

CANOLA digest

Top grade oil

Top quality canola is easier to process. No. 1 canola is worth more for a reason. **PAGE 10**

PLUS

Pure effort:
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Rapeseed Congress
roundup **38**

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CANOLA digest

on the
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TOP GRADE OIL

Green seed, heated seed, moisture and dockage all add costs to canola processing. No.1 canola with low dockage moves through crushing plants more efficiently.



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The Editor's Desk

Jay Whetter

Strong third

Three messages shone through as I listened to Boulos Chalhoub speak at the International Rapeseed Congress in Saskatoon in July. Chalhoub is a plant genomics researcher with the National Institute for Agricultural Research (INRA) in France, and what struck me in his talk was the age of *Brassica napus*, the diversity of its genome and the global collaboration in brassica genetic discovery.

Humans have been eating brassica oils, and *B. napus* specifically, for millennia. *B. napus*, the most common oilseed brassica species in agriculture, goes back as much as 7,500 years, forming from a cross between older species *B. rapa* and *B. oleracea*. The low erucic acid and low glucosinolate version as we know it is a new improvement, but such improvements are common and continuous. All very old crops have been improved in flavour, size, shape or quality over the years.

Chalhoub then spoke about *B. napus*'s diverse genome. *B. napus* has at least 2,000 genes responsible for oil production and biosynthesis, which is double the number of oil genes in soybeans and more than double the number in palm. With this edge in genetic diversity, canola breeders will be able to more quickly and broadly improve oil content, quality and other traits, he says.

The third encouraging message came on Chalhoub's closing slide. He listed

80 collaborators from around the world who are working on projects to decipher the *B. napus* genome. This collaboration going on behind the scenes, with input from Canadian researchers, is great news for our crop.

Together, canola and rapeseed rank third in the world for vegetable oil production, well behind palm and soybeans but well ahead of fourth place sunflowers. USDA figures for 2014-15 put global vegetable oil production at: 62.4 million tonnes for palm, 47.4 million for soybeans, 27.0 million for canola/rapeseed, and 15.2 million for sunflower. (Note these are oil numbers, not overall seed production.) Production of all four oil crops has increased over the past five years. Interestingly, olive oil was at 2.3 million tonnes in 2014-15, and production has decreased significantly over the past five years.

Our involvement with the IRC and its parent organization, the International Consultative Group for Research on Rapeseed (GCIRC), are important efforts as we work towards our goal of 26 million metric tonnes of production by 2025. With the genetic advantage of the *B. napus* genome, strong collaboration across all producing countries, and continued growth in demand, canola should remain a strong third. Brassica oilseeds are good, old crops. The world needs them. ●



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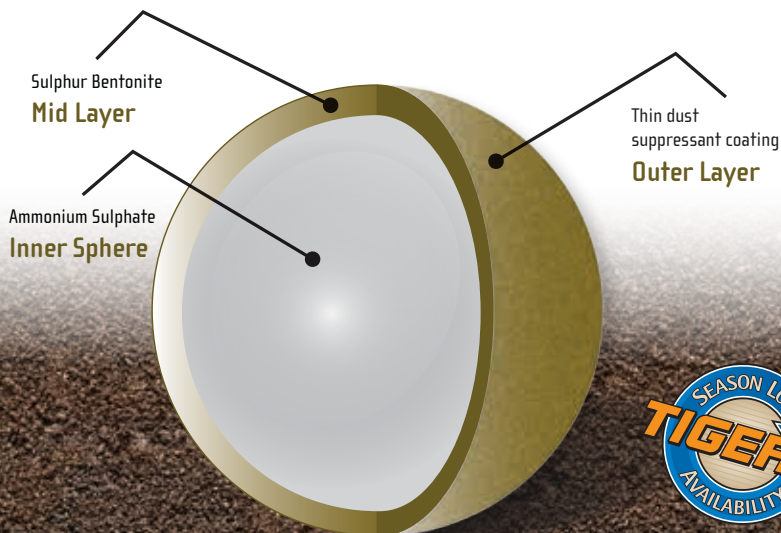
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To explain hybrid canola seed production is not your average birds and bees discussion. The challenges are to find parent lines that provide high hybrid vigour, and to keep the final product pure.

By Bruce Barker

Pure effort

F

orget much of what you know about conventional open-pollinated canola breeding. The breakthrough in canola hybrid plant breeding involves multiple parents, male sterility, female lines and male fertility restoration. All with help from bees and an emphasis on purity throughout the breeding and production process.

Since ICI Seeds introduced the first canola hybrid in Canada, Hyola 40 in 1989 followed by Hyola 401 in 1991, yields have been on a steady march upwards as plant breeders push the yield boundaries. Statistics Canada data shows average canola yield has grown from approximately 20 bu./ac. in 1989 to 35 bu./ac. in 2014 – almost 75 percent. The trend line is steadily upwards with an average yield increase of three percent per year.

“The canola industry has been doing hybrid production long enough that we are seeing good success. The increased vigour is real. The increase in yield is real,” says Dale Burns, canola breeder with Monsanto Canada at Lethbridge, AB.

Hybrid 101

In hybrid canola production, crossing two genetically different parent lines creates an F1 hybrid. The cross produces “heterosis” or hybrid vigour, resulting in more vigorously growing plants and higher yield. Typically, the more diverse the parent lines, the greater the heterosis.

“To get a really good hybrid, I like to say that neither parent is perfect,” says Burns. “The hybrid performs better by building on the complementary strengths of both parents.”

Brassica napus canola is self-pollinating, with male (anther) and female (stigma) parts on the same plant. The anthers produce pollen that fertilizes the stigma. In *B. napus* canola, about 75 to 80 percent of seed production is from self-pollination. That’s how traditional open-pollinated canola varieties grow.

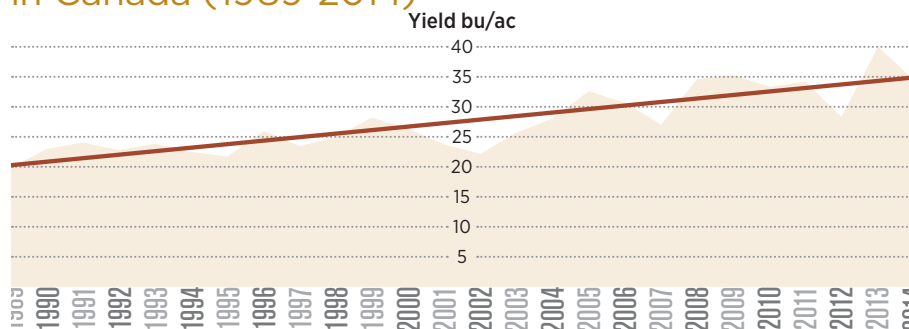
With hybrid canola, plant breeders had to overcome self-pollination by making one of the parents male sterile without any pollen-producing anthers so the plant had to outcross with another parent. Two systems have been developed to make canola hybrid production a reality.

Cytoplasmic male sterility (CMS) uses a unique cytoplasm surrounding the nucleus of a cell. CMS, derived from radish and canola, turns off male pollen production to make a male-sterile female plant (Line A). To produce the hybrid cross, a restorer line (Line R) is crossed with Line A to produce the F1 hybrid. Fertility is restored in the F1 seed because the restorer gene complements the unique cytoplasm. This F1 hybrid seed from Line A/R cross self-pollinates and is the hybrid seed grown by farmers.

In addition, a Line B (maintainer line) is developed to produce Line A parent seed. Line B has a normal canola cytoplasm and is thus pollen fertile, possessing the same nuclear genes as the Line A. The resulting cross produces more Line A seed.

CMS and variations such as CMS-Ogura are used by seed companies

Average canola yields by year in Canada (1989-2014)

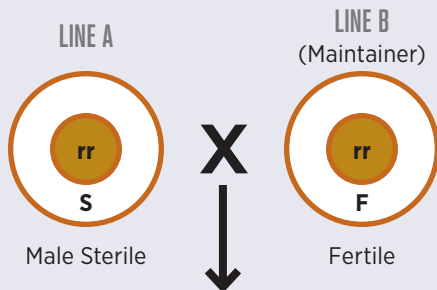


Source: Statistics Canada

Hybrid cross steps

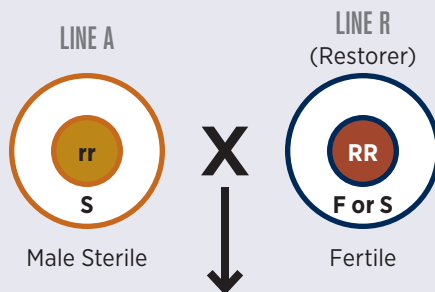
STEP 1

Foundation seed crossing block to produce more Line A seed



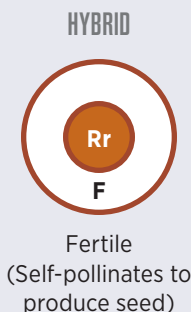
STEP 2

Hybrid seed crossing block to produce actual hybrid seed for commercial crops



STEP 3

Commercial canola production



S = sterile cytoplasm
F = fertile cytoplasm
rr = homozygous for maintainer gene
RR = homozygous for dominant restorer gene
Rr = homozygous for restorer gene

Source: Canola Council of Canada

“To get a really good hybrid, I like to say that neither parent is perfect. The hybrid performs better by building on the complementary strengths of both parents.”

— Dale Burns



Hybrid canola seed production requires a male sterile line that does not produce pollen. (The smaller flowers in the middle of the photo are male.) These males get pollen from fertile flowers, as shown on the left. Seed from these males will be hybrid — having two parents.

breeding glyphosate-resistant and Clearfield hybrids.

The second approach is used in the production of Liberty Link hybrids, and is based on a system developed by Plant Genetic Systems in Belgium. Male sterility in the female parent line is caused by a gene isolated from a common soil bacterium (Barnase gene) and inserted into the cell nucleus. Similarly, a restorer line uses another bacterium (Barstar gene) to restore male fertility in the F1 cross. The first Liberty-tolerant hybrids 3850 and 3880 were registered in 1996.

Hybrid seed production

Plant breeders evaluate new parental material, and if the material looks promising, the male sterility hybridization system is bred into the line. Plant breeders maintain thousands of parent canola lines and have evaluated them for their strengths and weaknesses.

“We will use established parent lines as testers for new parental material coming into the cross-breeding program. We might cross one new parent line with many different tester lines to evaluate its potential. From one new parental line, we might make 100 new potential inbreds,” says Dave Harwood, a plant breeder and technical services manager with DuPont Pioneer at Chatham, ON. Each year, most canola breeding companies will make thousands of new hybrid crosses for evaluation.

Over a process of seven to nine years, the thousands of new hybrid crosses are evaluated and funneled down to a few new hybrid crosses that are entered into registration testing, seed production, and ultimately commercial production. Plant breeders not only use in-field assessment to evaluate traits, but also molecular markers to ensure that desired traits (such as herbicide resistance or disease resistance) are in the hybrid line being tested.

“We might start with 100 promising crosses, but analysis with molecular markers might reduce that to 20 with the traits we want,” says Harwood. “Molecular markers can save plant breeders a lot of evaluation time and expense.”

continued on page 9



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This photo shows Line A in the wide sections and Line R in the narrow bands. Two rows of Line R were mowed for later flowering to extend the pollination opportunity. Once podding and seed set begins, Line R is mowed down so that it does not produce seed. Only seed from Line A plots — the hybrid seed — is kept. (Inset) Leafcutter and honey bees help with pollination. Leaf cutters are more active in hot weather while honeybees (shown) are more active in cooler, cloudy and windier conditions.

Burns says that in the early stages of testing hybrids, a small amount of hybrid seed is made from a test cross. This seed is grown out in small one-metre square cage plots covered with a thin gauze sheet to prevent cross pollination from other lines.

“The winners in the screening year get to go south for the winter. Larger quantities and more hybrids from parent line winners are produced in Chile for further testing back in Canada the following summer,” says Burns.

As the list of potential new hybrids is narrowed down, parent seed production is increased in anticipation of registration. Parental seed is produced mainly in Chile and the interior of British Columbia.

“In BC, one company will use the Kootenay River valley, another one the next valley over. The mountains provide good isolation between production sites to help maintain purity in the parent lines,” says Scott Horner, manager of HyTech Production Ltd. at Lethbridge, AB. HyTech works with plant breeders, distributors and trait developers to evaluate and produce parent lines and hybrid seed.

“The biggest question for companies is when to scale up parental line seed production for a new hybrid. Do you do it in parallel with the registration testing in

anticipation of a large product launch, or wait until registration is imminent and have a smaller launch year?” says Harwood.

