2017 Guide

SaskSeed

Saskatchewan Seed Growers Association

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PUBLISHER: Shaun Jessome
MANAGING EDITOR: Michael Raine
EDITOR: Brian Cross
ART DIRECTOR: Michelle Houlden
ADVERTISING DIRECTOR: Kelly Berg
CREATIVE DIRECTOR: Robert Magnell
MARKETING MANAGER: Jack Phipps
COVER PHOTO: William DeKay

EDITORIAL: P:306-665-3544
Editorial fax: 306-934-2401
newsroom@producer.com

ADVERTISING: 1-800-667-7776
Advertising fax: 306-653-8750
advertising@producer.com
NATIONAL SALES: Lisa Graham / Denise Bott
Suite 201 - 300 Willow Road
Guelph, Ontario N1H 7C6
Tel: 519-836-4072 Fax: 519-836-2499

SUBSCRIPTIONS: 1-800-667-6929
Subscription fax: 306-244-9445
subscriptions@producer.com

Return undeliverable Canadian addresses to: P.O. Box 2500 Stn Main, 2310 Millar Ave., Saskatoon, SK S7K 2C4.

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PRESIDENT'S MESSAGE

ROY KLYM | PRESIDENT, SASKATCHEWAN SEED GROWERS ASSOCIATION

For the 36th year, the Saskatchewan Seed Growers Association presents the *SaskSeed 2017 Guide*. Within these pages are articles that we believe are both timely and informative to assist you in 2017 crop planning.

Seed is the foundation on which the profitability of your operation is built. If your seed does not have the correct genetics, it does not matter how much you invest in nutrients, crop life products and shiny new iron. Without good seed, it may be impossible to reach maximum economic yield for your operation.

The Varieties of Grain Crops 2017 edition supplies you with an immense amount of information on selecting the correct varieties for your operation. As our markets become more selective and disease pressures increase, it is paramount to select varieties with the correct attributes.

This information is collected, correlated and authorized for submission and publication by the Saskatchewan Advisory Council for Grain Crops. Members of this organization should be congratulated for their hard work and dedication to agriculture in Saskatchewan.

These past few years have seen enormous changes throughout the grain industry. But with change is opportunity. Due to recent regulatory change, there will be a greater selection of new varieties to choose from. As pedigreed seed growers multiply new varieties for distribution to commercial growers, invaluable insight into the production of these crops is gained. Be sure to tap into this wealth of information before you make your varietal selections.

Both public and private breeding institutes continue to improve the quality and genetics of our grain and forage crops in Saskatchewan.

While it appears to progress at a slow speed to many, these dedicated individuals work tirelessly in an ever increasing, technologically-advanced system.

Through the purchase of certified seed, you are contributing to this research and the breeding of future varieties.

Research into genetics, agronomy and production methods has in the past and will in the future keep Saskatchewan growers competitive in the global marketplace.

The Saskatchewan Seed Growers Association and myself wish you all a prosperous and rewarding year in 2017.

THE TIMES ARE CHANGING … SO ARE FARMERS' VARIETAL CHOICES

BY SASKSEED STAFF

Western Canadian wheat growers are always on the lookout for promising new varieties that produce bigger yields and larger profits.

Last year, they found one in AAC Brandon.

According to the Canadian Grain Commission's *2016 Insured Acreage Report,* AAC Brandon was easily the most widely grown spring wheat variety in western Canada last year. Distributed by SeCan, Brandon was grown on more than 1.16 million insured acres across the West last year, up from 325,000 acres in 2015.

According to the CGC report, the vast majority of Brandon's acres were in Manitoba.

Growers there planted roughly 833,000 acres of Brandon compared to Saskatchewan producers who planted 252,000 acres and Alberta growers who planted 78,000.

Brandon's emergence as the most popular CWRS variety in the West occurred quickly.

In 2015, it was Western Canada's 12th most popular red spring variety, with total insured plantings of just 325,000 acres.

Brandon's 2016 acreage represents a 360 percent year-over-year increase, enough to push the variety past other more established CWRS offerings such as Harvest, Stettler and Utmost. It also surpassed other varieties that are rated moderately resistant (MR) to fusarium headblight, such as Cardale and Carberry.

Todd Hyra, Western Canadian business manager for SeCan, said a combination of factors allowed AAC Brandon to gain a larger share of Prairie wheat plantings last year.

"It's got a decent yield so it's among the top yielders but I don't think that's where the magic lies with this variety," Hyra said.

"Instead, it's the height, the straw strength and the fusarium rating. That's really what's working for this variety — in combination with yield potential — to make it very attractive to growers."

According to Hyra, Brandon's improved harvestability makes it an appealing option to busy growers who have lots of acres to manage.

"As farms get bigger and equipment gets bigger, the need for speed at harvest is essential," he said.

"So good straw strength, not having to battle through a lot of straw and having that crop standing up well is really important."

"And of course, overlying all of that is Brandon's MR rating for fusarium headblight, which from a CWRS perspective, is as strong a rating as we have right now."

According to data contained in the 2016 Saskatchewan Seed Guide, AAC Brandon ranked as one of the highest yielding CWRS varieties with an MR rating to fusarium.

Relative to Carberry which is also rated MR, Brandon yielded five to seven percent higher — depending on the area — over four site years of testing.

Based on 2016 data, only four other varieties — CDC VR Morris, CDC Plentiful, CDC Titanium VB and Waskada — offered higher yield potential than Brandon and a similar MR rating to FHB.

Hyra said wheat producers in Saskatchewan and across the West will be paying close attention to their varietal choices this year, especially in light of last year's conditions.

Fusarium headblight was a prevalent issue in most wheat growing areas of the West in 2016 and DON levels in both CWRS and durum were as high as ever, according to industry sources.

In addition to selecting a variety with the best resistance rating available, growers should also consider seed treatments, properly timed fungicide applications and other cultural practices that can reduce the risk of FHB infection.

Hyra said growers who choose a heavier seeding rate and sow into a uniform seedbed can reduce their risk of fusarium infection.

A heavier, more uniform plant stand will usually result in shorter and more condensed flowering period.

Condensed flowering can optimize the benefits of a well-timed fungicide application, thereby reducing yield losses caused by FHB as well as marketing challenges stemming from high DON levels.

In Manitoba, where farmers have been managing against fusarium for many years, CWRS growers have typically leaned heavily toward varieties that offer at least an MR rating to FHB.

In the CWRS class, the top three varietal selections in Manitoba last year were Brandon (833,000 acres), Cardale (376,000 acres) and Carberry (223,000 acres).

In Saskatchewan, CDC Utmost — rated moderately susceptible or MS —was the most popular insured CWRS variety last year with 602,000 acres planted.

Utmost was followed in Saskatchewan by four MR rated varieties: Cardale (347,000 acres), Carberry (333,000 acres), Brandon (252,000 acres) and CDC Plentiful (230,000 acres).

CDC Titanium, another MR rated variety, also saw huge gains in the province last year.

Titanium's insured acreage jumped from just 3,000 acres in 2015, up to 96,000 acres in 2016.

In durum producing areas, fusarium pressure in 2016 was a bad as it's ever been, said CGC research scientist Tom Graefenhan.

Wet conditions during flowering placed the province's durum crop at extreme risk of infection in most areas, he said.

In the absence of any durum varieties that offer even moderate resistance to FHB, the crop was a sitting duck.

In some areas, FDK levels were in the 30 percent range or higher.

"Just to give you an example of how bad the problem was last year, almost 40 percent of the durum samples submitted from Saskatchewan were affected by fusarium, so this is a significant number," Graefenhan said.

"In Alberta, it was almost 30 percent, which is also unheard-of for the province …."

All samples submitted to the CGC's Harvest Sample Program are visually inspected for fusarium damaged kernels or FDK.

Samples are not automatically tested for deoxynivalenol, or DON, the mycotoxin that has the potential to affect human and animal health.

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Nonetheless, Graefenhan said high DON levels are likely disqualify much of last year's durum crop from food and seed markets.

According to industry sources, a record number of durum acres went unharvested in 2016, partly due to poor harvest weather and partly due to elevated deoxynivalenol (DON) levels.

Some durum growers who were forced to make tough harvest decisions put their high-DON durum crops near the bottom of the priority list and opted instead to take off higher value crops whenever harvest weather would co-operate.

As far as varietal selections were concerned, Transcend surpassed all other durum varieties in terms of overall insured acres in 2016.

According to the CGC's *Insured Acreage Report,* Transcend was planted on more than one million acres in Western Canada last year, or roughly one quarter of all insured durum plantings.

Transcend was sown in 843,000 acres in Saskatchewan and 214,000 acres in Alberta.

Strongfield was the second most widely grown durum variety, with total western Canadian plantings of 910,000 acres, followed by Brigade (602,000), CDC Verona (362,000), CDC Fortitude (125,000) and AAC Raymore (115,000).

Hyra acknowledged that the industry has a lot of work to do to minimize the impact of FHB on durum.

Right now, there are no durum varieties that offer anything better than a moderately susceptible (MS) rating.

MS-rated durum varieties can fare relatively well if weather conditions are not conducive to FHB development.

But in 2016, the impact on quality was devastating.

"It's as bad as I've seen it anywhere in the traditional areas," Hyra said.

"The last two years for sure and maybe even three years, it's been really hard.

"Talking to seed growers and farmers across western Canada, it's just been devastating this year so it was a really tough go for most people with durum."

Hyra said elevated risk associated with FHB could have a negative impact on overall durum acres going forward.

"I think it will (affect acres)," he continued. "I think they (growers) will be moving toward other wheat classes with stronger tolerances … or switching out of wheat altogether."

Hyra said current durum offerings may have subtle differences in terms of resistance, but as a whole, the CWAD class is a long way from where it needs to be.

Until products with improved FHB resistance are developed and commercialized, growers should choose the best varieties available and use a full-management package to reduce risk.

"Always choose the strongest rating that you can in your category, of course keeping in mind the other agronomic limitations that you might have," he said.

"Even an MR rating is certainly no magic bullet," he added.

"Fusarium is a very complex disease but by using (an MR rated product) at least you're giving yourself a fighting chance and with the help of fungicides and maybe a little bit of heat during that flowering period, hopefully that will help to move that crop along."

TOP 10 CWRS WHEAT VARIETIES IN WESTERN CANADA

(insured acres)	B.C.	ALTA.	SASK.	MAN.	TOTAL
AAC BRANDON	-	78,220	252,123	833,846	1,164,189
STETTLER	6,818	796,377	37,000	150	840,345
CDC UTMOST	-	149,012	602,034	18,478	769,524
CARDALE	-	29,662	346,641	375,873	752,176
CARBERRY	-	116,020	332,951	223,068	672,039
CDC GO	14,457	536,393	20,384	27,528	598,762
HARVEST	349	287,130	133,004	126,879	547,362
CDC STANLEY	-	225,064	193,510	29,878	448,452
MUCHMORE	-	328,951	71,274	34,706	434,931
CDC PLENTIFUL	-	101,869	230,736	80,541	413,146
All varieties*	68,315	3,451,444	4,332,707	2,199,959	10,052,425

* Rankings are for 2016 insured commercial acres of CWRS wheat in Western Canada.

TOP 10 DURUM VARIETIES IN WESTERN CANADA

(insured acres)	ALTA.	SASK.	MAN.	TOTAL
TRANSCEND	214,178	842,969	946	1,058,093
STRONGFIELD	221,920	688,757	-	910,677
BRIGADE	107,799	494,302	331	602,432
CDC VERONA	48,157	314,388	-	362,545
CDC FORTITUDE	31,430	94,080	125	125,635
AAC RAYMORE	66,107	46,922	1,837	114,866
ENTERPRISE	14,499	57,807	-	72,306
EUROSTAR	752	69,797	-	70,549
KYLE	6,492	61,635	-	68,127
AAC MARCHWELL	-	54,791	-	54,791
All varieties*	740,682	3,577,591	3,509	4,321,782

* Rankings are for 2016 insured commercial acres of durum in Western Canada.

PEDIGREED ACRES DOWN SLIGHTLY IN 2016

BY SASKSEED STAFF

The Canadian Seed Growers Association (CSGA) has released its annual report on 2016 pedigreed seed acreage in Canada and as usual, the report reveals some interesting trends.

As of mid-November, a total of 1.326 million acres of pedigreed seed had been inspected in 2016.

That figure is down slightly from the 1.336 million acres inspected in 2015, but it is still the CSGA's second highest total in the past seven years.

Saskatchewan's inspected acres in 2016 were down marginally at 327,000 acres, compared to 333,000 a year earlier.

Alberta's acreage was up 40,000 acres to 345,000, compared to 305,000 in 2015.

Manitoba was down 22,000 acres to 358,000.

On a crop-by-crop basis, pedigreed wheat retained its claim as Canada's most widely-inspected crop type.

A total of 365,000 wheat acres were inspected across the country in 2016, including 128,000 acres in Saskatchewan, 106,000 acres in Manitoba and 85,000 acres in Alberta.

Soybeans were the country's second most-widely inspected crop. Soybean inspections conducted on nearly 315,000 acres last year.

Barley was next at 118,000 acres nationwide, followed by peas at 93,000 acres, alfalfa at 81,000 acres, hybrid canola at 59,000 acres, oats at 52,000 acres, lentils at 43,000 acres, timothy at 42,000 acres, ryegrass at 25,000 acres and flax at 21,000 acres.

Two crops in particular showed a huge increase in acreage.

At 93,000 acres, pea inspections hit their highest level in recent memory.

Pea inspection were conducted on 42,000 acres in Saskatchewan and nearly 40,000 acres in Alberta.

On a year-over-year basis, national pea inspections were up by more than 21,000 acres in 2016, representing a year-over-year increase of nearly 30 percent.

In 2015, Canadian seed growers paid for inspections on 71,000 acres of peas.

Lentil acreage also saw significant gains last year.

PEDIGREED SEED ACREAGE, BY CROP TYPE

CROP KIND	MAN.	SASK.	ALTA.	B.C.	ALL CANADA 2016	ALL CANADA 2015	CHANGE 2015-16
Alfalfa	15,753	18,877	46,630		81,260	69,967	11,293
Barley	12,168	41,241	50,378	347	118,207	111,474	6,733
Bean	606	250			3,348	3,846	-498
Birdsfoot trefoil	2,007	100			2,107	2,606	-499
Bromegrass	660	2,720	5,932	560	9,872	6,685	3,187
Buckwheat	1,113				1,582	1,141	441
Canarygrass		550			550	195	355
Chickpea		1,966	848		2,814	956	1,858
Clover	415	3,657	2,034		6,106	5,870	236
Hybrid corn					18,487	13,692	4,795
Faba bean	772	3,625	4,017		8,528	13,421	-4,893
Fescue	6,641	626	11,631	500	19,398	14,501	4,897
Flax	5,368	11,103	4,589		21,081	40,017	-18,936
Hemp	1,994	2,459	2,492		7,248	8,322	-1,074
Hybrid canola			50,306		58,801	53,831	4,970
Lentil		39,503	3,763		43,266	29,454	13,812
Mustard	40	382	3,740		4,162	3,126	1,036
Oats	12,870	11,882	7,352	240	51,939	59,966	-8,027
Peas	9,713	42,032	39,840	667	92,668	71,426	21,242
Rape		280	2,814		3,464	407	3,057
Rye	3,976	770	2,033	12	7,783	6,186	1,597
Ryegrass	22,201	2,485	550	150	25,386	24,851	535
Soybeans	131,955	4,420	167		314,533	338,769	-24,236
Timothy	22,877	4,438	12,854	2,027	42,246	43,763	-1,517
Triticale		780	3,216		4,136	3,511	625
Wheat	105,551	128,440	84,789	640	365,045	399,470	-34,425
Wheatgrass	130	1,675	4,100	470	6,376	5,044	1,332
Minor crops	980	3,217	1,141	42	5,672	3,309	2,363
2016 To Nov. 15	357,791	327,480	345,216	5,655	1,326,064		
2015	380,131	333,293	304,971	6,426		1,335,805	-9,741

Total lentil inspections in 2016 topped 43,000 acres. That represented a year-over-year increase of nearly 14,000 acres, or 47 percent.

Interest in lentils was buoyed by historically high market prices for commercial or common lentils that were sold primarily into Asian food markets.

Alfalfa also saw huge gains in 2016, with more than 81,000 acres inspected.

That compared to 70,000 a year earlier and represented a 16 percent year-over-year increase.

Plot inspections also hit their highest level in years with a total of 2,647 plots inspected last year, up from 2,399 in 2015.

Plot inspections in 2016 included 893 breeder seed plots, 88 foundation plots, 1,615 select plots and 51 probation plots.

Total CSGA memberships in 2016 were listed at 3,537, up 31 from a year earlier.

Alberta memberships were up sharply at 768, an increase of 75 memberships over 2015.

FORAGE PROGRAM TAKING SHAPE IN SASK.

BY SASKSEED STAFF

Saskatchewan forage growers could soon benefit from a new province-wide forage variety testing program.

Terry Kowalchuk, provincial forage specialist with Saskatchewan Agriculture, said plans to establish a provincial network of forage performance test sites are progressing as expected.

In a recent interview, Kowalchuk said work is continuing in hopes that demonstration sites will be established and plots seeded by spring 2017.

If that happens, the first variety-related performance data from the testing program would likely be available in 2018.

"The forage sector is really the foundation of the livestock industry in the province and as a result, having good information about forage varieties and their performance is very important to producers," Kowalchuk said.

"It's really about allowing producers to understand what the performance of commercially available forage varieties is in their region," he added.

"I think this is very important information for the forage sector."

Discussions aimed at setting up a province-wide testing program started a few years ago.

In 2014, the Saskatchewan Advisory Council of Forage Crops identified the lack of a co-coordinated testing program as a critical gap in provincial programming.

Efforts to establish a program began in earnest the following year and work continued throughout 2016.

Kowalchuk said the program will be a collaborative effort involving the Saskatchewan Forage Council, the Saskatchewan Ministry of Agriculture, the University of Saskatchewan, Agriculture and Agri-Food Canada and a number of regional AgriArm research groups.

Organizers have received assurances of funding from numerous groups including the Saskatchewan Cattlemen's Association, Sask Milk and the Saskatchewan Forage Seed Development Commission.

Initially, the program will operate with test sites at Melfort, Swift Current, Outlook and Saskatoon.

"We are still in the process of finalizing program protocols and ensuring that our AgriArm partners have the necessary resources — mainly land and equipment — to establish the plots," Kowalchuk said recently.

"We are also taking submissions from various seed companies and will be making a decision soon regarding which varieties will be included. We are targeting only key commercial varieties that are currently commercially available and are of interest to producers."

Forage companies that have expressed interest in submitting varieties for testing include Brett Young Seeds, SeCan and AgVision, among others.

In addition to testing forage varieties that are already commercially available, the program will also give public forage breeders an opportunity to test new experimental lines that are being considered for registration.

"Once we establish these sites, our public breeders will be able to put some of their most promising lines of different species into the trials," Kowalchuk said.

"This will provide public programs with some additional data in terms of how some of their potential lines compare against some of the existing commercial varieties."

Program organizers are still discussing fee structures, funding opportunities and budgets. A flat fee for participation is one funding model currently being discussed.

The total budget for the program is expected to be around $65,000 annually.

With a significant level of industry support already in place, the Saskatchewan Forage Council will be applying for additional funding through the Saskatchewan Ministry of Agriculture's ADOPT program.

"My feeling is that if we can just get enough support to get things started, then really it will take on a life of its own ... and the result and benefits will speak for themselves," Kowalchuk said.

"It's important information because many of the forage crops that are seeded in Saskatchewan are in place for long periods of time," he added.

"These are perennial crops that cost a fair bit of money to put in and usually once they're established, they're in for anywhere from five to 10, to even 15 years, so the decisions that producers are making with respect to the variety or even the mixture that they're using is very important."

Initially, performance data will be distributed among participating companies and program collaborators and publicized through newsletters, industry websites and other media.

Eventually, the data could be distributed to a wider audience through publications such as the Saskatchewan Seed Guide and Yield Saskatchewan.

Organizers are hoping to design a program that complements data from a similar program that is already operating in Alberta.

"We're trying to be cognizant of what's going on in Alberta," Kowlachuk said.

"If we can match some of the varieties that are of interest here in Saskatchewan with some of the varieties that are being tested in Alberta, we could potentially benefit from a whole bunch of extra site years of data plus we could get some valuable information through Alberta's quality analysis."

Kowalchuk said the Saskatchewan sites will likely include alfalfa and other forage species as well as grasses such as hybrid brome, meadow brome and crested wheatgrass.

Organizers are also hoping to include sanfoin and cicer milk vetch, non-bloating forage species that are generating considerable interest among forage growers, livestock producers and dairy producers.

Each test site is likely to have space for approximately 30 different varietal entries.

Each entry will be replicated four times at each site for a total of 120 plots per site.

To some degree, success of the program will hinge on the participation of private-sector forage seed companies, which have been asked to submit varieties for head-to-head testing.

So far, response has been encouraging.

If necessary, program organizers could purchase seed of commercially available varieties and enter it into the trials without the formal participation of seed distributors or agents.

Ideally, however, all forage seed companies will be asked to participate in the program and contribute to a robust testing system that benefits growers and the industry as a whole.

"We want to encourage participation from seed companies as much as possible," Kowalchuk said.

"But if we don't get the participation that we think we need, we could just go out and buy some seed from those varieties and put them in the trails anyway."

Kowalchuk said the process of organizing and establishing a provincial testing program has already led to a greater level of dialogue and collaboration among the various stakeholders in the forage industry.

"We're in a situation where we're collaborating with quite a broad range of partners and this has really generated a lot more dialogue about forage variety selection and performance so that's one of the really positive spinoffs of this project," he said.

"Forage is the foundation of the beef industry and the livestock industry in this province so understanding what varieties and what species to put in is very important for producers ... and for the province."

INDUSTRY STANDS BY BARLEY FAVOURITES

BY SASKSEED STAFF

The Canadian Malting Barley Technical Centre (CMBTC) has issued its annual list of recommended malting barley varieties for the 2017-18 growing season.

The list contains the names of malting barley varieties that the CMBTC recommends, based on the greatest potential for performance, quality and marketability.

"We examine selection rates and consult with industry to gauge the level of demand for specific varieties," said Peter Watts, managing director of the CMBTC.

"This gives the CMBTC and its members a clear idea of marketing opportunities for the coming season."

Among two-row malting barley varieties, CDC Copeland and AC Metcalfe are still the most desired varieties among foreign and domestic maltsters and brewers.

Copeland and Metcalfe are perennial favourites that have commanded the vast majority of prairie acres over the past several years. Both varieties are distributed through SeCan members and have established market demand, according to CMBTC.

AAC Synergy is a relative newcomer with growing demand. Pedigreed seed distribution rights for Synergy are owned by Syngenta.

The CMBTC listings show limited demand for Bentley, Newdale and CDC PolarStar. To inquire about contract production opportunities for Bentley and Newdale, growers are encouraged to contact Canada Malting Company.

