THE HIGHS: HYPOMANIC EPISODES

- Euphoria.
- Unhealthy optimism, inflated self-esteem and arrogance.
- Rapid speech, interrupting others, and racing thoughts.
- Aggression, hostility and lack of consideration for others.
- High energy levels — a person can work long hours without getting tired.
- Risk-taking behaviours, such as driving fast, spending money and increasing sexual activity.
- Highly goal oriented.
- Decreased need for sleep, tendency to be easily distracted and an inability to concentrate.

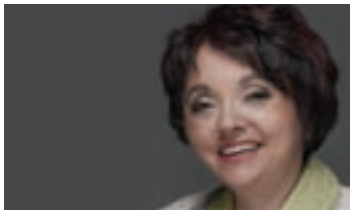
A person need not exhibit all the symptoms to be diagnosed. Moreover, the severity of the problem has to be considered in relation to the pain that it causes to the individual and his environment. Of course, when someone is at the top of the roller-coaster, it feels great.

We all experience cycles in our energy levels, mood, and ambition. However, when someone struggles to recognize himself in his way of thinking, feeling and acting from hour to hour or day to day, it's a sign that this variation has reached a level we should be concerned about.

Some people avoid seeking treatment because a certain degree of hypomania (i.e. the "highs") may help them succeed in life. This high phase is associated with creativity, investment and expansion. The person may also be highly convincing, charismatic and productive. The problem is that in periods of mild depression, the individual no longer has the physical and psychological ability to support her projects.

It is crucial to recognize if you suffer from a mood disorder. If you have doubts about yourself or a member of your family, consult your doctor or psychologist. Because the mood swings are not as dramatic as in bipolar disorder, cyclothymia often goes under the radar and is undiagnosed, but getting help can significantly mitigate its relational and financial consequences.

If you feel that your life is like a roller-coaster, go see a specialist — a little bit of a roller-coaster can be great, but too much will give you nausea and make you really sick. And someone else will have to clean up the mess. **CG**



Pierrette Desrosiers, MPS, CRHA is a work psychologist, professional speaker, coach and author who specializes in the agricultural industry. She comes from a family of farmers and she and her husband have farmed for more than 25 years. Contact her at: **pierrette@pierrettedesrosiers.com. www.pierrettedesrosiers.com**

‘You are what you eat’ applies to cattle too

The right forage makes a difference in dairy and beef operations

By Trudy Kelly Forsythe

Feed represents 30 to 50 per cent of production costs for a typical lactating dairy cow or feedlot finishing diet, and slightly less for a growing and gestating diet. It makes sense then that feed testing should be the centrepiece of all ration planning, for both feedlot and dairy operations.

Daniel Scothorn with Scothorn Nutrition in Nova Scotia says testing feed allows producers to target specific needs at different stages of development, ensuring animals with high-nutrient needs receive the highest quality forage, while lower quality forage goes to animals with lower nutrient needs.

“Cows fed a well-balanced diet will most importantly be healthy, but will also grow and milk more,” he says, explaining an optimal ration is best formulated using nutrient concentration determined from feed analysis. Proteins, starches, calcium and phosphorus, as well as vitamin and moisture analysis, need to be part of the overall picture.

How to test

Hay bales are tested with a hay probe. Scothorn recommends probing five to 10 per cent of the bales in a lot then sending a composite result to the lab. A best practice is to sort and stack hay by fields, grass-legume type and cutting. Each lot should be analyzed separately, or a composite created to reflect the feed-out strategy.

Other feeds, such as silages or haylage, should be tested similarly, with samples taken from the entire silo or stack, not just the surface. Differences in starch levels in corn silage are common within a single field, let alone between multiple fields or varieties.

Near infrared reflectance (NIR) spectroscopy, a rapid, reliable and low-cost computerized method, is one option to accurately analyze feed nutrient content. Another alternative is wet chemistry; it can take more time and cost more. Feed company reps, consultants and provincial extension agents can do feed testing, or there are a number of U.S.- and Canadian-based labs. These resources can also assist with ration planning.