When a parent line shows promise, it is also evaluated for flower timing and pollen production. HyTech conducts parent line evaluations, and assesses characteristics such as when flowering starts, plant height, length of flowering and pollen production. Parent lines are also rogued for hybrid off-types, and herbicide-tolerant spray tests are conducted.

“The important thing in hybrid production is that the Line A and Line R have to flower at about the same time so Line A is fertilized by Line R restorer pollen. If they don’t flower at the same time, seed production will be lower,” says Horner.

Field-scale hybrid seed is primarily produced in southern Alberta, with 50,000 to 60,000 acres of seed produced annually. Other secondary areas of production include Colorado, Washington and Chile.

For hybrid seed production, HyTech plants 12 rows of Line A female plants alternately with four rows of Line R restorer plants. The goal of the ratio is maximum pollination of the Line A plants. That means synchronizing flowering, and maximizing the length of time the Line R plants are blooming. Conventional or row-crop spacing is used depending on the characteristics of the parent lines.

While breeders try to match flower timing, Line R plants can also be manipulated to keep them flowering longer. Some of the Line R rows are

mowed to set back part of the Line R plants so that some of the line is in full bloom and the rest blooms later.

“The objective is to have maximum pollen production over a longer of period to time,” says Horner.

Leaf cutter and honeybees are used to help with pollination. Leaf cutters are more active in hot weather while honeybees are more active in cooler, cloudy and windier conditions.

Genetic purity is maintained by isolating fields of different genetics so that pollen from one field doesn’t end up in another. Canadian Seed Grower Association standards require 800-metre separation. HyTech uses 1,600 metres. Small armies of rogues also walk the fields to ensure genetic purity by removing off-types.

“Field isolation is the big one. We work with established producers and other companies to maintain minimum isolation distances to help ensure genetic purity,” says Horner.

Once podding and seed set begins, Line R is mowed so it does not produce seed – only seed from the Line A/R cross is harvested and becomes the F1 hybrid seed sold to farmers for commercial production the following year.

“Compared to corn, we have a 50-year lag in hybrid breeding, but plant breeders are continuing to make good advancements in canola hybrid breeding and production,” says Burns. “We hope we are only beginning to uncover the potential for hybrid canola.” ●

Bruce Barker is a freelance writer specializing in agriculture production.

“We work with established producers and other companies to maintain minimum isolation distances to help ensure genetic purity.”

—Scott Horner

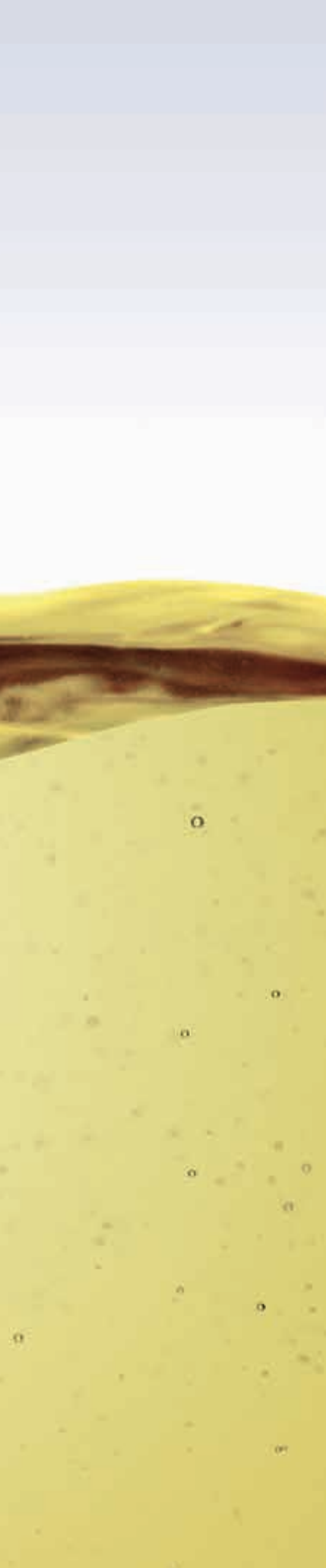
The quality of canola delivered affects the cost to process it into top quality oil and meal. No.1 canola is worth more for a reason.

By Jay Whetter

TOP
GRADE

OIL





G

reen seed, heated seed, moisture and dockage all add costs to canola processing, which is why seed delivered with high amounts of any of these factors will fetch a lower price. The bottom line is that No.1 canola with low dockage moves through crushing plants more efficiently.

Green seed

Green canola seed usually has issues other than just high chlorophyll levels. Canola delivered with high levels of green seed was probably swathed immature or was frozen before it had a chance to fully cure. Therefore canola with high green seed content also tends to have smaller seeds, more damaged seeds and a lower overall oil content per tonne of seed delivered.

High amounts of green chlorophyll in the seed also increase the processing cost because that chlorophyll must be removed to produce the light-coloured oil customers expect.

Processors use a clay filtration process to remove chlorophyll. Natural

clay particles — “Fuller’s earth” or “montmorillonite clay” used specifically for their high adsorption qualities — are added to the oil. Interestingly, these same clays are used to clarify wine. Chlorophyll molecules bond with the clay particles. The clay is then filtered, taking the chlorophyll with it.

Canola oil with higher chlorophyll content will require more clay and possibly more passes with the clay, adding to the cost required to clarify the oil. “All canola oil gets the clay treatment, but the more chlorophyll, the more clay and cost required for that step,” says Dave Thiessen, edible oils facility manager with Bunge in Altona, MB.

Adel Ghabour, quality assurance manager with Richardson Oilseed in Lethbridge, AB, adds that the more clay they have to use to remove colour, the more oil they lose in the process. “Oil is trapped within gaps in the clay, and that oil is not recovered unless the clay goes back through the extractor,” he says.

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“Red colour set in by heating is very difficult to remove. Deodorizers can’t remove it, and we end up with darker oil in the end.”

— Dave Thiessen

TOP
GRADE

Oil

12

Heated seed

Canola seed damaged in storage by heating does a number of things to degrade quality. Heating will burn off oil, so there is less oil per tonne of seed. Heating also changes the colour of the oil and increases free fatty acid content. For these reasons, processing plants tend to get very picky about how much they’ll take.

Processors can handle low levels of heated seed, but it still adds cost. Heating will “set” the natural red colour pigments in canola. All canola oil contains some red pigments, which are removed with the same clay process that removes the green chlorophyll molecules. “Red colour set in by heating is very difficult to remove,” Thiessen says. “Deodorizers can’t remove it, and we end up with darker oil in the end.”

Heated canola also has higher levels of free fatty acids. Fatty acids are usually in triglyceride bonds — three fatty acid molecules are attached to a central glycerol molecule. Free fatty acids are broken from the glycerol bond, and these “free” fats greatly reduce the stability and shelf life of oil.

Free fatty acids are found in all canola. Good quality new canola seeds will have about 0.5 percent of fatty acids in the free form. After a year in

storage, oxidation through the aging process will push that up to around 1.0 percent. Heated canola will have much higher free fatty acid levels, as heat breaks the glycerol bonds. Free fatty acids are removed with sodium hydroxide — or “soda” — in the refining process. The sodium molecule in the soda attaches to the fatty acid molecule to make “soapstock”, which is removed from the oil in a centrifuge.

A lot of canola meal leaves the processing facility in pellet form for easy handling.



Moisture

The optimum moisture content for canola entering a processing facility is between 7 and 7.5 percent. That is the target moisture for ideal cooking and flaking results. (See step 2 in the sidebar.) Processing plants adjust canola moisture up or down as needed before cooking.

“This delays product flow, which is an economic factor,” Ghabour says.

Optimum moisture levels are also important to limit the risks associated with seed spoilage and potential incubation of harmful bacteria and mold. Artificially increasing moisture levels by adding water to the canola seed prior to delivery has the potential to exacerbate these risks. Although this is an uncommon practice and illegal in the United States, it is important to understand that adulterating the seed with water to increase product weight not only increases costs associated with handling, it also poses a risk on the quality and safety of the downstream products.

Dockage

Processing plants clean the seed prior to processing. Dockage removed in cleaning the canola is typically added back to the process after extraction.

continued on page 14

DON'T PUT \$#!& IN YOUR BINS

Clean bins thoroughly prior to storing canola, ensuring bins are free of treated seed and animal protein. Never use malathion to prepare canola for storage or to treat bins used to store canola.

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Scalpings, which are items screened out of the seed that cannot be reincorporated into the meal, are taken to the landfill.

“High dockage means extra work for the pre-cleaning step, and it can add extra handling costs if dockage exceeds the amount that can be added to meal,” Ghabour says.

Canola processing is an important and necessary step in producing the end products our customers want. The extra costs to process lower grade canola demonstrate why Canada has grading standards and why striving for No.1 has economic rewards. ●

Jay Whetter is the editor of Canola Digest.



Adel Ghabour, quality assurance manager with Richardson Oilseed, explains the key steps in canola processing at CanoLAB in Olds, AB.

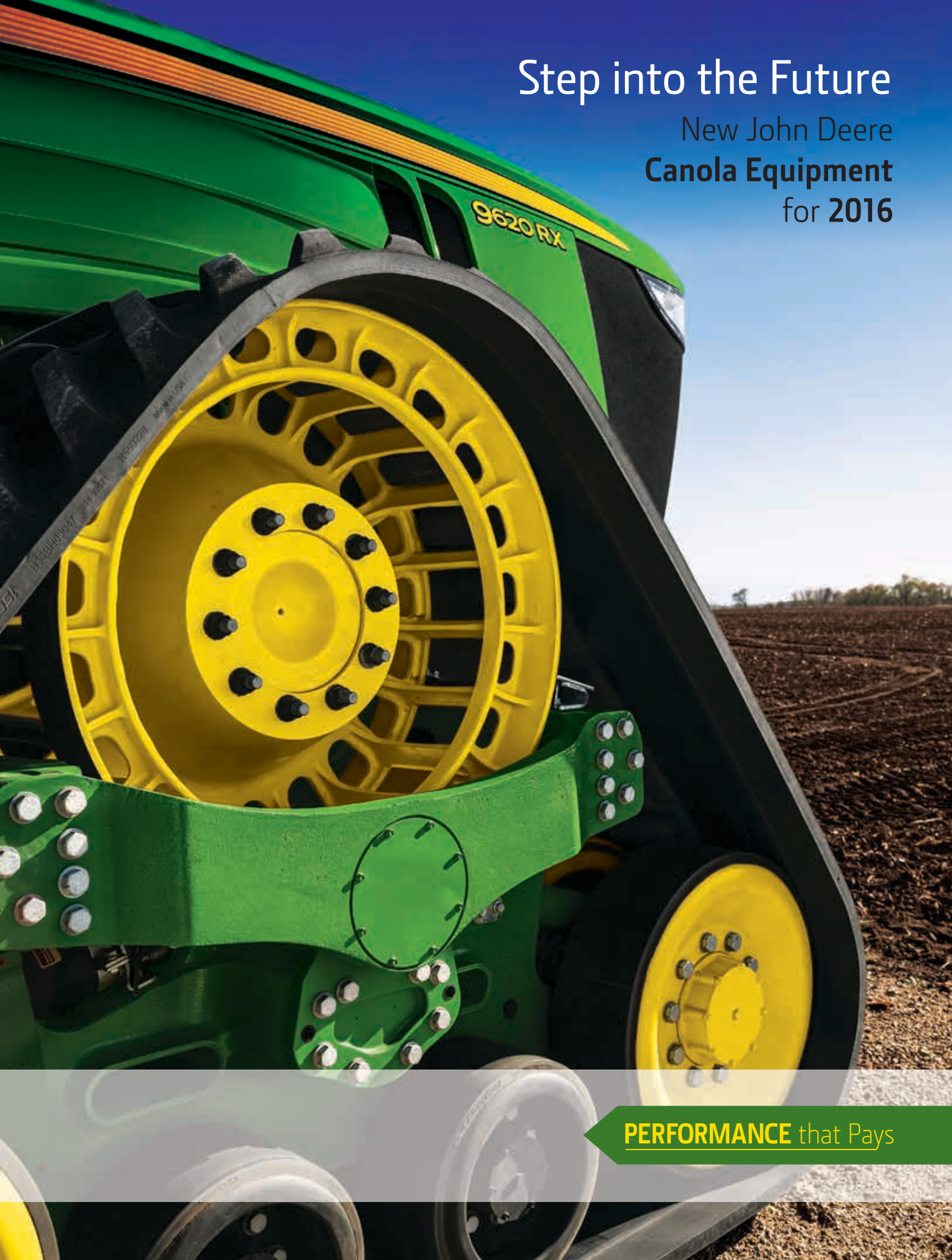
THE 11-STEP PROCESS

Canola goes through 11 major steps as it moves through a processing facility to be made into refined customer-ready oil and meal pellets.