Contract opportunities for CDC PolarStar and CDC PlatinumStar are available through Prairie Malt – Cargill.

Another SeCan variety, CDC Kindersley, is under commercial market development, meaning that end users are assessing its potential for large scale processing.

Among six-row malting varieties, Legacy, Tradition and Celebration are listed as having limited demand.

New varieties under development include AAC Connect and CDC Bow.

Varieties listed as "under development" in the CMBTC list have been registered by the Canadian Food Inspections Agency's variety registration office and are currently undergoing seed propagation.

Both Connect and Bow have been pilot-scale tested at the CMBTC and have exhibited good quality characteristics, suitable for all malt and adjunct brewing styles.

Distribution rights for AAC Connect are held by Canterra Seeds. Rights for CDC Bow are held by SeCan.

In addition to market opportunities, malt barley growers are encouraged to make varietal selections and seeding decisions based on agronomic considerations and feedback from grain company representatives, local elevator operators or malting companies.

Growers are encouraged to talk with local malting barley buyers about opportunities in specific production areas.

In all cases, growers are urged to use certified seed to ensure varietal purity, reduce disease incidence and increase the likelihood of selection.

Watts said the CMBTC's malting barley recommendations are published annually with input from grain companies, domestic and international maltsters and brewers, grower associations as well as seed companies.

"The list represents malting barley varieties that we believe have the greatest potential to be selected for malt" he said.

"We also recommend growers talk to their local elevators, or selectors from grain and malting companies, about the best two-row and six-row malting barley varieties to grow in their area."

Canada is one of the world's largest suppliers of malting barley and malt to the global brewing industry.

Exports of malting barley and malt were estimated at $845 million in 2015-16.

Canadian malting companies are the largest market for malting barley grown in Canada, processing close to one million tonnes annually. Domestically, Canadian brewers use 300,000 tonnes of malting barley per year to make 18.5 million hectoliters of beer.

The next largest market for Canadian malting barley is China, where shifting consumer preferences to higher quality beer is driving increased demand for Canadian malting barley. Demand for malting barley and malt from Canada is also strong in the United States, driven in part by the burgeoning craft brewing sector.

The CMBTC is a national, independent, non-profit organization with funding provided by members of the malting barley, malt and brewing industries, producers as well as provincial and federal governments.

The CMBTC conducts applied malting and brewing research, providing technical support to members and customers.

Based in Winnipeg, CMBTC facilities include a state-of-the-art malting plant and pilot brewery.

The CMBTC also operates Canada's only Malt Academy, offering courses on malt processing and brewing.

A complete list of CMBTC's recommended malt barley varieties can be viewed on Page VR15.

TOP 10 BARLEY VARIETIES IN WESTERN CANADA

(insured acres)	B.C.	ALTA.	SASK.	MAN.	TOTAL
CDC COPELAND	918	548,256	462,446	23,045	1,034,665
AC METCALFE	4,026	239,703	515,744	25,534	785,007
AAC SYNERGY	-	44,525	52,774	31,943	129,242
NEWDALE	-	34,004	20,809	23,829	78,642
LEGACY	-	2,696	66,325	3,026	72,047
BENTLEY	-	48,133	8,471	9,950	66,554
CDC MEREDITH	2,518	18,761	20,627	424	42,330
CELEBRATION	-	120	4,654	32,807	37,581
CDC KINDERSLEY	-	13,328	6,017	2,517	21,862
CDC POLARSTAR	-	1,787	19,055	-	20,842
All varieties*	23,423	2,227,415	1,613,229	352,348	4,216,415

* Rankings are for 2016 insured commercial acres of barley in Western Canada.

SECAN: STRONG FUTURE BUILT ON SOLID FOUNDATION

SPECIAL TO SASKSEED

SeCan, one of Canada's most trusted seed companies, celebrated its 40th anniversary last year. SeCan has 700 members and is the country's largest distributor of certified seed.

One of Canada's most recognized and trusted seed distributors celebrated its 40th birthday recently. SeCan, a grassroots, not-for-profit company was established in 1976.

It was created with a simple goal in mind — to get new cultivars produced by publicly-funded plant breeders into the hands of farmers more quickly, while efficiently collecting royalties and reinvesting them into varietal development.

Today, SeCan has 700 members and is Canada's largest distributor of certified seed.

In a recent interview, SeCan general manager Jeff Reid said the organization was ahead of the curve when it was founded back in the mid-1970s — and still is today.

"I think it is interesting that 40 years after SeCan was initiated, it seems in many respects to almost be just coming-of-age now, with all the talk about public, private and producer partnerships," Reid said recently.

"I think sometimes when there is a problem to solve, we start looking at creating new things as opposed to saying, 'is there a solution here that we are not seeing?'

"In that regard SeCan, I would say, is more relevant now than it has ever been."

From the get-go, SeCan was a private-public endeavour.

It combined the skills and breeding expertise of publicly funded plant breeders with the seed production and distribution network established by pedigreed seed producers and private sector seed companies.

SeCan is also unique in that anyone in Canada's seed sector can join, as long as they pay the fees and adhere to rules established by the organization.

As of last summer, SeCan had secured the distribution rights of more than 480 varieties of cereals, oilseeds, pulses, special crops, grasses, and legumes and had returned close to $97 million worth of royalties to plant breeders.

But according to Larry White, SeCan's third general manager, the royalties themselves were small compared to the financial returns realized by Canada's farmers.

Getting a new higher yielding red spring wheat variety into the hands of farmers "one year sooner (meant) millions of dollars for the whole industry," said White, who served as SeCan general manager from 1981 to 2005.

"That, to me, was the major contribution."

Before SeCan's formation, Canada's seed sector struggled to get new seed varieties out to commercial grain growers, White said. Many seed growers were also unhappy that new varieties were often distributed to pedigreed seed growers with accreditation to grow "select" seed.

Before SeCan, many seed growers couldn't gain access to lucrative new varieties early in the propagation process.

There were other irritants as well, including a drop in pedigreed seed sales to commercial farmers, White said.

Several universities, eager to secure more plant breeding funding, were looking for a way to capture a return on their innovations at a time when plant breeders' rights didn't exist.

A couple of universities tried releasing new varieties to one seed company, but other companies were dissatisfied that they had been left out of the process.

So the industry started looking for a viable alternative and SeCan emerged as "the other way," White said.

SeCan's was a unique method of distributing seed.

In some countries, government departments distributed new seed varieties.

In other countries, private seed distribution companies played a larger role and in others, distribution was accomplished through seed growers.

SeCan was a hybrid.

"They came up with an idea for a non-profit organization that would include all of the players," White said.

"It was really almost a melting pot of public and private coming together to get that job done in distribution," added Reid.

One of SeCan's first varieties was Bruce, a feed barley developed by the University of Guelph, which earned $300,000 in royalties.

Initially, SeCan's operations were managed part-time by Ed McLaughlin, general manager with the Canadian Seed Growers' Association (CSGA).

SeCan's first board was comprised of 26 directors representing everyone from publicly funded breeders and seed growers to seed plant operators and provincial departments of agriculture.

In 1998, the board was reduced to eight seats, reflecting changes in the seed industry.

Initially, all publicly developed seed varieties were distributed through SeCan, but by the 1990s distribution rights to new varieties were tendered.

"SeCan essentially no longer had a monopoly on those products," Reid said.

"We also started initiating collaborative research agreements with the public sector," he added. "Until that point, SeCan was just the distributor, but then we actually began taking baby steps to actually start facilitating and funding that research."

For example, SeCan invested in Agriculture and Agri-Food Canada's (AAFC) successful efforts to develop midge resistant wheat. Soon after SeCan's creation, pedigreed seed sales doubled, White said.

It got new seed to farmers quickly by estimating potential demand and getting seed to as many seed growers as possible.

The system minimized geographical production risks and ensured that ample seed supplies would be available in the first year of a new product launch.

SeCan also began promoting new varieties through advertising and demonstration plots.

Although most of its varieties come from AAFC, SeCan works with a half-dozen independent, European companies to get their varieties into Canada, Reid said.

"Increasingly that is where we see the role of SeCan," he said. "It is to give the critical mass to all those small, independent players.... We can actually put significant enough dollars back into research and development, strategy and branding and communications to allow them to be effective."

With SeCan now entering its 41st year, Reid said it's difficult to predict what the seed business will look like another 10 or 20 year down the road.

But there's a lot to be optimistic about, he added.

New developments in biotechnology are speeding up plant breeding and making it less expensive.

More companies can get into plant breeding and the business doesn't necessarily have to be dominated by a few, big players. However, opposition to genetically modified organisms could undermine innovation, Reid said.

This opposition could add to production costs and could potentially drive some of the smaller players out of varietal development.

"As a result, SeCan is going to be putting in a fairly significant investment into the new Centre for Food Integrity and working with Farm and Food Care to try and get out the good messages about what we mean by modern farming and the new technology that comes along with that, whether it be biotech or low-rate pesticide," Reid said.

SeCan is also encouraging its members to support Farm and Food Care.

As a not-for-profit company, it is well positioned to partner with farmers who want to invest in variety development.

"I think it really drives efficiency because we don't have a layer of shareholders where we are generating a profit that is going off to (them)," Reid said.

"Any excess of revenue over expenses that goes into our surplus fund has to go back into research and development."

By focusing on getting new varieties through the testing and registration process and then seed multiplication and distribution, SeCan is a powerful partner for big and small seed developers, he added.

"It's only a narrow band where we are horizontally integrated, but we think that is becoming an increasingly vital role that we can fill in not only when working with the public sector but also the private sector."

"We think there are going to be more players in the future to bring more interesting seed innovations to the market. I think there is a vital role there that we can play for anyone and everyone in the industry as opposed to trying to do everything all by yourselves."

This article was written by Allan Dawson. It originally appeared in the Manitoba Co-operator.

WORK PROGRESSING ON HYBRID WHEAT LINES

BY SASKSEED STAFF

Farmers in western Canada have always relied on innovation to make their farms more productive and more profitable.

From mechanical innovations such as combine harvesters and rubber wheeled tractors nearly a century ago, to the adoption more recently of chemical weed control products, genetically improved crop varieties and GPS assisted machinery, the evolution of prairie agriculture has always depended on the adoption of innovative new technologies.

Among the next wave of promising agricultural innovations is hybrid wheat, a product that has the potential to boost western Canadian wheat yields by 10 percent or more, stabilize yields under less-than-optimal growing conditions, and maintain wheat as a staple crop in profitable and sustainable rotations.

Hybrid wheat has been on the radar of North American wheat breeders for some time. But so far, product commercialization has eluded the industry.

Bayer is hoping to change that.

In 2016, officials with Bayer officially opened a new western Canadian wheat breeding facility near Pike Lake, Sask., about 60 kilometres southwest of Saskatoon.

The facility, part of Bayer's global network of plant breeding operations, will be dedicated exclusively to the development of hybrid wheat varieties for the Canadian market.

Marcus Weidler, VP Seed Operations, said the company's first hybrid wheat products could be commercialized and available to western Canadian growers by as early as 2023.

Bayer executive Marcus Weidler says the company's first hybrid wheat varieties could be available for commercial production by 2023.

"It's difficult to say what the yield bump of hybrid wheat will be because it will depend on the environmental conditions and on the specific hybrid product (being used) but I think it's safe to say that it will be around 10 percent," Weidler said.

"But what's even more interesting than yield bump is yield stability," he continued.

"We have already seen this in other countries, such as France, where hybrid wheat is a reality today. There, under optimal growing conditions, hybrid wheat varieties are already (producing higher yields) than in-bred lines, however, when environmental conditions are less than optimal, the hybrids out-yield everything else by a really wide margin."

"That yield stability will make production more reliable and more predictable under a wider range of environmental conditions," Weidler said.

Hybrid wheat is a cross between two carefully selected pure wheat lines.

Each hybrid variety contains genes from both parent lines.

The hybrid vigour or heterosis that is achieved by crossing the two distinct varieties is expressed when hybrid wheat seeds grow and produce their own seeds.

Hybrid wheat varieties are already being grown in some European countries and are being marketed by a handful of companies.

In addition to the higher yield potential that results from heterosis, hybrid wheat varieties that are being grown in Europe are known to have improved tolerance to abiotic stresses and improved nutrient utilization capabilities.

Promoters say this is partly due to the plant's enhanced genetic package and the more robust root system that is typical of hybrid varieties.

The development of hybrid wheat varieties is a task that involves many unique challenges, in terms of both seed production and seed distribution.

On the production side, one of the largest challenges is related to pollination.

"The challenge of hybrid wheat is primarily in seed production because the pollen of wheat is not flying, as it is with other crops.... Instead, it is dropping," Weidler said.

"So when you have a female line and a male line, that are being used to create a hybrid, they have to be in very close proximity to one another to have seed production accomplished."

Therefore, during the seed breeding and multiplication stages, great care must be taken to ensure that female and male lines are properly placed, so as to accommodate cross-pollination.

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Bayer forsees partnerships with pedigreed seed growers

The development and commercialization of hybrid wheat varieties by Bayer represents a significant business opportunity for pedigreed seed growers.

Marcus Weidler, VP of Canadian seed operations, said his company will be looking to establish new partnerships with a significant number of pedigreed seed growers across the West.

Bayer is investing $1.9 billion over 10 years into the development of hybrid wheat varieties that are suited to western Canadian growing conditions.

The company's first hybrid varieties are expected to hit the market by 2023, meaning that multiplication arrangements will likely be needed within the next few years.

"As a company ... we will have a lot of partners (helping with seed production) ... so there will be huge opportunities for seed growers and seed producers to work together with us...," Weidler said.

"They grow inbred wheat already so we need to have discussions with them and (figure out) how do we get this system started together."

Weidler said his company envisions a decentralized production model with pedigreed seed growers most likely producing the company's hybrid wheat seed under contract.

Contracted growers would be required to follow production protocols and quality assurance standards established by Bayer.

The company's preliminary estimates suggest that a single seed grower would produce and distribute Bayer's hybrid wheat products to commercial grain growers within a 100 kilometre radius.

Inventories of pedigreed seed would remain on the seed growers' farms but Bayer would retain ownership of the product.

"The details of the system have still to be worked out ... but I would say it will certainly involve more than 50 (partners) and I would even say it will probably be more than 100," Weidler said.

"We believe it wouldn't be fair to leave the production risk with the multipliers or the seed growers so they will likely produce the seed on our behalf (but) the inventory would be owned by Bayer."

Weidler said the company's first hybrid wheat products are likely to include parent lines from the CPS and CWRS classes.

"We are targeting the border between CPS and CWRS," he said.

"So if the female parent is from the CPS class and the male parent is from the CWRS class, when you bring the two parent lines together (to create a hybrid) the quality could be on the CPS side or on the CWRS side."

"By doing this, we are hedging our bets a little bit because we simply don't know in 2023, what the demands from the global market will be."

> *This is another opportunity to make Canadian wheat and Canadian agriculture more competitive on a global scale.*
>
> **MARCUS WEIDLER** | VP SEED OPERATIONS, BAYER

On the seed distribution side, another set of unique challenges must be addressed, Weidler explained.

"Unlike canola, where you have a multiplication rate of one seed to roughly 600 seeds, in wheat the ratio is anywhere between 1:30 and 1:50."

"This means that a much larger area is required to produce the same number of seeds.... Linked to this is the fact that the seed of wheat, relative to canola, is pretty bulky, which means that you also have to have a very decentralized seed production system."

A decentralized production model — one that employs numerous locations across the West — would eliminate the need to transport large quantities of bulky wheat seed over long distances at a potentially prohibitive cost.

In other words, the complex logistical task of producing hybrid seed and distributing it to end users must be accomplished efficiently and at a reasonable cost.

"So the question, for us, is how can you establish a very robust quality assurance sys-tem across the Canadian Prairies so that you can really supply your growers throughout western Canada with the seed that they require?"

These are a few of the complex questions that Bayer is currently working through.

Weidler emphasized that the company's Canadian researchers are not working alone.

Bayer's new Wheat Breeding Station near Pike Lake is part of the company's global network of breeding and research facilities. Within that network, each individual location is equipped to provide support and expertise to other regional breeding teams.

In Western Canada, the company will also rely heavily on collaboration and partnerships with established seed producers, Weidler added.

For example, to address logistical issues related to decentralized hybrid seed production and distribution, the company will require seed industry partners throughout Western Canada.

"We've done some preliminary calculations and we believe that we will need seed producers and processors (in a number of locations)," he said.

"As a company, this means that we will have a lot of partners ... so there will be huge opportunities for seed growers and seed producers to work together with us and to develop this hybrid wheat system for the western Canadian marketplace."

There will be obstacles on the road toward commercializing new hybrid wheat varieties for western Canadian growers.

But Weidler believes that hybrid wheat represents a significant breakthrough that will make western Canadian farms more profitable and the Canadian industry more competitive.

"We believe there is an upside for growers, in terms of returns on investment, because of the higher yields and ... because hybrid wheat will give wheat growers a better risk profile than they have today."

Weidler said Bayer officials were encouraged by recent changes to Canada's regulatory and legal environment, specifically the adoption of UPOV-91, which offers greater protections to innovators and encourages investments in Canadian plant breeding.

Bayer's experience with InVigor hybrid canola was another important factor that influenced the company's decision to pursue hybrid wheat in Canada.

"As a company, we felt that we really needed to offer our growers and our customers, not only canola seed but also wheat seed, and if they have those two products together, it would be a very compelling offer," Weidler said.

"With hybrid wheat varieties, we will have something to offer for the two most important crops that are grown in Western Canada."

But perhaps the most important factor behind the company's investment in Canadian wheat was the western Canadian farmer.

Growers in Western Canada are progressive operators and are known for their eagerness to invest in new technologies.

Their propensity to seek out new innovations that increase productivity is recognized around the world.

"When we started work on hybrid wheat in Germany in 2009 and 2010, we selected a couple of countries that we wanted to focus on, and Canada was one of those countries," Weidler said.

"That was partly because of the volume of wheat that is produced in Canada, but it was also because of the appetite of Canadian farmers for innovation — their ability to invest in innovation and embrace new products that are coming into the market"

" That was very compelling."

"Our company has committed $1.9 billion to make hybrid wheat a reality in Canada," Weidler continued.

"For us and for growers ... this is another opportunity to make Canadian wheat and Canadian agriculture more competitive on a global scale.

"At the same time, we recognize that this has to be a win-win for every partner, every player in this whole game."

FUSARIUM CONCERNS REACH NEW HEIGHTS

SPECIAL TO SASKSEED

Fusarium damage was common and widespread in all Saskatchewan crop districts last year. By some estimates, close to half of the province's durum production in 2016 was downgraded due to fusarium.

Western Canadian farmers will remember 2016 for a lot of reasons. One of those reasons is fusarium headblight (FHB).

Researchers and wheat industry experts attending the 8th Canadian Workshop on Fusarium Head Blight said 2016 will go down in history as one of the worst years for fusarium head blight in western Canadian spring wheat.

More than 200 scientists from Canada, the United States, Germany, England, Australia and Switzerland attended the Nov. 20-22 event to share their views and to examine the the latest research into FHB, a yield- and quality-robbing fungal disease.

"The 2016 western Canadian wheat harvest is potentially the worst on record for fusarium head blight (FHB) damage and DON (deoxynivalenol) levels in many crop districts," said Canadian National Millers Association president Gordon Harrison. "Fusarium damage is 1.5 to five times more than (what we've) experienced in recent years."

The United States suggests that flour should contain no more DON than one part per million. Some millers and food processors may demand even less.

"A significant portion of the (Canada Western Amber) durum (CWAD) wheat harvest (used to make pasta) may be unmarketable as milling grade," Harrison said.

No. 2 and 3 Canada Western Red Spring wheat (CWRS) — Canada's top bread-making wheat — also has high levels of DON, he said.

Downgrading could cost Prairie farmers $1 billion in lost revenue, he estimated.

Presumably some of those losses will be offset by crop insurance payments and some farmers might be eligible for aid under AgriStability.

Still it's a huge economic hit, and not just for farmers.

Grain companies will have less high quality wheat to sell. Overseas wheat customers with long memories might become more concerned about Canadian wheat quality.

"The predominant degrading factor this year is fusarium," said Tom Graefenhan, the Canadian Grain Commission's (CGC) microbiology program manager.

"I think it is important not to panic. We continue to work on the issues in a co-ordinated and dedicated way."

Durum wheat, which is more susceptible to FHB than other spring wheats, was especially hard hit this year, even in southwestern Saskatchewan where the climate is normally drier and FHB isn't usually a problem.

Based on preliminary data collected from the CGC's harvest sample survey, about 40 percent of the durum wheat still making food grade has been downgraded due to FHB and 25 percent has been downgraded to below food grade.

CGC data shows the percentage of fusarium-damaged kernels (FDK) — a measure of disease severity — hit a new high in Saskatchewan in 2016.

The combination of more disease — and in many areas greater damage within fields — is making it harder for grain companies to find good wheat to blend with heavier-damaged lots, Graefenhan said.

"It is probably the biggest challenge we've had in wheat supply in 21 years of contracting," added Bob Beard, cereal development director for Warburtons, the United Kingdom's biggest baker.

"You cannot use wheat that is over specification (for DON). We are lucky to be working with our farmers and the companies we are and have been able to secure additional supplies to make good the shortfall. But in some areas 60 per cent of our program is not usable, which mirrors probably what you're seeing elsewhere on the Prairies."

Warburtons imports around 190,000 tonnes of high-quality, identity-preserved spring wheat from Western Canada annually.

The Canadian wheat is blended with a similar volume of U.K. wheat to make bread.

While Warburtons expects to get enough western Canadian wheat to meet its needs in 2016-17, it will be tight, Beard said.

"It's not all bad. There are some regions where some of our farmers have grown surplus and we have taken that surplus gladly. But in other areas it has been decimated."

FHB's spread is worrisome, Harrison said.

His member mills need about three million tonnes of domestically produced wheat every year.

More FHB will require more testing and increased costs for millers, he said.

Harrison also noted DON hasn't caused an adverse health problem in Canada in 25 years, and he doesn't expect any now.

Canada's grading system uses fusarium-

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damaged kernels (FDK) as a proxy for testing actual DON levels.

But Harrison would like to see grades based on DON levels instead of FDK.

Sheryl Tittlemier, the CGC's grain safety program manager, says the correlation between FDK and DON still exists, but given the concerns about high DON levels, the CGC will investigate further.

The Alberta Wheat Commission recently suggested that grades be based on DON levels, which would require testing at the elevator.

Grain exporters are doing some of that now, as well as testing a portion of loaded cars "to avoid surprises," said Rhyl Doyle, Paterson Global Foods' director of export trading.

More testing is a good idea, University of Minnesota plant pathologist Ruth Dill-Macky told the meeting, because food markets are decreasing their tolerance for mycotoxins.

"I think that is going to necessitate us implementing high-speed mycotoxin testing at sales points in order to segregate grain lots in years when we do have lots of fusarium head blight so we can keep the toxins, as best we can, out of grain streams and not be commingling lots that may have different levels of toxin in them," she said.

