

JANUARY 2017

# CORN GUIDE

## READY FOR SPRING

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# HIGHER YIELDS

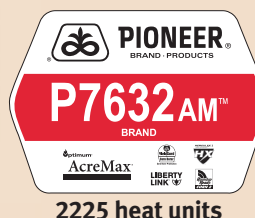
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# Corn yields still on the rise

Check out the numbers when you use interpolated data to even out our year-by-year weather swings

By Ralph Pearce,  
CG Production Editor

What if we could peer into the future and catch a glimpse of where our agriculture is heading? How would such a view shape the development of plant breeding and advances in technology, and maybe even the impact on farmers?

A University of Guelph PhD student is working to develop a new yield model, first for corn production but with an eye to also using it for soybeans, wheat and forages (the four largest crops by area in Ontario).

Qin Xu is working on the model with help from Dr. Glenn Fox, who co-authored a similar study in the 1990s with Dr. Brad Rickard, to determine whether grain yields in the province had reached a plateau.

The answer then was “No.” And more than 20 years later in year two of a three-year study using historical data at the county level dating back to 1950, Xu is finding the same answer.

“One of the purposes of the model is to do simulations of the effects of possible future changes in temperature and precipitation levels and timing,” explains Fox, who’s a professor of agricultural and natural resource economics in the department of food, agricultural and resource economics.

The research is actually a sort of revisiting of work into the longevity of advances

in innovation. Fox remembers such debates as a student in the 1970s, and then it returning in 1990s when there were real questions about whether the pace of technological change could be sustained.

“It’s sort of an ‘evergreen’ question: is technology slowing down in agriculture?” says Fox. “There are implications for a lot of things — global food security, farmers’ well-being, economic and social development — and it would appear, based on visiting these data at different points, that agricultural technology continues to advance in Ontario and Canada. Does that mean it’s going to go on forever? No, but each time we check in, it seems to be continuing to advance.”

The current model is based on an econometric model. Using data gathered across 29 counties from 1950 to 2013, the model will simulate the future effects of climate conditions and other factors of crop production, but it will estimate long-term effects that will span 50 years — from 2020 to 2070.

In order to make that model as realistic as possible, Xu started out by estimating four crop yield functions — for corn, soybeans, wheat and hay.

“Actually, one of the goals of my study

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“It’s sort of an ‘evergreen’ question: is technology slowing down in agriculture?”

— Dr. Glenn Fox,  
University of Guelph

is to consider what agricultural water use policies might be needed under different climate change scenarios,” says Xu, whose husband is also a PhD candidate, working on herbicide management in edible beans. “So in the later stage of my thesis, I may come up with several possible policies in agriculture and examine which policy could bring better water-use efficiency in all of agriculture, and then to compare it to crop insurance.”

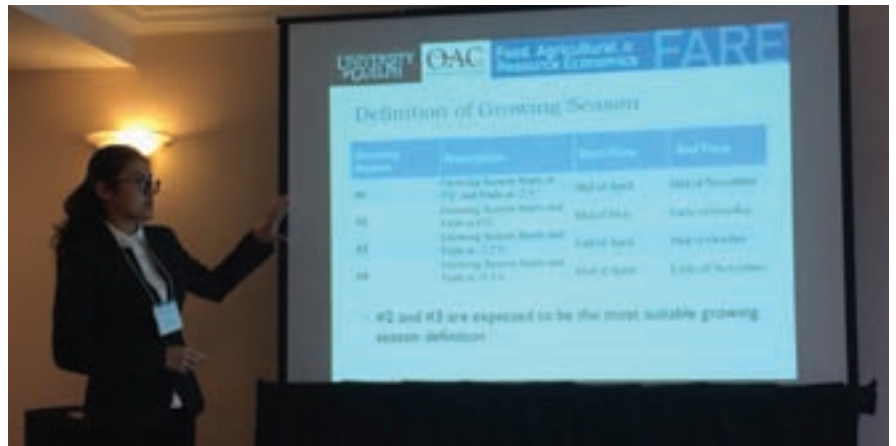
There are some unique and innovative developments taking shape in this study. One is the use of a new climate interpolation computer model developed by Natural Resources Canada (NRCan). In order to make this crop yield model as comprehensive as possible, it’s important to have a thorough dataset from as many locations across Ontario as possible. The challenge there is that when you look back to 1950, there weren’t many weather stations from which to garner temperature and precipitation data. Here’s where the computer model from NRCan comes in handy.

“It interpolates for locations that don’t have a weather station nearby,” says Fox. “They’ll use multiple weather stations to interpolate and basically create a synthetic observation point, based on elevation and distance and other characteristics. To our knowledge, no one has used these data to look at crop yields in the way Qin is doing.”

Thus far, Xu’s work has yielded some surprising results, including the optimal definition of “growing season,” which identifies it not by calendar date, but by temperatures. Among four different temperature ranges, the optimal definition occurs when a growing season starts and ends at -2.2 C, generally around the end of April and lasting to the middle of October.

“I’m trying to screen which one could better explain the actual yields we have now and is quite consistent with the growing season we have for corn,” says Xu. “Is that at the end of April or at the beginning of May, and to October in the fall? We have found the first day after the last occurrence of -2.2 C in the spring and ends on the preceding day of the first occurrence of -2.2 C in the fall.”

“We actually haven’t attempted to model any change in climate between 1950 and 2013,” adds Fox. “We’re basically treating that as the reference period and treating it as a period of homogeneous climate, recognizing that that’s probably



Qin Xu, a PhD student from the University of Guelph is developing a model for estimating the impact of future climate conditions on corn yields.

## When would it make sense for more Canadian growers to irrigate their corn?

not true, but we’re not measuring any sort of trends of changes. What we’re planning to do is to take the coefficients that were estimated in the model and then take several of the climate change projections and run those through the model to see what effect that would have on yields over the simulation period, from 2020 to 2070.”

What this project isn’t addressing are the agronomic factors that have become standards in corn production, such as planting density or seed depth. At its core, the research is trying to determine models for climate-related practices, including irrigation, and how those relate to increasing corn yields. In the U.S., similar research has been used in models with updated data for calculating crop insurance premiums.

Xu and Fox aren’t measuring the effects of any one particular technology. There is a time trend in the model which picks up the net and cumulative effect of all technologies that have been implemented in past decades. But those could include biological, chemical or mechanical technologies that have come to the fore from 1951 to 2013. And there have been some significant changes in corn production, including planting densities, genetic improvements of hybrids (and other crops, as well). But it’s the combined effect of all of those that Fox and Xu believe is captured in the time-trend variable.

One of the other hoped-for features of the simulation models that Xu is building is that it will give farmers the option to use irrigation in these future scenarios during abnormally dry periods. Part of her research has determined that corn yields would be higher with greater levels of both precipitation and solar energy during the growing season. On the other hand, higher precipitation levels before the growing season tend to cause a reduction in yields.

Fox notes there isn’t much irrigation that goes on in Ontario field crop production now compared to what takes place in the U.S. But some observers have suggested that in the future in Ontario, farmers might want to use irrigation more. So the models being developed by Xu could determine the extent to which irrigation practices give rise to water-use conflicts.