1. Seed is delivered by truck either by individual producers or grain companies. The truck is inspected and sampled, then graded according to Canadian Grain Commission Standards to determine the value to the vender along with the current price for the grower. Seed is segregated as to the type and/or grade and stored until used by the processing plant. Modern processing plants usually just have a week or two of storage capacity.
2. Seed is cooked and then flaked by roller mills to ensure all oil is exposed to as much surface area as possible. Optimum flake thickness is 0.3 to 0.38 mm. Flakes thinner than 0.2 mm are very fragile, while flakes thicker than 0.4 mm result in lower oil yield.
3. A mechanical screw-type expeller squeezes about two-thirds of the oil from the flakes.
4. After expelling, the high-oil expeller cake (meal plus remaining oil) goes through solvent (hexane) extraction to separate the remaining oil. The cake moves through a long wash chamber as hexane is poured over top, dissolving the oil from the meal.
5. Meal is then heated to remove the hexane, which is condensed and used again. Meal is then ground and/or pelleted for sale into the feed market.
6. Oil removed from cake in step 4 is desolventized by heating it under vacuum. Hexane becomes a gas at 60 to 65°C, so it boils off at a much lower temperature than the oil, making separation easy. This gas is vacuumed from the heating chamber and condensed back into a liquid for reuse.
7. Oil removed from expellers in step 2 has the solids removed by filters or centrifuges and is combined with oil from the extraction process in step 6.
8. The combined oil then goes for refining. Step one in refining combines oil with sodium hydroxide — “soda” — to react with water-soluble components. This removes gums and free fatty acids to create a product called soapstock, which is a high energy feed ingredient. Soapstock is separated from the oil with a centrifuge.
9. Oil is then clarified using a clay that adsorbs any pigments remaining in the canola oil. Oil is filtered to remove the clay.
10. The final refining step is deodorization. Oil is heated to 240°C under almost perfect vacuum to distill off short chain molecules, such as any remaining free fatty acids, along with flavour and odour compounds. The final product is mild tasting, light coloured canola oil.
11. This oil is then weighed and shipped in railcars, truck tanks or smaller containers to a packaging facility where it is bottled. ●

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Learn more about [The Canola 100 Agri-Prize](#) and find out how you can win a complete set of John Deere equipment if you're the first farmer to crack 100 bushel canola. Visit www.AGRIPRIZE.com for official rules and details.

speed changes and can deliver prescription rates based on your defined management zone. Add a boost of uptime to your efforts with two key valuable systems: Load Command™ provides speedier load times and automatic disengage once the sprayer tank is full; Direct Injection lets you change rates and products on-the-go without stopping to mix.

You've done the work to get your canola to full growth; now it's time to get the full potential out of your field. We have a couple of options to help. First, for farmers who prefer to swath, go with the new **W155 Windrower**. The W155 allows full-width use of the platform with speeds up to 12 mph (19 km/h) to cut more crop in less time. Not only does the W155 have higher horsepower than its W150 predecessor, it delivers faster acceleration without stalling. And a new integrated AutoTrac option helps to reduce any operator fatigue.

For the straight-cutters among you, you're sure to appreciate the **2016 S-Series Combines**. They feature the entirely new Dyna-Flo™ Plus cleaning system. In limited shoe conditions, your total combine capacity in canola is heightened by 13%, providing 1.5 more acres harvested per hour. Equally as important, you get a 28% reduction in tailings volume. Add to that our new Active Terrain Adjustment option ... it adjusts the settings of the Dyna-Flo Plus shoe when working slopes. So if you have rolling terrain, this is a must. Active Terrain Adjustment ensures your combine maintains ground speed and minimizes grain loss whether you're going uphill or downhill. And don't forget our 2015 offering, the tough small grains package, which provides canola growers 20% more throughput. Add it all up and what you have is the most canola-focused combine ever engineered. Enjoy.

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By now you're familiar with **AutoTrac**, but here's a refresher: with this hands-free guidance tool, we take the pressure off manual performance and put it in the hands of our assisted steering technology. Serving as both a convenience and cost of ownership solution, AutoTrac can reduce input costs, lower fuel usage, and improve your overall operation.

Check out **Machine Sync**, our innovative machine-to-machine communication and logistics tool for increased productivity in the field. It simplifies unloading on-the-go by automating the position of the grain cart relative to the combine. And during seeding operations, coverage maps and guidance lines can be shared between tractors increasing productivity when running multiple seeders in the same field.

Then there's **Harvest Mobile**. It works directly from your iPad in your combine cab to deliver in-depth info on field performance by visualizing mapping layers such as ground speed, wet and dry yield, and average moisture. You can see exactly what's going on in your field. And it displays machine settings, like rotor speed, fan speed, and more. Harvest Mobile also enables Interactive Combine Adjustment (ICA). ICA simplifies machine controls to help the operator go from novice to know-it-all in far less time.



JOHN DEERE

By spending time at harvest to ensure the combine spreads straw and chaff evenly, growers can improve canola plant establishment in the spring.

By Justine Cornelsen

Start with the vanes

Plant establishment is one of four agronomy pillars on the Canola Council of Canada strategic plan to reach the average yield goal of 52 bu./ac. by 2025. The plan includes a 3 bu./ac. yield gain from better understanding of seed placement and seed mortality. Seeding slow and shallow with adequate moisture in the spring will give the tiny canola seed a chance to germinate. Seedbed preparation is an important factor to get that plant up and out of the ground, and a huge component of seedbed preparation starts in the fall with residue management.

Clumps of straw and chaff insulate the soil, keeping soil temperatures cool in the spring for seeding. Thick clumps of residue also make it difficult for the drill to place seed in the soil and for

seedlings to emerge when they are placed accurately. Good residue management in the fall will help enhance drill performance, allowing for increased seed survival and better field uniformity in the spring.

Combine adjustments

Let the combine do the work to provide a thin even layer of residue. This could eliminate the need to go in again to harrow or burn off residue. Before making any changes, get out and check spread patterns to see how performance can be improved. If displeased with the results, change one setting on the combine at a time to mark differences in performance. Here's where to look to make changes:

Vanes. Changing the angle of vanes on the back of the chopper can

be a simple and effective step, having one of the biggest impacts on the width and uniformity of residue spread. The deflector plate can be moved up or down and individual vanes can be adjusted side to side.

Cut height. Cutting higher means less residue goes through the combine and needs to be spread over the soil surface. The ideal is to find a cut height that is tall enough to improve residue spreader performance but not so tall as to affect residue flow through the drill in the spring. Taller stubble also traps more snow. Dropping straw for baling is one of the few situations where short stubble is appropriate.

continued on page 20

Sharp chopper blades will improve chop and distribution of residue.





Adjustment to the vanes can make a big improvement in the width and uniformity of residue spread.

Spread width. Larger header widths are becoming popular, which can present a challenge to the spreader's ability to reach that same width for even distribution. Combine specialists say it can be done, it just takes time and patience with the altering of settings. Varying environmental conditions will play a role in spread performance, so settings may need to be adjusted again to suit the changing conditions.

Chopper knives. Make sure straw chopper knives are sharp. Sharpen them or replace them if necessary. This needs to occur regularly.

Fan speed or chopper speed. Higher speeds may help in heavy stubble or with wide headers. However, when it comes to fan speed the first consideration should be to limit harvest seed loss. Crop yield takes a priority over residue distribution in this case. Chopper speed could be increased if needed.

Chaff spreader. Minor adjustments to the chaff spreader are possible to distribute chaff as wide and thin as possible.

Spreading chaff equally depends on the type of combine. Single rotor and conventional combines are fed differently and the distribution of chaff and straw will be different depending on the type.

Harrowing

Heavy harrowing can be useful to spread straw in the fall or early spring if errors in the combine's performance are evident. When using harrows, watch the level of aggressiveness as harrows cause soil erosion and disturbance, which will degrade the seedbed and dry it out. They can also rip out standing stubble, which is a beneficial crop residue component that helps prevent soil erosion. Standing stubble is also off the soil surface, which allows for optimal performance of drill openers.

Producers will notice their successful residue management steps in the spring while monitoring the stand establishment. With canola, a target of seven to 10 plants per square foot will ensure the crop can reach its full yield potential. Examine areas with low plant counts and determine if thick residue influenced emergence. Make note of chaff distribution patterns seen across the field and relate that back to combine set up the previous fall.

Harvest can be a rushed and hectic period. Taking the time to properly adjust the combine to ensure successful residue management will pay off in next year's plant stand establishment. ●

Justine Cornelsen is the Canola Council of Canada agronomy specialist for Alberta South.

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Interact with your grower organizations

Saskatchewan Canola Development Commission, Alberta Canola Producers Commission and Manitoba Canola Growers Association are farmer-directed organizations that exist to increase the profitability of canola producers through research and extension, advocacy, market development and consumer education. These organizations help farmers grow a better canola crop, positively influence legislation and farm policy, help consumers understand and be supportive of modern farming practices, and build strong markets for canola and its value-added products. They also look ahead, digging into terms like “sustainability” and “social license to operate” and what they really mean to the farm.

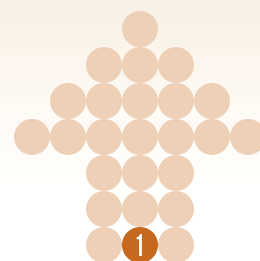
COLLABORATION



Producer groups contribute to the **Canola Council of Canada**, which works on behalf of the entire canola value chain on crop production, market access and trade, and market development. Producer groups work together with the **Canadian Canola Growers Association** to advocate for national policy issues. Canola producer organizations work with other commodity organizations to hold three major producer conferences each year: FarmTech in Alberta, CropSphere in Saskatchewan and CropConnect in Manitoba.

\$7.3 BILLION

The total farm gate receipts for canola in Canada in 2014, according to Statistics Canada. The canola industry's overall contribution to the Canadian economy is \$19.3 billion per year.



For every \$1 a producer organization invests in agronomic research, producers can leverage further public investment and a high return by applying the knowledge gained.

43,000

More than 43,000 farmers grow canola and depend on canola to generate a large share of their revenues.



TOP 10 WAYS

to interact with your canola organization

1. Call the office, talk to the staff.
SaskCanola: 1-877-241-7044
ACPC: 780-454-0844
MCGA: 204-982-2122

2. Explore the websites to find out more about the people, events and services each organization offers.
www.saskcanola.com, www.albertacanola.com,
www.canolagrowers.com, www.canolacouncil.org
and www.ccca.ca.

3. See us face to face at producer meetings.



4. Attend an event: FarmTech, CropSphere, CropConnect, AgDays or CanoLAB. Learn from the experts, connect with producer directors, meet organization staff.

5. Contact a Canola Council of Canada agronomist.

www.canolacouncil.org/what-we-do/canola-council-of-canada/agronomy-team

6. Listen to our radio shows and podcasts.

7. Sign up for free email newsletters: SaskCanola Producer Update, Alberta Canola Connections, and Manitoba's Canola Crush. Find the short sign up forms on the organizations' websites.

8. Read Canola Digest magazine.



9. Read Canola Watch, the CCC's free and timely agronomy email. Sign up at www.canolawatch.org.



10. Follow the organizations on social media. On Twitter, follow

@ellenSKCanola @AlbertaCanola
@CanolaGrowers @CanolaWatch



Help us help you. Use the opportunities above to tell the organizations what you need, want, like and dislike so they can meet your needs as a producer.

These five growers explain their last big agronomy change, the motivation behind their decision, the trusted advice they sought and the result.

By Jay Whetter

Decision precision



Val Katerenchuk

Val Katerenchuk St. Albert, AB

For the past five years, the Katerenchuks — who live in St. Albert but farm north of Vegreville — have been trying to modify their no-till John Deere air hoe drill to improve canola seed survival. “Our goal is to reduce our seeding rate without sacrificing our max yield,” says Val Katerenchuk. “We have tried cutting back our plants, but it reduces our max production. We need to get a better survival rate.”

So they started looking for a better paired opener. They looked for

helpful advice everywhere — from trade shows to the Internet — researching different openers and manufacturers. “After talking with Dutch specialists, we decided to try their modified opener that channels the seed horizontally versus down.”