FHB is on the rise because of wet weather. The disease thrives under warm, moist conditions, increased corn production (corn also produces FHB) and more conservation tillage (FHB persists in wheat residue).

Farmers can't control the weather. And corn production and reduced tillage aren't going away, she said. But there are things farmers can do to manage FHB with an integrated approach. It starts with encouraging farmers to grow wheat varieties that are more FHB tolerant.

"Eliminating susceptible cultivars is really key to preventing this disease from gaining traction," Dill-Macky said.

"And while we can make incredible strides in developing germplasm that has resistance, it's important for us to remember that there are still varieties out there that are moderately susceptible or more susceptible and it is actually very important for us to find ways to discourage growers from having those, or discourage wheat breeders from releasing those varieties, so we can have varieties that are resistant or moderately resistant on the vast majority of acreage."

Percentage of Canada Western Red Spring wheat samples containing fusarium submitted to the Canadian Grain Commission Harvest Sample Program from 2010 through 2016.

	CROP DISTRICT	2016*	2015	2014	2013	2012	2011	2010
MANITOBA	1	96.1	77.4	62.9	68.3	67.4	47.8	46.5
	2	90.8	56.4	70.4	55.4	57.1	16.7	39.7
	3	95	65.5	71.4	23.2	61	15	44.7
	4	94	58.1	67.8	26.4	54.4	7.4	26.4
	5	73.8	29.5	53.1	34.6	41.5	14.5	42
	6	68.7	42.7	71.8	38.6	51.9	0	30.5
	7	90.2	66.5	43.6	44.8	29.7	13	62.2
	8	97.3	81.1	56.3	56.7	29.4	21.7	62.3
	9	93.8	70.7	37.7	26.1	17.9	2	87.5
	11	95.2	58.3	33.3	45.4	10	0	57.1
	12	50	39.1	0	16.7	13.3	30	50
SASKATCHEWAN	1A	81.8	64.5	87.1	66	52.8	10.3	14.5
	1B	90.8	45.9	71.3	40	54.7	4.8	12.8
	2A	81.8	38.5	71.9	41.7	46.2	0	0
	2B	88.6	61.4	77.7	27.3	56.6	4.4	11.1
	3AN	75.0	11.8	39.1	9.5	3.3	3	0
	3AS	66.7	11.8	23.4	3.8	1.7	5.4	3
	3BN	94.1	36.5	29.7	1.4	1.7	1.3	1.7
	3BS	62.5	14.3	14.6	0	0	0	0
	4A	16.7	0	16.7	0	0	0	0
	4B	55.6	0	37.6	5.4	0	3.7	3.1
	5A	96.8	72.8	66.3	27.5	68.5	8.7	17.5
	5B	75.0	49.2	67.8	42.7	58.5	26.5	28.9
	6A	90.1	57.8	75.7	31.8	62.5	8.2	21.5
	6B	91.7	58.8	90.3	16.9	62.9	13.2	13.9
	7A	97.8	59.8	68.8	13.8	37.8	3.6	14.7
	7B	76.2	26.1	56.1	8.6	37	2.8	7.9
	8A	96.3	71.9	84.6	33.1	75	34	29.3
	8B	97.5	78.6	90.8	26.9	80.5	17.1	20.3
	9A	71.6	47.6	73.1	12.7	57	6.8	12.5
	9B	56.8	9	55.6	12	24.4	0	11.3
ALBERTA & B.C.	1	40.7	4.6	21.5	23.6	7.5	2.2	3.8
	2	34.2	18.1	25.4	25.8	18.6	10.2	7.6
	3	21.9	11.3	22.9	21.7	5	6.1	0
	4	49.4	7.9	23	14.1	12.9	4.8	4.3
	5	39.0	11.3	33.9	29.2	19.4	3.5	6.4
	6	38.5	6.9	33.3	25.7	8.8	5.9	0
	7	14.5	2.7	25	9	1.9	2.3	0.8

Farmers also have access to better fungicides to control FHB, including Prosaro, Caramba and Proline.

But those products must be applied at the right time — within seven days of flowering, using 20 gallons of water per acre to get good coverage.

Dill-Macky recommended spraying in the evening or morning so dew can help get the product on the wheat heads.

Farmers also need to know some of those fungicides also contain strobilurins, which control leaf spots, but can increase DON levels, even when applied pre-heading.

Plant breeders and molecular scientists are searching hard for new forms of FHB resistance.

The more resistant a variety is, the less FHB will be able to colonize its residue, Dill-Macky said.

A wide range of genes are being tested but "we haven't seen the silver bullet and I don't think that is really going to happen. However, increased regulation is making it harder to field test genetically modified wheat."

"I think we have some potential to make progress in this area if we aren't challenged... by the legal side of doing things," Dill-Macky said.

This article was written by Allan Dawson. It originally appeared in the Manitoba Co-operator.

NEW PROTOCOLS TO BE IMPLEMENTED IN 2017

BY SASKSEED STAFF

Pedigreed seed growers who treat their seed before selling it will be expected to follow a new set of safety guidelines and protocols in 2017.

Russel Hurst, executive director of the Agrichemical Warehousing Standards Association (AWSA), said new seed treatment protocols developed over the past few years were to be rolled out Jan. 1, 2017.

The protocols, known as Accredited Seed Treatment Operating Standards (ASTOS), were created by CropLife Canada following a multi-year consultation process that involved all commercial seed treatment operations, including the pedigreed seed industry.

"We tried to ensure that we had all of the various stakeholders involved," said Hurst during a recent interview. "We think what we've come up with is something that's fairly practical and doable."

"Our end goal is to ensure that the industry has a base level of environmental health and safety protocols that are being undertaken and implemented and adhered to by the entire industry."

Accredited Seed Treatment Operating Standards will apply to all commercial seed treatment applicators, including pedigreed seed growers, who treat seed in a commercial setting.

According to Hurst, all commercial applicators will be expected to comply with the protocols prior to treating any seed this year. Industry wide compliance is expected by Jan. 1, 2018.

To gain accreditation as an authorized treatment facility, applicators will be required to have their treatment facilities and practices audited by a certified auditor.

The cost of an audit is typically negotiated between the auditor and the facility operator. A standard audit would normally take between two and three hours to complete is expected to cost around $500.

Facilities will be examined to ensure compliance to roughly 70 standards, including storage facilities, spill containment, ventilation, and emergency response plans.

Once accreditation is gained, facilities will be required to repeat the audit process every two years.

Pedigreed seed growers who treat seed prior to selling it will be expected to conform to a new set of safety guidelines in 2017. Industry-wide compliance is expected by Jan. 1, 2018, says AWSA executive director Russel Hurst.

"What we're asking is that any facilities that are treating seed should complete an audit prior to treating in 2017, Hurst said.

"Any commercial seed treatment operations that are treating seed ... will go through the audit process and we would look to have the program fully implemented by the end of the year."

Hurst said its important to note that the ASTOS protocols will not apply to all seed treatment products that are currently on the market.

Nor will commercial grain growers be prohibited from buying products that are typically applied on the farm, by growers themselves.

Only designated products — specifically those have been identified by product manufacturers — will fall under the new safety protocols.

A complete list of designated products was still being finalized as of late 2016. Hurst said the finalized list was to be distributed to seed treatment facilities before Jan. 1, 2017.

Accredited seed treatment facilities will also be able to view the designated products list on-line at www.awsa.ca.

Development and implementation of the new standards has been several years in the making.

The program was conceptualized several years ago when Health Canada raised concerns about the safety and handling of some seed treatment products that pose a potential risk to the environment.

"Back in 2010 ... the industry recognized seed treatment as one of the big growth businesses ... and we wanted to ensure that we had appropriate stewardship initiatives in place for those seed treatment products," Hurst explained.

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SEED LABS REPORT MIXED BAG OF QUALITY

BY SHIRLEY BYERS

Pedigreed seed samples that were submitted for laboratory testing in late 2016 revealed a little bit of everything, ranging from good quality to downright ugly.

But in general, the 2016 seed crop was not much different than most crops in the country.

In many cases, disease was a prevalent characteristic.

"A couple of years ago, fusarium was really high (but) this year, it's even higher," said Bonnie Ernst, accredited seed analyst and co-owner at Prairie Diagnostic Seed Lab in Weyburn, Sask.

"It's especially high in durum," she continued.

"Wheat is a little higher too but durum is the main problem. This year, I have had levels of fusarium in durum at over 50 percent."

A couple of years ago, Ernst's lab began to see the odd sample that was showing very high levels of FDK.

In 2016, the number of badly infected samples is up.

Generally, if the disease is higher, germination and vigour have been lower, she added.

The problem with fusarium, Ernst explained, is that there can be a huge discrepancy between the estimate of infection provided at the elevator and what shows up in the lab.

For example, a producer might tell her the visual test they got at the elevator was only three percent.

"I basically tell them you might as well multiply that by at least 10 percent, because we grow it on plates and we actually see what's growing within the seed…."

"Guys aren't realizing — and this is for any disease — if you can actually see it, visually, then it is going to be way worse than what you're seeing because even the healthy-looking kernels may have it."

> *I think seed treatments are going to be very important this spring, because of the fusarium level.*
>
> **BONNIE ERNST** | PRAIRIE DIAGNOSTIC SEED LAB

Walter Pitz, owner and operator at Parkland Laboratories in Melville, Sask., said lots of fusarium has been showing up in samples sent to his lab as well.

Asked whether those high fusarium levels can be reduced by cleaning, Pitz and Ernst said they aren't sure.

"To my knowledge, no," said Pitz.

"Some of the more severely infected seeds are shrivelled and smaller than the regular population in a seed lot, depending on what size of screen is used. I guess conceivably the smaller seeds would actually be cleaned out, one would be eliminating some of the infected seed but honestly, to what extent, I couldn't say. It's certainly not the answer for sure."

"Most of the time I don't see much of a difference (after cleaning)," added Ernst.

'But there are some who tell us they've cleaned a tremendous amount and I do see some differences."

Pitz said a long wet growing season and harvest in 2016 has sparked more requests for falling numbers tests on durum and wheat.

The falling number test assesses sprout damage in a sample.

An enzyme known as alpha-amylase is found in sprout damaged wheat.

The falling number test measures the time, in seconds, that it takes for a stirrer to fall through a hot slurry of ground wheat.

The greater the amount of alpha-amylase in the wheat, the thinner the gelatinized starch paste and the faster the plunger will fall through the slurry.

The higher the falling number, the longer it takes the stirrer to fall.

This indicates that the wheat being tested is sound and satisfactory for most baking processes.

According to the Canadian Grain commission website, a No. 1 Canada Western Red Spring (CWRS) wheat normally has a falling number greater than 350 seconds.

Pitz said this year might be a good year to conduct vigour tests on seed samples as well germination tests.

Adverse weather can drive seed into a state of dormancy and it can also kill the embryo.

A vigour test will give growers a better idea of whether they're dealing with dormancy — which will be rectified by cold temperatures and time — or if a significant number of seeds are, in fact, not viable.

"If I was a farmer, if I had to make a decision as to what my seeding rate would be, I'd base it more on my vigour test than on my germination test," he said.

This year, it will be especially important for growers to request a seed analysis report when they purchase seed, added Ernst.

"Fusarium isn't a factor that would prevent a pedigreed label and neither is vigour, but these are things you need to know," she said.

"I don't know any pedigreed grower who wouldn't give you that information. They're not hiding it."

Seed treatments also will be more beneficial than ever.

"I think seed treatments are going to be very important this spring, because of the fusarium level," Ernst said.

"If they're considering using seed with higher levels, usually they can get their seed tested with the treatment. Then they know exactly what they're putting into the ground."

Ernst said the majority of the pulses she's seen have been good.

"Generally pretty decent for germ and vigour," she said.

However, Pitz said he's seen a wide variation in germination.

He's seen peas testing from the high nineties down to the fifties and sixties, depending or where they were grown. He's also seeing more ascochyta than in a dry year.

Desiccation can have an impact on germination in pulses, Ernst added.

"If they've been desiccated, sometimes it shows up in the germ," she said.

"Peas are much more finicky on mechanical damage."

Ernst has also seen slightly higher levels of botrytis and sclerotinia but the majority of samples are still within an acceptable range.

CERTIFIED SEED: IT'S ALL ABOUT QUALITY

Planting certified seed is the first step to ensuring that your crop gets the best start possible. The blue tag is your assurance of quality and purity.

What is the Canadian Seed Growers' Association and what does it do? For many farmers in Canada, the answers to those two questions are clear.

But for others, familiarity with the CSGA is limited.

Perhaps they've heard of the association. But they may not fully understand the organization's critically important role in supporting the production of high quality pedigreed seed across the country.

The CSGA represents 3,500 seed growers across Canada.

It's key role is to provide standards for crop certification, according to Canada's Seeds Act and Regulations.

When farmers buy certified seed, they aren't just buying seed, they are buying an assurance of quality and purity.

It takes several generations for new pedigreed seed varieties to become available for commercial production.

The process begins at public and private research companies, where the breeder selects desirable traits for new variety development.

It typically takes several years for the plant breeder to assemble enough breeder seed to begin seed multiplication.

The seed is increased over a regulated number of years, depending on whether the crop is self-pollinated or open-pollinated.

Open-pollinated crops are available after fewer years to reduce cross-pollination with nearby off-type varieties.

Certified seed is the last generation, and is available to producers for commercial production.

All classes are strictly regulated to ensure that seed purity is maintained until it reaches commercial growers.

Seed purity is critically important to the pedigreed seed industry and is maintained with the help of a quality assurance system that is administered and upheld by CSGA, in collaboration with the Canadian Food Inspection Agency (CFIA) and other groups.

Seed purity refers to sample quality with respect to weed seeds, inert material (gravel, chaff, fungal bodies, etc.) and number of off-type seeds, as defined by the CFIA.

Varietal purity of 99.8 percent must be maintained to be classified as pedigreed seed.

To comply with this stringent quality requirement, there are three stages of pedigreed seed crop production that a successful certified grower must follow.

The first stage is crop production.

During production of pedigreed seed, the land used by pedigreed seed growers must be free from off-type varieties and similar crop varieties.

As well, pre-determined isolation distances must be maintained.

Minimum isolation distances vary from crop to crop and are in place to reduce the chances of varietal contamination through cross-pollination or other means.

The pedigreed seed crop must be free of prohibited noxious weeds, as outlined in the Weed Seeds Order of the Seeds Act.

The crop must also be free of disease and must be inspected by a licenced seed crop inspector (LSCI) before harvest begins.

If the crop passes inspection, the grower will be issued a crop certificate by the CSGA.

To ensure varietal purity and eliminate potential contaminants, seed growers often spend much of their time roguing pedigreed seed crops.

This usually involves walking through the crop, row by row, and manually removing contaminants and off-types by hand.

The second stage in the process is seed storage.

Pedigreed seed growers must carefully harvest, handle, condition, and store the grain to ensure that seed purity and quality is maintained.

Equipment and storage facilities must be thoroughly cleaned, and seed from each field should be stored separately to avoid commingling.

The third stage is grading and inspection.

Grading involves germination testing and overall evaluation of seed lot quality, and an assessment of the number of weed seeds and off-type varieties in the harvested seed.

Producers who buy certified seed for planting on their commercial grain farms often ask whether the certified seed they are buying contains seed-borne diseases.

The only diseases specified in The Seeds Act are true loose smut in barley and the presence of ergot or sclerotial bodies.

Common seed-borne diseases such as ascochyta in pulses, anthracnose in lentils, fusarium in cereals, and blackleg in canola are not regulated by the Act, and thus it is buyer-beware for these diseases.

Farmers who buy certified seed are therefore encouraged to ask the seed grower whether a seed disease analysis was conducted by a commercial seed testing laboratory.

If a seed disease analysis was conducted, seed buyers can request a copy of the lab report.

Disease free seed is always recommended for planting.

The presence of weed seeds is another area of potential concern for pedigreed seed growers and seed buyers.

Certified seed is not guaranteed to be free of weed seeds although reputable seed growers will make every effort to ensure the seed they are selling is clean and free of impurities.

Upon request, seed dealers must provide buyers with a certificate of analysis outlining the species and number of weed seeds present.

At the Breeder, Select and Foundation levels of pedigreed production, there is almost zero tolerance for any weed seed content.

Tolerance levels are slightly higher in the Registered and Certified classes. There are also varying tolerances for the presence of different crop types. Large seeded crops such as corn, beans and cereals typically have lower tolerances than small seeded crops such as forages, turfgrass or vegetables.

For all crop types, there is zero tolerance for the presence of prohibited noxious weed seeds as outlined in Weed Seeds Order, regardless of the seed's class or pedigree.

In some cases, there may be confusion about noxious weeds that are covered by the Seeds Act (Canada) and noxious weeds that are covered under the Noxious Weeds Act (Saskatchewan).

The weeds covered under these two acts are not the same.

The Seeds Act is administered federally and needs to reflect the needs of the entire country, whereas the Noxious Weeds Act applies to Saskatchewan only.

While many weeds are named as noxious in both acts, there are some weeds that are found in one act and not the other.

When buying certified seed, be sure to request a certificate of analysis from suppliers of certified seed to check for noxious weeds that are important to Saskatchewan under the category of other weeds, so that new noxious weeds are not being introduced to land that is clean and free of noxious weed species.

Growers who buy certified seed should always look for the recognizable blue tag when buying certified seed.

The blue tag is an assurance of quality and purity.

When a producer buys certified seed, it should have an official blue tag, pedigreed documentation (provided from the seller), and a copy of the mechanical purity. Germination analysis should also be provided.

Plant Breeders' Rights **Fast Facts**

Understanding the changes and your obligations

As of **February 27, 2015**, all new PBR-protected varieties will be protected under the new legislation that conforms to the UPOV 1991 convention, bringing Canada in line with the rest of the world, and opening opportunities for increased investment to make new varieties available to Canadian farmers. It brings opportunity, but it also brings new obligations for the value chain.

	91	PBR Progress through Research
Are all varieties protected under the same *Plant Breeders' Rights (PBR) Act*?	As of February 27, 2015, all new varieties submitted for PBR are protected under the new legislation. These varieties carry the PBR 91 symbol.	All varieties granted protection under the PBR prior to February 27, 2015 continue under the original *Act*. These varieties carry the original PBR symbol.
Breeders' rights		
What are **breeders'** rights?	Breeders' rights are now expanded under the new PBR *Act*. Authorization from the breeder is required to produce, reproduce, sell, clean/condition, stock, import or export seed of PBR-protected varieties.	Authorization from the breeder is required to sell, or produce for sale, seed of PBR-protected varieties.
Can **breeders** be compensated on harvested grain?	Yes, if seed was obtained and used illegally or without the authorization of the breeder, the breeder can choose to seek compensation, including for lost royalty revenue; lost markets; and for court costs; on delivered grain produced from that seed.	No

APHANOMYCES ATTACKS PEAS AND LENTILS

BY SHIRLEY BYERS

Ed Lefsrud, past president of the Canadian Seed Growers Association, remembers the July day three years ago when he discovered aphanomyces in a field of peas on his farm near Viking, Alta.

In a circular patch, about five to seven metres in diameter, something was definitely amiss.

He walked in to take a closer look.

"There was nothing in the centre, of the circle, nothing growing for about fifteen feet," he said. "As you worked your way out from the centre, you could see dead peas, then brown, then red, then green on the outer edge of the circle."

There were other, similar but much smaller patches scattered around the field.

Lefsrud didn't know what was affecting the field but he was heading to Warman, Sask., for a growers' field day so he decided to dig up some of the affected plants and take them along to show.

When pulse crop researchers Sabine Banniza and Tom Warkentin from the University of Saskatchewan and Sherrilyn Phelps from Saskatchewan Pulse Growers saw the plants, they told him they suspected the culprit was aphanomyces.

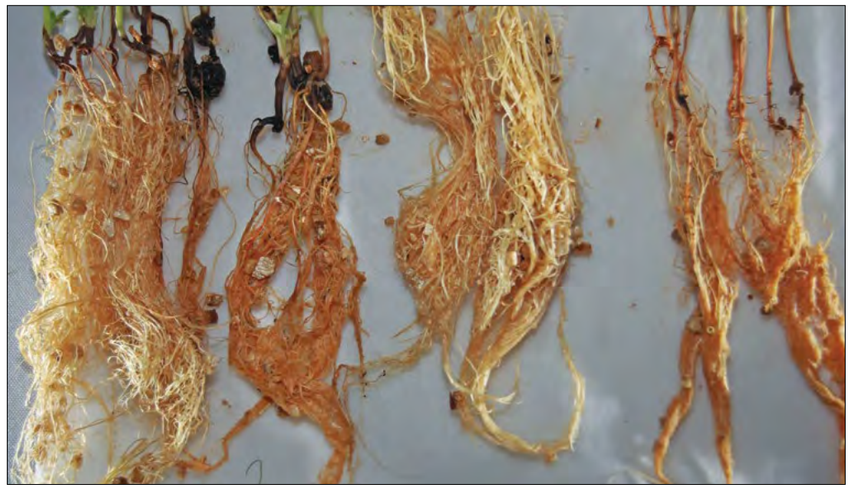
"They didn't want to jump the gun, but they were right," said Lefsrud.

Like most people at the time, Lefsrud had never heard of the disease.

"I couldn't even pronounce the word," he said.

"And I certainly couldn't spell it."

Aphanomyces is a root rot pathogen but it's not the only one, said Barbara Ziesman, a provincial plant disease specialist in Saskatchewan.



Yield losses caused by aphanomyces are becoming more common in Saskatchewan. The disease affects peas and lentils.

"Root rots are a complex of organisms," she said.

"It's a fungal-like organism, but not a true fungus. It overwinters in the soil as oospores, which are hard walled resting structures that can survive in the soil without a host for a long period of time. Aphanomyces is a soil borne pathogen. It cannot be transmitted on the seed unless there is dirt on the seed. It is only soil borne."

All varieties of pea and lentil are susceptible to the disease.

"Chickpeas and faba beans can be affected and can have oospores but they will not have as high disease severity as susceptible plants will," Ziesman said.

Banniza, a U of S professor and Ministry of Agriculture Strategic Research Program Chair, was among the researchers who compiled the *First Report of Aphanomyces Euteiches in Saskatchewan*, a document published in 2012.

She stated that the pathogen was probably widespread and present for a long time with recent environmental conditions enabling its detection.

Although aphanomyces has been reported on pea and other legume crops since in seven of 10 Canadian provinces since 1948, it had not been identified in Saskatchewan until 2012.

That year, after wet conditions over several seasons, aphanomyces euteiches was identified in samples from three diverse locations in the province — near Medstead in the northwest, Swift Current in the southwest and Assiniboia in the south-central area.

In 2016, Syama Chatterton of Agriculture and Agri-Food Canada in Lethbridge led a root rot survey that looked for the disease in 150 Saskatchewan fields.

Aphanomyces euteiches was confirmed by DNA testing on 44 percent of the pea fields surveyed and 32 percent of the lentil fields.

Controlling the spread of the disease is important to the pulse crop industry but there is still uncertainty about how the disease spreads.