“The challenge with innovation is that it’s inherently unpredictable — because you’re imagining something that doesn’t exist,” says Fox. “So at any point in time, it’s really sort of a glass-half-empty-glass-half-full scenario, but if you look at the half-empty part, we don’t know what the next innovation is going to be, and what happens if it isn’t — what happens if there is no next innovation?”

For now, that’s not a concern. **CG**



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THE POWER TO MAKE THINGS GROW



Farm organizations are as important as ever for farmers who want to keep producing at their best, says OSCIA president Gord Green

By Ralph Pearce,  
CG Production Editor

# THE BIG LESSON

For Gord Green, “ag in the classroom” is a 24-hour-a-day, seven-day-a-week, 365-day-a-year opportunity, whether the classroom that he happens to be in at the moment is in the field, in a lecture hall, at a community centre or on a bus tour.

In any setting, Green wants to learn, and he has made it a key strategic goal of his operation.

It’s one of the reasons why Green speaks so highly of the Ontario Soil and Crop Improvement Association (OSCIA). For him, the association represents a constant opportunity to share new ideas and concepts with peers and like-minded individuals.

“I started going to meetings when I was kid with my dad,” says Green, who’s currently the OSCIA president. “You tag along, and other kids maybe did a little too, so I started off that way and I was always a member when I was farming. Then in the 1980s, someone approached me to be a local county director and I did that for 10 years. A few years went by and I was asked to be a director for the provincial board and that was 2008 or 2009.”

A fifth-generation crop and livestock producer, Green, his wife Laura and his son David, farm the family operation — named Greenholm Farms near Brookside, between Embro and Stratford, Ont.

His great-great grandfather began farming in 1843, with Gord starting his career in 1977, farming alongside his dad. A few years later, he began slowly taking over the farm, and nearly 40 years later, the same thing is happening with David slowly succeeding Gord (although he keeps the books to monitor the business at various levels).

Laura also helps out feeding the calves, but her role is part of the succession planning too, and she is trying to step back from those duties.

Together, they own 750 acres and rent 75, and are blessed with what can be a very forgiving Bennington silt loam soil. Green holds to a four-year rotation, with two years of corn (one year silage, the next year grain corn), then soybeans followed by either wheat or a forage. He also milks 210 cows at any one time, and has 15 head of beef cattle, as well. Interestingly, there’s also an anaerobic digester on the farm, with a Feed-in-Tariff (FIT) program contract for it.

## UNIQUE LEARNING EXPERIENCE

Time can be a hard-to-find commodity with both dairy and field cropping operations, yet for his involvement in OSCIA, Gord is only too happy to free up what is required. Maybe it means spending fewer hours than he’d like on other activities, but he feels the benefits he derives from his time with the association are undeniable.

“It’s a general information sharing organization and that’s where all of the newer ideas on cropping come from,” says Green. “It’s the material that’s presented at annual meetings, and that kind of stuff intrigues me, so I’ll always look forward to the meetings and get the latest information. People share their information very well in the organization, so if somebody’s doing something unique and they’re getting bumper yields, they’re more than happy to talk about it if you ask them.”

Growers perform their work on small plots or there’ll be a number of different

farmers working on the same thing, so everyone learns from those relationships. What makes his involvement in OSCIA even more enjoyable and beneficial is the depth of involvement of the Oxford County SCIA. There’s a bus trip every year that Gord and Laura try to join, as well as information meetings through spring, summer and fall. As an example, the fall meeting occurs the night before the start of Canada’s Outdoor Farm Show and features explanations of why local fields yielded as they did, or what’s coming for soybean harvest. As with other county chapters, there’s usually a host of locally conducted crop trials on members’ farms.

It’s another opportunity for shared learning, and Green gravitates towards that because he’s always looking to improve his operations, whether it’s through innovation in the milking parlour or trading ideas and suggestions with like-minded farmers.

“If I do something, I like to do it because it’s the best way to do it,” says Green. “I started farming with my dad, and we were conventional tillage and plowing, and you’d go to the meetings and hear about no till, especially no-till wheat. They tried that and it worked, and they had their own drill, then rented on and then went back to their own. But then I went to a few meetings and heard about the advantages of not burning off organic matter, and I decided that we’d better try no till, so one crop at a time I got into no till about 20 years ago.”

The process was a one-crop-per-year progression, with no-till corn being the

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most worrisome. Green finally settled on strip till for corn, and they've been doing that ever since. He'll even no till forages in because he's tried it and it works for him, year after year.

He may not do everything that dedicated no tillers subscribe to but he's tried different practices and found what works best for his farm.

"I like to think I'm innovative but there's also a danger where sometimes you can be on the bleeding edge and not on the leading edge," says Green. "There've been leaders before me who've developed these ideas, and they've shared their information and I thought it had merit, so I've tried it and I've been doing it. There are other approaches I haven't tried yet, and maybe I will and maybe I won't. But I'm watching and seeing how they're getting along it."

### ALWAYS WILLING TO TRY

A perfect example of a "tried-and-tested" practice at Greenholm Farms is the use of cover crops. After corn silage, Green plants forage rye and harvests that in the spring for feed. After wheat, he plants oats which he harvests for feed in the fall. They could use a more complex mix for cover crops but forage rye and oats both yield well for feed, and they're both a decent cover crop. Other species and blends may do better at breaking up a plow pan, but for what he needs out of cover crops/forage crops, he's getting it.

"I think some of the fundamentals like forages and a good crop rotation are very valuable," says Green, noting the importance of a return to the basics of farming,

while also paying attention to technology, including precision ag systems. "Maybe we've let some of those slide in the past. It's simple to have one or two crops, so we tended to gravitate towards that — and some of the technologies like Roundup Ready allowed us to. But the more crops we have in the rotation, the better."

When he talks about some of the newer technologies like split applications of nitrogen using Y Drops, he's interested in learning more, even though he has yet to try the system. One of the reasons he hasn't is due to the age of his equipment as well as the rolling topography on the farm. He could pay more for a system that can adjust to the terrain, but isn't prepared to make that investment right now. For one, he has manure that he's applying, which releases nitrogen in a manner that's more effective for his management needs, plus something like split applications of nitrogen can run into his hay cropping schedule.

It all comes back to what's best for Green's farm, his farming practices, and his time management situation.

As Green begins to slowly scale back his involvement on the farm, he considers what's ahead for the industry and sees the impact that government and consumer-based special interest groups are having. Even though he concedes that accountability is increasingly important, the way the rules are changing isn't always for the better.

"We have to demonstrate that we're being responsible, but that takes time and resources," says Green, and even though it can increase the stress levels for farmers, it's

a fact that's hard to sidestep. "We were doing a good job before in the dairy industry, as far as producing the product. But now we have to do a lot of paperwork to show that we're managing that way, as opposed to before when we did it our own way and they didn't pay attention to it."

Green believes that to be the case across the agri-food industry, and even if cash croppers aren't seeing the same accountability freight train approaching in the distance, it really is coming. What concerns him even more is that some older farmers are exiting the industry in order to avoid staying and incorporating any new directives.

"They're leaving for the wrong reason, and it's almost like they're being regulated out of the business," he says.

Still, he's focused on the tasks at hand, which means more learning and perhaps even broadening that definition of "the classroom." He considers himself a conventional farmer, in that he uses science-based practices and technologies, including fertilizers and herbicides. But it's well within reason that conventional farmers could learn a thing or two from organic producers, and vice versa. There are also opportunities to learn from other sectors, such as horticulture, or from other regions, other countries, from government extension personnel or university trials.