They also put air brakes on the lines to slow canola seed so it drops into the seedbed without bouncing. They saw the air brakes on display at a John Deere trade show booth and at the AgLand dealership in St. Paul.

Their drill has 10" row spacing and 3.5" paired-row Dutch openers. They seed

at around 4.0 to 4.3 mph to maintain accurate seed depth between 1/2" and 1".

“Our drill is amazing in cereals, and the seed to fertilizer separation is perfect — no burn in either canola or cereals,” she says. But does it achieve the canola seed survival they seek?

“It used to be harder to find the canola seed. Now it’s easier to find and seed is where it’s supposed to be, so it must be working,” she says. However 2015 was a dry spring, so it may take another year to make a better assessment.

continued on page 28

Advantage

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Lee Moats

Riceton, SK

Lee Moats has added Greenseeker to his equipment line for canola and wheat production. He uses the boom-mounted sensors to make variable-rate nitrogen top ups based on the immediate needs of the crop.

“We had been concerned about over-applying nitrogen relative to the moisture available to us. We felt this was wasting money and probably not ideal for sustainability,” Moats says. “Greenseeker allowed us to mitigate the risk of over-applying and respond in those great years when the crop needs more nitrogen.”

Moats tapped into three important sources for background information to help guide his decision. First, his good network of agrologists. He has been

“Frequently I find it’s one individual who provides the impetus toward a solution. In this case it was Guy Lafond, who was working on Greenseeker research at the time.”

—Lee Moats

a professional agrologist for years and, at Ducks Unlimited, where he worked at the time, he had agrologist coworkers looking into the same issues of fertilizer rates, water quality and sustainability. Second, organizations doing practical research on variable rate fertilizer, including private agronomy companies, the University of Saskatchewan and Indian Head Agricultural Research Farm (IHARF). Third, the late Guy Lafond, the Agriculture and Agri-Food Canada (AAFC) research scientist who worked closely with IHARF.

“Frequently I find it’s one individual who provides the impetus toward a solution. In this case it was Guy Lafond, who was working on Greenseeker research at the time,” Moats says.

Greenseeker provided the tool to set nitrogen rates based on the crop’s immediate need. “Variable-rate fertilizer based on historical results didn’t relate to what I needed because on my farm the biggest variability is driven by in-season moisture,” Moats says. “My best areas this year would have produced zero yield last year because it was flooded out.”

The first few years Moats used Greenseeker, the tool called for top-dress nitrogen because rainfall was much higher than expected. With drier conditions this year, Greenseeker called for zero additional nitrogen.



Adam Gurr

Adam Gurr

Brandon, MB

Adam Gurr has changed his approach to canola seeding rates, a decision motivated by economics.

“I saw others going to rates as low as 2.5 lb./ac., which seemed too low to me,” Gurr says. “So I set up a replicated field trial for three seeding rates: 2.5, 4 and 5.5 lb./ac.” Gurr also runs AgriTruth Research, an independent field-scale research provider. See more at www.agritruth.ca and follow @Agritruth on Twitter. Farming decisions based on field trial evidence are important to him.

He is in the fourth year of seeding rate trials, and in that process he discovered a simple new way to set seeding rates using thousand seed weight as a guide. He takes the weight of the seed in grams per thousand, subtracts 20 to 30 percent, and uses that number as his seeding rate in lb./ac. For example, if seed weighs 5 grams, he’ll seed at around 4 lb./ac. (5 less 20% is 4). If seed weighs 4 grams, he’ll seed at around 3.2 lb./ac.

“I tried 4.5 mph and saw no difference in stand establishment.”

—Adam Gurr



Lee Moats

This approach provides enough seed to meet Gurr's target of 7 to 8 plants per square foot. What helps is that he has been able to consistently achieve seed survival of 80 percent or more.

Keys to his high seed survival rates, he says, are an independent-link drill that places all seed at a consistent depth (he has a Seed Hawk) and RTK guidance for precise inter-row seeding. Gurr has a no-till system, yet with his precise seed placement, all seeds go into black soil between last year's cereal rows.

He typically waits until the last half of May to seed canola, which will further help seed survival. He seeds at 5.5 mph, which he has found works well with his drill and soil conditions. "I tried 4.5 mph and saw no difference in stand establishment," he says.



John Kowalchuk

"I am lucky to have some very progressive farmers in my area that are willing to share their knowledge."

—John Kowalchuk

John Kowalchuk **Trochu, AB**

One of Kowalchuk's biggest challenges in canola production has been early weed control. He recently made the decision to start spraying the fall before canola, usually a post-harvest on wheat to help ease early weed pressure.

"What really drove the point home was one year I sprayed glyphosate on part of a field post-harvest," he says. "Even with a pre-seed application of glyphosate, the canola where I sprayed the fall before was much healthier due to less perennial weed competition."

Kowalchuk had been getting pretty good in-crop control throughout the field, but he felt that a lot of damage to yield potential had already been done, with weeds tying up early season moisture and nutrients. "Even at harvest, you could still see the difference between the part of the field that had the fall application and the part that did not," he says.

Good experience among his neighbours first gave Kowalchuk the idea to try post harvest applications to control perennial weeds. "I am lucky to have some very progressive farmers in my area that are willing to share their knowledge," he says. "I talked to a few of them and heard very good results."

He also talked to a few different retailers on timing of application and what rates to use, and had discussions with chemical company reps at field days.

"Weed pressure on my farm has steadily decreased over the last few years and this tells me that it is working very well," he says. "It's a nice feeling when you go to spray your crop in the spring and all you see is canola that's off to a great start with very little weed competition."



Charlene Bradley

Charlene Bradley **Stranraer, SK**

Charlene Bradley is a SaskCanola director and farms with her husband, Scott. They tried straight combining canola last year for the first time, motivated by continued frustration at watching swaths blow away in the wind.

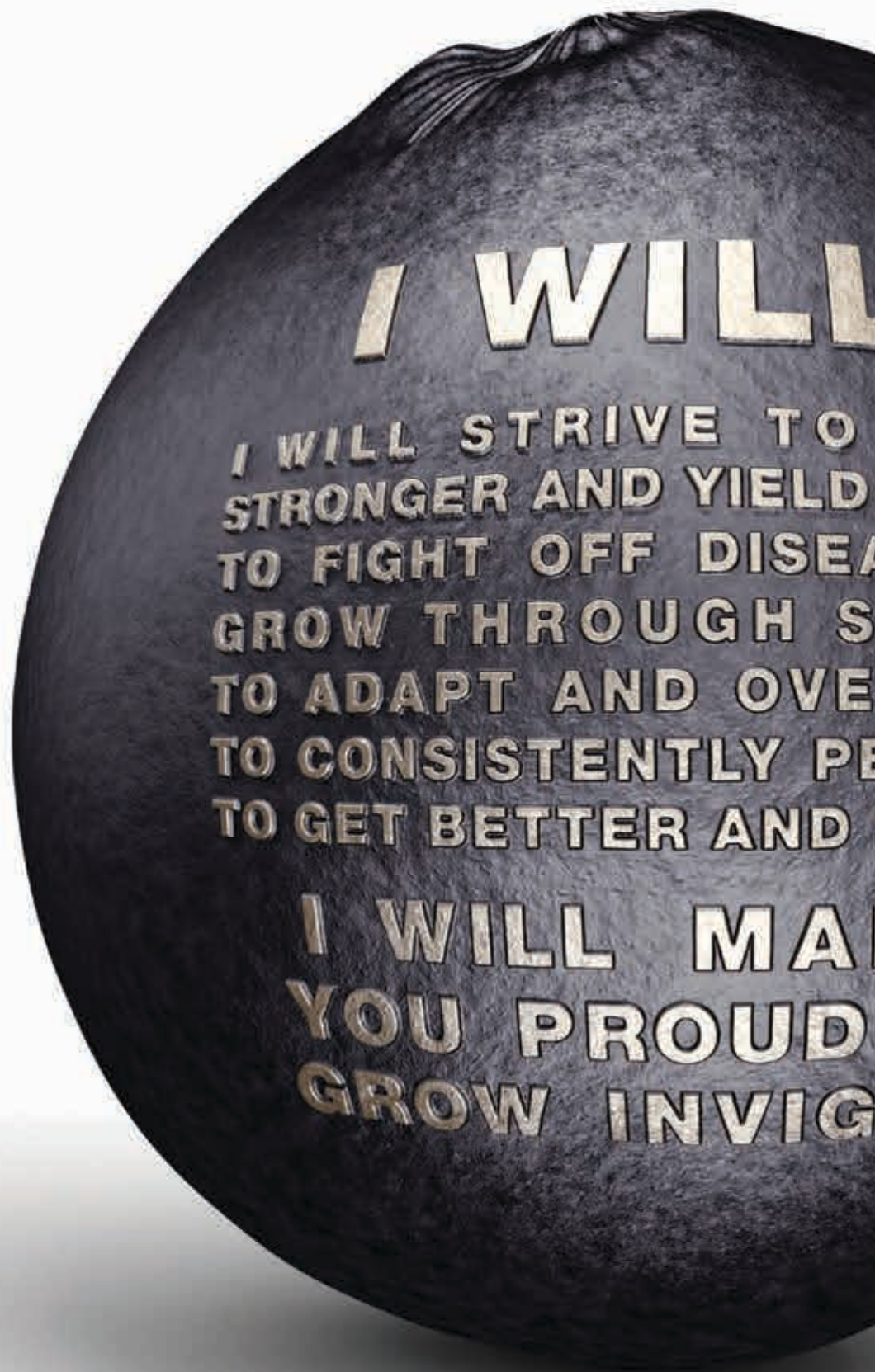
"Two years ago we lost an estimated 40 percent of our yield from rolling swaths," Bradley says. "Canola is an expensive crop to grow, and we felt that any risk from leaving canola for straight cutting would be much less than the pod shattering due to swaths rolling in the wind."

Last year's crop was another high-risk crop for wind-blown windrows. It has been hailed on and was short and light. Before straight cutting, the Bradleys reached out to others who had tried straight combining canola and read farm media coverage and other literature to gather tips to increase their success.

They had bought a John Deere 635 flex header a couple years ago, and their research suggested that it should be fine for straight combining. "We've run flex headers for 20 years or more, so we were fairly confident it would work and it did," Bradley says. "The table auger and variable speed reel made it easy."

Even though it was short and thin, the straight-combined crop yielded 25 bu./ac. The Bradleys plan to keep straight combining as part of their canola harvest program. ●

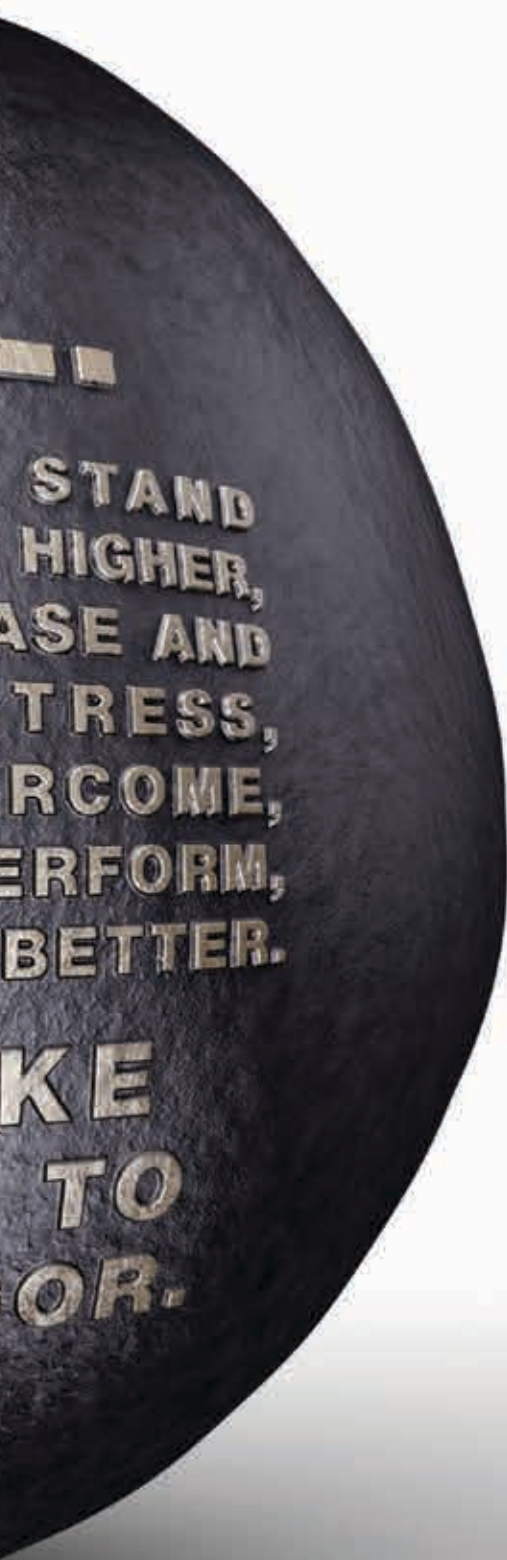
Jay Whetter is the editor of Canola Digest.