"It's unclear how it spreads and also unclear how ubiquitous it is," said Ziesman.

"It's not a new pathogen. We know that it is soil borne. It lives in the soil and doesn't produce any airborne spores."

Ziesman said the increased moisture that Saskatchewan has experienced in the last several years has definitely increased the severity of aphanomyces.

Aphanomyces overwinters as oospores. The oospores germinate and produce sporangia which then produce zoospores.

The zoospores have a little tail that enables them to travel short distances throughout the soil, moving toward susceptible plants.

"It is thought that when the oospores germinate, they do so in response to chemicals produced on the roots of susceptible plants."

Sarah Foster, president and senior seed analyst with 20/20 Seed Labs at Nisku, Alta., said rotation is the key to prevention.

"Rotation. Rotation. Rotation," said Foster.

Ziesman agreed.

A short rotation between susceptible crops is going to increase the amount of pathogen present. When you start to spread it out, you will reduce the buildup.

And, if a field has confirmed aphanomyces in the soil, then producers should stay away from pea and lentil there for at least six years, Ziesman added.

"That's not going to get rid of the pathogen but it's going to prevent that buildup. That is definitely the most effective management structure."

"Often you get more than one organism involved at the same time, so the best thing a producer can do to know if aphanomyces is an issue is to have the affected plant tested."

According to Banniza at the U of S, soil tag on seeds or equipment could spread aphanomyces.

But since it has been identified more or less in every region of the province that's been surveyed, she wonders if earth tag is very relevant.

"I think if a grower has had root rot problems in pea or lentil, it would be a good idea to get the soil tested for aphanomyces," Banniza said.

"If the test shows aphanomyces, the best and probably the only effective management strategy is a rotation away from pea and lentil for six to eight years."

"Also, if there are infested and non-infested fields on a farm, it may be advisable to move farm equipment from the non-infested fields to the infested fields, and not the other way round, or give them a thorough clean to remove earth tag."

Producers might also want to consider looking for another legume for their rotation.

"All pea and lentil varieties currently grown in western Canada are susceptible to aphanomyces root rot," said Tom Warkentin, professor and Ministry of Agriculture Strategic Research Program (SRP) Chair. "In contrast, faba bean, common bean, chickpea, and soybean varieties are generally resistant."

It's also important to remember that seed treatments registered for control of pythium or fusarium won't be effective against aphanomyces, said Ziesman.

One seed treatment, INTEGO Solo, is now fully registered for aphanomyces for lentil and pea, but the treatment is used for suppression, not control of the disease.

Susceptible pea and lentil varieties will be susceptible over the entire life of the plant but seed treatment is only effective two to three weeks after it is applied.

Meanwhile, three years out from when he first discovered aphanomyces on his farm, Lefsrud considers himself fortunate.

He reckons his peas have lost maybe one or two percent to aphanomyces. Yield losses in other parts of the Prairies have been much worse.

Lefsrud recommends applying seed treatments to all pea crops and growing peas in about a five-year rotation.

Varietal resistance to aphanomyces will take time

Aphanomyces is a nasty pathogen infecting peas and lentils. Unfortunately, there are no resistant varieties currently available.

As a result, the best defences that growers can employ is using good rotations and ensuring that peas and lentils are planted on clean fields.

"All pea and lentil varieties currently grown in Western Canada are susceptible to aphanomyces root rot," says Tom Warkentin, professor and Ministry of Agriculture Strategic Research Program (SRP) chair.

"In contrast, faba bean, common bean, chickpea and soybean varieties are generally resistant."

However, scientists at the University of Saskatchewan are collaborating with colleagues in France and the United States to develop pea and lentil cultivars with improved resistance.

American and French scientists have been studying aphanomyces in peas for the past 15 years or so.

Researchers have identified germplasm with improved, though not complete, levels of resistance. This germplasm should be useful in breeding new Canadian varieties, said Warkentin.

"In the case of lentil, efforts are underway to evaluate wild lentil relatives for improved resistance," he said.

There are a couple of issues that make developing resistant varieties especially challenging, he added.

"No complete resistance has been identified and, the resistance that has been identified in pea is controlled by several genes, making it a substantial challenge to 'pyramid' these genes into an adapted variety. We plan to use molecular markers to facilitate this process."

Aphanomyces also affects alfalfa. Resistant varieties have been developed in alfalfa.

But resistance in alfalfa will not be of any help in developing resistant pea or lentil varieties said University of Saskatchewan researcher Sabine Banniza.

Researchers think that the disease can pass from species to species within the legume family.

"I don't think there is absolutely solid data on whether all aphanomyces strains can infect all susceptible legume species with the same efficiency or whether there has been a bit of specialization on particular crops."

So how long will it be before Saskatchewan pea and lentil gain access to new pea and lentil varieties with improved resistance to the disease?

"(We) can't answer that definitively ...," said Warkentin

"Not in the next (few) years."

— BYERS

PULSE BREEDERS SERVE UP NEW OFFERINGS

BY DELANEY SEIFERLING

Pulse breeders at the University of Saskatchewan's Crop Development Centre (CDC) are constantly working on developing new varieties with improved yield, disease and weed resistance and tolerance, and other desirable attributes.

They are also constantly working on getting these new varieties tested and into the hands of Saskatchewan growers as soon as they're ready.

As a result of this work, there are several noteworthy varieties that are expected to be available to growers in coming years through the Saskatchewan Pulse Growers variety release program. Here are a few names to watch out for.

Red lentils

CDC Impulse and CDC Proclaim, both released to Select seed growers in 2014, are varieties that commercial lentil growers should watch for, says Sherilyn Phelps, Saskatchewan Pulse Growers' agronomy and seed program manager.

CDC Proclaim is similar to the benchmark CDC Maxim, which is currently the most widely grown red lentil in Saskatchewan, while CDC Impulse is 10 percent larger than CDC Maxim. Both CDC Proclaim and CDC Impulse have good disease resistance, early-to-medium maturity and they are both Clearfield varieties.

Another one to watch for is CDC Redmoon, according to Phelps. Although it won't be available to growers for a couple of years, this variety is also similar to CDC Maxim and early testing shows very high yields. It is not a Clearfield variety.

CDC Roxy is an extra small red lentil registered by the CFIA in 2014. Although it's not a Clearfield variety, it is plumper than most extra smalls and has good lodging tolerance.

Green lentils

A new French green lentil variety to watch for is CDC Marble. Released to Select growers in 2013, it has a slightly lighter colour than other French greens but has improved lodging tolerance and a good disease package and yield. Marble is not a Clearfield variety.

Pulse crop breeders at the University of Saskatchewan's Crop Development Centre are continuously working to develop varieties that offer bigger yields and improved traits. Several noteworthy varieties are expected to be available to growers in coming years through the Saskatchewan Pulse Growers variety release program.

CDC Kermit, a small green variety released in 2014, is noteworthy for its similarity to CDC Viceroy and CDC Invincible, the two most widely-grown small green varieties in Saskatchewan last year.

Although not a Clearfield variety, CDC Kermit has good yield potential and good lodging tolerance.

In large greens, CDC Greenstar was released in 2013 and is noteworthy for being the largest seed size in its class.

It also has high yield potential and it is a Clearfield variety. In terms of colour, CDC Greenstar lands between CDC Greenland and CDC Plato.

"We are also hoping there will be new large greens coming out of the CDC breeding program soon that are Clearfield varieties," Phelps says.

Peas

According to CDC pea breeder Tom Warkentin, a yellow pea to watch for is CDC Inca. First released in 2015, seed likely won't be available to growers for another couple of years, but the new variety has a strong yield potential for southern Saskatchewan.

"Based on data available so far, it has a seven percent yield advantage over CDC Amarillo in the south," Warkentin says.

In green peas, CDC Greenwater is the one to keep an eye on.

First released in 2014, it is already showing strong potential for yield with a 21 percent yield advantage over CDC Striker (currently the most widely grown green pea variety in Saskatchewan) in the south and a 13 percent yield advantage in the north.

Although not new, CDC Raezer and CDC Limerick are both up and coming varieties, gaining substantial acres in Saskatchewan. Released in 2011 and 2012, respectively, they both provide greater yield than CDC Striker.

Chickpea

There won't be any new chickpea varieties released next year, but CDC chickpea breeder Bunyamin Tar'an and his team are busy prepping new varieties for potential release in 2018, all of which will be IMI-tolerant.

Of the current varieties there are a few that are noteworthy, Tar'an says.

The most promising include CDC Orion, released in 2010, and CDC Leader, released in 2011. CDC Palmer also has good potential. It was released in 2014.

"All these new kabulis are well adapted to Saskatchewan conditions, and CDC Leader in particular is relatively early maturing compared to the other medium-large kabuli," Tar'an says.

> *We are also hoping there will be new large greens coming out of the CDC breeding program soon that are Clearfield varieties.*
>
> **SHERILYN PHELPS** | SASKATCHEWAN PULSE GROWERS

Phelps adds that CDC Palmer has a lot of characteristics that will appeal to growers.

"It has a large seed size and is similar to CDC Orion, which is what guys are tending to look for," she says.

CDC Palmer also has yield similar to Orion and a medium-to-late maturity, while Orion has a later maturity.

Faba bean

The most recent faba bean variety released was CDC Snowdrop in 2012. This was the first small seeded, low tannin faba bean released from the CDC breeding program. It has been gaining acreage in Saskatchewan over the last couple years.

For information on all CDC developed varieties, visit http://saskpulse.com/growing/varieties/cdc-developed-varieties/.

Minimize production risk when trying new varieties

New crop varieties are the spice of life for commercial grain and oilseed growers. The improved genetic packages they contain can offer a variety of benefits to growers, including higher yield potential, improved disease resistance, better agronomic performance, improved straw strength and standability, enhanced end-use quality , better tolerance to abiotic stresses such as heat and drought, and ultimately, better value and marketability.

But there are risks involved with growing new varieties as well. Relative to established varieties, new cultivars have a limited track record. And although they have been assessed in pre-registration trials and multiplied by pedigreed seed growers, they are new to commercial grain farmers who have acquired certified seed.

For that reason, growers who are considering growing a new pulse variety for the first time should take a cautious approach and test the variety on limited acreage.

"Growers should be trying new varieties every year on limited acres to see how they perform under their production system, because every area is different," said Sherilyn Phelps, Saskatchewan Pulse Growers' agronomy and seed program manager.

"It's always good to try new varieties on limited acres, like half a field or a 20-acre piece, just to see how they perform."

Phelps also advises growers to be mindful that yield shouldn't be the first or the only priority when it comes to choosing new varieties.

Other considerations such as disease resistance, Clearfield tolerance and growing conditions specific to your farm should be factored into the decision.

"If you're in a shorter growing season, you might want an earlier maturing variety, or if you're looking to spread out your harvest workload, you may want to look at an earlier variety to ensure you get it off before your other crops are ready."

Saskatchewan Pulse Growers offers a wide range of production related materials to producers that are interested in trying new varieties or trying a new crop type.

For more information about choosing varieties, visit http://saskpulse.com/growing/.

— SEIFERLING

PRODUCERS' PULSE INVESTMENTS HIT NEW LEVELS

BY SASKSEED STAFF

Saskatchewan pulse growers have invested heavily into the development of new pulse crop varieties. In June, Saskatchewan Pulse Growers announced $23 million in funding to breeding programs at the Crop Development Centre in Saskatoon.

The investments that prairie pulse growers make into the development of new pulse crop varieties has never been greater than it is today.

In June, the Saskatchewan Pulse Growers (SPG) announced nearly $23 million in funding to support pulse crop breeding at the University of Saskatchewan's Crop Development Centre (CDC) for the 2015-16 to 2019-20 time period.

The funding will be applied to the third five-year term in SPG's 15-year pulse crop breeding agreement with the CDC and will support continued work in the areas of pea, lentil, chickpea, dry bean, and faba bean breeding.

"The availability of continually improving pulse crop varieties from the CDC has fuelled the rapid growth of pulse crop production for Saskatchewan growers over the past 20 years," SPG's vice chair Corey Loessin said.

"Our investments in support of pulse crop breeding will help to keep Saskatchewan growers positioned among the most competitive in the world."

In 2005, SPG and the CDC signed a 15-year pulse crop breeding agreement that provided three separate blocks of funding, each covering a period of five years.

Funding for the first five-year term of the agreement was $6.2 million.

This was followed by a $9.2 million commitment in the second five-year term and a $23 million investment for the third term. This brings total funding through the 15-year SPG-CDC agreement to more than $38 million.

Since 1997, more than 110 pulse crop varieties developed by the CDC have been released through SPG's variety release program.

"We believe the CDC pulse breeding program is the most successful in the world," said Carl Potts, executive director with SPG.

"Canada now has a dominant share of global trade in lentils and peas. Our investment in CDC will help to realize our goal of at least one pulse crop for every acre in the province by realizing further gains in other pulses such as chickpea and faba bean".

Meanwhile, Saskatchewan's pulse crop plantings reached their highest level in history in 2016 .

Kofi Agblor, managing director at the CDC, said it's no coincidence that Saskatchewan's pulse acreage has been following a steady upward tend.

New varieties funded by the province's growers and developed by the CDC have created new market opportunities and built a stronger industry in the province.

"The CDC is pleased to be continuing our partnership with SPG through the next five-year term," Agblor said of the June funding agreement.

"This significant increase in funding from SPG will support plant breeder's work on a long-term basis, ensuring they are able to deliver on the agronomic and end-use attributes that are most important to Saskatchewan farmers through innovative plant breeding. "

Agblor said the University of Saskatchewan will continue to contribute significant infrastructure and other in-kind resources towards pulse crop breeding, while maintaining royalty-free commercialization of arising varieties to Saskatchewan producers during the term of the agreement.

Accountable to and funded by growers, SPG's strategic direction is guided by a seven member, grower-elected board.

The organization's mission is to provide leadership for profitable growth for the Saskatchewan pulse industry.

Also last year, the SPG announced that the producer levy collected on pulses and soybeans grown in Saskatchewan would be reduced to 0.67 percent from one percent for a one year period, effective August 1, 2016.

The decision to lower the producer levy amount was made by SPG, with approval from Agri-Food Council.

"At SPG, we recognize that increased pulse acres and growing market demand has led to a record high value of production for pulses," the organization said in a prepared statement.

"As a result, SPG levy revenue has exceeded the organization's operating expenses in recent years, as levy has increased from $13 million in 2013-14 to an anticipated total of $25 million in levy revenue in 2015-16. "With this in mind along with a significant accumulated reserve, we felt it was appropriate to reduce the levy to better match revenues with expenses and to keep more money in the pockets of growers.

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PUTTING A PRICE ON MIDGE TOLERANT WHEAT

BY KAREN LEWIS

The seed industry now has a solid handle on the financial benefits of midge tolerant wheat.

Since the launch of the first midge tolerant varieties in 2010, growers and industry have been strongly committed to stewardship of the technology that protects a crop from the damaging effects of orange blossom wheat midge.

Research can now quantify just what their effort is worth.

According to program evaluation experts, Ference and Company, the net benefits of the midge tolerant wheat innovation is approximately $455.8 million. This finding comes from a cost-benefit analysis report prepared for Agriculture and Agri-Food Canada.

The Ference and Company study puts the total development cost of the innovation at $16.3 million, which includes ongoing investment over the next three years.

"We were really pleased to see these numbers," says Mike Espeseth, communications manager for the Western Grains Research Foundation (WGRF) and co-chair of the midge tolerant wheat stewardship committee.

"It's great to see that technology investment is paying off for western Canadian agriculture."

WGRF is just one of the many stakeholders who funded the development of midget tolerant wheat varieties.

According to Espeseth, putting an actual value to midge tolerant technology underscores the importance of protecting it.

In an effort to protect the technology, every midge tolerant wheat producer commits to signing a Stewardship Agreement at the time of seed purchase.

Specifically, growers agree to limit the use of farm-saved seed to one generation past Certified seed, which keeps the refuge at the necessary level.

There is currently only one midge tolerant gene called Sm1. The industry can't risk losing this gene or putting its efficacy in jeopardy.

The midge tolerant wheat stewardship committee works hard to ensure this message reaches growers.

Stewardship reviews are another way that growers are reminded of their commitment to protect the technology.

According to Todd Hyra, business manager for SeCan in Western Canada, wheat growers are very receptive to the compliance reviews, which are ongoing.

"That being said, there are a few difficult situations that we follow-up on and, if necessary, take enforcement actions," Hyra said. "It's a very small number, but they risk a lot for the entire trait."

An interspersed refuge system is critical to preserving the Sm1 trait. It prevents the build up of the virulent midge population, which carries a mutation that allows them to attack midge tolerant varieties.

Without the interspersed refuge system, midge tolerance could break down within 10 years and there is no other known source of midge tolerance.

Thanks to the diligent stewardship practices of growers, varieties that contain the Sm1 gene can continue to be developed.

Six new varieties are available for the upcoming growing season, bringing the total number of midge tolerant wheat options to almost 20.

> *When you're not spraying out all of the beneficial insects, that allows things to fall into balance. It also allows producers to focus on other challenges when they've got midge under control.*
>
> **TODD HYRA** | SECAN

Adding new classes of wheat to the midge tolerant line-up exposes the technology to growers who may not have had a chance to try it before.

Hyra views this as an opportunity to teach new growers, as well as previous ones, how it works.

"Midge must feed on the kernel in order to trigger the response and turn them off feeding," Hyra explained.

"It is midge tolerance, not midge resistance. In the case of a midge tolerant variety, sometimes you will see some damage in the sample, but because you are retaining more of those kernels, you have more grain. As opposed to the ones that are fed on completely and blown out the back of the combine."

There are hot spots of midge in Saskatchewan each year.

In 2016, the eastern part of the province had the highest risk of infection, but there were no major outbreaks.

"I really do believe in midge tolerance keeping everything in balance," said Hyra.

"When you're not spraying out all of the beneficial insects, that allows things to fall into balance. It also allows producers to focus on other challenges when they've got midge under control."

AG LABOUR SHORTAGE TO DOUBLE BY 2025

BY SASKSEED STAFF

The gap between labour demand and the domestic workforce in agriculture has doubled from 30,000 to 59,000 in the past 10 years, according to research conducted by the Canadian Agricultural Human Resource Council (CAHRC).

The research also indicates that by 2025, the shortage of workers in the Canadian agri-workforce could reach 114,000.

The findings were released late last year in a report entitled *Agriculture 2025: How the Sector's Labour Challenges Will Shape its Future.*

The research revealed that primary agriculture has the highest industry job vacancy rate in Canada at seven percent.

"The sustainability and future growth of Canada's agriculture and agri-food industry is at risk," said CAHRC executive director Portia MacDonald-Dewhirst.

"It is critically important that this risk is acknowledged and mitigated in an intentional and strategic way."

MacDonald-Dewhirst said the Canadian agriculture industry has been encouraging young people and workers from other sectors to choose agriculture as a career.

Despite extensive efforts, gaps still exist.

CAHRC is warning of a large labour void in the future, with a widening gap between available agricultural labourers and market demand.

Labour shortages create avoidable risks to Canada's farmers.

To minimize that risk, primary producers should be afforded the same or greater access to both domestic and foreign workers in the future as they have now.

The study examined labour shortages affecting only primary production. Agri-food industries such as food and beverage processors or input suppliers were not considered.

The research points to a critical labour shortage that exists today and suggests that the lack of agricultural labourers will become even worse in the next 10 years.

Unless it is addressed, the labour shortage could have potentially serious consequences for business viability, industry sustainability and future growth.

CAHRC said access to less labour for Canadian farmers now and into the future will also affect food security for Canadian consumers and limit the export potential of Canada's entire agri-food industry.

Finding and retaining reliable farm labourers is an ongoing challenge for the industry. A new study suggests the demand for farm workers will outpace supply.

To address the labour issues identified in the research, CAHRC, with the help of the Government of Canada, has developed agriculture-specific human resource (HR) tools designed to support modern farm operations to manage their workforce.

CAHRC offers Agri Skills, online and in-person training programs, and the Agri HR Toolkit – an online resource guide and templates to address the HR needs of any business.

For agricultural organizations, there are customized labour issues briefings that apply the new research to specific commodities and provinces.

The tools allow agricultural organizations to explore the labour implications within their specific area.

For more information on these and other CAHRC offerings visit www.cahrc-ccrha.ca.

CAHRC's report, Agriculture 2025: How the Sector's Labour Challenges Will Shape its Future can be downloaded at http://www.cahrc-ccrha.ca/agriLMI.ca .

The research was validated through industry consultations that were conducted across Canada.

Consultations included 1,034 surveys of employers, workers and industry stakeholders, 80 telephone interviews, six focus groups with a total of more than 100 participants, and seven webinars focused on specific commodity groups with 100 participants in total.

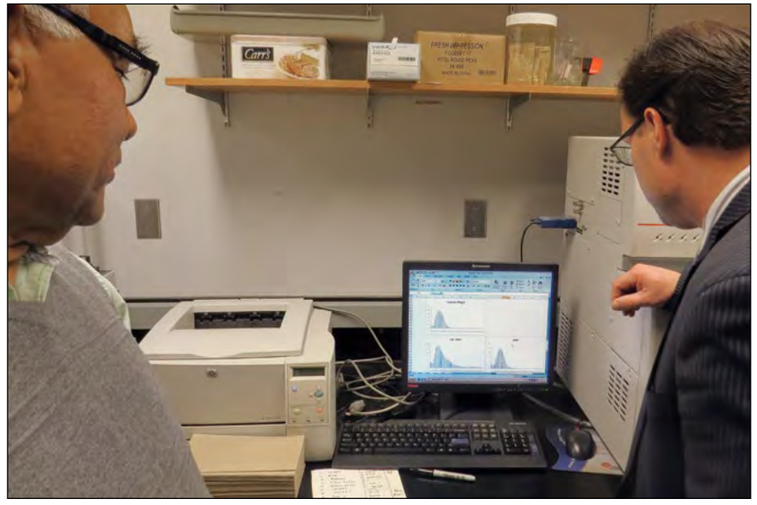
The research was funded in part by the Government of Canada's Sectoral Initiatives Program.

The Canadian Agricultural Human Resource Council works with industry leaders, governments and educational stakeholders to research, develop and communicate solutions to the challenges in employment and skills development in primary agriculture.

The Council also leads collaborative implementation efforts in support of the national Workforce Action Plan for the agriculture and agri-food sector. For more information visit www.cahrc-ccrha.ca.

RESEARCHER MAKES PROGRESS IN FHB FIGHT

BY SASKSEED STAFF



University of Saskatchewan researcher Ravi Chibbar, left, says new mutagenic wheat lines show promise in the ongoing fight against fusarium.

Researchers at the University of Saskatchewan have identified a handful of experimental wheat lines that could represent a significant step forward in the battle against fusarium headblight.

Ravi Chibbar, a U of S expert in molecular biology and plant genetics, says new experimental wheat lines that were tested in a fusarium nursery at Carman, Man., show a significant improvement in FHB resistance relative to existing varieties.