When to test

Scothorn recommends testing hay in the fall when it is put up to ensure proper allocation based on quality. “For example, if a dairy farm has low-acid detergent fibre (ADF)/high-energy silage, but also an allotment of high-ADF/low-energy silage the better feed should be saved and allocated to lactating animals, whereas the high-ADF silage should be fed to dry cows or heifers.”

Ration planning

Feed testing is key when planning rations. It allows the best allocation of forages for the various requirements of cattle based on ages or production levels. Nutrient concentration can vary, especially in forages. Alfalfa hay, for example can have proteins from 10 to 25 per cent, whereas grass hay will contain between four and 18 per cent protein.

Once feed inventories are complete, estimate the feeding period and total number of animals to be fed to calculate rough estimates of what will be required to optimally feed the herd. Amounts required will also vary depending on weather conditions and potential waste.
A computerized ration balancing program allows for the evaluation of a variety of feed options, and in turn, optimal economic performance.

Regional differences

Scothorn does note that there are different considerations based on a farm’s location. “Field sizes tend to differ in parts of the country,” he explains. “For example, in the Prairies, fields vary from 160 to 640 acres. This will often have less variation if it makes up a pile of silage compared to other parts of the country where field size may only be 10 to 20 acres in size. Therefore, if the farm has several small fields, then more testing should be conducted in order to get an accurate representation of the feed.”

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BUILD your kids' math skills

To excel at farming, your children will need better math skills than they may be getting at school. Here's how to help

Despite the billions of dollars spent on education each year, student math test scores continue to fall in most of Canada. The alarming statistics don't bode well for the success of future generations. Like reading, math is a fundamental skill, necessary for success in life and work.

John Mighton who established JUMP Math, a tutoring program now being used by more than 170,000 students across Canada, the U.S. and other countries, insists that any child can learn math.

Contrary to the popular notion that only those who are gifted in math can do well in it, Mighton believes every student can do well if they are taught in the right way and if they are given the opportunity to practise in order to consolidate what they learn.

"Math is easier than it appears," Mighton says.

Mighton insists that kids are born with wonder and curiosity, and they enjoy solving problems. "They lose that wonder and curiosity… it's our job to keep it alive."

Mighton's own personal success in math came late in life. Although he loved math as a youngster, he was convinced by his teachers that he didn't have the necessary aptitude to have a successful career in math. So he pursued his love of theatre instead and eventually went on to win the Governor General's award for one of the plays he wrote.

Despite the award, it was difficult to make a living writing plays so he always had a part-time job to keep himself afloat financially. It was after he convinced a woman to hire him as a part-time math tutor — despite not having a degree in math — that he rediscovered his love of math.

After years in the trenches, working with struggling students and finding ways to improve their math scores by leaps and bounds, Mighton founded the JUMP Math tutoring program. Although he had nearly failed calculus in his first year of university, Mighton later went on to get an advanced university degree in math and now is a math professor at the University of Toronto.

His struggles with math make him an ideal candidate to found a math tutoring program, says Mighton.

Mighton had several tutors working with him, and while he was very pleased with the progress his students were making, he realized it would be more efficient to develop resources for teachers to help them in the classroom.

Mighton sees many problems with the way math is being taught in schools. Too often kids believe early on that "they aren't good at math." It's a catch-22, he says. "The more a child falls behind, the more anxious they get, the worse they will do."

He adds, "If a teacher makes the students feel comfortable they will do better."

Part of the problem is that teachers don't actually know how to improve their teaching. "Teachers are my heroes but many admit they don't have enough training to teach math," asserts Mighton.

It's also difficult for teachers to help individual students when there are 25 or more students in a class. "Students need more guidance than they are getting in school," says Mighton.