I WILL

**I WILL STRIVE TO
STRONGER AND YIELD
TO FIGHT OFF DISEASE
GROW THROUGH STRESS
TO ADAPT AND OVERCOME
TO CONSISTENTLY PERFORM
TO GET BETTER AND**

**I WILL MAKE
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The canola agronomy series for *Canola Digest* 2015-16 will look into some of the more difficult decisions canola growers face. This article looks at the time crunch at harvest and how one grower decides to swath or straight combine, when to swath and how fast to combine.

By Taryn Dickson

Harvest crunch



Time management at harvest is critical and decisions around plant maturity and harvest operation timing can preserve the yields you've worked hard all growing season to achieve. Lukas Hofer, farm boss at Treesbank Colony near Wawanesa, MB, has figured out a few ways to maximize the return on his time and effort. These may be applicable to many other growers, too.

Hofer manages 6,200 acres with about one third seeded to canola and the rest to wheat, corn, soybeans and faba beans. Hofer has found a way to reduce harvest losses considerably — achieving more than the 2 bu./ac. gain the Canola Council of Canada's strategic plan estimates growers can achieve, on average, from harvest management.

Harvest timing starts in spring

Hofer can't control the weather, so he focuses on the harvest components that he can control. "Staggering crops at seeding has helped," he says. "We put the early varieties in first and long varieties in later so we're more likely to have them all ready at different times. It spreads out the swathing window." Using this method, he can harvest fields in a sequence that maximizes each crop's yield potential and is achievable for him and his nine-person crew.

Hofer also pays extra attention to seeding rates, speed and spacing to increase his chances of a uniform field that will make the harvest timing decision easier.

Swath or straight cut?

Hofer considers whether to swath or straight cut before planting. For fields he plans to straight cut, he chooses varieties based on days to maturity, shatter resistance and lodging resistance. However, if conditions change by harvest time and straight combining isn't possible, Hofer will go with swathing.

"We want to secure the seed quality, so we look at the forecast along with how many acres are left to do, and then alter our planned course of action if needed," he says.

Hofer sees the potential benefits in straight cutting canola, but he always compares the outcome against swathed fields (noting the growing season conditions) to make an accurate

“Combine speed can change every year, but with the swath that our 35-foot swather lays down, we can’t go too fast. Just 3.5 to 4 mph.”

— Lukas Hofer

assessment. Straight combining does reduce manpower, fuel and necessary equipment. It could potentially increase yield, seed size and oil content, and decrease both green seeds and total harvest losses. But leaving canola standing also has drawbacks. “There is more risk if you leave it standing for straight-cutting, which can be nerve-wracking,” he says.

One way he reduces that risk is by using a pre-harvest glyphosate application. After trying four different intervals, Hofer determined the best option was harvesting 12 to 14 days after spraying. When using a desiccant or pre-harvest glyphosate application, it is always best to follow the label recommendations and to check www.spraytoswath.ca for pre-harvest intervals.

If Hofer happens to have two fields ready to straight cut at the same time, he goes with the higher yielding field first. “This helps get the risk out of the way and avoid having any potential hail or bad weather hit that field,” he says.

Good record keeping and being open to change are keys to making improvements and figuring out what works best, he says. And by trying limited acres at a time, Hofer spreads out the farm’s upfront risk while allowing him to test alternatives that could end up reaping huge rewards.

Swath timing

For swathed fields, Hofer aims to catch the crop at 70 percent seed colour change (SCC) and to avoid swathing during the hottest, driest portion of the day.

“I always like to take a turn on the swather and see how much shelling is going on. If that’s an issue, we’ll shut it down and go in the evening,” Hofer says. “We can swath all night if we need to,



in order to get the crop down safely without pods shattering or dropping.”

To judge SCC, Hofer wants to ensure the majority of the crop is at the perceived stage. “We walk into the field in several spots, on every quarter, and not just on the edge,” he says.

Measuring loss

When it comes to combine timing, Hofer focuses on moisture content. “We like to harvest at less than 10 percent moisture, preferably at 9.0 to 9.5 percent. However, if this doesn’t work out, we make sure to dry it down before storing it in the bin.”

To balance the lack of moisture, Hofer requires that combining be done at a low speed and that contents going out the back of the combine are checked. “Combine speed can change every year, but with the swath that our 35-foot swather lays down, we can’t go too fast. Just 3.5 to 4 mph.”

Hofer sets out six pans to check harvest losses. After the combine drives over the pans, they weigh the collected seeds. Based on their system, the aim

is to be under five or six grams. “If it’s at seven or eight grams we can adjust on the go, but if it’s 15 or more, we will stop,” he says. “These adjustments are absolutely worth the time and effort.”

Even though harvest can be a stressful time with limited hours, Hofer says it’s imperative to carry out management strategies to maximize yield. By keeping good records and constantly testing his techniques (against a check) in different situations, he can continue to learn and improve his harvest management techniques to increase the farm’s profitability.

“Don’t let people cut corners,” Hofer advises. “Checking fields in multiple locations, testing for harvest losses every time, and making adjustments as needed are all vital. ●

Taryn Dickson is the resource manager for the Canola Council of Canada’s crop production and innovation department.

The CCC took part in a June 2015 trade mission to create new export opportunities and increase agricultural trade with China.

By Maxim Legault-Mayrand

Sizzling opportunities in China

As appetites and middle-class wealth grow, China needs more food than it can produce domestically. The last decade has seen the rapid growth of canola exports to China from Canada to meet increased demand for edible oils.

A third of Canada's canola is exported to China, which represents \$2.8 billion annually. Canola exports to China consist primarily of seed and oil, with opportunities to grow the meal market. In this context, the canola industry aims to improve market access, as well as increase understanding of canola oil



Left: Meetings with key Chinese stakeholders during the mission allowed the CCC to build relationships with government, businesses and academics. Right: CCC president Patti Miller speaks to media at an event introducing canola oil to Chongqing.

health benefits and meal nutritional advantages. Promoting and exploring these business opportunities through trade missions can open doors for the industry, increase local engagement, reduce trade barriers and allow ongoing business-to-business dialogue.

On June 9-18, 2015, the Canola Council of Canada (CCC) took part in a trade mission with senior officials from Agriculture and Agri-Food Canada, the Canadian Grain Commission and the Canadian Food Inspection Agency in Shanghai, Chongqing and Beijing, China.

The trade mission focused on creating new export opportunities and increasing agricultural trade ties with China.

Delegation meetings with key Chinese stakeholders during the mission allowed the CCC to build relationships with government, businesses and academics. The mission also provided an ideal opportunity for a media event introducing canola oil to Chongqing media. This local engagement was a unique forum to share the growers' perspective on the Canadian

“Our media event was one way to help better inform Chinese consumers of the benefits of canola oil. Through this event we had the potential to reach over 500 million consumers.”

— Bruce Jowett

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By Carson Callum

Canola meal for Chinese swine and poultry

his past spring, the Canola Council of Canada (CCC) took part in a mission to China with members from Agriculture and Agri-Food Canada (AAFC) to promote Canadian canola meal as a beneficial protein ingredient for swine and dairy rations. The main goals of the mission were to establish new relationships with key businesses and academics, and to maintain connections with specific dairy companies.

Charles Qin, the new CCC canola meal representative in China, led the mission along with Denis Petitclerc, director general for AAFC's Science and Technology branch. Additional delegates on this mission included Martin Nyachoti with the University of Manitoba, and H  l  ne Lapierre and Candido Pomar with AAFC. Both Nyachoti and Lapierre currently run research programs as part of the canola meal Science Cluster Program under Growing Forward 2 with AAFC.

First stop on the mission was at the 2015 China Dairy Exhibition. Lapierre was an invited speaker and gave a presentation promoting the use

of canola meal in dairy feed rations. Thousands of dairy industry professionals from across China attended this event.

The next two stops were at two canola processing facilities in Fujian, both of which currently accept and process Canadian canola seed. The group met with representatives at each location to discuss their observed usage and perceptions of Canadian canola meal within the livestock industry. Both companies sell the meal primarily into the nearby aquaculture and duck markets, and there appears to be an opportunity to increase awareness about the value of canola meal as an ingredient in higher value dairy and swine diets.

Next, the group visited Wens in the province of Guangdong, the industry leader in swine and yellow bird production and the fourth largest feed enterprise in China. The technical team at Wens were very interested in the information provided on canola meal, specifically its use in swine and dairy diets. They expressed a strong desire to buy canola meal directly from Canadian processors. The CCC is working with Wens on the

possibility of running a demonstration using canola meal in swine diets. The goal is to raise the value of Canadian canola meal in the diets of pigs. Wens' usage of canola meal in swine diets is far below what current research supports.

South China Agriculture University in Guangdong, one of the top ranked agriculture universities in China, also welcomed the delegation. Nyachoti and Qin presented information about canola meal, feed efficiency and the livestock industry in Canada. The university has a study underway on the use of canola meal as a replacement for soybean meal in shrimp diets. Qin will maintain communication on this project.

Next, the group travelled north to meet with Newhope Liuhe Group in the province of Shangdong. Newhope is the most influential livestock feed company in China. The company is highly integrated, with a focus on swine and broiler nutrition. Newhope greeted the delegation with a tour of their lab facilities and gave a highly detailed report on canola and rapeseed quality in China. It has been identified that, in order for the CCC to provide



canola industry, the importance of the trade relationship between China and Canada, and the many health aspects of canola oil.

"Our media event was one way to help better inform Chinese consumers of the benefits of canola oil," says Bruce Jowett, vice president of market development with the CCC. "Through this event we had the potential to reach over 500 million consumers; it was a great success."

Apart from Chongqing's media event, the trade mission created the possibility of an annual Canada-China Canola/Rapeseed Dialogue held with key government and industry stakeholders. This dialogue would be focused on promoting a stable and predictable trading relationship, cooperation, and resolution of market access issues.

"China is undergoing significant change," says Patti Miller, president of the CCC. "This dialogue would lay the groundwork for improved understanding of issues impacting trade of canola between Canada and China."

The dialogue would provide opportunities to better understand a wide range of regulatory changes in China, as well as build an understanding of Canada's canola market among China's agricultural decision makers, Miller says.

The CCC is working in close partnership with the federal government to develop China as a predictable market. Support for market access and trade development activities increase the consumption and value of canola oil and meal in China. As demand for edible oils increases, cooperation and coordination becomes crucial for both industry and government. ●

Maxim Legault-Mayrand is market access manager with the Canola Council of Canada.



Charles Qin

CCC'S NEW MEAL CONSULTANT IN CHINA

In spring 2015, the CCC brought Dr. Charles Qin onboard to help promote canola meal to the Chinese feed industry. Qin has extensive experience in the swine and poultry feed sectors in China and brings forth many well established relationships with key feed companies of interest to the CCC. Qin is fluent in English and Mandarin and will work closely with the CCC's canola meal manager to promote canola meal to the dairy, swine, poultry and aqua industries in China. ●

promotional support for the canola meal produced in China by approved canola processing facilities, there needs to be a better understanding of the quality of this meal compared to the quality of meal coming right from Canada. Newhope may be just the company to help. Its R&D director has a strong collaborative relationship with canola meal researchers at the University of Manitoba.

The focus of the trip then returned to dairy diets as the group headed to Tianjin Agriculture University and Academy of Agriculture Science. Tianjin professor Xuewei Zhang, currently doing canola meal research, brought the group to Jialihe Dairy Farm, the top producing dairy farm in Tianjin. Its current canola meal usage is at two percent of total feed consumption. Jialihe Dairy gets its meal from the canola processing plant in Yingkou, Liaoning.

The group headed to Beijing to meet with chief dairy scientist, Shengli Li at China Agriculture University. Shengli Li took part in canola meal demonstration trials in dairy cattle in 2009. His efforts helped demonstrate the value of canola

meal as a key ingredient in dairy diets, specifically at Sanyuan Dairy, the company that services the Beijing fluid milk market.