The promising mutagenic lines show resistance levels approaching those in Sumai-3, an experimental Chinese germplasm that is widely recognized as containing the best genetic sources of FHB resistance in wheat.

"We sent about 10 experimental lines to ... Carman and there we found one line that had a visual rating index that is very close to Sumai-3," Chibbar said.

"Sumai-3 has a visual rating index of five and our best line was eight, so the line is very promising."

A second line that was tested in Carman had a visual rating index of 12 and other experimental lines that were examined by plant pathologist Randy Kutcher also showed ratings that were significantly lower than those observed in existing varieties in the Canada Western Soft White Spring (CWSWS) and Canada Western Red Spring (CWRS) wheat classes.

The experimental lines developed by Chibbar were produced mutagenically, using AC Nanda as the source variety.

AC Nanda is a CWSWS wheat variety developed by researchers at Agriculture and Agri-Food Canada in Lethbridge.

Chibbar and his colleagues chose to work with a CWSWS variety because soft white varieties are known to be more amenable to cultural protocols that are used in mutagenesis.

The next step is to incorporate the promising genetic material contained in Chibbar's experimental lines into new wheat varieties. To do this, researchers need to backcross the experimental lines with newer varieties in the target CWRS class.

This work is expected to take several years, meaning that new CWRS wheat lines with improved FHB resistance could be a long time in the making.

Chibbar is also hoping develop molecular markers that can be used in marker assisted breeding.

Molecular markers would allow plant breeders at the U of S to speed up the breeding process and bring new varieties to growers more quickly.

Chibbar said it is too early to estimate when CWRS lines with improved resistance will be available to commercial growers.

Nonetheless, the fact that a new source of resistance has been identified comes as good news to the western Canadian wheat industry, which dealt with significant fusarium-related losses in 2016.

"What we do is essential the pre-breeding work that will eventually be used by our breeders," said Chibbar, who declines to offer timelines.

"But at least we can say that we have some lines that look very promising."

Chibbar's efforts to develop new sources of FHB resistance grew out of a project that involved the development of wheat spikes in a controlled laboratory setting, or in vitro.

A few years ago, he and colleagues at the U of S demonstrated that an immature wheat spike that had not yet emerged from the boot could be grown to maturity in a small test tube under controlled environmental conditions within 35 days.

By growing an immature wheat spike in a test tube, researchers eliminated environmental factors that could not be controlled in a field setting.

After successfully demonstrating the in vitro method, Chibbar then started to think about how the new method could be applied. He and a colleague decided to apply a mutagenic substance known as ethyl methyl sulfonate, or EMS, to spikes of AC Nanda to see if the in vitro wheat spikes that develop would contain any genetic mutations.

The results were encouraging. The addition of EMS created hundreds of genetic mutations in the laboratory population.

The next step was to inoculate the spikes with fusarium spores.

"We thought the in vitro spike culture would be a very good system to assess and expand the genetic resources to address the problem of fusarium head blight," Chibbar told SaskSeed.

"It has worked well. When we assessed the mutagenic lines that had been inoculated with fusarium, some lines had very low disease severity...."

Chibbar's team has also characterized some of the target genes associated with FHB resistance.

The changed nucleotide sequences of these genes have been used to develop genetic (DNA) markers that could be used by wheat breeders to introduce FHB resistance into other non-resistant wheat lines.

"We already have one marker but we want to develop more markers and then do marker assisted selection so that with very few backcrosses, we can get that resistance into new wheat varieties."

Kutcher, a plant pathologist at the University of Saskatchewan's Crop Development Centre, said progress has been made over the past 10 or 15 years toward the development on wheat varieties with better fusarium resistance.

But advances have been slow.

"It's a difficult disease because there's no one or two genes that do a complete job, as far as offering resistance ...," he said.

"Unfortunately, there's no magic solution," he continued.

> *There's no magic solution (to fusarium) ... Varietal selection is just one part of the picture.*
>
> **RANDY KUTCHER** | PLANT PATHOLOGIST

"Sometimes, for example, you'll find a gene for stem rust or stripe rust that has a great effect ... but with fusarium, there's nothing really that jumps out ... so I don't think growers can count on having the ultimate resistant variety any time soon...."

Kutcher said growers should take a multi-pronged approach to dealing with fusarium.

The best strategies will include careful varietal selection, good rotations, soil and residue management, and timely application of fungicides during the proper growth stage.

"There are moderately resistant varieties available but if growers are going to have to buy to deal with the problem, that's just not going to work."

"Varietal selection is just one part of the picture when it comes to managing this disease."

CSGA
Canadian Seed Growers' Association

How is **Certified Seed** Produced?

www.seedgrowers.ca

1 Variety Development
In labs and fields, Plant Breeders develop new seed varieties with new traits and improved yields. Certified seed sales help develop new varieties.

2 Parent Seed Multiplication
Most Breeder seed is produced in small amounts and CSGA seed growers multiply this seed.

3 Field Selection
Seed growers carefully select fields which meet strict previous land use requirements of CSGA.

4 Planting Equipment Sanitation
During planting, seed growers protect quality by investing extra time cleaning machinery and planters to remove seed of other varieties, difficult-to-separate weeds or other crop kinds.

5 Isolation
Certified seed production fields are carefully isolated from other crops to prevent contamination from other varieties or crop kinds.

6 Roguing
Seed growers inspect their crops throughout the growing season and remove off-types, other varieties, problem weeds and other crop kinds that have emerged during the season.

7 Field Inspection
Seed crops are inspected at a specific stage of maturity during the growing season by third-party inspectors licensed by the Canadian Food Inspection Agency (CFIA).

8 Certification
After passing the field inspection and meeting all CSGA standards, the seed grower receives an official crop certificate.

9 Harvesting Equipment Sanitation
Before and during harvest, seed growers protect quality by investing extra time cleaning their harvesting, transfer and storage equipment.

10 Harvesting
At the proper stage of maturity, the seed crop is harvested by the seed grower.

11 Separate Seed Storage
To preserve varietal purity and provide a traceability record, Certified seed requires separate storage bins to preserve unique genetic identities.

12 Testing and Grading
Federal Seeds Regulations require CFIA-accredited graders to verify that pedigreed seed is tested by CFIA-accredited labs for compliance with standards for germination and physical purity.

13 Bagging and Tagging
Certified seed is packaged and labeled by variety name with an official blue Certified seed tag.

14 Commercial Farmer
Certified seed is planted by commercial farmers to produce their large commercial crops of grains and oilseeds.

15 Food Processor
Food processors who demand grains and oilseeds grown from Certified seed get the assurance of starting with identity-verified ingredient characteristics to ensure consistent, high quality, premium products.

The Canadian Seed Growers' Association (CSGA) represents seed growers and provides leadership as the organization that certifies the pedigreed seed crop of all agricultural crops in Canada except potatoes.

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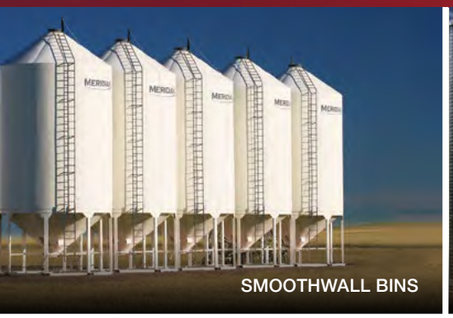
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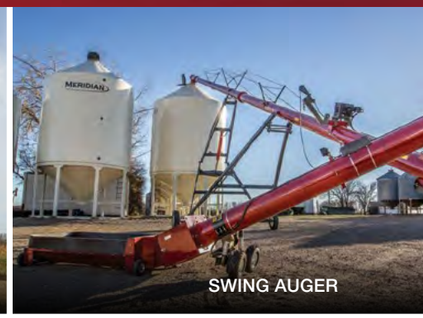
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How is **Certified Seed** Produced?

1 Variety Development
In laboratories and fields, Plant Breeders work diligently for many years to develop new seed varieties with improved genetics. For farmers, this means improved yields due to better lodging resistance, drought tolerance or insect and disease resistance. For food processors, this relates to innovative characteristics. A portion of the Certified seed sales is reinvested in research to develop new and innovative seed varieties.

2 Parent Seed Multiplication
Breeder seed is usually produced in small amounts, so CSGA seed growers multiply the seed. Accredited CSGA plot growers choose a seed variety to produce in their elite parent seed plots. They reproduce this small amount of seed in accordance with rigorous production certification standards that ensure varietal purity and freedom from impurities. Their Select or Foundation class seed provides the parent seed for other seed growers to produce Registered and Certified class seed crops.

Breeder & Select Plots > Foundation & Registered Seed > Certified Seed > Commercial Grains & Oilseeds

The investment in additional production time means Certified seed growers are committed to producing a proven, quality product.

3 Field Selection
Seed growers carefully select the field in which to produce their crop. Seed growers are required to follow stringent CSGA regulations for previous land use to prevent contamination from other varieties and difficult-to-separate weeds or other crop kinds in their Certified seed crops.

4 Planting Equipment Sanitation
During planting, seed growers protect quality by investing extra time cleaning machinery to ensure no seed of other varieties, difficult-to-separate weeds or other crop kinds are mixed with the seed. When growers change varieties, the entire planter is cleaned to remove all seed of the previous variety.

5 Isolation
Certified seed production fields are carefully isolated from other crops to prevent contamination from other varieties or difficult-to-separate other crop kinds. Seed crop kinds with different types of pollination risks have different isolation requirements. The isolation distance required by CSGA also varies depending on the crop kind in the neighboring field.

6 Roguing
To preserve the purity of Certified seed crops, seed growers inspect their crops throughout the growing season and remove other varieties, off-types, weeds and other crop kinds that have emerged during the season.

7 Field Inspection
Seed crops are inspected at a specific stage of maturity during the growing season by third-party inspectors licensed by the Canadian Food Inspection Agency (CFIA). Inspectors verify isolation distances, previous land use history and parent seed identity. They also complete representative counts throughout the seed field to report impurities such as off-types and other varieties and difficult-to-separate weeds and other crop kinds.

8 Certification
After crop inspection, the inspection report is appraised by the Canadian Seed Growers' Association (CSGA). The CSGA assures the crop has been produced in compliance with its standards. After passing field inspection and meeting CSGA standards, the seed grower receives the official crop certificate that is required for CFIA-Registered Seed Establishments to label seed with official blue Certified tags.

9 Harvesting Equipment Sanitation
Before and during harvest, seed growers protect quality by investing extra time cleaning their harvesting equipment. This prevents common seed, weed or other crop seeds getting mixed with the Certified seed at harvest. When seed growers change fields to harvest a different variety, the entire combine is cleaned to remove all seed of the previous variety harvested.

10 Harvesting
At the proper stage of maturity, the Certified seed crop is harvested by the seed grower.

11 Separate Seed Storage
To preserve varietal purity and provide a traceability record from where the seed was grown all the way to the consumer's table, Certified seed is the first link of an identity preserved (IP) system chain which requires a separate storage bin and records for each variety to preserve its unique genetic identity.

12 Testing and Grading
Federal Seeds Regulations require pedigreed seed sold in Canada to be tested for compliance with official grade standards for germination and physical purity by CFIA-accredited labs and graders and labeled by CFIA-registered seed establishments. The federal standards for germination and physical purity of Certified seed are much higher than common grade seed, which assures a higher quality product. Federal Seeds Regulations prohibit common grade seed from being sold by variety name. Common grade seed is from a crop which has not been certified by the CSGA.

13 Bagging and Tagging
After receiving the official CSGA crop certificate and a certificate of analysis from a CFIA-accredited lab, which verifies compliance with seed germination and physical purity standards in federal Seeds Regulations, Certified seed is packaged and labeled by variety name with an official blue Certified seed tag by a CFIA-registered seed establishment. Only then is the seed designated as Certified seed; only then can agricultural field crop seed be sold by variety name.

14 Commercial Farmer
Certified seed is sold to commercial farmers to plant their large commercial crops of grain and oilseeds. Commercial farmers are choosing Certified seed of a specific variety to get the latest innovation, increased yields, improved disease and lodging resistance. Many commercial farmers work closely with food processors to deliver specific varieties of grains and oilseeds under an identity preservation programs.

15 Food Processor
Food processors who demand grains and oilseeds grown from Certified seed get the assurance of starting with identity-verified ingredient characteristics to ensure consistent, high quality, premium products. They also get documented traceability of their food products right back to the field where the Certified seed was produced. Certified seed is the foundation of quality foods and a promise they can market specific varietal characteristics to today's health conscious and food savvy consumers. Ask for grains and oilseeds grown from Certified seed from your grain handler, miller, crusher, ingredient supplier or food manufacturer.

WORK UNDERWAY ON WHEAT RESEARCH CLUSTER

BY SASKSEED STAFF

Efforts aimed at developing a new national wheat research cluster in Canada appear to have plenty of momentum heading into 2017.

Late last year, funding organizations from across Canada announced their intention to develop a Canadian National Wheat Cluster that will conduct research in a number of key areas relevant to the wheat industry.

Participating organizations include the Alberta Wheat Commission, Ducks Unlimited, Manitoba Wheat and Barley Growers Association, Saskatchewan Wheat Development Commission, Saskatchewan Winter Cereals Development Commission, Western Grains Research Foundation, Winter Cereals Manitoba Inc., and the Canadian Field Crop Research Alliance, whose members include Grain Farmers of Ontario, Producteurs de grains du Québec, Atlantic Grains Council, and SeCan Association.

Participating organizations have identified key research priorities and have called for letters of interest from researchers who are seeking funding to support projects that fall within priority areas.

The new wheat research cluster wil replace the current National Wheat Improvement Program (NWIP), which is supported by many of the same organizations and receives funding from Agriculture and Agri-Food Canada through the Growing Forward 2 AgriInnovation Program.

The NWIP is a $25.2 million, five-year collaborative agreement that expires in March 2018.

The new cluster is aimed at continuing work on important wheat research after the NWIP ends in slightly more than 12 months.

The new cluster would allow the wheat industry to access additional federal funding through the new Agriculture Policy Framework (APF), once Growing Forward 2 programming expires.

According to guidance documents, priority research areas include variety and germplasm development as well as wheat specific agronomy projects.

The development of new wheat varieties and germplasm should focus on:

- increased yield;
- improved yield stability;

Continued on page 93 »

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TOOLS TO HELP YOU MAKE BETTER CHOICES

The CPT system includes both small plot and large field scale trials. Results for 2016 are based on 13 small plot trials and a number of field scale trials across the Prairies. Further information and variety evaluation tools are available online at www.canolaperformancetrials.ca.

Site distribution is based on seeded acres in Manitoba, Saskatchewan, Alberta and British Columbia.

The small plot system ensures that:

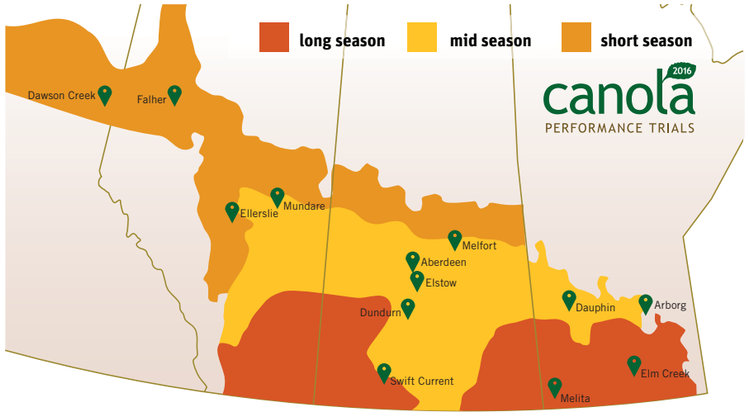
- All varieties are treated with appropriate commercially associated herbicides and seed treatments.
- An independent third party representative inspects all trials.
- Varieties are in blocks based on maturity. That way, harvest occurs at the appropriate time to minimize harvest losses due to maturity differences.

Field scale comparisons add extra perspective for assessing consistency in variety performance. Comparisons are based on harvested strips of 0.5 to 1.5 acres each. Field scale data is not necessarily replicated in all cases, but the data presented has been audited to make sure it complies with CPT protocols.

CV – For coefficient of variation (CV), the lower the CV value, the more reliable the test. For example, if comparing results from two test locations, one with a CV of 4% and the other with a CV of 8%, the test with the CV of 4% can be considered more reliable. There is always variability in research trials. The key is designing and managing experiments so CVs stay within a reasonable range. For the CPT, experience has shown that CVs below 15% indicate good test reliability.

LSD – The least significant difference (LSD at a 5% level of statistical significance) for each dataset indicates whether differences between varieties are statistically meaningful. Varieties should only be considered different in yield performance if the numerical difference between them is greater than the LSD value. Using the sample table below, if the LSD is 5.0, varieties A and B are not statistically different, B and C are not statistically different, but A and C are statistically different. In the yield graphs for each season zone, LSD for each variety group is given on the left.

Variety	Yield (bu./ac.)
A	52
B	54
C	58
LSD	5.0



USING THE TABLES

Results are organized by short, medium and long season zones. CPT uses the Western Canada Canola/Rapeseed Recommending Committee (WCC/RRC) season zones, which are based on typical frost free days, growing degree days and soil type. Grey wooded soils, for example, are in the short season zone. See Table A for specific numbers for each zone.

Small plot and field scale data will be presented separately in the following tables. For more detailed performance results, growing conditions and production details for specific trial sites, use the online CPT database at www.canolaperformancetrials.ca.

The tables include yield, days to maturity, height and lodging scores for each variety. Lodging scores are between 1 and 5, with 1 being no lodging and 5 being completely lodged.

Gross revenue is based on yield multiplied by $10.79/bu. This is based on $475.90 per tonne, the March 2017 futures close on Sept. 30, 2016 and a 50-pound bushel weight. Premiums are included in the calculations for specialty market varieties.

In the tables, varieties are listed numerically and alphabetically, starting with Clearfield (CL) varieties, followed by Liberty Link (LL) and Roundup Ready (RR).

Each zone and small plot location is identified on the map. Use the map to identify your growing season zone and trial locations closest to your farm.

To evaluate yield potential, look at all small plot and field scale locations in your growing season zone and the average yield for your zone. Consider other information such as maturity, lodging resistance and cost.

Table A: Season Zones

Season	Frost Free Days	Growing Degree Days (Base 5ºC)*
Short	75–95	1,100–1,450
Medium	95–115	1,450–1,700
Long	115+	1,700+

*On a base 5ºC scale, growing degree days only accumulate on days when highs are above 5ºC.

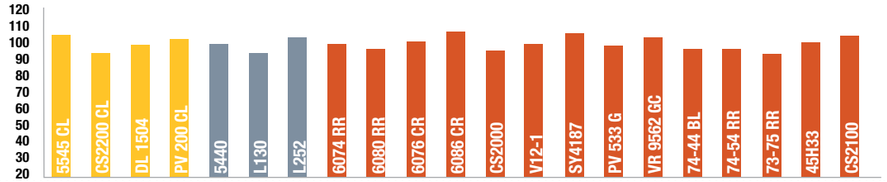
Canola performance trials 2016 results: average results by season zone (small plot data)

Variety	Long Season Zone (2 trials)					Mid Season Zone (9 trials)					Short Season Zone (2 trials)						
	Yield (bu./acre)	Yield (% 5440)	Maturity (days)	Lodging (1-5)	Height (inches)	Yield (bu./acre)	Yield (% 5440)	Maturity (days)	Lodging (1-5)	Height (inches)	Yield (bu./acre)	Yield (% 5440)	Maturity (days)	Lodging (1-5)	Height (inches)	Disease Tolerance[3]	Distributor
Clearfield																	
5545 CL	50	105	96	3.0	47	58	99	101	2.6	49	51	100	117	2.8	43	BL	BrettYoung
CS2200 CL	44	95	96	3.0	46	56	93	102	2.0	51	50	97	118	2.8	41	BL	Canterra Seeds
DL 1504*	47	100	97	2.9	48	58	97	102	2.0	52	57	110	118	2.8	40	BL	DI Seeds
PV 200 CL	48	103	97	3.4	45	57	96	101	2.5	50	46	90	116	3.0	42	BL	Proven Seed/CPS
LSD	6					7					5						
Liberty Link																	
5440	47	100	95	1.9	46	60	100	100	1.2	52	51	100	117	2.8	40	BL	Bayer CropScience
L130	45	95	95	2.4	44	59	98	99	1.4	50	48	94	114	2.3	40	BL	Bayer CropScience
L252	49	104	96	2.9	46	65	108	99	1.9	49	53	103	118	2.5	40	BL	Bayer CropScience
LSD	7	10	7														
Roundup Ready																	
6074 RR	47	100	94	2.3	47	58	99	102	2.0	50	56	110	116	2.5	39	BL/S	BrettYoung
6080 RR	46	97	93	2.5	45	59	100	100	1.8	48	50	97	118	1.3	40	BL	BrettYoung
6076 CR	48	101	96	2.6	48	57	95	101	2.2	51	51	99	117	2.3	42	BL/CR/S	BrettYoung
6086 CR	50	107	94	2.3	47	59	99	102	2.3	51	50	98	119	2.5	41	BL/CR	BrettYoung
CS2000	45	96	97	3.9	46	60	99	100	2.5	50	53	103	118	3.5	42	BL/CR	Canterra Seeds
V12-1**	47	100	93	2.5	45	57	96	100	2.3	49	50	98	115	2.3	40	BL	Cargill – Victory Hybrid Canola
SY4187	50	106	97	1.8	49	61	102	101	1.8	53	50	96	116	2.3	41	BL/CR	Syngenta
PV 533 G	46	99	91	2.7	46	60	101	98	1.7	48	51	99	115	2.5	40	BL	Proven Seed/CPS
VR 9562 GC	49	104	93	2.7	49	64	106	99	2.0	51	48	94	117	2.3	41	BL/CR	Proven Seed/CPS
74-44 BL	45	97	92	3.2	43	59	100	98	2.1	46	51	99	115	2.5	38	BL	Dekalb
74-54 RR	46	97	96	3.5	47	57	96	98	2.7	47	50	97	118	3.5	37	BL/CR	Dekalb
73-75 RR	44	94	95	3.8	44	60	100	99	2.6	46	48	94	118	2.8	38	BL	Dekalb
45H33	47	101	93	2.5	47	60	101	99	2.1	50	50	97	115	3.0	43	BL/CR	Dupont Pioneer
CS2100	49	105	93	3.3	45											BL	Canterra Seeds
LSD	6					7					6						
Check Mean 5440 (bu/ac)	**47**					**60**					**51**						

(1) Indicates varieties with specialty oil profiles and premiums associated with pricing. Visit www.canolaperformancetrials.ca for more details. (2) Indicates varieties that have been supported for registration.
(3) Indicates genetic resistance with an "R" or resistant rating to specific disease affecting canola, BL = Blackleg, CR = Clubroot.