Another part of the problem is that math is like a ladder; if you miss a step it's hard to go on to the next level, says Mighton. "Children stop paying attention because they don't think they can do it."

Kids also suffer from cognitive overload. "They are being asked to learn too many things at once," says Mighton.

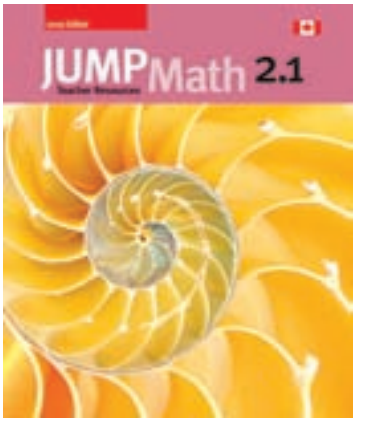
The JUMP Math program uses a system of guided discovery. It allows students to discover math concepts independently in manageable steps while the teacher provides sufficient guidance, examples, feedback and scaffolding for all students to work towards their full potential.

And it works. An independent study showed that students using the JUMP Math program progressed at twice the rate of the control group. JUMP Math is a complete package of resources intended to cover the curricula for Grade 1 through Grade 8.

Parents can also help their children develop fundamental math skills at home. Play board games or card games that involve numbers. Show how you use math skills when baking or calculating crop yields or production per cow. Practise counting and go through the times table at home to reinforce fundamental skills. (For more suggestions for what parents can do to help, see the sidebar.)

JUMP Math is a registered charity which operates as a social enterprise deriving most of its income from sales of print and digital program resources, and from teacher professional development. Income from sales is reinvested into the organization to further JUMP's mission of encouraging an understanding and love of math in students and educators.

By the way, Mighton was appointed an officer in the Order of Canada in 2010 for his work with JUMP Math. **CG**



Help your children develop fundamental math skills at home

John Mighton, PhD and founder of JUMP Math tutoring program, offers these at-home suggestions:

1. Play games involving numbers, i.e cribbage, Monopoly, and snakes and ladders.
2. Modify the "Go Fish" game. Instead of seeking out matching pairs, the goal is to try to get pairs that add to 10. For example, if a child has a one, they must ask for a nine to make a pair that adds to 10. Then change the target number to numbers other than 10. If needed, you can give the student a list of numbers that add to the target number.
3. Make it relevant to kids. Show kids where math can be used such as measuring, cooking, baking, building, and calculating speeds and distances travelled.
4. Help your kids develop a learner mindset. Reinforce that everyone can learn math.
5. Watch your words. Avoid saying, "I wasn't born with math ability."
6. Show them that perseverance and hard work pay off. Students who believe that success depends on innate ability do poorly compared to those who believe that success depends on effort.
7. Reinforce numeracy skills at home by practising multiplication times tables and counting. Research has shown that extensive practice is needed to master new skills and concepts. Students who haven't mastered basic number facts have trouble seeing patterns and making estimates and predictions.
8. Resources for parents and teachers for Grade 1 to Grade 8 are available on the JUMP Math website with a free account at //jumpmath.org/jump/en/teachers_guides_intro.

A CASCADE you don't want

You may think of a cascade as a soothing brook bubbling over some rocks, but a prescription cascade is not as pleasant. The term refers to the treatment of the side-effects of one drug when a new second drug is prescribed. These side-effects can be mistakenly identified as a new condition, and of course this new condition needs a new drug, making a third drug necessary to counteract the side-effects of the second drug, and so on.

Just like dominoes, these prescriptions cascade, and the result may be a hospital visit or nursing home admission.

Almost everyone can benefit from these measures to avoid taking drugs unnecessarily

At highest risk are older individuals just because they often take more different medications and have more health conditions. Studies have reported that over half of women 65 and older take five or more different prescription medications; 12 per cent of this age group take nine or more.