The trip provided opportunities to establish several key relationships, specifically with the two major feed companies — Wens and New Hope. Charles Qin will continue to develop these relationships and others. The CCC's goal is to begin progressive canola meal promotion to the swine industry in China due to the proximity of this industry to the main ports of entry and canola processing facilities in China receiving Canadian seed. We face many obstacles when it comes to perception and usage of canola meal in China. But our hope is that a focused strategic approach will help us gain the highest value for canola meal in the largest livestock feed producing country in the world. ●





Carson Callum is canola meal manager for the Canola Council of Canada.

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The International Rapeseed Congress in Saskatoon attracted experts from around the world to provide updates on canola and rapeseed advancement. Here are some highlights.

By Jay Whetter

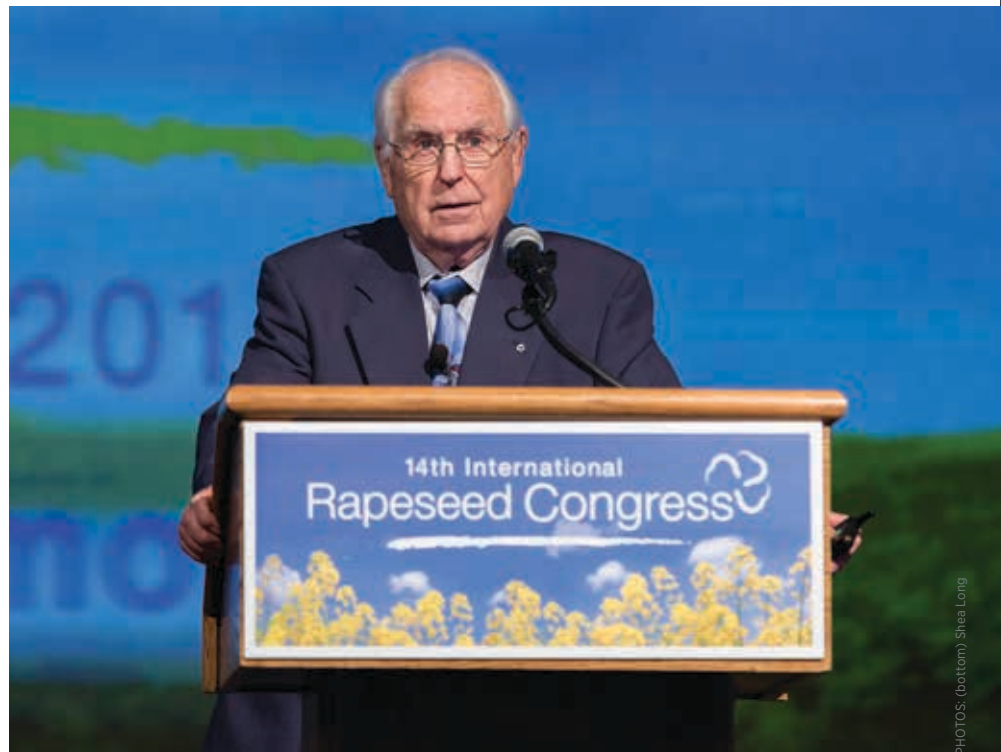
Global effort for a common cause: Canola

There is something comforting when you see public and private researchers from around the world meet to share knowledge and collectively advance canola and rapeseed production. You think, “This is a crop that matters.”

That is what happened this past July when Saskatoon hosted over 850 delegates from 33 countries for the GCIRC’s International Rapeseed Congress, a high level global gathering of canola and rapeseed scientists.

GCIRC, an abbreviation for a French title that translates as the International Consultative Group for Research on Rapeseed, was established in 1972 to facilitate and promote the scientific development of canola and rapeseed. This was its 14th International Rapeseed Congress (IRC), which is held every four years in different cities. The Canola Council of Canada (CCC) and AgWestBio co-hosted IRC 2015.

Keith Downey, one of the lead researchers who developed canola, presented the opening address. He says, “The congress is one of the few places where all the researchers in canola



Keith Downey, one of the lead researchers who developed canola in the 1960s, says the International Rapeseed Congress is one of the few places where all the researchers in canola come together for scientific exchange of information.



14th International Rapeseed Congress

SASKATOON 2015

Folkhard Isermeyer, president of Germany's Thünen Institute, says the fact Canada is the only major exporter of canola has both benefits and risks.



Peter Phillips, professor at the University of Saskatchewan, says Canada's increased market share of global canola/rapeseed production is driven largely by Canada's acceptance of seed technology.

come together for scientific exchange of information. It solidifies the world community on canola and rapeseed."

The adopters win

The GCIRC board has made a conscious effort to broaden the scope of the congress, which was historically production focused, to include more sessions on topics related to quality, processing, utilization and market trends.

Peter Phillips, distinguished professor at the University of Saskatchewan's Johnson-Shoyama Graduate School of Public Policy, and Folkhard Isermeyer, president of Germany's Thünen Institute, made back-to-back presentations looking at opportunities and challenges for canola and rapeseed.

Phillips showed that Canada had 25 percent share of global canola/rapeseed production in 2013-14 (and a five-year average of 23 percent), up from 19 percent two decades ago. He says this increased share is driven largely by Canada's acceptance of seed technology. "The adopters win," he says.

"When we export 90 percent of what we grow and process, market acceptance is key to a healthy, profitable industry."

—Patti Miller

But Canada is the major exporter of canola or rapeseed. The other large producing regions — Europe, China and India — use theirs domestically. The benefit, Isermeyer says, is that Canada has made strong trade relationships, giving it a significant competitive advantage over any other exporters entering the market. The risk, he adds, is that Canada relies on other countries' technology and trade policies to maintain its export business.

"This emphasizes the importance of the Canola Council of Canada's efforts in trade and market access," says Patti Miller, president of the Canola Council of

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AAFC research scientist Isobel Parkin says the complexity and liquidity of Brassica genomes gives canola an advantage over other oil crops when it comes to potential genetic advancement.

Canada and co-chair of the IRC event in Saskatoon. “When we export 90 percent of what we grow and process, market acceptance is key to a healthy, profitable industry. It also emphasizes the need for everyone in the industry, especially scientists, to help educate consumers and governments about the technology we use and its contribution to sustainable, safe food production.”

New specialty canola oils

James Petrie, a canola genetics specialist with Australia’s Commonwealth Scientific and Industrial Research Organisation, presented his latest work on developing a transgenic approach to modify canola oil to include eicosapentaenoic acid (EPA) and up to 12 percent docosahexaenoic acid (DHA) in the seed oil — two healthy omega 3 fatty acids humans get from eating wild fish. Given the stress on natural populations of wild fish and the health benefits of these oils, there could be significant demand for this canola — as long as it gets regulatory approval.

Petrie has successfully introduced a suite of genes from microalgae, the primary producers of these specialized fatty acids, into *Brassica napus*, and is currently working with the licensee Nuseed on field trials. “One hectare of 12 percent DHA canola equals the DHA from 10,000 fish,” he says. “This makes an extremely strong sustainability argument.”

Exploiting genetic diversity

The global canola and rapeseed effort is looking for lots of genetic solutions — including higher yield, disease resistance, drought tolerance and nitrogen use efficiency — and with advanced genetic mapping technology and genome sequencing, many solutions will continue to come through selective breeding.

Isobel Parkin, research scientist and canola geneticist with Agriculture and Agri-Food Canada in Saskatoon, presented on the complexity of the Brassica genomes and the benefits this complexity provides for canola.

“One hectare of 12 percent DHA canola equals the DHA from 10,000 fish. This makes an extremely strong sustainability argument.”

—James Petrie

The *B. napus* genome map, with around 100,000 genes, was first released in 2014 through an international collaboration led by Boulos Chalhoub, research director at French National Institute for Agricultural Research. In the short time since that work was completed, tools have come along that can map a genome in about 14 minutes.

With these tools, geneticists can explore the complexity of *Brassica* genomes to look for target genes. The six major Brassica oilseed species — *napus*, *rapa*, *junceae*, *carinata*, *nigra* and *oleracea* — have three major genomes. The enhanced tools scan genomes quickly, so geneticists can use the brassicas’ genetic fluidity to find desired traits and further develop other Brassica species as oil crops, Parkin says.

For example, geneticists can compare the genomes for canola lines with better drought tolerance to the genome of canola with low drought tolerance and observe the differences in gene expression. “This should give us a clean association for desired genes,” Parkin says. “We can use this to shorten the breeding process for traits of interest.”

Chalhoub, who collaborates with Parkin and 80 other scientists from around the world on this work, says *B. napus* has more than 2,000 genes responsible for oil production and biosynthesis, which is double the number of oil genes in soybeans and more than double the number in palm. With this edge in genetic diversity, canola breeders will be able to more quickly and broadly improve oil content and quality as well as other traits, Chalhoub says.

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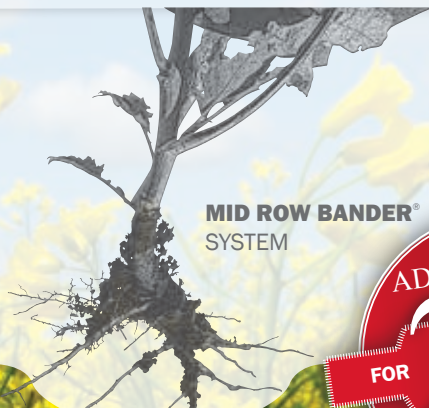
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Sclerotinia stem rot resistance: The challenge of phenotyping

While genetic sequencing has advanced rapidly, scientists still have a long way to go in identifying multi-gene traits and phenotypes. A phenotype is how a genome interacts with its environment.







The quest for true sclerotinia stem rot resistance demonstrates this challenge. Martin Barbetti, professor in plant biology at the University of Western Australia, leads a study in India, China and Australia to find sclerotinia resistance in oilseed brassicas. To be marketable, a resistance trait must relate to stem infection resistance, the most costly infection, and it must be repeatable, he says.

In his presentation, Barbetti used extreme close-up images to show how brassica plants with sclerotinia resistance will build up a wall of woody lignan cells around a stem infection, blocking it from getting into vascular tissue where it spreads. His team has found this “excellent resistance” to the prevailing sclerotinia biotypes among brassica crops in India.

What’s interesting is that resistance traits are often temperature dependent. Barbetti says that while some of the more promising resistance traits seem to work well at cool temperatures, the disease pathotypes seem to overcome the resistance at high temperatures.

Igor Falak, who has worked to develop Pioneer Hi-Bred canola with improved sclerotinia tolerance, says it could be 10 more years before we have sclerotinia resistance strong enough to eliminate the need for fungicide. Sclerotinia resistance is not a single gene like clubroot resistance, he says. With sclerotinia resistance, it will likely be quantitative with lots of genes working together. With so much “noise” in the environment, finding the genes

The major canola/rapeseed producers

	SHARE OF GLOBAL PRODUCTION (2014-15)*	DOMINANT CANOLA/RAPSEED SPECIES	GM PRODUCTION ALLOWED
 EUROPE (28 EU COUNTRIES)	34%	<i>B. napus</i> (double low glucosinolates and erucic acid)	No
 CANADA	22%	<i>B. napus</i> (double low glucosinolates and erucic acid)	Yes
 CHINA	20%	<i>B. napus</i>	Under review
 INDIA	10%	<i>B. juncea</i> and <i>B. rapa</i>	No
 AUSTRALIA	5%	<i>B. napus</i> (double low glucosinolates and erucic acid)	Yes
 U.S.	1.6%	<i>B. napus</i> (double low glucosinolates and erucic acid)	Yes
OTHER	7%		

*Source: USDA

responsible is difficult, especially since genes seem to express so differently depending on the environment, Falak says. “You have to respect the pathogen when you work with sclerotinia,” he says. “If you are not humble, you get smacked in the face.”

In the 130 or so presentations at IRC, the sharing and collaboration in all aspects of canola and rapeseed became clear.

“Fewer and fewer crops get significant attention from international private breeding companies. Canola remains one of them,” says CCC president Miller. “With palm and soybeans the dominant two vegetable oil crops globally, canola

needs the international collaboration that GCIRC strives for — especially for Canada, where canola is such a large part of the agriculture economy.”

Downey spoke about the value of having Canadian public and private researchers participate in the Congress and in ongoing collaborative research. “Canada used to be the leader in rapeseed and canola science in just about every aspect. We look around the world now, and China and Germany I think are well ahead of us and moving very fast,” he says. “Canola is a very important aspect of our diet and it’s very important for our income from foreign exports. Everything has to come together to make advances.”