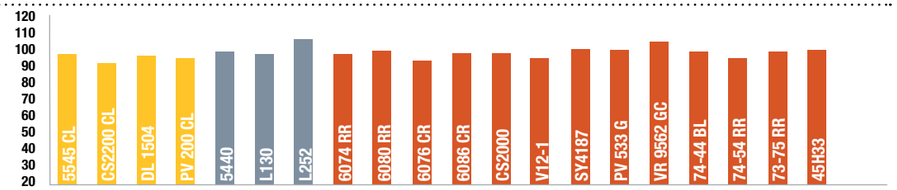
Long Season Zone:
% of 5440 (47 bu./ac.)

- Clearfield LSD: 6
- Liberty Link LSD: 7
- Roundup Ready LSD: 6



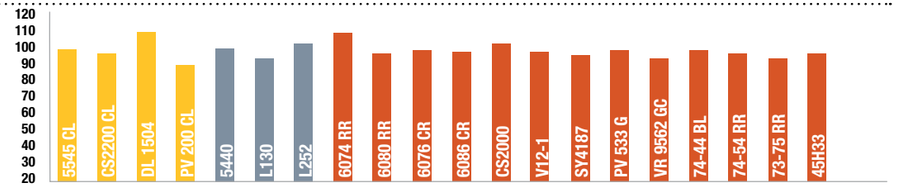
Mid Season Zone:
% of 5440 (60 bu./ac.)

- Clearfield LSD: 7
- Liberty Link LSD: 10
- Roundup Ready LSD: 7



Short Season Zone:
% of 5440 (51 bu./ac.)

- Clearfield LSD: 5
- Liberty Link LSD: 7
- Roundup Ready LSD: 6



LONG SEASON ZONE | Small plot results by location

	ELM CREEK, MAN.						MELITA, MAN.						
Variety	Yield (bu./acre)	Yield (% 5440)	Gross Revenue/ac.	Days to Maturity	Lodging	Height (in.)	Yield (bu./acre)	Yield (% 5440)	Gross Revenue/ac.	Days to Maturity	Lodging	Height (in.)	Distributor
Clearfield													
5545 CL	51	100	$554	98	2.8	–	48	111	$521	94	3.3	46.7	BrettYoung
CS2200 CL	42	83	$457	98	4.0	–	46	106	$500	95	2.0	46.5	Canterra Seeds
DL 1504*	50	98	$542	98	3.3	–	44	101	$475	95	2.5	48.4	DI Seeds
PV 200 CL	45	88	$488	98	3.8	–	51	118	$554	95	3.0	44.6	Proven Seed/CPS
LSD	8						4						
Liberty Link													
5440	51	100	$553	97	2.0	–	43	100	$470	93	1.8	46.0	Bayer CropScience
L130	48	95	$524	97	2.8	–	41	94	$443	92	2.0	43.9	Bayer CropScience
L252	51	100	$554	98	2.8	–	47	108	$509	95	3.0	46.0	Bayer CropScience
LSD	6						8						
Roundup Ready													
6074 RR	50	97	$538	92	2.7	–	45	103	$486	95	2.0	46.7	BrettYoung
6080 RR	44	87	$481	92	3.0	–	47	108	$507	94	2.0	45.0	BrettYoung
6076 CR	49	96	$531	98	3.0	–	46	106	$500	95	2.3	48.1	BrettYoung
6086 CR	48	94	$519	92	2.7	–	53	121	$569	95	2.0	46.9	BrettYoung
CS2000	46	90	$500	98	4.0	–	44	101	$475	95	3.8	46.1	Canterra Seeds
V12-1**	46	89	$551	91	2.0	–	48	111	$582	94	3.0	45.2	Cargill – Victory Hybrid Canola
SY4187	49	96	$533	98	1.8	–	51	116	$548	95	1.8	48.8	Syngenta
PV 533 G	45	89	$491	91	2.7	–	47	109	$513	92	2.8	45.8	Proven Seed/CPS
VR 9562 GC	50	98	$541	92	2.3	–	48	110	$519	95	3.0	48.5	Proven Seed/CPS
74-44 BL	45	89	$490	91	3.7	–	46	105	$494	93	2.8	42.8	Dekalb
74-54 RR	44	85	$471	98	3.8	–	48	110	$515	95	3.3	47.1	Dekalb
73-75 RR	43	85	$469	97	3.8	–	45	103	$483	94	3.8	44.4	Dekalb
45H33	47	91	$503	92	2.0	–	48	111	$521	95	3.0	47.3	Dupont Pioneer
CS2100	50	97	$536	91	3.7	–	49	113	$532	94	3.0	44.5	Canterra Seeds
LSD	5						6						
Check Mean 5440 (bu/ac)	51						43						
Grand Mean (bu/ac)	47						47						
CV%	7.3						8.4						

*Variety supported for registration by the Western Canadian Canola/Rapeseed Recommending Committee (WCC/RRC). **Indicates varieties with specialty oil profiles and premiums associated with pricing.
Visit www.canolaperformancetrials.ca for more details.


MID SEASON ZONE | Small plot results by location

	ELLERSLIE, ALTA.						ELSTOW, SASK.						MELFORT, SASK.						
Variety	Yield (bu./acre)	Yield (% 5440)	Gross Revenue/ac.	Days to Maturity	Lodging	Height (in.)	Yield (bu./acre)	Yield (% 5440)	Gross Revenue/ac.	Days to Maturity	Lodging	Height (in.)	Yield (bu./acre)	Yield (% 5440)	Gross Revenue/ac.	Days to Maturity	Lodging	Height (in.)	Distributor
Clearfield																			
5545 CL	85	93	$916	119	2.8	48	56	77	$603	95	2.8	49	59	107	$636	95	2.5	54	BrettYoung
CS2200 CL	79	87	$855	119	2.3	48	58	80	$625	96	2.5	52	55	101	$600	101	2.0	59	Canterra Seeds
DL 1504*	84	92	$909	119	2.5	50	62	85	$668	96	1.3	54	53	96	$571	100	2.0	59	DI Seeds
PV 200 CL	88	96	$952	116	3.5	45	60	83	$650	95	1.8	55	56	101	$600	98	1.8	56	Proven Seed/CPS
LSD	13						9						4						
Liberty Link																			
5440	91	100	$988	113	1.6	51	72	100	$782	95	1.0	56	55	100	$594	97	1.0	60	Bayer CropScience
L130	93	102	$1,010	112	2.0	48	65	90	$702	94	1.0	54	58	106	$628	95	1.0	58	Bayer CropScience
L252	102	111	$1,098	114	2.8	47	72	99	$775	96	1.3	53	60	110	$653	95	2.0	54	Bayer CropScience
LSD	9						6						13						
Roundup Ready																			
6074 RR	83	91	$896	119	3.8	46	65	90	$702	95	1.3	54	57	104	$616	100	1.5	56	BrettYoung
6080 RR	78	85	$840	117	3.0	43	63	87	$679	95	1.5	49	57	105	$621	98	1.3	57	BrettYoung
6076 CR	83	90	$893	117	2.9	47	62	86	$673	96	1.5	55	54	97	$579	101	2.0	60	BrettYoung
6086 CR	85	93	$922	119	2.6	50	64	89	$696	96	1.8	55	56	102	$606	101	2.5	59	BrettYoung
CS2000	93	102	$1,003	114	2.9	46	60	82	$644	95	2.3	53	60	110	$652	100	1.8	60	Canterra Seeds
V12-1**	83	91	$1,002	114	3.1	48	62	86	$751	95	2.0	50	54	98	$650	98	2.0	55	Cargill – Victory Hybrid Canola
SY4187	91	100	$984	117	2.0	51	69	95	$742	95	1.8	56	54	98	$582	100	2.3	58	Syngenta
PV 533 G	82	90	$889	116	2.5	48	68	94	$736	94	1.3	51	51	92	$548	92	1.3	53	Proven Seed/CPS
VR 9562 GC	94	103	$1,019	115	2.6	48	66	91	$709	94	1.5	54	65	118	$699	98	1.5	58	Proven Seed/CPS
74-44 BL	81	88	$873	112	3.5	44	62	86	$673	94	2.0	47	57	103	$614	94	2.0	51	Dekalb
74-54 RR	82	89	$882	113	3.6	46	59	81	$635	94	2.3	50	51	93	$555	91	2.0	52	Dekalb
73-75 RR	89	98	$965	116	3.4	43	61	84	$657	93	2.5	47	57	103	$613	96	2.8	51	Dekalb
45H33	85	93	$914	116	3.3	48	66	92	$717	95	2.0	51	57	104	$620	97	1.8	57	Dupont Pioneer
LSD	11						6						6						
Check Mean 5440 (bu/ac)	91						72						55						
Grand Mean (bu/ac)	86						64						56						
CV%	8.7						7.3						8.2						

*Variety supported for registration by the Western Canadian Canola/Rapeseed Recommending Committee (WCC/RRC). **Indicates varieties with specialty oil profiles and premiums associated with pricing.
Visit www.canolaperformancetrials.ca for more details.

	MUNDARE, ALTA.						SWIFT CURRENT, SASK.						
Variety	Yield (bu/acre)	Yield (% 5440)	Gross Revenue/ac.	Days to Maturity	Lodging	Height (in.)	Yield (bu/acre)	Yield (% 5440)	Gross Revenue/ac.	Days to Maturity	Lodging	Height (in.)	Distributor
Clearfield													
5545 CL	64	108	$694	95	–	50	61	96	$660	105	3		BrettYoung
CS2200 CL	62	104	$667	97	–	50	57	89	$612	103	1.5		Canterra Seeds
DL 1504*	63	106	$677	96	–	50	58	92	$631	104	2		DI Seeds
PV 200 CL	65	110	$707	96	–	50	61	96	$660	104	2.8		Proven Seed/CPS
LSD	8						6						
Liberty Link													
5440	59	100	$641	96	–	49	64	100	$687	102	1		Bayer CropScience
L130	62	105	$674	96	–	50	57	90	$616	103	1.8		Bayer CropScience
L252	63	106	$680	96	–	49	66	104	$715	101	1.5		Bayer CropScience
LSD	12						4						
Roundup Ready													
6074 RR	61	103	$658	96	–	47	56	88	$607	102	1.3		BrettYoung
6080 RR	69	117	$750	95	–	49	52	81	$557	102	1.3		BrettYoung
6076 CR	65	110	$704	95	–	50	57	89	$614	104	1.8		BrettYoung
6086 CR	65	109	$700	96	–	48	60	95	$651	106	1.8		BrettYoung
CS2000	67	113	$724	96	–	47	57	90	$620	104	3.3		Canterra Seeds
V12-1**	67	113	$807	96	–	49	52	82	$627	104	2		Cargill – Victory Hybrid Canola
SY4187	61	102	$656	97	–	51	58	91	$624	102	1		Syngenta
PV 533 G	64	107	$688	95	–	47	61	95	$655	100	1.8		Proven Seed/CPS
VR 9562 GC	67	113	$722	95	–	50	59	93	$641	100	1.8		Proven Seed/CPS
74-44 BL	67	112	$720	96	–	48	66	103	$711	101	1.3		Dekalb
74-54 RR	68	115	$738	96	–	48	53	84	$578	102	3.3		Dekalb
73-75 RR	58	98	$629	96	–	48	55	86	$594	100	2.5		Dekalb
45H33	65	110	$703	95	–	49	61	96	$659	101	2.5		Dupont Pioneer
LSD	10						4						
Check Mean 5440 (bu/ac)	59						64						
Grand Mean (bu/ac)	64						58						
CV%	10.4						5.5						

SHORT SEASON ZONE | Small plot results by location

	BARRHEAD, AB						DAWSON CREEK, BC						
Variety	Yield (bu./acre)	Yield (% 5440)	Gross Revenue/ac.	Days to Maturity	Lodging	Height (in.)	Yield (bu./acre)	Yield (% 5440)	Gross Revenue/ac.	Days to Maturity	Lodging	Height (in.)	Distributor
Clearfield													
5525 CL	45	94	$485	117	–	45	58	105	$625	–	2.8	40	BrettYoung
CS2200 CL	46	97	$498	118	–	44	54	98	$584	–	2.8	39	Canterra Seeds
DL 1504*	49	103	$529	118	–	44	65	117	$700	–	2.8	40	DI Seeds
PV 200 CL	40	84	$434	116	–	44	53	96	$571	–	3.0	39	Proven Seed/CPS
LSD	5						5						
Liberty Link													
5440	48	100	$515	117	–	42	55	100	$596	–	2.8	39	Bayer CropScience
L130	45	94	$484	114	–	42	52	94	$558	–	2.3	39	Bayer CropScience
L252	49	103	$532	118	–	41	57	103	$614	–	2.5	39	Bayer CropScience
LSD	3						11						
Roundup Ready													
6074 RR	49	104	$534	116	–	40	64	115	$688	–	2.5	38	BrettYoung
6080 RR	46	97	$499	118	–	42	53	97	$577	–	1.3	37	BrettYoung
6076 CR	44	93	$481	117	–	44	58	105	$628	–	2.3	40	BrettYoung
6086 CR	49	102	$526	119	–	42	51	93	$557	–	2.5	39	BrettYoung
CS2000	48	102	$523	118	–	42	58	105	$623	–	3.5	42	Canterra Seeds
V12-1**	45	94	$486	115	–	41	56	101	$604	–	2.3	39	Cargill – Victory Hybrid Canola
SY4187	44	92	$473	116	–	42	55	101	$600	–	2.3	40	Syngenta
PV 533 G	45	94	$486	115	–	42	58	104	$622	–	2.5	37	Proven Seed/CPS
VR 9562 GC	44	93	$481	117	–	41	52	94	$563	–	2.3	41	Proven Seed/CPS
74-44 BL	45	95	$489	115	–	40	57	104	$617	–	2.5	37	Dekalb
74-54 RR	43	91	$468	118	–	37	57	103	$615	–	3.5	37	Dekalb
73-75 RR	43	91	$468	118	–	40	53	97	$578	–	2.8	36	Dekalb
45H33	45	95	$488	115	–	44	55	100	$596	–	3.0	42	Dupont Pioneer
LSD	4						8						
Check Mean 5440 (bu/ac)	48						55						
Grand Mean (bu/ac)	46						56						
CV%	6.9						10.3						

*Variety supported for registration by the Western Canadian Canola/Rapeseed Recommending Committee (WCC/RRC). **Indicates varieties with specialty oil profiles and premiums associated with pricing.
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RAPESEED & CANOLA | Western Canadian Canola Rapeseed Recommending Committee

The Western Canadian Canola Rapeseed Recommending Committee evaluates lines based on agronomic performance disease resistance and end-use quality. The table contains B. napus varieties supported for registration in 2016 .