"Always have your eyes open and be watching and learning," Green says. "Be willing to try new things, or at least be willing to consider them. Learn from others and mentor others. I think we can learn a lot from each other." **CG**

"Always be watching and learning," Green says. "Be willing to try new things, or at least be willing to consider them."





# Manage down-force

New monitors and individual-unit controls give growers a better shot at top yields

By Ralph Pearce, CG Production Editor

It was in March 2012 that Dr. Fred Below of the University of Illinois first published his list of the seven wonders of high-yield corn production, revolutionizing how North America's farmers and agronomists think about corn management.

Is it time to shake up that list?

Even keeping in mind the differences between growing conditions south of the border and in Canada, it's stunning to see how much has changed in just five years, and it's arguable that Below's "group of seven" should maybe be expanded today to as many as nine or 10 critical parameters affecting performance and yield.

Some of those new factors might even surprise you.

As precision ag systems continue to flex their muscles, with everything from yield monitors to variable rate systems to data management platforms, there's a case to be made for boosting the importance of planter down-force as a factor in improving emergence and ultimately yield.

Try starting with a comparison to electronic technology. Less than 20 years ago, computer manufacturers and Internet service providers tried to convince consumers that everyone except a rare straggler was already hooked up to the Internet. Perception didn't equal reality, however, as Internet usage among businesses was actually only about 50 per cent at the time, while consumer usage was thought to be roughly half of that.

The same phenomenon is colouring the uptake of precision ag systems: the number of users hasn't mushroomed the way some manufacturers and dealers have suggested.

Yet one of the challenges in wider use of precision ag systems is the very definition and varied availability of different precision systems. Some farmers have managed to keep their choices limited to yield monitors and auto steer while others are delving into variable rate fertilizer systems (Y Drops, for one) or UAV monitoring. That kind of choice can be daunting — even intimidating.

Much the same is true with down-force. Seed dealers and advisers are realizing there's a greater impact from "proper" down-force on a planter. Yet there are many systems to address that goal, from a simple spring system to pneumatic to hydraulic or even fully automated systems that adjust down-force as many as three times per second per row unit.

"The precision guys have been incredibly successful with that concept, so much so that we're all putting those kinds of systems on our planters," says Steve Hosking, product specialist with AGCO Canada. Nor are they alone. Deere, Case, and Kinze along AGCO's own White planters have been incorporating new down-pressure systems in the last few years.



This is a representation of the SeedSense 20/20 monitor and the information it provides, including population, down-force, ground contact and loss per acre (middle of the fourth column).

PHOTO: AGCO CANADA

**"With this monitor, it spells out what needs to be adjusted back at the planter."**  
— Steve Hosking, AGCO Canada

The advances in down-pressure have been enhanced beyond spring, pneumatic or hydraulic systems, but what's impressed Hosking the most are the advances in monitoring systems that measure everything that is affecting the seed-drop by the row unit. An operator will see real-time percentages of population, singulation, down-pressure and seed spacing, including skips, doubles and misses. The new systems warn when the row unit starts to bounce, so the operator should probably slow down to get better seed placement. They even go to the extent of showing the operator the value of the lost crop in dollars and cents if they don't correct the adjustments that are causing the inefficiencies.

A grower can even have electric drives that provide variable rate and swath controls that are individual to the row unit. It has improved performance to the point where the operator in the

*Continued on page 10*

## TOP SEVEN YIELD FACTORS FOR CORN

In March 2012, this was the list of Dr. Fred Below's seven most influential factors in driving corn yields. How much will this change in 2017?

1. Weather
2. Nitrogen
3. Hybrid selection
4. Previous crop
5. Plant population
6. Tillage
7. Growth regulators

**"This kind of technology makes sense to (the farmer)." — Steve Hosking, AGCO Canada**

tractor knows exactly what's happening in the rows behind him. With all these technologies, there's little doubt the grower has better control over their seedbeds than ever. Even if they still got out of the tractor and dug for seed, there's little chance they could ever tell how many skips and doubles there are, or how much the row unit has been bouncing.

It's that kind of information that has improved the performance on planters, providing operators with information that allows them to make the necessary adjustments to plant the seed at the depth and spacing they want.

### PRECISION AG MEANS PRECISE DATA

Does a grower become a better farmer just by buying new electric drives for a planter or having automatic down-pressure sensors on each row unit?

Not without proper instruction and a level of familiarity. But once those are achieved, there's certainly the opportunity to advance efficiency and improve production.

The overall trend in precision ag planting has been slow in its adoption — much like other systems — and some of that has to do with the age of farmers, many of whom struggle with efficiency on a computer. Now, when talk turns to using a monitor, Hosking says the adaptability changes.

"With this monitor, it's more of a hands-on concept, spelling out what needs to be adjusted back at the planter," Hosking says. "The average farmer is pretty good at operating machinery, and this kind of technology makes sense to them. It seems that it's being more readily adopted than other precision technology that has come along before it. Maybe that's why it's taking off and it's such a big news story."

If there is an impediment to its rate of adoption, the biggest one is the price of corn, especially when it's around US\$3.50. Hosking

believes that if we were at the price levels of two to three years ago, more growers would be making more purchases of this type of equipment. Farmers do want this technology, he insists; they are struggling to pencil it out right now in the current marketplace.

### CONTROL THE CONTROLLABLE

Adding precision ag adds one more component in the production spectrum that is readily controllable — unlike the weather. Everything else — nitrogen levels, hybrid selection, population, tillage — are all aspects that growers control. For Tom Snyder, controlling the controllable in the form of down-force can come at a basic level or at several advanced levels. The first, most important step is paying attention to the down-force.

"It's going to be an advantage, just simply the act of paying attention, and saying, 'We're going to be more actively adjusting our down-force according to conditions,'" says Snyder, owner of Grand River Planters in Caledonia, Ont. "Technically, that can be done without a monitor, as far as making adjustments with the tools that we have and making changes accordingly. The reality is that it gets us part of the way down the path. In order to do it properly, an automatic control down-force system is going to get us further."

Snyder has an AirForce system that controls things planter-wide, and that's still better than making manual adjustments according to field conditions, because it's going to react as it goes through the field. The next step is to go to a faster-acting hydraulic system that's still either planter or sectional control, but the ultimate really is an individual row control that senses each row and then controls each row.

"I don't think any of those options are bad, it's just a matter of setting your sights on the end goal and then deciding how you're going to get to that end goal," adds Snyder. "It could be incrementally or it could go all-in and go to the Cadillac system right off the hop. None of those answers is wrong."

They're not wrong, but Snyder also acknowledges the adaptability of the individual plus the unique properties of each farm. Grower A may be in a situation where they don't need a down-force control system, and then it becomes a cost or an expense instead of an investment. However, Grower B might be in a spot where the numbers are telling Snyder that they really should invest in a DeltaForce system and that they are going to get a good payback, and that it will be an investment and not an expense.

"From our standpoint, in our operation, what we do with growers is we'll have the down-force conversation," says Snyder. "The reality is that I don't know his situation well enough to say, 'AirForce is the answer for you,' or 'DeltaForce is the answer or something in between is the answer.' What I do tell them is to get a monitor in their cab that tells us what their down-force is currently. And then with that data, it's really about collecting information and making an informed decision."