How common are prescription cascades? No one really knows for sure because they remain underidentified, although you may actually hear news reports about them. For example, a 71-year-old Montreal woman was admitted to the hospital because of a fall. She had been prescribed an antihypertensive for her high blood pressure; then two diuretics or water pills for edema that may have been caused by the antihypertensive; then a drug to combat her overactive bladder and increased trips to the bathroom; and then finally a drug to ease her dry mouth side-effects. All the medications contributed to her dizziness, thereby increasing her risk for the fall. Luckily, the hospital sorted out her medication regime and she returned home.

Often, when an individual is admitted to a nursing home, all their medications are stopped, then started again one by one. This isn't a cost-saving measure, but an attempt to ensure that the new resident is only taking what they need for their health, as opposed to something to treat a side-effect. As a result, dosages often differ after admission in the hope that side-effects will be reduced.

While the elderly are more often affected, anyone can be at risk especially if they take medications routinely, and almost everyone can benefit from these measures to avoid taking drugs unnecessarily. First, you want to understand exactly why you are taking the medication and what the potential side-effects could be. (Yes, that means you should read the prescription information that your pharmacist gives you!)

Whenever you have a new medication added to your regime, also have your doctor, nurse or pharmacist review your complete medication profile. You're looking for something that you may not need, something that may be causing you side-effects, or something that may be just as effective in a lower dose. Never be afraid to ask if you could change a drug or its dose. If you see specialists besides your family doctor, make sure that everyone has a copy of your up-to-date medication list. (Don't forget to include herbal remedies, natural products, and non-prescription medications that you take on a regular basis.)

As you age, your body's ability to use medication changes and this may mean you need to lower a drug dose or even stop it completely.

A great resource is the Beers' Criteria. It lists drugs that older adults need to use with caution, together with the reasons why. It's available online and is easily understood.

One class of side-effects that are especially bothersome the older you get are the anticholinergic side-effects, such as dry mouth, difficulty urinating, constipation, blurred vision, drowsiness, or memory lapses. A wide variety of drugs has these side-effects, including antihistamines, muscle relaxants, overactive bladder drugs, antidepressants, antipsychotics, and drugs used to treat Parkinson's.

Ideally you want to take the most effective drugs in the lowest effective doses, especially if you are older. Remember too that knowledge is power when it comes to avoiding side-effects and the prescription cascade. **CG**

Marie Berry is a lawyer/pharmacist interested in health and education.

NEXT ISSUE

Allergies can be life threatening and range from latex gloves and dish detergent to bee and wasp stings. In the next column we'll look at just how common some of these allergies are and the use of epinephrine auto injectors for severe allergic reactions.

When life happens all around you

That's when you somehow end up getting in everybody's way

Harvest was generally going well at the Hanson farm. The weather was holding up, the equipment wasn't breaking down, the yields and quality coming off were a little better than they'd hoped, and Dale had settled into his role as a trucker. Dale was happy. Until Thursday.

It wasn't even lunchtime when things started to go wrong. Dale had been on the grid road in the tandem truck, halfway out to the canola field, when he'd spotted the moose in the neighbour's field. He pulled over and reached for his phone to turn on the camera.

The moose was somehow both majestic and awkward. Dale snapped photos as it casually cleared a fence, loped a few yards, then stopped to look at Dale as if to say, "How'd you like that?"

Dale was transfixed, zooming in for a closer shot before he heard the honking.

His father Ed had been shuffled out of the combine rotation this season, having not fully recovered from the stroke he'd had in the winter. When Dale's daughter-in-law Elaine climbed up into the cab on the first day of harvest, Ed didn't say anything; he just looked away. Ed was too depressed to crack jokes about the fact that women were running both of the Hansons' combines, since Dale's wife Donna had also taken on the job the year before, and proven to be excellent.

By Week 2, Ed was comfortable enough to make sarcastic comments about how tired he was getting of eating sandwiches for lunch and supper, but Elaine shut that down, telling Ed that the new babysitter had a Crock-Pot full of stew in the house.