CHECK VARIETIES	VARIETY	CO-OP NAME	ORGANIZATION	HERBICIDE RESISTANCE*	YIELD AVG	YIELD SSZ	YIELD MSZ	YIELD LSZ	MATURITY	BLACKLEG RATING	BLACKLEG % OF WESTAR	%OIL	%MEAL PROTEIN	HEIGHT	LODGING
45H29, 5440		4CN0024	Bayer CropScience	LL	6.3	0.3	1.4	17.9	1.6	MR	27.1	0.2	0.6	-0.4	0.5
45H29, 5440	LR250	4CN0044	Bayer CropScience	LL	11.6	8.0	8.2	19.6	1.8	R	29.2	1.4	-0.1	1.2	0.5
45H29, 5440		4CN0059	Bayer CropScience	LL	7.6	1.6	4.8	16.2	1.5	R	25.8	1.4	0.0	-0.6	0.2
45H29, 5440		4CN0064	Bayer CropScience	LL	6.3	3.0	3.3	13.4	1.4	R	24.3	2.2	0.8	0.1	0.3
45H29, 5440		4CN0065	Bayer CropScience	LL	4.1	0.0	3.3	9.7	1.2	R	23.2	0.3	0.7	3.4	0.3
45H29, 5440		4CN0118	Bayer CropScience	LL	7.1	2.4	5.5	14.4	0.6	R	21.3	-0.8	-1.1	0.3	-0.1
45H29, 5440		5CN0125	Bayer CropScience	LL	3.9	-0.2	0.8	12.0	-1.9	MR	34.1	0.6	-0.1	-6.4	0.1
45H29, 5440		5CN0127	Bayer CropScience	LL	7.0	-0.9	5.9	16.7	1.4	MR	31.0	1.5	0.3	-5.0	0.0
45H29, 5440		5CN0130	Bayer CropScience	LL	8.8	1.6	5.1	21.9	-1.5	R	28.7	-0.3	-0.1	-7.9	-0.1
45H29, 5440		5CN0131	Bayer CropScience	LL	6.5	1.2	1.6	19.6	-0.7	R	28.7	0.0	-0.4	-6.6	-0.4
45H29, 5440		5CN0136	Bayer CropScience	LL	7.0	4.5	6.2	9.6	3.3	R	22.1	-1.2	0.1	7.1	0.6
45H29, 5440		5CN0214	Bayer CropScience	LL	10.4	8.4	7.9	16.0	1.2	R	26.6	-0.6	-0.8	-2.9	-0.1
45H29, 5440		5CN0216	Bayer CropScience	LL	3.9	1.5	1.8	9.9	1.4	R	23.7	0.6	0.8	-1.8	0.5
45H29, 5440		4CN0001	Bayer CropScience	LL	0.5	0.4	-0.2	4.1	-0.5	R	26.2	-0.2	0.3	0.0	0.0
45H29, 5440		4CN0004	Bayer CropScience	LL	5.4	3.0	5.6	7.7	1.9	R	17.8	-0.6	0.2	0.0	0.0
45H29, 5440	SY4187	14H1176	Cargill Limited	RR	3.2	1.3	2.4	3.6	1.7	R	19.6	0.8	0.2	6.1	-0.1
45H29, 5440		14H1187	Cargill Limited	RR	-1.8	1.6	-2.8	-2.2	0.2	R	24.9	0.3	-0.3	-4.6	-0.3
45H29, 5440		PS-AFH 13-1704	Crop Production Services Canada	RR	-7.3	-13.1	-9.0	0.4	2.0	R	15.9	-0.1	0.6	2.8	0.2
45H29, 5440		PS-SN 13-1650	Crop Production Services Canada	RR	0.1	-0.9	0.7	0.2	0.1	R	26.7	0.5	1.5	-2.9	0.2
45H29, 5440		PS-SY 13-1579	Crop Production Services Canada	RR	1.8	-0.2	-0.9	7.8	1.8	R	20.0	-0.4	1.4	-2.6	0.2
45H29, 5440		PS-SY 13-1651	Crop Production Services Canada	RR	0.3	-0.4	-1.5	3.7	0.3	R	22.8	0.2	1.0	-7.0	-0.1
45H29, 5440		PS-SY 13-2931	Crop Production Services Canada	RR	1.0	-2.7	2.0	3.1	1.4	R	18.0	0.7	0.6	-4.7	0.1
45H29, 5440		14DL30122	DL Seeds Inc.	CF	-0.2		-4.4	5.3	2.0	R	29.5	-0.1	-0.3	-1.1	0.0
45H29, 5440	6074 RR	13DL30323	DL Seeds Inc.	RR	1.3	2.9	1.2	0.2	2.2	MR	33.4	0.5	-1.6	-4.8	-0.1
45H29, 5440		14DL30209	DL Seeds Inc.	RR	-0.4	-4.6	-1.4	3.4	0.5	R	25.1	0.4	0.3	-1.9	-0.5
45H29, 5440		14DL30213	DL Seeds Inc.	RR	-0.8	-0.4	-1.5	-0.2	-0.1	R	28.4	1.2	-0.5	-9.2	-0.3
45H29, 5440		14DL30404	DL Seeds Inc.	RR	-2.9	-5.0	-2.3	-3.4	1.0	R	28.8	-0.8	0.3	-2.8	0.1
45H29, 5440		14DL30419	DL Seeds Inc.	RR	-3.2	-2.7	-5.2	-1.3	1.6	MR	30.0	0.9	0.1	1.7	-0.3
45H29, 5440	6080 RR	14DL30420	DL Seeds Inc.	RR	3.6	-1.5	1.7	8.3	0.5	MR	31.9	0.7	1.0	-5.8	-0.2
45H29, 5440	6076 CR	14DL30513	DL Seeds Inc.	RR	-4.6	-7.0	-5.4	-2.1	2.6	R	29.3	-0.3	0.0	5.3	-0.1
45H29, 5440	14H1176	CL2562966H	Dow AgroSciences	CF	-8.7	-10.1	-11.2	-3.6	1.8	MR	32.0	0.5	3.2	-2.4	0.2
45H29, 5440		G3697124H	Dow AgroSciences	RR	-8.5	-12.5	-5.1	-9.9	1.9	MR	38.9	-0.9	-0.3	-2.2	0.1
45H29, 5440		G32176	Monsanto Canada	RR	-5.4	-11.3	-3.7	-3.5	-0.1	R	25.9	0.4	2.5	-6.1	-0.4
45H29, 5440		G49720	Monsanto Canada	RR	-3.4	-5.7	-4.2	-0.5	-1.5	MR	31.3	-0.3	2.0	-11.3	0.0
45H29, 5440		G49732	Monsanto Canada	RR	0.7	-1.0	0.5	2.0	-0.9	MR	37.1	1.0	-0.2	-9.8	-0.7
45H29, 5440		G49733	Monsanto Canada	RR	2.6	-1.7	4.5	3.4	-0.7	R	23.3	1.3	0.9	-9.8	-0.3
45H29, 5440		G49735	Monsanto Canada	RR	-3.5	-4.5	-3.6	-2.6	-0.7	MR	36.6	1.4	0.8	-11.8	-0.6
45H29, 5440		G49738	Monsanto Canada	RR	-2.0	-5.0	-0.1	-1.1	-1.3	R	24.4	0.7	1.7	-10.0	-0.1
45H29, 5440		G49740	Monsanto Canada	RR	-2.3	-5.5	-1.3	-1.6	-0.7	R	26.9	1.2	2.6	-11.2	0.0
45H29, 5440		G49741	Monsanto Canada	RR	-1.5	-4.8	-2.3	3.0	-0.7	MR	35.6	0.3	2.2	-9.4	-0.5
45H29, 5440		X25475G1	Monsanto Canada	TF	3.6		-1.6	19.7	0.4	R	11.2	0.0	1.2		
45H29, 5440		X35153G1	Monsanto Canada	TF	-1.5		-6.6	15.8	-1.6	R	23.2	0.4	2.9		
45H29, 5440		X37965G1	Monsanto Canada	TF	0.7		-1.5	7.1	-1.0	R	19.6	-0.2	1.2		
45H29, 5440		X49733G1	Monsanto Canada	TF	1.2		0.1	5.0	-0.6	R	16.8	1.0	1.4		
45H29, 5440		X49720G1	Monsanto Canada	TF	-5.2		-7.8	2.6	-0.5	R	20.7	-0.2	2.5		
45H29, 5440		X49732G1	Monsanto Canada	TF	2.7		-0.1	12.7	-0.6	R	21.4	0.9	-0.1		
45H29, 5440		13N0471I	Pioneer Hi-Bred Production LP	CF	-0.2	-3.4	-0.2	3.2	0.9	R	25.2	0.6	1.2	-0.9	-0.1
45H29, 5440		13N0486I	Pioneer Hi-Bred Production LP	CF	0.4	-4.4	-2.3	8.2	2.6	MR	31.4	-0.7	0.8	8.4	-0.1
45H29, 5440		14SS0554I	Pioneer Hi-Bred Production LP	CF	-3.4	-4.3	-2.2	-3.9	3.6	R	24.6	0.7	1.4	10.1	0.0
45H29, 5440		13N0680L2	Pioneer Hi-Bred Production LP	RF3	-7.3	-25.9	-10.8	1.2	-0.4	MR	30.3	-0.2	0.5	0.0	0.0
45H29, 5440		13N0683L2	Pioneer Hi-Bred Production LP	RF3	2.9	-6.9	-0.5	9.0	0.4	R	24.1	0.4	1.0	0.0	0.0
45H29, 5440		13N0922L	Pioneer Hi-Bred Production LP	RF3	-1.2	-28.9	-4.5	7.7	0.1	MR	36.3	1.4	2.2	0.0	0.0
45H29, 5440		14GG1404L	Pioneer Hi-Bred Production LP	RF3	-6.4	-21.9	-10.3	2.7	0.6	R	27.0	-0.9	1.2	0.0	0.0
45H29, 5440		14GG1399G	Pioneer Hi-Bred Production LP	OG	-2.0	-2.8	-2.4	-1.1	1.3	MR	38.4	-0.3	1.4	0.0	0.0
45H29, 5440		14GG1400G	Pioneer Hi-Bred Production LP	OG	-4.7	-7.9	-5.6	-2.7	1.5	MR	32.7	0.4	0.0	0.0	0.0
45H29, 5440		14GG1401G	Pioneer Hi-Bred Production LP	OG	-1.2	-15.5	-4.1	4.8	1.6	R	19.4	1.1	1.3	0.0	0.0
45H29, 5440		14GG1402G	Pioneer Hi-Bred Production LP	OG	-7.2	-1.7	-5.0	-10.9	1.8	R	24.8	0.4	-0.8	0.0	0.0
45H29, 5440		14GG1403G	Pioneer Hi-Bred Production LP	OG	-3.9	-16.6	-0.2	-7.2	1.3	R	25.7	2.5	2.6	0.0	0.0
45H29, 5440		13N0587R	Pioneer Hi-Bred Production LP	RR	-6.1	-7.6	-4.6		-1.0	R	28.9	0.9	0.9	-7.1	-0.5
45H29, 5440		13N0599R	Pioneer Hi-Bred Production LP	RR	-6.0	-4.5	-7.4		-1.9	MR	45.8	1.1	0.7	-11.3	-0.5
45H29, 5440		13N0911R	Pioneer Hi-Bred Production LP	RR	-0.6	-6.3	0.8	3.5	-0.6	MR	44.5	2.2	2.4	-7.9	-0.1
45H29, 5440		13N0913R	Pioneer Hi-Bred Production LP	RR	-3.7	-5.4	-2.2	-4.0	-0.9	MR	46.8	1.4	2.0	-7.0	-0.2
45H29, 5440	45M35	13N0924R	Pioneer Hi-Bred Production LP	RR	3.7	-2.5	5.2	9.0	0.1	MR	34.0	3.1	1.9	-5.4	-0.1
45H29, 5440	PV 560 GM	13N0925R	Pioneer Hi-Bred Production LP	RR	2.9	-1.1	5.8	3.7	-0.4	MR	35.0	3.1	2.8	-0.5	-0.1
45H29, 5440		13N1296R	Pioneer Hi-Bred Production LP	RR	-5.8	-7.6	-5.6	-4.2	-1.4	MR	39.3	0.8	2.1	-3.8	-0.3
45H29, 5440		13N1416R	Pioneer Hi-Bred Production LP	RR	4.4	2.5	2.7	8.9	1.7	MR	30.4	1.5	0.1	3.0	0.1
45H29, 5440		13N1418R	Pioneer Hi-Bred Production LP	RR	3.3	1.8	3.3	5.1	0.4	MR	33.3	1.3	0.2	-0.8	0.0
45H29, 5440	PV 581 GC	13N1424R	Pioneer Hi-Bred Production LP	RR	4.4	-0.1	5.3	8.6	0.6	R	29.3	1.3	1.1	-0.8	-0.1
45H29, 5440	45CS40	14GG1204R	Pioneer Hi-Bred Production LP	RR	-2.7	-2.3	-4.5	-0.6	0.2	MR	30.4	0.4	1.8	2.3	0.1
45H29, 5440	PV 590 GCS	14GG1205R	Pioneer Hi-Bred Production LP	RR	-2.6	-5.0	-4.7	2.9	-1.1	MR	35.1	0.3	2.5	-5.9	-0.1
45H29, 5440		13H3615	Cargill Limited	RR	-6.4	-8.3	-6.1	-5.6	0.9	R	23.9	0.3	2.3	-7.6	-0.5
45H29, 5440		5CN0198**	Bayer CropScience	LL + RR	4.4	5.0	3.1	7.6	1.0	R	20.5	-0.6	-0.5		
45H29, 5440		5CN0519**	Bayer CropScience	LL + RR	1.9	0.9	2.6	1.0	-1.7	R	25.2	-0.1	-0.2		
45H29, 5440		DL1502CL**	DL Seeds Inc.	CF	0.0	5.4	0.2	-1.4	1.6	R	23.7	0.4	0.8		
45H29, 5440		DL1503CL**	DL Seeds Inc.	CF	0.7	9.3	0.9	-1.5	2.8	R	18.7	0.6	0.1		
45H29, 5440		DL1504CL**	DL Seeds Inc.	CF	0.6	5.3	-0.1	1.0	0.6	R	18.3	0.5	1.1		
45H29, 5440		DL1513RR**	DL Seeds Inc.	RR	-3.3	-8.6	-2.8	-3.2	2.0	R	14.4	-0.1	-0.2		
45H29, 5440		G15P9329**	Monsanto Canada	RR	-5.4	-7.7	-3.2	-5.5	0.2	R	21.5	1.3	1.0		
45H29, 5440		G15P9374**	Monsanto Canada	RR	-4.6	-2.6	-2.6	-6.3	-1.0	R	25.5	0.2	1.3		
45H29, 5440		X98689G1**	Monsanto Canada	TF	0.7		-1.6	5.3	0.7	R	4.0	1.6	1.6		
45H29, 5440		X49641G1**	Monsanto Canada	TF	-4.6		-4.7	-4.3	-0.1	R	13.2	0.3	2.5		
45H29, 5440	1024 RR	G5428584H**	Dow AgroSciences	RR	-12.6	-18.7	-13.8	-5.7	2.9	R	29.8	0.3	3.7		
45H29, 5440	2024 CL	CL3701975H**	Dow AgroSciences	CF	-13.8	-19.2	-15.0	-8.7	3.8	R	24.3	-0.3	3.7		
45H29, 5440		PS-ARJ 14-1935**	Crop Production Services Canada	RR	-3.7	-5.3	-4.9	-1.1	1.9	R	5.6	1.1	1.4		
45H29, 5440		PS-AHP 13-2294**	Crop Production Services Canada	RR	-1.5	-12.6	-2.8	3.3	0.8	R	5.2	1.6	2.1		
45H29, 5440		PS-APS 14-2295**	Crop Production Services Canada	RR	-4.2	-4.1	-5.3	-0.7	0.9	R	12.2	0.4	1.8		
45H29, 5440		PS-ARK 14-3562**	Crop Production Services Canada	RR	-16.1	-15.1	-17.7	-12.1	0.4	R	9.2	1.5	3.1		
45H29, 5440		14H1179**	Cargill Limited	RR	-1.2		-2.6	3.6	0.9	R	20.0	1.3	1.2		
45H29, 5440		14H1222**	Cargill Limited	RR	10.9		6.8	26.9	1.1	R	20.3	1.2	1.0		
45H29, 5440		15RH1167**	Cargill Limited	RR	2.3		0.0	9.9	1.0	R	16.5	1.0	1.0		
45H29, 5440		15GG0508R**	Pioneer Hi-Bred Production LP	RR	3.9	1.1	2.5	9.3	0.7	R	14.7	1.7	2.4		
45H29, 5440	14GG0892R	14GG0892R**	Pioneer Hi-Bred Production LP	RR	2.2	1.8	1.1	4.6	1.3	R	26.6	2.2	3.8		
45H29, 5440	14GG0895R	14GG0895R**	Pioneer Hi-Bred Production LP	RR	4.6	-3.2	4.1	13.3	1.2	R	25.4	3.0	3.8		
45H29, 5440		14GG1221R**	Pioneer Hi-Bred Production LP	RR	1.3	3.5	-0.7	3.1	-0.2	MR	33.1	0.7	2.4		
45H29, 5440		14CG1217R**	Pioneer Hi-Bred Production LP	RR	2.4	4.6	-1.6	8.3	0.3	R	26.1	0.6	2.1		
45H29, 5440		14GG1212R**	Pioneer Hi-Bred Production LP	RR	0.8	4.9	-2.6	3.2	0.7	R	23.1	-0.2	-0.5		
45H29, 5440	15GG0241R	15GG0241R**	Pioneer Hi-Bred Production LP	RR	-1.9	-5.5	-4.6	7.2	-0.3	R	15.9	0.9	2.5		

* BX = Bromoxynil, CF = Clearfield Resistant, CONV = Conventional, LL = Liberty Resistant, RR = Roundup Resistant, TF = Truflex-Glyphosate Resistant, RF3 = Glufosinate Ammonium (RF3), OG = Optimum Gly-Glyphosate Resistant, LL AND RR = Stacked Liberty Link and Roundup Ready Traits ** 3 YR INTERIM

CANADIAN FOOD INSPECTION AGENCY

VARIETY REGISTRATION REPORT

The list below contains the names and details of crop varieties registered by the Canadian Food Inspection's Variety Registration Office (VRO) between Nov. 1, 2015 and Nov. 15, 2016.

CROP KIND	VARIETY NAME	EXPERIMENTAL NUMBER	REGISTRATION DATE	REGISTRATION STATUS
ALFALFA	COMPASS	FG 48M365	11/27/15	National
	PV ULTIMA	FG 47M314	11/27/15	National
	WL 358LH	FG 49H345	11/27/15	National
	WL 366HQ	FG 57M121	11/27/15	National
	SYMPHONY	FG 45M324	01/08/16	National
	42HVXRR	FG RRL43M113	03/04/16	National
	FOOTHOLD	CW A112002	08/12/16	National
	OCTANE	CW A113010	08/12/16	National
BARLEY	DS7176RB	C717-030	12/11/15	National
	CLAYMORE	TR12733, BZ509-216	02/12/16	National
	OREANA	TR12735, BZ509-448	02/12/16	National
	AAC CONNECT	TR12225, BM0421-205	04/01/16	National
	CDC FRASER	TR12135, SM090669	06/30/16	National
	ANGUS	OS11-108	07/08/16	National
	CDC ASCENT	HB13324, SH100049	07/08/16	National
BUCKWHEAT	KENMAR	DF-6	01/29/16	National
CANOLA	UA ALFAGOLD	A07-29NI	11/13/15	National
	SY4187	14H1176	03/31/16	National
	45M35	13N924R	03/31/16	National
	45CS40	14GG1204R	03/31/16	National
	PV 590 GCS	14GG1205R	03/31/16	National
	6076 CR	14DL30513	03/31/16	National
	6080 RR	14DL30420	03/31/16	National
	6074 RR	13DL30323	03/31/16	National
	CS2000	13DL30122	04/15/16	National
	PV 560 GM	13N925R	04/15/16	National
	PV 581 GC	13N1424R	04/15/16	National
	14GG0892R	14GG0892R	04/22/16	National
	14GG0895R	14GG0895R	04/22/16	National
	HYHEAR 3	H118086RR	06/03/16	National
	1020 RR	G3697124H, 3697124	06/03/16	National
	5545 CL	14DL30122	06/10/16	National
	L230	5CN0125	06/10/16	National
	L233P	5CN0130	06/10/16	National
	PV 540 G	PS-SY 13-2931	06/24/16	National
	LR250	4CN0004	07/22/16	National
	PV 540 G	PS-SY 13-2931	11/13/15	National
	LR250	4CN0004	01/15/16	Interim
	1024 RR	G5428584H, 5428584	03/11/16	Interim
	2024 CL	CL3701975H, 3701975H, 3701975	04/01/16	Interim
	15GG0241R	15GG0241R	04/15/16	Interim
	14CG1217R	14CG1217R	05/20/16	Interim
	14GG1221R	14GG1221R	05/20/16	Interim
	15GG0508R	15GG0508R	05/20/16	Interim
	V14-1	14H1222	07/15/16	Interim
	6086 CR	DL1513 RR	08/19/16	Interim
CLOVER	COMPANION	WC-2	03/04/16	National
	APOLO	SYN 8	03/24/16	National
	GLACIER	GTBD 06	03/24/16	National
	BEARCAT	RC0704	04/08/16	National

CROP KIND	VARIETY NAME	EXPERIMENTAL NUMBER	REGISTRATION DATE	REGISTRATION STATUS
CLOVER	RAMPART	WC-1	04/22/16	National
	BOMBUS	WKL 94	06/24/16	National
FABABEAN	FABELLE	SR 4026	06/24/16	National
FESCUE	PAYLOAD	TF0401	04/08/16	National
	KENTUCKY 32	FTF-4	04/29/16	National
	OTARIA	G 0069, RSC 61	06/17/16	National
FIELD BEAN	SV6894GB	BKBC6V1312 or 12-BKB-1312	11/27/15	National
	SV1893GH	NAVC6V1200, 12-NAV-1200	11/27/15	National
	SV6139GR	PINDJ091012 or 12-PIN-1012	11/27/15	National
	SV6533GR	PINC6V1314 or12-PIN-1314	11/27/15	National
	VIPER	9303	04/15/16	National
	AAC EXPLORER	L11PS211	05/20/16	National
	AAC WHITESTAR	L10GN821	05/20/16	National
	AAC Y012	L11YL012	05/20/16	National
	AAC Y015	L11YL015	05/20/16	National
FLAX	WESTLIN 60	FP2388, 07-009-F7-335	03/24/16	National
	AAC PRAIRIE SUNSHINE	FP2357	03/31/16	National
	CDC BURYU	FP2316 (F07144)	04/01/16	National
	CDC MELYN	FP2429 (F08X425)	04/01/16	National
LENTIL	CDC PROCLAIM	IBC 550	11/20/15	National
	CDC SB-3	IBC 697	11/20/15	National
	CDC REDMOON	637806	11/20/15	National
	CDC KERMIT	3592-13	11/20/15	National
OAT	AAC BLAKE	OA1347-2	02/12/16	National
	AAC NORANDA	OA1357-2	02/12/16	National
	FIONA	PGR-N09-81	04/08/16	National
	AAC KOLOSSE	OA1342-1	04/08/16	National
	KYRON	CFA1207,C3M15026	05/06/16	National
	CASINO	11ANS02	07/08/16	National
	FUEGO	12ANS03	07/08/16	National
ORCHARDGRASS	DEVOUR	PPG-OG 106	03/04/16	National
	TRAILBURST	OG0201	04/08/16	National
	PROVIDER	OG-4	06/17/16	National
PEA	CDC ATHABASCA	CDC 3094-05	04/08/16	National
	CDC SPECTRUM	CDC 2936-7	04/08/16	National
	CDC SPRUCE	CDC 3007-6	04/08/16	National
	AAC COMFORT	P0511-06	05/06/16	National
POTATO	CELANDINE	HZD 99-1437	11/13/15	National
	JEANNE	DK 85-51	11/20/15	National
	MONTICELLO	NY102	11/20/15	National
	CERISA	DM99-63-7	12/04/15	National
	CANBERRA	RTS 98-55	12/11/15	National
	AAC FUSHIA	F05061=AR2010-11	01/08/16	National
	AAC GLOSSY	F05060=AR2010-10	01/08/16	National
	YELLOW STAR	Mk 04 01 01	01/15/16	National
	LEHIGH	NY 126	02/12/16	National
	WANETA	NY 138	02/12/16	National
	BUTTERFLY	HZD99-979	04/01/16	National
	CAROLINA	HZ-00-1036	04/01/16	National
	CHALLENGER	RZ-96-98	04/08/16	National
	SMART	HZD 98-2242	04/08/16	National
	VIOLET QUEEN	HOT 02-7001	04/08/16	National
	CAMPAGNA	QP02228.08	04/15/16	National
	KATERI	QP99165.05	04/15/16	National
	ACCELERATE	J3	04/22/16	National
	CULTIVATE	E12	04/22/16	National
	GENERATE	F10	04/22/16	National
	AAC RED VIOLA	AAC CV99256-2 (AR2013-06)	04/22/16	National
	CHILEAN SPLASH	AB00065	04/22/16	National

CROP KIND	VARIETY NAME	EXPERIMENTAL NUMBER	REGISTRATION DATE	REGISTRATION STATUS
POTATO	PURPLE PRINCE	MI NEGRA	04/22/16	National
	YELLOW GLORY	Feb-86	04/22/16	National
	LAMOKA	NY 139	06/24/16	National
	PERLINE	98.44.2	06/24/16	National
	GOLDEYE	BRS 04-355	06/24/16	National
	LADY AMARILLA	CMK 1997-002-025	06/24/16	National
	LITTLE GIANT	BRS 07-283	06/24/16	National
	MIMI	11.R.95	06/24/16	National
	RED SNAPPER	BRS 06-51	06/24/16	National
	AAC SPLENDOR RUSSET	CV01236-3	06/30/16	National
	GEMSON	98Z147A43	07/08/16	National
	LABELLA	yp 91-105	07/08/16	National
	AAC STOUT	CV99222-2	07/08/16	National
	ROSEMARIE	K3929	07/08/16	National
RYE	BONO	RT212	06/10/16	National
RYEGRASS	TETRAPRIME	PPG-LMT 103	03/04/16	National
	TETRASWEET	PPG-FPRT 103	03/04/16	National
	DIAMOND T	ORETARX	04/22/16	National
	BOOST	ORTET	06/10/16	National
	ARVICOLA	LP 9905, WD 2016	06/17/16	National
	MELPETRA	DVP 031614, WD 1881	06/17/16	National
	MELQUATRO	DVP 91564, WV 349	06/17/16	National
	SORAYA	LP 0355, WD 1826	06/17/16	National
	TARANDUS	TARANDUS	06/30/16	National
SOYBEAN	HYDRA R2	C4M13008 R2, CFS13.3.01 R2	12/04/15	National
	KULTANA R2	CFS14.9.03 R2 / MR3115N	12/04/15	National
	NSC STARBUCK RRX2	FL0013A1-C0DNN, 01050494	12/11/15	National
	NSC WATSON RR2Y	GS000906	12/11/15	National
	DS085F1	09G14F5	01/08/16	National
	DS177P1	17G14P6	01/08/16	National
	DS146D1	14G13D3	01/08/16	National
	PS 1210 NLL	EXP1216NLL,ML 1261N	01/08/16	National
	PS 1716 R2	EXP1716R2, MR1714	01/08/16	National
	DS045C0	HX04C54	01/15/16	National
	ZELDA	PR1120646	01/15/16	National
	NORDIKA	PR1208232	01/15/16	National
	ALASKA	PR1134501	01/15/16	National
	24-12RY	FLZ514A2-C0YNN, 01057518	01/29/16	National
	25-11RY	CR0110, 0209R2, 0215, R0216, MK0210A3-D1AAC, 01050509	01/29/16	National
	26-14RY	FL0313A7-C0YNN, 01050520	01/29/16	National
	28-15RY	FL0513A4-C0YNN, 01050544	01/29/16	National
	29-62RY	RM1313A4-C0YNN, 01050628, CR1423N	01/29/16	National
	31-14RY	EV2613C9-C0YNN, 01050906	01/29/16	National
	32-62RY	FN2913D2-C0YNN, 01051034, AG2836	01/29/16	National
	LS ECLIPSE	MKZ314A2-C0YNN, 1057526	01/29/16	National
	RR2 OPTIC	BN1913A2-C0YNN, 01050718	01/29/16	National
	RR2 CAPELLA	EV2313C5-C0YNN, 01050807	01/29/16	National
	RR2 ATLAS	MK0613B9-C0YNN, 01050571	01/29/16	National
	PS 0088 R2	FLZ214A4-C0YNN, 01057531	01/29/16	National
	CAIRNS R2	MKZ514A8-C0YNN, 01057523	01/29/16	National
	PR03175R2	BN2413A7-C0YNN, 01050834, AG2336	01/29/16	National
	TH 36007RR2YN	FLZ113A2-C0YNN, 01050493, CR00803N	01/29/16	National
	PR02900R2	FL0913A3-C0YNN, 01050585, CR1114N	01/29/16	National
	MIKO R2	MK1013A2-C0YNN, 0105050605	01/29/16	National
	R2C1010	FL0613A3-C0YNN, 01050558	01/29/16	National
	MYLITTA R2	MR1612, C4M14013 R2	01/29/16	National
	P28T71X	XR27AK14RX	02/05/16	National

CROP KIND	VARIETY NAME	EXPERIMENTAL NUMBER	REGISTRATION DATE	REGISTRATION STATUS
	P31T38X	XR30AR14RX	02/05/16	National
	P31T52X	XR30AT14RX	02/05/16	National
	ZALTYS R2	CFS14.9.03 R2 / MR3115N	02/05/16	National
	P10T41X	XR08A15X	02/05/16	National
	P09T29X	XR09AP15X	02/05/16	National
	P22T24X	XR23AQ15X	02/05/16	National
	P24T84X	XR25AL15X	02/05/16	National
	P33T19X	XR33AU15X	02/05/16	National
	S10-S1	X2R1152,AR1310416,GS1016	02/19/16	National
	S001-B1	CW1410087 (X2R00152)	03/11/16	National
	S006-W5	AR12010501 (X2R00753)	03/11/16	National
	S14-A6	NE1318382 (X2R1455)	03/11/16	National
	PS1304NR2	GS1204, AR1310304	03/11/16	National
	NSC AUSTIN RR2Y	GS00570, AR1310870	03/11/16	National
	CBT114B2-C0DNN	CBT114B2-C0DNN	03/18/16	National
	CBT144C2-C0DNN	CBT144C2-C0DNN	03/18/16	National
	CBZ214A3-C0DNN	CBZ214A3-C0DNN	03/18/16	National
	CBZ814A1-C0DNN	CBZ814A1-C0DNN	03/18/16	National
	CBZ914B7-C0DNN	CBZ914B7-C0DNN	03/18/16	National
	DOMINGO RX2	CBZ214A7-C0DNN	03/18/16	National
	S003-L3	X2R00451, AR1215503	03/18/16	National
	DS124U1	15G13U9	04/01/16	National
	DS143C0	OAC 10-40C	04/01/16	National
	S14-H3	AR1102956X, XC1450	04/01/16	National
	P005T13R	P005T13R	04/08/16	National
	P006T46R	P006T46R	04/08/16	National
SOYBEAN	P08T96R	P08T96R	04/08/16	National
	P10T48R	P10T48R	04/08/16	National
	P28T62R	P28T62R	04/08/16	National
	PS 0610 NLL	EXP0677NLL, ML0663N	04/08/16	National
	RR2 MAGNITUDE	GS0593, G01312093	04/08/16	National
	P19T39R2	XB19Y15R2	04/22/16	National
	S009-J1	G01112037, X2R00932	04/29/16	National
	DS101C0	10Y15K5	05/20/16	National
	CF2707XT	MK0614F6-C0DNN, 01056979	05/20/16	National
	DKB005-52	MKZ214A6-C0DNN, 01057075	05/20/16	National
	DKB01-11	MK0314C9-C0DNN, 01056929	05/20/16	National
	DKB10-01	MK0814C7-D0DNN, 01057010	05/20/16	National
	DKB21-11	RM2114A8-C0DNN, 01057181	05/20/16	National
	DKB26-61	BN2914G9-C0DNN, 01057424	05/20/16	National
	DKB32-21	AK2814B9-C0DNN, 01057348	05/20/16	National
	PRO 26X662N	AK2414A4-D0DNN, 01057255	05/20/16	National
	TH 87003 R2X	MKZ514A9-C0DNN, 01057072	05/20/16	National
	EXCURSION R2X	MK0514D4-C0DNN, 01056961	05/27/16	National
	EXPO R2X	MK0714D1-C0DNN, 01056994	05/27/16	National
	EXPRESS R2X	AW1914J9-C0DNN, 01057115	05/27/16	National
	PRO 06X663N	FL0714C3-C0DNN, 01056991	05/27/16	National
	PRO 24X663N	AK2314G9-C0DNN, 01057207	05/27/16	National
	PRO 29X663N	OX2914R8-C0DNN, 01057454	05/27/16	National
	PS 0333 XRN	MK0014B8-C0DNN, 01056904	05/27/16	National
	MARDUK R2X	MKZ214A7-C0DNN, 01057076	06/03/16	National
	PS 2555 XRN	AW2314M1-C0DNN, 01057212	06/03/16	National
	BARKER R2X	MK0014B6-C0DNN, 01056902	06/03/16	National