The one thing Snyder has learned from his dealings is that when a grower starts to measure performance first — not control it — it can be a real eye-opener to the farmer or the operator as to how much variation there is within a field or even within a known soil type across the field. There's so much variation in some fields that even with Snyder's four-row planter, he can still see differences from row one to two to three or to row four.

Although he agrees that precision ag has been slow from a planter/down-force perspective, Snyder points to automatic control systems, where the uptake hasn't been "aggressive" but it's



been encouragingly good. “Definitely the move to measuring it — the first step in that journey — we’ve had really good uptake with that,” says Snyder. “Growers are looking at that aspect, what it’s really looking at, and then learning what’s our next step, what’s our biggest payback or that ‘lowest stave on the barrel’. The reality is that if a grower is looking at down-force, that’s a good thing, but if his soil pH is down around 5, we’re going to tell you to get that pH fixed first.”

If down-force isn’t the grower’s primary limiting factor, then perhaps it’s not the best move for them to make at this time. Growers don’t need to just “jump in” with both feet and try to incorporate all aspects of a precision ag system. That course has the potential to be too daunting or overwhelming. There’s also a little bit of resistance to the learning and familiarity, yet one of the biggest trends Snyder is seeing is that no matter what system you’re using to get that data in front of you, there needs to be a clear understanding of what the data are telling you.

“Precision Planting, for instance, telling you what your down-force numbers are probably is a different language than what the John Deere system is and that’ll be different from the AgLeader system,” says Snyder. “But the message to the grower really needs to be that whatever the system you’re choosing, you have to know what the numbers are, and that really puts the onus on the dealer.

It’s a considerable hurdle and a very important point: it’s wrong to assume growers understand a system just because they may be ready to purchase it. Snyder says it’s good to know that people have their strong points — and their weak points — and sometimes people need a little help defining both.

“I think it’s something that we didn’t pay enough attention to (in the past),” says Snyder. “There are always going to be the growers who pay attention to their details and probably do those field-to-field adjustments. But the reality is that there are a lot of planters out there that haven’t been adjusted since they were delivered from the dealer. The industry as a whole is paying more attention to down-force. Does that mean everyone’s changing their down-force on every field? No, but I think it’s becoming one of those factors we look at.”

### WHAT’S AHEAD?

Are there further enhancements coming or is the better course of action a matter of getting more farmers to make a move on down-force systems? That’s a tough question. There are those growers who led the charge to get automatic down-force systems on their planters and they’re likely to develop more sophisticated systems. That approach isn’t for every grower though. Still, it’s likely having more growers pay attention to down-force and its impact on planting will be a benefit to the whole industry.

Right now, Snyder has a DeltaForce system that reacts three times per second per row. If he has a grower who’s on the fence about down-force systems, Snyder says he doesn’t need the top of the line. What he does need is to understand what down-force is and how it changes in the field.

“It’s about educating and working with growers, and everyone’s situation is so different,” says Snyder. “As a dealer, I have no right to push a grower in a direction that’s just going to cost them money and not give him a return. Even if it gives them a return six years from now, it’s not fair to them to have that conversation that starts with step one that’s going to give you 12 bushels using DeltaForce. Maybe just paying attention to down-force will give them four bushels. Well they’ll be better off with that four bushels in year one than spending all of that money on DeltaForce.” **CG**

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# Corn silage moves west

The prospect of more tons per acre and fewer worries about harvest weather is prompting some cattle producers to park the baler

By Angela Lovell

High land prices and persistent problems with haying weather in Western Canada are prompting more cattle producers to consider corn silage. Acreage has increased steadily in for the past five years, especially in Alberta where producers seeded 110,000 acres of silage corn in 2016, up from 70,000 acres in 2012.

“New genetics have made corn a viable, consistent option for Western Canada,” says Nicole Rasmussen, DuPont Pioneer’s area agronomist for Alberta and British Columbia. “Before, hybrids just weren’t early enough, but with advancements the last few years, producers can grow more silage of consistently high quality, and it’s more economical per acre than growing cereal silage.”

Manitoba Agriculture estimates corn silage production costs for 2016 at \$31.40 per wet ton, compared to \$38.93 per ton for barley silage and \$35.98 per ton for alfalfa/grass silage.

“When you have expensive land, would you rather utilize hay at 4.5 tons per acre or corn at 12.5 tons an acre?” asks Ray Bittner, a livestock specialist with Manitoba Agriculture.

“Corn silage is much more energy dense than hay or cereal silages, so adding fat deposits to cows in winter or gain on calves is easy, and it’s not hard to supplement the lower protein in the ration.”

Rasmussen says energy is the most important and expensive part of feeding cattle. Corn silage averages 66.4 per cent energy content TDN (total digestible nutrients) per ton compared to 65.5 per cent for barley silage and 60.4 per cent for alfalfa/grass silage.

“The more energy that’s in the silage, the less grain a producer has to feed, which is a cost benefit and is easier on the animal’s system,” Rasmussen says. “If a producer does a good job putting up barley silage, he gets 15 to 18 per cent starch, whereas good corn silage in Alberta has 25 to 32 per cent starch.”

## SILAGE CONVERT

André Steppler, a cattle producer near Miami, Man., started growing silage corn five years ago and says he will never go back to making hay.

“Corn silage has been hugely positive for us,” says Steppler, who first tried it because he wanted more consistent feed quality for his 1,000 purebred Charolais cows, bulls and yearlings. With high land prices and rental rates, he wanted to get more tonnage per acre.

“Corn silage is allowing us to do a better job of supplying nutrition and a balanced ration to our cattle, and we have a product we can control at all times so that the rumen environment is always what we want and we don’t risk damaging any animals because of the way they are fed,” says Steppler, who averages 15 to 19 tons of feed per acre.

“The quality of the feed is also better. In a year like this where we had rain every other day it would have been virtually impossible to get high-quality forage put up through hay bales.”

Steppler acknowledges there are some risks with growing only corn silage. An early frost could wipe out his winter feed source, but he tries to mitigate that by choosing a variety that is well within his maturity window — around the 2200- to 2300-heat unit range.

“We are more interested in having energy in the pile because we can add straw into our rations to give us extra tonnage,” says Steppler. “We are looking at the most amount of energy we can produce within the means of our heat units. That’s how we determine what we are going to grow.”

## CALCULATE SILAGE COSTS

Manitoba Agriculture has an online tool that can help producers calculate and compare their silage production costs at [www.gov.mb.ca/agriculture/business-and-economics/financial-management/cost-of-production.html#forage](http://www.gov.mb.ca/agriculture/business-and-economics/financial-management/cost-of-production.html#forage).



## CUSTOM CONTRACTORS IN DEMAND

Most corn growers on the Prairies use custom contractors to chop and ensile their corn. The cost to chop and pack a good crop of corn silage is around \$6.50 to \$7.50 per ton, says Peter Gilbraith, a custom silage contractor from St. Claude, Man.

Custom operators can leverage their equipment costs over a much longer season, chopping alfalfa silage in May, June and July, making barley silage in July and August, and corn silage right up until November.

"Most corn should be cut in September and October but when frost comes in early September, the custom operator may have 40 days of corn silage work and only 10 good days before the corn gets too dry," says Bittner.