Banished from the combine, Ed had taken on the role of gopher, driving to town for parts, moving trucks, and generally helping out anywhere he could. That's how it came to pass that on this Thursday morning, he was in his red truck, delivering Elaine's lunch.

Ahead of him, he could see that Dale had pulled over on the road. Slowing down, he soon realized what Dale was up to, then muttered to himself. "Guy thinks he's David Suzuki. Sitting around enjoying the wildlife while the rest of us work."

But just when Ed pulled out to pass Dale, the Hansons' hired man, Mark, came looming up over the hill from the opposite direction. Mark was in the semi, taking the first load of canola back to the yard.

> **"If you're not too busy taking photographs or kidnapping anybody," old Ed finally said, giving his head a shake, "can you give me a ride to the combine?"**

Dale looked up from his phone screen in time to see it. Ed swung close to the path of the grain truck, while Mark edged over as much as he could, although it wasn't all that far, with so little time to plan and a full load.

The narrow grid could barely fit three vehicles. Mark's mirror passed right over Ed's truck.

Then, once Ed was safely past the grain truck, he pulled too quickly back to the right. Dale had about three seconds to picture Ed's truck rolling into the ditch. But Ed held it straight and got it back under control.

Ed honked angrily, and kept driving. Dale turned to see Mark steadying the load safely back in the centre, and keep driving toward the farm.

Dale turned off his camera. Next time, he'd wait for an approach.

A few hours later Dale was in trouble again.

He'd dumped the truck and was headed back to the field when he saw his grandson Connor jumping on the trampoline by the house. "Want to come to the field?" Dale asked. Connor whooped and yelled and climbed up into the truck before Dale had his window rolled back up.

The two had a great time, picking up a load of canola and looking at bugs in the stubble. Dale took photos of Connor pretending to drive the truck while they waited for a full hopper. Back in the yard, Dale congratulated himself on his safety consciousness, instructing Connor to stay in the truck with his seatbelt buckled while Dale moved the auger and unloaded. "You don't want to lose any fingers, right Connor?" he'd said.

But Dale's great afternoon was the 14-year-old babysitter's worst nightmare.

Allie looked out the kitchen window a few minutes after Dale had picked up Connor. She was calm when there was no bouncing blond boy on the trampoline. She put a sweater on Connor's toddler sister,

CONTINUED ON PAGE 66

still sleepy from her nap, and took Jenny outside. "I think your brother's in the sandbox," Allie said.

When Connor wasn't in the sandbox, or in the treehouse, or riding his bike, Allie started to worry. When he wasn't in the garden or the shop, panic set in. "Not the dugout. Not the dugout," she thought to herself as she ran through the yard, dragging Jenny, both of them shouting Connor's name.

Finally Allie sat down on the step, in tears, and got out her phone. She was about to dial 911, but just as she reached for her screen, the phone rang.

It was Elaine. "Thought I'd check on the kids," Elaine said. Then she heard Allie sobbing. "What is it? What's wrong?"

Elaine acted fast, immediately picking up the two-way radio in the combine cab. "Has anyone seen Connor?" she called out to everyone on the farm near a radio.

The seconds of silence terrified her, until a little boy's voice came over the air. "Hi Mommy." Connor was still in the cab of Dale's truck, waiting patiently for his grandpa.

Not even the photos of a very cute Connor enjoying the afternoon in the field could save Dale from a severe lecture on the protocols of taking small children from their babysitters, especially on a farm during harvest. Once the babysitter had calmed down and Connor was enjoying a Freezie, Dale was sent back to work. On his own.

At the end of the day, Ed drove his red truck over to where Dale was unloading more canola. "If you're not too busy taking pictures or kidnapping anybody, can you give me a ride to the combine? I'm going to bring it home. Donna can come back with you."