The next IRC is in Berlin in 2019. For more on GCIRC, visit www.gcirc.org. For more on IRC 2015, go to <https://event-wizard.com/irc2015/0/welcome/>. ●

Jay Whetter is the editor of Canola Digest.

—Patti Miller

“With palm and soybeans the dominant two vegetable oil crops globally, canola needs the international collaboration that GCIRC strives for — especially for Canada, where canola is such a large part of the agriculture economy.”



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ABreport



Leaders wanted to represent Alberta canola growers

The Alberta Canola Producers Commission (ACPC) is seeking four canola growers to serve as directors on the board for a three-year term. This year, directors are needed in regions 3, 6, 9, and 12.

ACPC divides Alberta into 12 regions, with each region electing a producer director to represent the canola growers in that region. The board of directors meets quarterly and is guided in decision making by four committees comprised of board members: Agronomic Research, Governance and Finance, Grower Relations and Extension, and Market Development.

Who can become a director? Anyone who has paid a service charge on canola to ACPC since August 1, 2013 is eligible to stand as a director. Eligible producers can be individuals or represent a corporation, partnership, or organization. In order to be nominated, eligible producers must grow canola within the defined region but do not have to reside within it.

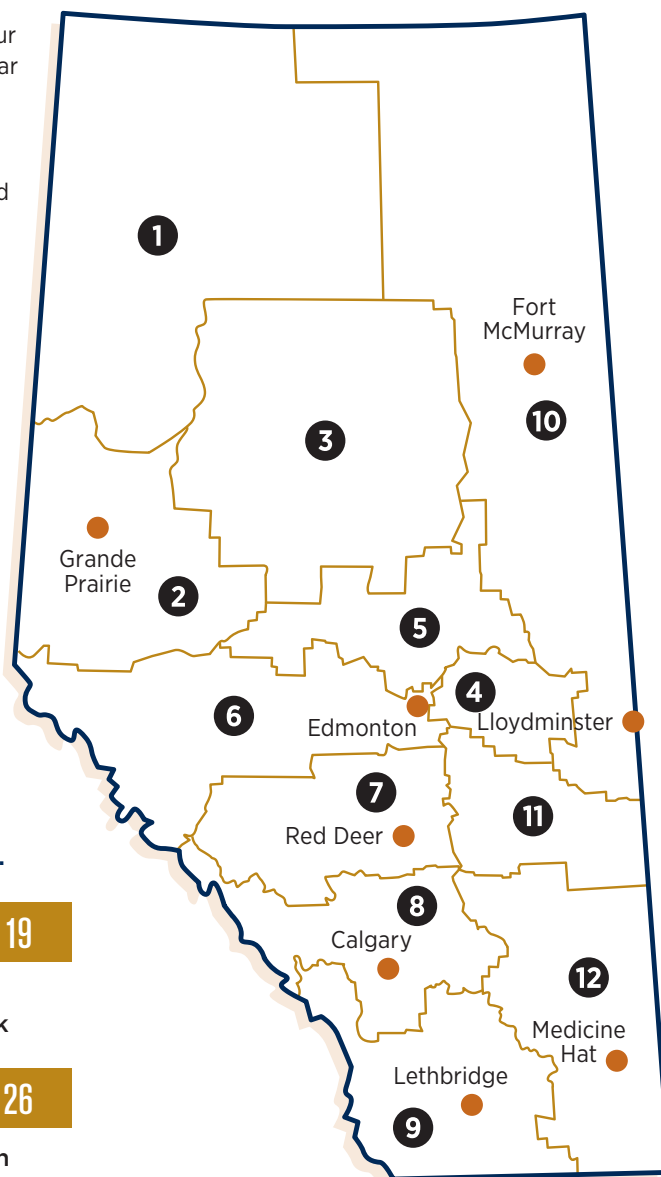
For detailed descriptions of the regions, or for more information please visit www.albertacanola.com or call the office at (780) 454-0844.

2015 Regional Meetings

Get the knowledge you need to be more profitable at one of our 12 regional meetings. Topics will include agronomy, marketing and business management.

Find the meeting nearest to you and save the date.

NOVEMBER 17	NOVEMBER 18	NOVEMBER 19
Grande Prairie Strathmore	Fairview Calmar	Falher Westlock
NOVEMBER 24	NOVEMBER 25	NOVEMBER 26
Lacombe Camrose	Vulcan Vegreville	Vermilion



CONNECT WITH US!

ACPC Connects is your window into the activities of the ACPC as we work both locally and globally to make Alberta canola producers more profitable. These posts are written by our directors and staff. The post on our recent event, canolaPALOOZA, was written by John Guelly, director in region 5. You can find more Connects posts on www.albertacanola.com. ●

An agronomy carnival at canolaPALOOZA

By John Guelly, ACPC director

canolaPALOOZA took place June 23, 2015 on a bright, sunny day at the perfect plot of land at the Agriculture & Agri-Food Canada Lacombe Research Centre in Central Alberta.

Over 250 of our closest friends (producers and agronomists) and dozens of Western Canadian canola experts met to look, listen, talk and ask questions about the thousands of canola plants that were planted earlier this spring. It was a magnificent combination of information, carnival atmosphere, food, and impromptu social get-togethers.

Registration was free, and the ACPC and Canola Council of Canada hosted the event in cooperation with the fabulous technical and scientific staff at the Lacombe Research Centre. There were several generous sponsors.

The event was designed with no set schedule. Attendees were encouraged to spend as much time at each station as they wanted, jumping into a conversation with any of the available experts to ask questions on anything from soil profiles to combine settings. It was nice to have the option to learn as much as you wanted without time restrictions and still be able to visit friends and neighbours whenever you wanted.

Stations included:

- Soil pits, soil sampling and soil tests
- Bees and honey
- Plant stand diagnostics
- Insects and pests
- Seeding rates and spacing
- Canola diseases
- Fertility trials
- Combining losses
- UAV and drone applications
- Spray nozzle selection

More than 70 canola plots sized 12' by 50' were growing on hand to give a powerful visual and speaking points. Plots included comparisons of:

- Seeding rates
- Seed sizes
- Row spacing
- Planting equipment types
- Micro applications
- Macro rate changes

As well as mystery diagnostic plots including:

- Seeding speed
- Seeding depth
- Excessive trash
- Conventional till versus direct seeding

Lunch was free and available from a number of on site food trucks that included fish or pulled pork tacos, gourmet grilled cheese made with many options such as apples, bacon, and maple syrup; an ice cream truck, churros, popcorn and much more.

This was a fun-filled educational event that benefitted all canola producers, from new growers to the well-seasoned canola gurus. An event like no other I have been to. Time is sacred during the growing season, but this was one event that was well worth parking the sprayer or taking a pass on that round of golf and a burger. We can only hope that canolaPALOOZA grows into an annual event! ●

Ross McKenzie and Roger Andreiuk went to great depths to discuss soil profiles.



The disease station featured the pathologists known as the "Lesions of Doom" and a dunk tank!





Global perspectives... local knowledge

The canola industry was lively during the summer season with many top-notch events, including the 14th International Rapeseed Congress (IRC) held in Saskatoon July 5 to 9, co-hosted by Ag-West Bio and the Canola Council of Canada (CCC). IRC is the most comprehensive forum for discussing advancement in the rapeseed industry.

To complement the world-renowned IRC event, SaskCanola hosted a Blackleg Summit in Saskatoon on July 5, providing an opportunity for researchers involved in SaskCanola's Growing Forward 2 Agri-Science Project to present their work to both the public and private research community. Attendees represented the upper echelon of the blackleg research community, including researchers from many parts of Canada, the U.S., Australia, China, France, Germany, Serbia, Czech Republic and Poland.

Initial research results presented about blackleg (also known as phoma stem canker that afflicts susceptible canola varieties) demonstrate significant progress in both the understanding of the blackleg pathogen and resistance. Many of the research studies focused on the development of blackleg-resistant cultivars by introducing novel resistance genes transferred through hybridization. Understanding the disease and fungicide resistance in pathogen populations can also help determine the sustainability of chemical management of blackleg disease.

The Blackleg Summit marked a midway point under the Growing Forward 2 Agri-Science Project for SaskCanola and partners, the Alberta Canola Producers Commission and the federal government. They will continue to fund researchers from across Canada to work towards new discoveries and solutions for blackleg in canola until 2018.

As a finale to IRC 2015, on July 9th Congress attendees had the opportunity to participate in field tours east of Saskatoon. The tours were a collaborative, community event, with representation from Agriculture and Agri-Food Canada (AAFC), BASF, Bayer CropScience, Canola Council of Canada, Cargill, Crop Production Services, Dow AgroSciences, Monsanto, and SaskCanola. Participants had the opportunity to see historical canola plots at the AAFC research station, and company representatives provided background about the Canadian canola industry while leading them through plots seeded with different varieties of canola.

Producers in attendance identified several important factors that affect crop quality worldwide, including the need for proper integrated pest management (IPM), weed management, lower rates of seed pod shatter, and drought tolerance.

The historical canola plot tours served as a great way to wrap up a monumental week for the canola industry. A week that celebrated how far we've come as an industry in terms of leading edge research, collaboration and innovation — and showcased the endless opportunities that lie ahead as we look towards a very bright future for canola! ●

CropSphere 2016 Conference

SaskCanola has been working with other commodity groups to present Saskatchewan farmers with the third annual CropSphere conference in Saskatoon, January 12-13, 2016. We are pleased to partner with the Saskatchewan Pulse Growers, Saskatchewan Oat Development Commission, SaskFlax, SaskBarley, and Sask Wheat.



Three keynote speakers have been confirmed to present at the conference:

- **Jesse Hirsh** – a broadcaster, researcher, public speaker and internet strategist, Jesse analyzes trends and developments in technology.
- **Jeff Rubin** – economist, author and former chief economist with CIBC World Markets.
- **Kristjan Hebert** – grain and oilseed farmer from Fairlight, SK, and managing partner of Hebert Grain Ventures.

Breakout sessions will allow producers to choose topics that will help them the most in their farm business operations. Four breakout rooms will run concurrently to address topics related to research and agronomy, new technology, marketing and general agriculture issues.

In addition to the conference sessions, the host groups will hold their annual general meetings (AGMs) at TCU Place during the week. We encourage registered canola producers to attend the SaskCanola AGM on Monday, January 11, 2016 at 1:00 p.m.

Please visit www.cropsphere.com to view the conference program and pre-registration details. Follow [@cropsphere](https://twitter.com/cropsphere) on Twitter for the most up-to-date information. ●

SaskCanola launches new strategic plan

This summer, SaskCanola announced a new strategic plan that aims to increase engagement with producers and elevate canola's profile to the next level. Dale Leftwich, Chairman of SaskCanola's Board of Directors, said the plan sets out the vision and mission, and defines action for how the organization will continue to add value to producers' canola.

"SaskCanola's vision is focused on making producers and their communities more prosperous," said Leftwich, who farms near Esterhazy. "We are taking a holistic approach. Saskatchewan producers grow a variety of crops including canola, they serve their communities, they provide mentorship to young producers, and they add significant value to rural and urban localities. Growing producer prosperity encompasses all of these things."

SaskCanola has established four strategic priorities for the organization:



RESEARCH

- Focus research expenditures on fostering innovation, decreasing production risk, and increasing sustainability, resulting in enhanced producer profitability.



PRODUCER ENGAGEMENT

- Engage in dialogue with Saskatchewan canola producers to strengthen relationships and gain understanding so we can best address their challenges.



ADVOCACY

- Provide a positive influence on legislation and policy to improve the landscape for producers.
- Inform and influence consumers in order to improve their perceptions of canola and agriculture.



CANOLA PROMOTION

- Promote the value of canola and its products leading to increased demand and enhanced customer awareness.

"Our new plan will propel us forward in pursuit of excellent opportunities that will benefit producers," explained Janice Tranberg, SaskCanola's executive director. "Collaboration with the entire value chain will be key to progressing in the most efficient and effective manner."

For more information about SaskCanola's strategic plan and priorities, please visit saskcanola.com/news/latest_news.php?detail=617. ●

SAVE THE DATE

NOVEMBER 24-25, 2015

Agribition Grain Expo

Evraz Place, Saskatoon, SK

NOVEMBER 2015

Producer Meetings

SaskCanola is working collaboratively with partners on this fall's producer meetings to be held in various locations across Saskatchewan in November.

For the latest event details and pre-registration information, please visit www.saskcanola.com or call 1-877-241-7044.