"The last corn chopped will be over-dry and ensile poorly because of the poor ability to pack the air out. The other end of the issue is that a custom operator will try to start chopping the first corn as soon as a producer will let him, so often the first fields will be harvested too wet, and then the piles weep moisture and the silage does not ensile well in the pile causing protein losses and severe feed intake limitations."

Unfortunately, there are not enough custom silage operators to go around. Gilbraith is turning work down as more and more producers turn to corn silage to replace hay.

Steppler uses a custom contractor to chop and pack his corn silage, which has freed up a lot of time previously spent baling, and is much cheaper than doing round-baled hay.

Since Steppler began growing corn silage a lot of his neighbours have followed suit, but they've had to collaborate with each other to try and make sure they get high-quality silage off at the right time.

"We all try to sow the same variety at the same time so that when it comes to the cutter coming all our fields are done at the same time," says Steppler. "The biggest disadvantage of corn silage is to make sure your corn is cut when it needs to be cut. This year everybody was lucky but if we ever got a frost in early September everybody would need their silage done

**"Local testing is really important because the performance of corn hybrids differs by environment, so a product that does well in Manitoba may not necessarily do well in Alberta."**

**— Nicole Rasmussen, DuPont Pioneer**

right away and it would be a disaster because there are just not enough custom guys doing it."

## PICK THE RIGHT HYBRID

Most grain and silage hybrids are interchangeable, but what's important for producers to understand is that half of the silage yield and most of the energy comes from the corn ear, so producers shouldn't necessarily exclude hybrids that are for grain. What's more important is to look for hybrids that have been tested and proven to work locally.

Pride Seeds has a silage program called Total Ration Solutions which identifies corn hybrids by maturity zone for basic agronomics as well as the high energy and digestibility desirable for silage.

"Local testing is really important because the performance of corn hybrids differs by environment, so a product that does well in Manitoba may not necessarily do well in Alberta," says DuPont Pioneer's Rasmussen. "Producers should have a realistic idea of what their heat units are for their area and pick a product that fits, and understand that each company's heat unit ratings are different."

"There is something called relative maturity and it's kind of industry's way to standardize ratings, but many of the ratings are for Eastern Canada and they don't correlate to Western Canada. It's important for producers to get out and look at test plots and make sure the product is proven in their area."

It's important for producers as well to match a corn hybrid for the long-term average heat units in their area, not just jump into a potentially unsuitable hybrid on the basis of a couple of good years.

"There can be a temptation to be more aggressive and go with a later hybrid, especially if you were basing that decision on a year like this one, where we didn't have a killing frost until later in the season," says Dave Den Boer, manager of product development and agronomy for Pride Seeds. "But that's unusual, and to be risk free, a producer needs to know what

heat units they normally get in their region averaged over three or more years."

Hybrids should consistently reach harvest maturity just before frost, so selection is one of the most important management decisions in silage production.

## SILAGE CHARACTERISTICS

Breeders are always looking to improve both yield and quality of corn hybrids whether it's for grain or silage, but there are certain agronomic characteristics that make a variety better for silage.

"We look for the same basic agronomic factors such as strong emergence, leaf disease resistance, stalk strength and harvest maturity," says Den Boer, who adds Pride Seeds and other companies will have new corn hybrids in each maturity group for both grain and silage in 2017.

"Our job isn't done unless the farmer is putting more beef on the rail, or more milk in the tank," says Doug Alderman, vice-president of sales and marketing for Pride.

"We test all maturities of corn for Goss's wilt because it's something we've seen as far north as Red Deer and Lacombe in yield-damaging amounts," says Rasmussen. DuPont Pioneer has released some of the earliest corn hybrids on the market in the last couple of years and is adding new resistance traits. "We're putting resistance to corn borer in all maturity groups as well with our Optimum AcreMax trait package," he adds.

The potential for corn as a silage crop in Western Canada is growing, especially as producers can maximize their land base by growing more tons of feed per acre and potentially freeing up some acres for other crops, or to increase their herd size.

But beef and dairy prices will have to make the investment worthwhile.

"We can do all that we can agronomically to help producers grow corn," says Alderman. "But at the end of the day, producers have to be in the cattle business to support the silage market" **CG**



Bales would be left at the edge of a field to await transportation to the processing plant in Sarnia.

Farmers need to invest now if the the new corn-stalk project is to go ahead

# A biomass co-op

By Ralph Pearce, CG Production Editor

Farmers aren't negative or pessimistic by nature, but they are realists. When it comes to business proposals, they've heard terms such as "sure-fire" and "can't-miss" before, not always with good cause.

So, do those terms work for the proposed corn biomass co-op?

You decide, but it appears there may be a good case for the new farmer-driven, farmer-centric co-op venture now taking shape in southwestern Ontario. At least, that's the pitch that the Cellulosic Sugar Producers Co-operative (CSPC) is making in discussions it is now holding with farmers who could be potential partners in the venture.

If and when the processing plant is built near Sarnia, the co-op would then merge the talents and expertise of AGRIS Co-op, Comet Biorefining and Bioindustrial Innovation Canada, along with participating farmers.

Initially, the plan is to use two-thirds corn stover and one-third wheat straw,

with an annual demand for 75,000 tonnes of biomass to run the new processing facility. The co-op will handle all removal activities. It will flail-chop the stover, bale and stack it, and truck the bales off the farmer's fields. (In order to be cost-effective, those farmers will be located within 100 km of the proposed plant in Sarnia.)

Project leaders are looking to get 55,000 acres under contract to generate \$11 million in funding from their farming partners. Comet Biorefining has raised its own equity with 70 per cent of the total \$70 million value, with the rest being held as commercial debt. There are also three lenders working together on due diligence, including Farm Credit Canada, Libro Credit Union, and the Business Development Bank of Canada.

On the farmer's part, participating in the co-op will require a commitment of 100 acres minimum. Then, in exchange for an initial investment of \$200 per acre, farmers will receive \$25 per tonne for corn stover (at approximately 1.5 tonnes per



**“When you vertically integrate your business... you have that ability to not just be a price-taker anymore.” — Dave Park, CSPC president**

acre) and \$40 per tonne for wheat straw (at approximately 1.2 tonnes per acre), all adjusted to 15.5 per cent moisture.

That’s roughly \$62 per acre annual return, comprised of \$42 from the removal of corn stover (or wheat straw) from the field, and another \$20 for the value of the high-purity dextrose that’s processed from the plant and sold to end-use customers.

With back-of-the-envelope math, that means a four-year payback on the investment, after which the farmer keeps essentially all of that annual return.

### DOUBLE THE OPPORTUNITY

It’s a significant development, both in economic and environmental terms. A co-op venture, as many farmers know, reduces risk and provides stability in a variety of farm transactions. But with this venture, participating farmers will also help themselves and their soils by removing up to 30 per cent of their corn stover, which could help alleviate some challenges with residue management.

For most of the last five years, growers have been doubly challenged by trends that have seen higher plant populations as a way to boost yields, combined with improved genetics in corn hybrids that have strengthened stalks. Together, that means farmers are leaving a thicker mat or tougher, longer-lasting residue that makes it difficult to maintain no-till farming.

Production practices are also lengthening the growing season, keeping corn healthier for longer periods, says Dave Park, a Lambton County farmer and president of the cellulosic sugar co-op.