Dale was busy doing the mental math, calculating how many bushels they'd collectively put in bins during the day. When they got to the field, he was still adding seven and carrying the four. At the corner of the field where Donna waited with the combine, Ed got out of the truck. Dale waved him off and turned around to drive home. He got to the corner before his phone rang.

"I could ride with your dad in the buddy seat, but I thought you might take me home," Donna said.

Dale went back to pick up his wife.

"This has been a terrible day," he told her. "One thing after another."

Donna laughed. "Dale! Have you been watching the rest of the country? It's raining every three hours in parts of Alberta. My cousin at Moose Jaw was hailed out. Jeff's friend from Rosetown is using a mower to clean up his lentils! Meanwhile, things are going fine here! You've had time to look at the wildlife and enjoy your grandson! And now you're driving me home. Like a date. After years of flooding and hail out here, it's our turn. Let's enjoy it."

Dale grinned, and drove his wife back to the yard. **CG**

Leeann Minogue is the editor of *Grainews*, a playwright and part of a family grain farm in southeastern Saskatchewan.

REFLECTIONS

BY ROD ANDREWS
RETIRED ANGLICAN BISHOP

The engineer on the huge steam engine reaches up and pulls a rope. The whistle pierces the autumn air. It signals a horse-drawn rack to come alongside an antique threshing machine. A belt transfers energy from the tractor to the threshing machine. Pulleys turn. Screens move back and forth. Men in coveralls take up pitchforks and toss sheaves into the hungry machine.

We are gathered in a field near Borden, Sask. This year the event means more to me than re-enacting old-time threshing. I watch "my" first grain crop spill out of the threshing machine into a grain wagon.

In early June, Dave, an antique tractor buddy, volunteered me to seed the crop. "Rod and I will fire up our antique tractors and put the crop in." Dave pulled a set of harrows. Volunteers hitched my 1945 John Deere AR to a 1943 Massey seed drill, filled the drill with seed grain, gave me a few instructions and sent me off.

My arms were sore by the end of the day. I learned why modern tractors have power steering. I was dusty and my clothes were greasy but I felt good about my efforts. Over the summer Dave and I drove out to check "our" crop. We even circled the field a few times in the air. Dave cautiously pointed out a small area I had missed. Errors are obvious from the cockpit of an airplane.

I have been around farms most of my life, but I had never seeded a crop.

Most of my seeding has been preaching. During my working years it was a weekly routine to prepare and deliver a sermon. As a bishop I served a cathedral and 53 parish churches so I delivered sermons in a variety of settings.

Each July, I am asked to lead an ecumenical worship service at an event called Pion Era at the Western Development Museum in Saskatoon. The service is outdoors unless it rains. I base my sermons on a fictional couple who comes west from England to homestead in the early 1900s.

This year museum staff challenged me to preach about leadership change on the family farm. I described how George, patriarch of the family, farms with his oldest son Alfred. George makes most of the farm decisions, controls the farm finances and is resistant to change. Alfred sees many opportunities to improve the farm. George is devastated when Alfred considers moving to another district to start his own farm. George goes to church and listens to a sermon about change and allowing people to determine their path in life. The sermon gives George encouragement to help Alfred set out on his own.

In August, I was invited to lead a Sunday service in Rosthern, Sask., while their regular minister was on vacation. "The Lutherans will join us because their pastor is also on vacation. Next Sunday we will attend their church." The necessity of finding practical solutions draws people together.

Some sermons can be too long. John Clarke served as Anglican archbishop in northern Alberta for many years. His cathedral was in Peace River, a long way from his churches in Fort McMurray but close to a town called Grimshaw. One Sunday John began his sermon in Peace River by saying, "As I was driving home from Fort McMurray I was thinking about… " He preached for a long time on a variety of topics. After the service a farmer shook his hand and said, "John, next time start your drive in Grimshaw."

Suggested Scripture: Psalm 126, Ecclesiastes 11:1-6

Rod Andrews is a retired Anglican bishop. He lives in Saskatoon.

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