JANUARY 11-14, 2016

Crop Production Show

PrairieLand Park, Saskatoon, SK

Stop by the canola booth in Hall B to talk with SaskCanola board and staff and Canola Council of Canada staff and agronomists.

JANUARY 11, 2016

SaskCanola AGM

TCU Place, Saskatoon, SK

JANUARY 12-13, 2016

CropSphere

TCU Place, Saskatoon, SK

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MBreport



Interested in helping to shape the future of the canola industry?

The Manitoba Canola Growers Association (MCGA) is seeking members to stand for election for its board of directors. This is a great way to get involved with an organization that is at the cutting edge of the canola industry. MCGA oversees the distribution of research funds, promotes Canadian canola and represents canola growers in industry matters.

Eight members from around the province are elected to the MCGA board. Four members are elected as directors every two years and serve a term of four years. Directors can continue to serve on this board for three consecutive terms (for a total of 12 years).

Nominations should be submitted to the main business office, 400-167 Lombard Avenue, Winnipeg, MB, R3B 0T6, on or after October 15, 2015 and no later than 4:30 p.m. C.S.T. on November 2, 2015. Nomination forms must be signed by six eligible MCGA members and must be accompanied by a picture and short biography (limited to 150 words or less). Nomination forms are available on our website or by calling the office at 204-982-2120.

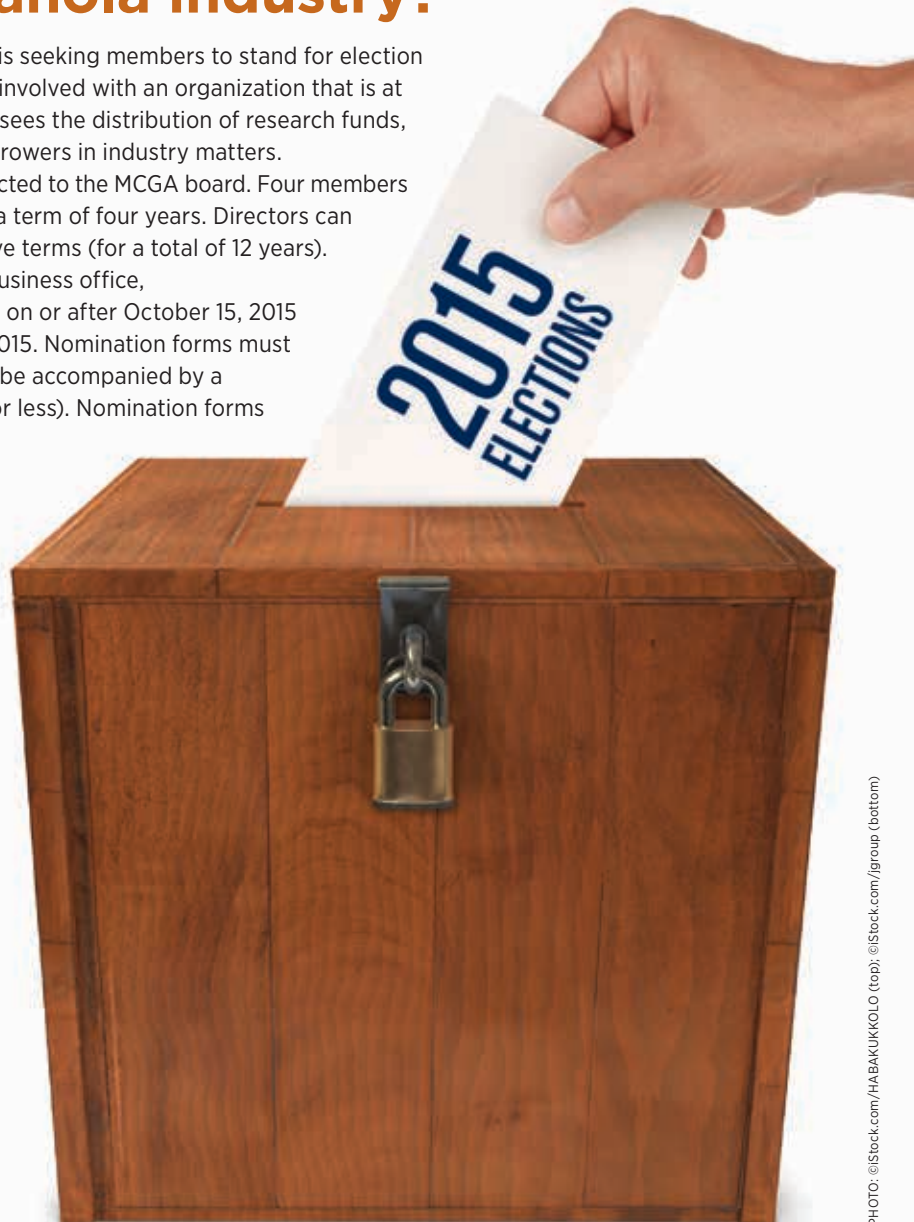
For more information on election procedures, board duties and how to become a director, visit www.canolagrowers.com. ●

Board member benefits

Why become a board member?
What's in it for me and my farm?

- Networking with farmers across Canada
- A 30,000-foot view of the canola industry and its impact on your farm
- Help ensure the farm voice is strong, effective and impactful in regulatory affairs
- Develop skills in business connections, media interactions, board governance and many other areas
- Varying levels of involvement based on your available time

The canola and agriculture industry need your voice to remain an effective, strong voice. Broaden your horizons. Join the MCGA Team. ●





SAVE THE DATE

CropConnect Conference

February 10-11, 2016
Victoria Inn, Winnipeg MB

2015 Scholarship Winners

The Manitoba Canola Growers Association is proud to announce the 2015 scholarship winners. Five \$1,000 scholarships have been awarded to deserving high school students across Manitoba.

This year's recipients are:



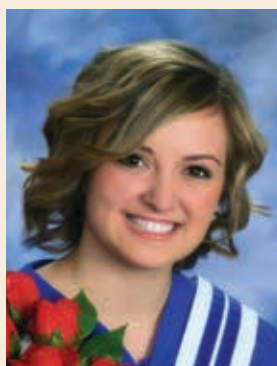
Kalen Dunn

from Hartney, MB plans to attend the University of Saskatchewan to take Agriculture and Bioresources.



Tara Frisch

from Manitou, MB plans to attend the University of Manitoba to take Pre-Veterinary Studies.



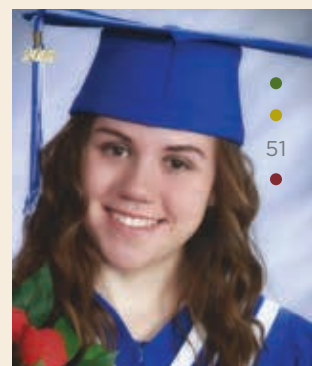
Nikoda Holopina

from River, MB plans to attend the University of Manitoba to attend the Asper School Commerce Program.



Renate Jochum

from St. Francois Xavier, MB plans to attend the University of Manitoba to take Agriculture.



Halle Thomas

from Hartney, MB plans to attend the University of British Columbia Okanagan to take Nursing.

The \$1,000 scholarships are available to students who come from a farm that is a member of the Manitoba Canola Growers Association, and who are planning to attend post secondary education in any field within two years of graduating. Students submitted their applications, which were judged by an independent panel based on academic standing, canola connection, references, essay submission and school and community involvement.

Congratulations to this year's winners! We wish you the best of luck as you pursue your chosen careers. ●



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Sign up for our **Canola Crush Newsletter** to get timely information on canola agronomics, research, marketing and upcoming events. Sign up at www.CanolaGrowers.com



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Students learn how to advocate for food science.

By Alison Neumer Lara

Standing up for science

Like many food science students, Ohio State University's John Frelka and Matthew Teegarden reasoned that logic and an abundance of scientific evidence might open up a healthy dialogue about food in the sometimes fact-starved world of bloggers.

Together with four other students, they penned an open letter to Vani Hari, better known online as the "Food Babe," an author and activist critical of the food industry. Many accuse her of fear-mongering with investigations into ingredients she calls "toxic."

"It is all too tempting for us to use this opportunity to pick apart your investigations individually," the students wrote in a post that went viral and caught national attention. "Instead we will take your attacks in stride and use them as motivation to further our scientific prowess and do a better job in communicating good science to the public."

The importance of educating the public about food science and technology has been a long simmering issue for the food industry, which has traditionally commented gingerly (if at all) in cases

such as the Food Babe. But now, as online misinformation increasingly results in confused and concerned consumers, food scientists and the food industry are recognizing the critical need to add their voices.

Making sense of science

As part of this effort, CanolaInfo, the Canola Council of Canada's global oil promotion program, sponsored the first Food Communicators Workshop led by the Institute of Food Technologists (IFT). As part of the application process, IFT asked all 45 entrants to submit a video discussing food science and technology in consumer-friendly language. Frelka and Teegarden were among 10 graduate students and young professionals selected from across the United States to attend.

The one-day program, held at IFT's headquarters in Chicago in April, provided participants with intense media training, including social media tactics, interviewing techniques and how to boil key issues down to a sound bite to reach a target audience.

"The workshop was a great opportunity to help bright, young food scientists – those preparing to enter the industry and eventually lead it – hone the skills necessary to become advocates for food science," said Shaunda Durance-Tod, CanolaInfo program manager. "Canola oil has unfortunately been subjected to myths and misinformation in the media so we know how important it is to communicate with consumers and stand up for science."

At the workshop, Durance-Tod spoke about some of those myths and how effective communication through a variety of mediums – from media outreach to industry partnerships – is helping dispel them. Participants also had the opportunity to work through a case study involving canola oil: a post by the Food Babe with several false accusations that the oil is harmful to human health. In the exercise, students outlined strategies to respond via traditional and social media in their roles as food scientists.

continued on page 54

"Canola oil has unfortunately been subjected to myths and misinformation in the media so we know how important it is to communicate with consumers and stand up for science."

—Shaunda Durance-Tod

John Frelka, with the beard and blue shirt, takes part in a session at the IFT Food Communicators Workshop. The Ohio State University student joined five others in writing an open letter to the Food Babe blogger challenging her misinformation.





Lily Yang practices her on-camera communication at the IFT workshop. Yang helps coordinate “barfblog,” an evidenced-based opinion page on food safety issues.

Joining the conversation

An important first step is to simply speak up, stressed John Coupland, professor of food science at Pennsylvania State University and incoming IFT president, who also spoke at the workshop. Coupland has a blog called “Chemicals in My Food” and also blogs for Popular Science.

“As food scientists, we need to be confident talking about what we do and its value,” he says. “After a major food article or issue in the news, the public conversations that follow are worse because food scientists tend to keep their heads down. We’d have a better society and better food if we’d be willing to engage in a conversation about it.”

Workshop participants responded enthusiastically to this call for action and many of them, like Frelka and Teegarden, are already tweeting, blogging and podcasting their way into the discussion. This led them to apply for the workshop and connect with other participants.

“Together, I think the 10 of us can be a very powerful voice,” says participant Nicole Arnold of North Carolina State University. “As an individual, you can only do so much, so it’s important for

“Be conscious of how easy it is to get seduced into extrapolating and talking outside your expertise. Once you get that plausibility, you have more responsibility. You have to make the effort to be right.”

—John Coupland

us to bond together on these different hot topics and misinformation.”

Lily Yang of Virginia Tech, who, with Arnold, helps coordinate “barfblog,” an evidence-based opinion page on food safety issues, argued that all their peers should be ready to publicly stand up for science, too. “Not all food scientists want to communicate, but if they do get asked questions, they should know how to speak and what to say,” Yang says.

Food scientists can also be proactive in helping the public understand these issues. “We need to start the discussion rather than waiting to get attacked and react,” says Lindsay Murphy, a participant from the University of Tennessee.

To that end, workshop presentations sought to help students understand how to make effective arguments – primarily, how to break down the science and make it relatable to consumers. Participants learned about using anecdotes and non-scientific language to explain concepts.

“We want, as a scientific society, to disagree in a civil way,” says Jerry Bowman, vice president of communications and media relations at IFT, who led the day’s media training. “But you’ve got to get out of the lab and make it personal.”

At the same time, Coupland cautions, scientists must recognize their limitations, even if pseudo health bloggers or general assignment reporters don’t.

“Be conscious of how easy it is to get seduced into extrapolating and talking outside your expertise,” he says. “Once you get that plausibility, you have more responsibility. You have to make the effort to be right.”

An important lesson for all. ●

Alison Neumer Lara is communications manager at Inkovation, Inc. in Chicago, Ill.

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