“This is a way to lessen our costs by having the co-op take over some of those fall practices that we would normally carry out,” says Park. “Then we can get back to more no till that some farmers — myself included — have gone away from in recent years because we haven’t had as much success no tilling into corn stalks as we once did.”

It’s also a way to add value to the current corn crop while farmers vertically integrate themselves by partnering with Comet Biorefining, for the opportunity to not only be the raw material suppliers but also be part of the ownership group of the Sarnia plant.

It’s a strategy, Park says, that will move farmers up the value chain. “By inserting ourselves into the value chain, we’re vertically integrating ourselves, and when you vertically integrate your business, it removes risk from a portion of it,” he says. “You have that ability to not just be a price-taker anymore, you’re moving yourselves up a couple of rungs on the ladder, and that vertical integration will give us more consistent returns and take some of the ebbs and flows out of the market.”

Park was one of four representatives of the co-op to speak at a pair of demonstration days, held in November on two different farms in Lambton County, one near Forest on the farm of Brad Goodhill, and the other at Chuck Baresich’s farm north of Bothwell. Each day’s exhibit attracted roughly 70 attendees, with demonstrations geared to showcase the machinery the co-op will purchase, taking the tasks of baling, stacking and transporting out of the hands of the farmer.

The machinery included a Hiniker flail chopper which makes two passes to create a 40-foot windrow, an AGCO/Hesston 2270 HD baler which creates 3x4x8-foot bales averaging 1,200 pounds, and a ProAg bale stacker that retrieves and stacks the bales at the edge of a field.

Asked about their progress lining up the various business interests for consideration as partners, Park says that once

the project’s backers decided on the technology used by Comet Biorefining, things began falling into place. But in order to conduct due diligence in business, some things take more time.

But the wait is over, Park now says, and he sees this next step of attracting investment from farmers and building the value chain with those participating growers as a critical phase, and one that will bring important benefits to those growers.

“If we don’t try, we’ll never know, and certainly this is about building a market, and these things sometimes aren’t an easy road to go, but they do build momentum,” Park says. “For all of those people who say it won’t work, there are just as many who say it will. The reality is that we’re going to give this a good effort, and I think it will go — I do see some merit in this project.”

### THE PROCESS

In the past, there have been some concerns about bale quality because of the length of time the bales sit in the field, often in wet conditions. But according to Andrew Richard, chairman and chief technology officer with Comet Biorefining, the end-produce is high-purity dextrose, and one of the main ingredients in the processing of the stover is water.

*Continued on page 16*



After the flail chopper makes its second pass, the windrowed stover is ready for baling.

Richard says that in tests at one of Comet's European facilities, bales from southern Ontario were collected in spring, and they were quite wet. Yet the results showed little reason to be concerned about moisture content or length of time between baling and processing. The Comet process, says Richard, is "quite forgiving."

As for targeting dextrose as the end-product, Richard notes the Sarnia plant, once complete in 2018, would produce 27,000 tonnes annually, a relative drop in the bucket in the North American bio-sugars market, which he estimates at somewhere between two and three million

tonnes. World-wide demand, he says, is roughly 12 million to 13 million tonnes per year, with most of that met with dextrose or cane sugar.

"We are the only cellulosic sugar company that is taking this approach with dextrose, and we did it because we wanted to be able to hit an existing specification," says Richard. "We wanted to compete with corn-based dextrose, and then we put a process around it to compete cost-wise as well as quality-wise. Corn dextrose is sold into an existing large market in North America — about four million tonnes — for chemicals and some food uses."

Most of the existing chemical companies as well as the emerging ones — such as BioAmber, which is trying to build a different route through succinic acid and butanediol — all use corn-based dextrose. That means anyone wanting to supply them with dextrose must hit precise specifications. But at least they know exactly what they have to achieve.

"When you think about emerging markets in bioplastics or the types of products that would replace petroleum, such as what BioAmber is trying to do, that market is as big as you can imagine — tens of millions of tonnes, if not more," says Richard. "At that point, you need to compete, not just on the quality of the material, but the cost. That is very dependent on the conversion technology and it's dependent on oil processing. Everyone likes \$100 oil better than \$50 oil: for us, neither one is really an issue."

#### THE VALUE STATEMENT

More than just adding value to a bushel or an acre of corn, the co-op will provide an ownership opportunity. That's an important facet for Jim Campbell, general manager of AGRIS Co-op, based in Chatham.

Campbell knows the numbers, and is fluent at incorporating them into his conversation: \$200 per acre invested, \$62 per acre annual return, 55,000 acres to be contracted, 75,000 tonnes of material required, \$70 million total value of the co-op and the plant.

But then he adds another number that he believes is particularly important: 100 per cent. That's the percentage of the co-op that will be owned by farmers.

"When you're done, you will own the co-op — it will be 100 per cent farmer-owned — there will be no other equity in the co-op except for you," Campbell says. "Then the co-op is going to turn around and invest in the plant, and when we're

done that, the co-op will own about one-third of the plant."

It's not just another commodity being sold at the local elevator, adds Campbell. Through their involvement with the co-op, farmers will enter the value stream.

Campbell understands that value chain scenario: it's part of what's made AGRIS Co-op the success it is, and why farmers invest in co-operatives, as well. Yet the proposition comes down to two simple questions: does removing some corn stover from a grower's field make sense, and does investing \$200 for a \$62 annual return also make sense? That's the ultimate decision Campbell puts before farmers.

It's also a challenge that's been placed before Jay Cunningham, CSPC's business development manager. As the project moves from winter into early spring, it's his task to entice farmers to contract with the co-op before spring planting in 2017, enabling the stockpiling of corn and wheat bales during the summer and fall, and awaiting final construction of the plant in early 2018.

"The challenges I see are getting out and getting the correct information out to as many producers as we can," says Cunningham, who's worked for years in agricultural business and financing, and is also a farmer. "Farmers are going to look at this and say, 'This has been a challenge, with the heavy corn stover and getting more so with the genetics, the fertilizers and the yields we've been getting.'"

It's also an opportunity to fix a problem and get paid for it at the same time, he notes. And it's an exciting new opportunity to go into a new field, much like the sugar beet growers in Kent and Lambton counties did 20-plus years ago, and have a new market for something that normally gets plowed down anyway.

What's impressed Cunningham through the early going is not the few objections he's heard, it's the questions, and some really good questions, he says, particularly about taking corn stover from the field. No matter how dense the mat of residues may be or the long-term impact of plowing or knifing it into the ground, that stover represents soil organic matter. But the fact that the process only takes 30 per cent from the field must be understood.

"Everyone's farm is going to be different," he says. "If it makes sense for you, on your type of ground and with your operation, and the way you till and the way you plant, then we'd be happy to discuss it with you." **CG**

## THE CSPC INITIATIVE — JUST THE FACTS

### Key factors for successful cornstalk baling:

- Bale density.
- Uninterrupted baling.
- Bale weight of 1,200 to 1,400 lbs.

### Harvesting requirements:

- Past grain harvest on fields having corn grain yields greater than 150 bu./ac.
- Crop rotation to avoid using the same fields every year.
- Variable stover harvest rate from one to two tonnes/ac.
- Cover crops during rotation.

### Harvest protocol:

- Producer contacts CSPC when grain has been harvested to schedule stover removal.
- Flail chopper creates 40-foot windrows (two 20-foot passes).
- High density baler creates 1,400-lb. bales.
- Stacker will temporarily stack bales at the edge of the field.
- Bales will be removed from the edge of the field within 120 days.





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# Improving nature

Corn and the environment  
can work hand-in-hand,  
and thanks to our farmers,  
in many cases, they  
already do

By Ralph Pearce,  
CG Production Editor

Every harvest season, word spreads quickly about yield. And happily, that trend line is up, with growers taking off phenomenal yields whenever the weather is halfway co-operative.

But can today's yields co-exist with a healthy environment?

It's a question that is getting asked more and more. And for the most part, it seems, the answer is a solid "yes."

That's not to say the job is done. Agriculture, like any industry, needs to keep pushing environmental care and accountability; it can't rest on its laurels. But we also shouldn't lose sight of the fact that our progress on the environment over the last couple of decades has often been as amazing as our progress on yields.

Indeed production and the environment actually go together quite nicely, says Paul Sullivan. In his view, there's nothing better for the soil and the environment than an optimal-yielding field that's been managed around its limitations and seasonal stresses.

Partly, that's because it so often makes sense to farm with the environment in mind, says Sullivan, a certified crop adviser from Kinburn, Ont. For instance, it doesn't make sense to over-apply nutrients, whether you're looking at it from an environmental or an economic viewpoint.

It's true with soil management and other agronomic decisions too, Sullivan says. For instance, the movement to reduced tillage, the uptake of Roundup Ready and other transgenics, and the adoption of precision ag systems may all have been good for the farmer's bottom line, yet they have also created benefits for the environment too.

Sullivan agrees that agriculture has done plenty to boost production and safeguard the environment, but he also applauds the industry for being open to more changes in practices. He points to soil erosion as just one area that requires constant monitoring.

"One of the biggest things that plagues agriculture, and it's probably no



Higher productivity has been the key motivator in agriculture for years, but that doesn't mean today's yields are coming at the expense of the environment. In fact, high yields can be good all around.



different than anything in human nature, is that we're pretty resistant to change," says Sullivan. "We would rather stay with the status quo and complain about it than make some changes or try something different."

In agriculture, there's also a difference among generations. Sullivan works with young people who are more inclined to look at a bigger picture than their parents or grandparents might, and are always looking forward as opposed to wanting things to be the way they were.

### ENVIRONMENTAL AWARENESS IS NOT NEW

Dr. Darren Robinson maintains that growers have done a very good job embracing practices that not only boost production but keep environmental health in sight. He believes the majority of growers are good at striking a balance between production and putting in place management tactics to reduce or eliminate environmental impacts, and he sees the reduction in the use of fertilizers and inputs in the past 20 years as a signal that growers are mindful of their effects on the environment.

"Some of the practices that growers used years ago might have had negative environmental impacts," says Robinson, an associate professor specializing in weed management at Ridgetown Campus, University of Guelph, where he has watched the agri-food industry make its adjustments when needed.

"At the time it was more of a lack of understanding — we didn't know that was happening," Robinson says. "When we acquired the knowledge, changes happened. Growers are the practitioners but I believe the whole ag community — and that includes people such as myself, and in extension and at the retail end — didn't have the awareness and knowledge of those things."

In some cases, such as with transgenics and chemical formulations, there have been challenges with continuous usage. If it's glyphosate resistance that's being discussed, Robinson says that occurred because of the selection pressure put on populations that already had resistance to it. The same thing occurred with the Group 2 chemistries, and atrazine before them.

"The tendency in business, and in anything we do, is that you find something that works well, is really efficient and reduces the time that it takes to complete



Can higher production co-exist with monitoring and maintaining the environment?  
The answer seems to be "Yes!"

**"The industry can't continue to function without doing things that make sense for the farmer's bottom line."**

**— Paul Sullivan, certified crop advisor (CCA)**

a task," says Robinson. "Across the board, that's what we do, and it doesn't matter if it's agriculture or any other industry. But telling growers to not rely on something that works really well is a little analogous to telling someone they can't use a Phillips screwdriver to turn a screw with a Phillips head, and that they have to use a slotted screwdriver. It still works, just not as well."

It doesn't mean that farmers have to abandon the technologies they've come to rely on, it just means they have to adjust

and adapt to the shifts that naturally evolve — even after a few years.

Karen Jacobs is another advocate for the co-existence of high production agriculture and environmental sustainability. She echoes Robinson and Sullivan in their observations, adding that some environmental considerations, such as improving soil health, have shown direct positive effects on increasing yields.

*Continued on page 20*

“Other environmental considerations may require a small amount of land to be taken out of production, but the benefits often outweigh the costs,” says Jacobs, environmental outreach specialist with Ontario Soil and Crop Improvement Association (OSCIA). “Planting a buffer strip along a waterway can improve water quality both on the farm and downstream, and may offer other benefits such as providing some habitat for wildlife or acting as a windbreak.”

Jacobs sees the production-tied-to-environment approach as being different for each farm and for each farmer based on their practices. Some may have the knowledge, resources and confidence to push their environmental goals while others may be satisfied with reaching more baseline environmental considerations.

Jacobs runs down the list of programs geared towards environmental stewardship, which in many ways can enhance production, directly or indirectly. Some were developed years ago, such as nutrient management plans and environmental farm plans, and they could also be a stepping stone to other funded programs.

There is also the Farmland Health Check-up (part of the Farmland Health Incentive Program (FHIP)) and the Soil Health Check-Up (part of the Soil Health Improvement Program (SHIP)) that can provide CCA-guided planning which can then trigger government funding for on-farm measures.

Those programs work, Jacobs says, because farmers adopt them.

“Producers should be praised for their stewardship efforts,” Jacobs says, adding that as an industry, farmers and stakeholders need to be more comfortable talking about everything that’s being done. “And we need to push that message outside of our own circles to allow it to reach a wider audience. Farmers can continue to demonstrate their respect for our resources by being open to new ideas, testing them for practical application and adopting those that make that specific farm business more sustainable.”

### MORE STILL TO BE DONE

Most people in agriculture agree that there is more that can be done to spread those positive messages about on-farm practices, especially to consumers who know so little about the realities of modern-day farming.

Sullivan believes agriculture can do much more to aid in the process of keeping the public better informed, first by



The development of a matrix of technologies has made no till a viable, profitable choice for many growers, while also helping the environment.

being up front about the tools of the trade, and then to challenge those sources that misrepresent the facts about farming.

“What we should be doing is promoting the technologies we have, what they are, what they do and why we use them,” says Sullivan. “Consumers don’t necessarily like change either. They get something and they want to keep getting it. When they get information about something, when they get it once, it’s hard to change their opinion.”

But Sullivan is optimistic. He points out when he was in school 30 years ago, there was no emphasis on justifying things that were being done — no question about why, it was just the way things were done. Now when students get out of school today, they’ve been taught that they have a responsibility to communicate what they’re doing and what’s happening within the industry.

“It becomes a continuing movement within our industry to communicate to the end-user,” says Sullivan. “We don’t understand the consumer any more than they understand agriculture, and the more we talk back and forth, the better we’re able to understand each other and realize where things are coming from. In

most cases, that’s where things fall off the rails, when we don’t understand something and we immediately condemn it.”

Even in the last three to five years, as the number of people who advocate for agriculture continues to rise, the focus has also been shifting, so we’re doing a better job of talking to consumers in terms that they understand.

Robinson also agrees with the advocacy angle, and that farmers need to be more involved in sharing the positive stories and being up front with consumers on why they use herbicides and GMOs or high-horsepower tractors. Granted, that’s a bigger challenge than 20 years ago, when most of the newer technologies simply didn’t exist.

The important thing, as Robinson sees it, is that the advocacy must come across as an explanation, not as some kind of self-congratulation.

“An audience is more likely to listen to advocacy if we do it in a positive way and show the value of what the agri-food community does for society at large,” Robinson says. “Farmers deserve the recognition, but I would worry that if it comes across as praise, it might not be received the way we want it to be.” **CG**





# Finding hope in 2017

It's easy to be pessimistic due to global corn stocks, but demand is setting new records too. So consider posting some standing market orders, and watch prices daily

By Philip Shaw

Every year farmers go to the field hoping for something better than last year, and even though now is the dead of winter, plans are being made to raise a successful corn crop in 2017.

For eastern Canadian farmers, corn has earned its status as the “go-to” crop for the region. A few years ago, this was because the price was quite high, but lately it has more to do with productivity. In 2015, the Ontario corn crop yielded roughly 170 bushels per acre. And in 2016, despite drought in many parts of the province, the overall yield is still likely to finish in the 160 bushel per acre range.

Over the last 20 years, corn productivity has been climbing by approximately 2.3 bushels per acre per year. However, in the last five years this productivity rate has been accentuated upward, largely thanks to genetics.

Of course, productivity is a vicious cycle; the more corn we produce, generally speaking, the more corn we find on the world and Ontario corn markets, pushing the price lower. It's a never-ending conundrum, as we saw again in 2016 when U.S. and worldwide corn production increased.

So as we look into 2017, corn producers face a challenge of abundance. In 2016, the American farmer produced a record crop of corn, which is weighing on our corn futures market. Despite not having highly profitable signals to plant corn in 2016, those U.S. farmers produced a record crop of 15.226 billion bushels, according to the November USDA crop

report. The U.S. had an average yield of 175.3 bushels per acre, another record. The new record (15.226), when compared to the 2015 total of 13.601 billion bushels, seemed almost science fiction in its magnitude.

This big crop in the United States forced an early low in the corn market of \$3.14 on August 30. Corn futures prices rose after that into late October only to fall to \$3.37 on December 2. Needless to say, this big crop continues to weigh on corn futures prices. Projected ending stocks for the 2016-17 corn-marketing year have ballooned to 2.403 billion bushels.

With that as a backdrop, producers in Eastern Canada have a great challenge as they look out into 2017. How many acres should be planted to corn in 2017, especially at a time when soybean prices have been more buoyant? What are the factors that will affect the market in 2017, perhaps pushing the corn futures price higher? How will the Ontario cash corn market be impacted in 2017, especially at a time of a low Canadian dollar? What are the other market factors aside from supply and demand that may play a role in the price of corn in 2017?

It is easy with those large supply numbers to be somewhat pessimistic on corn for 2017. However, the one shining star within the corn complex is record corn demand at 14.610 billion bushels as of the November 2016 USDA crop report.

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This demand is higher than 2015 corn production and continues to grow, which is a very good thing because it is preventing futures prices from going lower on the year when we have had record crops. It is also a very good thing because the growth in corn demand will not be easily slowed when corn production is curtailed someday through some type of weather-related event.

In times of big surplus, that reality can seem so far away but, in fact, it will happen at a certain point. This record demand will eventually help the corn price, although getting there may be an adventure.

Part of our jigsaw puzzle may be put in place this coming winter with the production of corn in Brazil. USDA is currently estimating the corn crop growing in Brazil to 83.5 MMT, but many private estimates within Brazil are higher. Argentina is also set to produce more corn this year, and those two areas in the southern hemisphere will be important to watch this winter as their crop matures. This production coming out of South America may have a further impact on the futures price.

South America, parts of the Black Sea region and a few other countries have an impact on the price of corn in some parts of the world through their exports. However, the United States is by far still the largest producer of corn in the world and the largest corn exporter.

Looking ahead into 2017, the number of U.S. acres that get planted to corn will have a big effect on corn prices. In 2016 American farmers planted 94.5 million acres of corn, which was significantly higher than the year before where they planted 88 million acres. In the spring of 2016 there was little price incentive to plant that much more corn, but it was done anyway. How might this manifest itself in 2017? Will the American farmer plant just as much corn? Or more? Or much less?

An argument could be made in the late fall of 2016 that there would be more soybeans planted versus corn in 2017. The reason for that is that soybean futures were \$2 higher than at the same time in 2015 for an extended period of time in the late fall of 2016. With record soybean yields coming off the fields in 2016 and with significantly higher soybean futures prices, an argument can be made for a switch to soybeans in 2017.



## Huge recent growth in corn demand is stable

Of course, at this early stage it is difficult to say. With corn productivity jumping on an annual basis, those price incentives might not be as powerful as they once were in the decision-making process, and good planting weather can also do wonders for spring corn planting.

But then, too, there are lots of unknowns ahead, including how the Trump administration will deal with ethanol and any changes in the renewable fuel standard. There is also concern how agricultural trade might be affected under a Trump administration.

In the late fall and especially after the Trump election, the value of the U.S. dollar has strengthened significantly. Economic growth rates in the United States are rising and this has also caused the U.S. dollar to rise. With the possible interest rate hike from the U.S. Federal Reserve, this will likely strengthen the U.S. dollar further. A stronger U.S. dollar is a headwind for corn futures prices as it makes it more expensive in foreign currencies. In fact, a higher U.S. dollar is mostly a negative for agricultural commodity demand. As we go into 2017, this remains a concern.

In Eastern Canada, our US\$0.75 dollar as of early December has helped Ontario cash grain prices go over \$4 bushel. Earlier in 2016 Ontario had an import basis for corn. However, a crop that was deemed damaged in Ontario from drought has been much better than expected, and

Ontario basis levels have dropped partly because of that.

With the ending of the Ontario Ethanol Growth fund on December 31, 2016, those plants will lose their subsidies. However, the Ontario ethanol sector is strong because of the support they had received, and will likely be healthy into the future.

Last year Ontario planted 2.015 million acres of corn and in 2017 will likely plant that again or more, especially since wheat acres are down slightly from 2016 levels. As of early December 2016, new crop cash prices for corn are approximately \$4.60 per bushel on a December 2017 futures value of \$3.77.

As we look into 2017, the challenge for eastern Canadian corn farmers is to measure all of these market factors. A production calamity somewhere in the world will likely be needed to shed much of the burdensome supply within this market. 2017 weather in the prime U.S. corn-growing areas will likely determine the size of the crop again. On that path, there will be much uncertainty as the crop is made.

That means there will be many marketing opportunities for Ontario farmers, who, at the same time, must factor in the volatility of the Canadian dollar.

As winter goes along the possibilities may become clearer. Standing pricing orders are always useful. Daily market intelligence is key. **CG**





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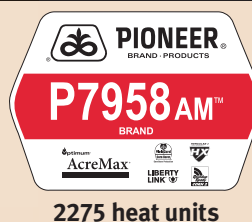
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