CROP KIND	VARIETY NAME	EXPERIMENTAL NUMBER	REGISTRATION DATE	REGISTRATION STATUS
SOYBEAN	0077 XRN	MKZ114A1-C0DNN, 01057081	06/03/16	National
	DALAMO R2X	FL0714B5-C0DNN, 01056984	06/03/16	National
	RX0636	MK0614F4-C0DNN, 01056977	06/03/16	National
	GIBIL R2X	FL0914C1-C0DNN, 01057021	06/03/16	National
	CF3207XT	AK2314H2-D0DNN, 01057209	06/03/16	National
	RX DEFENDER	FLZ114B2-C0DNN, 01057079	06/03/16	National
	RX BALLISTIC	5X2814D4-C0DNN, 01057341	06/03/16	National
	RX KODIAK	FL0614C1-C0DNN, 01056968	06/03/16	National
	VERTIGO R2	X2R0858, AR1210246, GS0847	06/03/16	National
	PS 2666 XRN	BL2714F8-D0DNN, 01057333	06/03/16	National
	RX2436	EV2114C5-C0DNN, 01057176	06/03/16	National
	SALTO R2	OW1012353, XR0542,GS0553	06/10/16	National
	DS0067Z1	009G15Z3	06/17/16	National
	DS038A1	06G15A8	06/17/16	National
	DS244N1	24G15N3, AM10995468	06/17/16	National
	DS268V1	26G14W2	06/17/16	National
	DS032R1	01G13R1	06/17/16	National
	DS064Y1	05G15Y8, SM14328903	07/08/16	National
	DS215Y1	05G15Y8, SM14328903	07/22/16	National
	KOSMO R2	PR40901043	08/19/16	National
	NSC LEROY RR2Y	NSM EXP44 R2	08/19/16	National
	TORRO R2	PR1418113R2	08/19/16	National
	VOLTA	PR1504502	08/19/16	National
SUNFLOWER	ETHIC	EGH693,SL693	06/10/16	National
TIMOTHY	CATAPULT	TM0804	04/08/16	National
	ANJO	DVP 001657, WL 259	06/17/16	National
TRITICALE	AAC DELIGHT	T225	02/19/16	Regionally Restricted
	HOTSHOT	ACS 10495, T235	04/22/16	Regionally Restricted
	CIRCUIT	ACS 58406, T218	05/06/16	National
DURUM WHEAT	CDC CREDENCE	DT583, D06.5.120	06/24/16	Regionally Restricted
	AAC STRONGHOLD	DT862, A0719-KZ06	07/08/16	Regionally Restricted
SPRING WHEAT	AAC CROSSFIELD	HY 1632, EPWB317	01/08/16	Regionally Restricted
	AAC ENTICE	HY 1627, EPWB-318	01/08/16	Regionally Restricted
	AAC PARAMOUNT	SWS433, 11B-17, 10A-421	01/08/16	Regionally Restricted
	SY479 VB	BW 479	02/12/16	Regionally Restricted
	SY637	PT637	02/12/16	Regionally Restricted
	AAC VIEWFIELD	BW965,B0763&AA016	02/12/16	Regionally Restricted
	AAC CONCORD	BW963,B0501-AL04D	02/19/16	Regionally Restricted
	AAC REDBERRY	BW966,B0763&AB044	02/19/16	National
	CDC LANDMARK	BW971, W10091	04/08/16	Regionally Restricted
	CDC KINLEY	HW616, HW09107	04/08/16	Regionally Restricted
	CDC HUGHES	PT588, W10096	04/29/16	Regionally Restricted
	SY SLATE	BW496,05S2145-30	06/10/16	Regionally Restricted
	SYNOX	BS10-104, 07-GU-436	06/10/16	Regionally Restricted
	ELGIN ND	SD 13-1, 2014-11	06/10/16	Regionally Restricted
	CDC THROTTLE	GP131, HY03.06.058	06/24/16	Regionally Restricted
	DAGON	CM9019/CFB1015	06/30/16	Regionally Restricted
	CDC TERRAIN	HY537, HY04.27.070	07/08/16	Regionally Restricted
	SY ROWYN	HY2013, 03S0253-7	07/08/16	Regionally Restricted
	AAC AWESOME	GP151, 12B09	07/08/16	Regionally Restricted
	TOUNDRA	07SW419.05	07/08/16	Regionally Restricted
	EASTON	CM9004	08/26/16	Regionally Restricted
WINTER WHEAT	AAC WILDFIRE	W512,LK 1064	11/27/15	Regionally Restricted
	UGRC C2-5	UGRC C2-5	11/27/15	Regionally Restricted
	CURTIS	DANW1019, TW686-049,SC16-001SR	03/24/16	Regionally Restricted
	LEXINGTON	CFBA1201, ACS10208	05/13/16	Regionally Restricted
	DREW	CM7363, SR7363J, 112301W, W990117E1	08/26/16	Regionally Restricted

AGRICULTURE CANADA 2016 VARIETY REQUEST FOR PROPOSALS

Agriculture and Agri-Food Canada (AAFC) would like to thank the companies that submitted proposals to commercialize pedigreed seed of AAFC varieties under the 2016 Request for Proposal. Based upon marketing and production strategies, marketing experience and financial offer, our evaluation committee has selected the following proposals:

Variety	Company (Awarded License Rights)
ACUG 13-1 Navy Bean	Canterra Seeds
ACUG 14-1 Navy Bean	Hensall District Co-operative Inc.
ACUG 14-3 Navy Bean	Hensall District Co-operative Inc.
BW968 Canada Prairie Spring Wheat	SeCan Association
CR318-6 Cranberry Bean	Canterra Seeds
DT862 Canada Western Amber Durum	SeCan Association
EC0387-2 Wheat	Advantage Seed Growers Inc.
FP2401 Flax	FP Genetics Inc.
FP2422 Flax	SeCan Association
GP151 Canada Western Special Purpose Wheat	SeCan Association
OT13-04 High-Protein Soybean	Bramhill Seeds Ltd.
OT13-09 Natto Soybean	Hensall District Co-operative Inc.
P0520-116 Field Pea	FP Genetics Inc.
PT250 Canada Western Red Spring Wheat	SeCan Association
W526 Canada Western Red Winter Wheat	FP Genetics Inc.

No proposals were received/accepted for the following lines:

Varieties marked with an asterisk will be offered again through the 2017 RFP process.

*ACUG 14-3 Navy Bean
ACUG 13-01 Otebo Bean
ACUG 13-03 Otebo Bean
ACUG 13-C1 Cranberry Bean
*BW1013 Canada Western Red Spring Wheat
*BW1016 Canada Western Red Spring Wheat
*CR312-8 Cranberry Bean
*DT863 Canada Western Amber Durum
FP2354 Flax
*HS5617-11 Six Row Barley
HW037 Canada Western Hard White Spring Wheat
*OT13-11 Edamame Soybean
*OT14-08 Soybean
OX-141 Tofu Soybean
OX-142 Tofu Soybean
*OX-151 Tofu Soybean
*OX-152 Tofu Soybean
P0414-02 Field Pea
*P0521-109 Field Pea
PT472 Canada Western Red Spring Wheat
PT474 Wheat

Prairie Grain Development Committee

The Prairie Grain Development Committee (PGDC) facilitates the exchange of information relevant to the development of improved cultivars of grain crops for the Canadian prairies. In 2016, the committee recommended the following lines for registration:

BARLEY

TR13606 –TR13606 is a two-rowed, rough-awned malt barley that is well-adapted across western Canada and does especially well in the black soil zone, yielding 15 percent higher than AC Metcalfe.

TR13606 has good kernel traits similar to AC Metcalfe. It has a good combination of disease resistance including resistance to the surface-borne and loose smuts, and intermediate resistance to common root rot. In field tests, TR13606 has consistently shown lower ratings for scald than the malting checks AC Metcalfe and CDC Copeland. Excellent lodging resistance and earliness will make TR13606 a good production choice for growers. Supported for interim registration. Proposer and affiliation: P. Juskiw et al. FCDC, Alberta.

TR13609 –TR13609 is a promising new two-rowed, rough-awned malting line with potential for craft brewing. TR13609 has shown consistently low DON levels, accumulating up to 50 percent less DON than AC Metcalfe in five years of testing at Brandon. It has good kernel plumpness with a promising malting quality profile of low protein levels, high extract, low DP, and good modification with low wort Beta-glucan.

TR13609 is well-adapted to all soil zones of western Canada with average yields 12 percent higher than AC Metcalfe and six percent higher than Copeland. It is tall with good lodging resistance. TR13609 has a superior combination of disease resistance compared to the malting checks including resistance to the surface-borne and loose smuts, and moderate resistance to FHB and scald. Proposer and affiliation: P. Juskiw et al. FCDC, Alberta.

TR13812 - TR13812 is a two-row, hulled, LOXless malt barley with good adaptability across Western Canada. It combines good agronomic performance — strong straw and yield approaching Xena — and physical grain quality — good test weight, kernel weight, high plumps and low thins — with moderate resistance to spot blotch and spot-form net blotch. The malting profile of TR13812 is good with grain protein similar to CDC Copeland, malt alphaamylase activity similar to AC Metcalfe, extract greater than AC Metcalfe and CDC Copeland, and good malt beta glucan levels, friability and FAN. Proposer and affiliation: A. Beattie et al. Crop Development Centre, University of Saskatchewan, Saskatoon, Sask.

TR14928 - TR14928 is a promising two-row hulled malting barley line that is widely adapted to western Canada. It is particularly suited to the craft brewing industry. It was seven percent higher yielding than AC Metcalfe and four percent higher yielding than CDC Copeland over two years of testing across all soil zones. It has shorter, stronger straw and lodging scores less than half that of the checks with heavier, considerably higher plump kernels than the checks.

TR14928 has an acceptable disease resistance package overall, including resistance to moderate resistance to scald, common root rot and two races of smut. It was similar to the checks with intermediate resistance to net blotches and FHB and is susceptible to stem rust. TR14928 has a desirable malting quality profile with higher malt extract than AC Metcalfe and CDC Copeland and consistently lower protein than the checks.

TR14928's combination of favorable agronomic traits, disease resistance, and malting quality would make it a useful two-row malting barley cultivar for western Canadian producers and the malting and brewing industry.

Supported for interim registration. Proposer and affiliation: F. Kirigwi et al. Syngenta, Canada.

BEANS

CR318-6 - High yielding cranberry bean line with upright determinate growth, good lodging resistance, good seed quality and disease resistance. In the long-season, wide-row dry bean cooperative registration trials over seven station-years, the average yield of this line was 125 percent of the cranberry bean check variety, Etna. The seed size of CR318-6 (428 g/1000 seeds) was slightly larger than Etna (415 g/1000 seeds). Average maturity (97 days) was five days later than Etna (92 days). CR318-6 was resistant to anthracnose races 73 and 105, while Etna was susceptible. CR318-6 and Etna had similar resistance to white mould. In the field ratings of common bacterial blight (CBB) resistance in the coop trials, CR318-6 had lower severity but similar incidence to the check Etna. In the CBB disease nursery, CR318-6 had better resistance to common bacterial blight than Etna, especially during the early growth stage. This line is suited for the dry bean growing region in southern Manitoba. Developed by Agriculture and Agri-Food Canada, Morden, MB.

CR312-8 - High yielding cranberry bean line with upright determinate growth, good lodging resistance, good seed quality, and early maturity. In the long-season, wide-row dry bean cooperative registration trials over seven station-years, the average yield of CR312-8 was 106 percent of Etna, the cranberry bean check cultivar. The seed size of CR312-8 (458 g/1000 seeds) was significantly larger than Etna (415 g/100 seeds). Average maturity (93 days) was similar to Etna (92 days). CR312-8 and Etna had similar resistance to white mould. Both CR312-8 and the check Etna were susceptible to common bacterial blight and anthracnose races 73 and 105. This line is suited for the dry bean growing region in southern Manitoba. Developed by Agriculture and Agri-Food Canada, Morden, MB.

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PGDC VARIETY REGISTRATION RECOMMENDATIONS (CON'T)

3620-3 - Flor de junio bean line produces a pink and yellow bean typically grown and marketed in Mexico. It would be a niche market variety in Canada for export to Mexico and the USA. Because flor de junio beans are not currently grown in Canada, 3620-3 was compared to checks of other market classes. The line produces a compact plant that is medium-to-late maturing for Saskatchewan. It has consistently yielded substantially higher than all the market class checks (CDC Pintium, Envoy and CDC Jet). The line has a seed weight slightly smaller than a pinto but larger than a black or navy – not unlike the market class comparison – Mejorado. It is tolerant to both races of anthracnose tested but is not tolerant to common bacterial blight. Developed by Crop Development Centre, University of Saskatchewan, Saskatoon, Sask.

L11PS211 - Indeterminate, upright bush (Type 2a) pinto bean with improved seed coat colour. This line features improved field resistance to white mould compared to the check cultivar AC Island, similar to CDC WM-2. It is similar to the check cultivars for seedling resistance to anthracnose races 73 and 105. The maturity rating for L11PS211 is two days later than the check cultivar. Canning and cooking quality traits are similar to the check cultivars. L11PS211 is suitable for production across southern Alberta.

L11YL012 - High yielding yellow bean line with determinate, upright bush (Type 1) growth habit and improved seed coat colour compared to the check cultivar, CDC Sol. The seed yield of this line is similar to the check cultivar and the maturity is one day later than CDC Sol. L11YL012 has a slightly lower lodging resistance than the check cultivar, but is not a concern in this line with a determinate bush (Type 1) growth habit. The line showed partial field resistance to white mould in terms of incidence and severity. It is susceptible to anthracnose races 73 and 105, similar to the check cultivar. The canning and cooking quality traits are similar to the check cultivar. This line is adapted for production across southern Alberta and Saskatchewan. Developed by Agriculture and Agri-Food Canada Lethbridge Research and Development Centre, Lethbridge, Alta.

L11YL015 - High yielding yellow bean line with a determinate, upright bush (Type 1) growth habit and improved seed coat colour compared to the check cultivar, CDC Sol. The seed yield of L11YL105 is similar to the check. This line has a maturity rating one day later than the check cultivar. Lodging resistance is slightly lower with L11YL105 than the check cultivar, but is not a concern in this line with a determinate bush (Type 1) growth habit. White mould incidence is slightly higher than the check, but is not a concern since white mould severity is low, similar to CDC Sol. The line is susceptible to anthracnose races 73 and 105. Canning and cooking quality traits are similar to CDC Sol. The line is adapted for production across southern Alberta and Saskatchewan. Developed by Agriculture and Agri-Food Canada Lethbridge Research and Development Centre, Lethbridge, Ata.

PGDC VARIETY REGISTRATION RECOMMENDATIONS (CON'T)

CANARYGRASS

C05041 - Glabrous annual canarygrass line that yielded, on average, 22.2 percent higher than CDC Maria, 6.5 percent higher than CDC Bastia and 12.1 percent higher than CDC Togo over 42 trials in a nine-year period in Saskatchewan. C05041 is similar in days to heading and maturity to the three canarygrass check cultivars. The line is shorter strawed than the checks with similar test weight and seed mass. Compared to CDC Calvi, C05041 yielded 0.8 percent less but was earlier maturing and shorter-strawed based on data collected in 28 trials over a seven-year period. The seed (groat) colour of C05041 is yellow. This line is adapted to the annual canarygrass growing regions of western Canada. Developed by Crop Development Centre, University of Saskatchewan, Saskatoon, Sask.

FLAX

FP2432 – Yellow flax line. Breeding Institution or Canadian Representative: Helen Booker, Crop Development Centre, University of Saskatchewan.

FP2461 – Flax line. Breeding Institution or Canadian Representative: Scott Duguid, Agriculture and Agri-Food Canada – Morden.

FP2484 – Flax line. Breeding Institution or Canadian Representative: Scott Duguid, Agriculture and Agri-Food Canada – Morden.

FP2497 – Flax line. Breeding Institution or Canadian Representative: Michelle Beaith, CPS Canada Inc.

LENTILS

IBC 839 - French green lentil line with tolerance to imidazolinone herbicide. This line is higher yielding than the green cotyledon variety CDC QG-3 and similar to the French green variety CDC QG-2. IBC 839 demonstrates better lodging resistance than CDC QG-3 and CDC QG-2. The line also has better disease resistance characteristics compared to CDC QG-3. Cotyledon colour, flowering

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PGDC VARIETY REGISTRATION RECOMMENDATIONS (CON'T)

time, maturity and plant height were similar to CDC QG-3. Seed weight is slightly smaller than CDC QG-3 but similar to CDC QG-2. The seed thickness of IBC 839 is slightly less than that of other cultivars with the same seed diameter. Developed by Crop Development Centre, University of Saskatchewan, Saskatoon, Sask.

IBC 937 - High-yielding large green lentil line with improved lodging resistance compared to CDC Improve and CDC Impower. IBC 937 has tolerance to imidazolinone herbicide. Over three years of testing in the lentil registration recommendation trial, IBC 937 yielded 114 percent relative to CDC Improve and 111 percent relative to CDC Impower. Seed coat colour, cotyledon colour, flowering time, maturity, plant height and seed weight were similar to the check varieties CDC Improve and CDC Impower. Seed thickness is greater than that of both CDC Improve and CDC Impower, making IBC 937 more suitable for lentil dehulling. This feature is of economic importance in markets where dehulled large green lentils are used as a supplement to the supply of tur dal, also known as pigeon pea (Cajanus cajan). IBC 937 is slightly shorter than CDC Impower and CDC Improve, similar to CDC Maxim. This line shows no improvement in disease resistance compared to CDC Impower and CDC Improve. Developed by Crop Development Centre, University of Saskatchewan, Saskatoon, Sask.

3674-15 – This small red lentil line is not tolerant to imidazolinone herbicide. The line demonstrated consistent high yields compared to the check variety CDC Maxim. Over two years of testing in the lentil registration recommendation trial, the yield of 3674-15 was 106 percent of CDC Maxim. In the 2013-15 lentil regional variety trial, the yield of 3674-15 was 113 percent of CDC Maxim. Seed coat colour, cotyledon colour, flowering time, maturity, plant height and seed weight were similar to CDC Maxim. Seed diameter was slightly less than that of CDC Maxim but seed thickness was higher than CDC Maxim, making 3674-15 more suitable for lentil dehulling. 3674-15 has disease resistance characteristics similar to CDC Maxim. Developed by Crop Development Centre, University of Saskatchewan, Saskatoon, Sask.

IBC 975 – This mall red cotyledon lentil line is tolerant to imidazolinone herbicide, and is high yielding compared to the check variety CDC Maxim. IBC 975 was tested for two years in the lentil registration recommendation trial (LRRT) where the yielded 111 percent of CDC Maxim. Data from the 2015 lentil regional variety trial shows the yield of IBC 975 was 106 percent of CDC Maxim. Seed coat colour, cotyledon colour, flowering time, maturity, plant height and seed weight were similar to CDC Maxim. Seed diameter was slightly less than that of CDC Maxim but seed thickness was greater than CDC Maxim, making IBC 975 more suitable for lentil dehulling. IBC 975 has similar agronomic and maturity characteristics to CDC Maxim and similar disease resistance characteristics. Developed by Crop Development Centre, University of Saskatchewan, Saskatoon, Sask.

OATS

OT2105 – Milling oat line with a good combination of earlier maturity and acceptable yield for western Canada. The lodging ratings were similar to AC Morgan. OT2105 has lower oil content with acceptable levels of betaglucan and protein. The disease resistance is good for the western Prairies. Proposer and affilation: J. Mitchell-Fetch, Agriculture and Agri-Food Canada, Brandon.

OT3080 - High beta-glucan, low oil milling oat variety with excellent groat percentage, excellent test weight and kernel weight, high plumpness and low thins, and earlier maturity combined with good yield potential and very good lodging resistance. OT3080 also demonstrated reaction to crown rust similar to CDC Dancer and resistance to smut. Proposed by A.D. Beattie, B.G. Rossnagel and T. Zatorski, Crop Development Centre, University of Saskatchewan, Saskatoon, Sask.

OT3085 - High beta-glucan, low oil milling oat variety with very good groat percentage, good plumpness and low thins, and earlier maturity combined with excellent yield potential and very good lodging resistance.

OT3085 also demonstrated reaction to crown rust similar to CDC Dancer. Proposed by A.D. Beattie, B.G. Rossnagel and T. Zatorski, Crop Development Centre, University of Saskatchewan, Saskatoon, Sask.

OT6011 – Feed oat line. OT6011 is a medium maturing, short stature, high grain quality feed oat with good grain yield. Though originally bred to be a milling oat, the slightly higher groat oil will serve the equine and oat feed industry well. Kernel plumpness and uniformity is excellent, adding to the grain quality appeal of this oat line. OT6011 is best suited for production in the black, brown and grey soil zones of Alberta and western Saskatchewan. Proposer and affiliation: Jim Dyck, Oat Advantage.

PEAS

CDC 3525-5 - This yellow cotyledon, semi-leafless field pea variety demonstrated improved yield — 111 percent — compared to the mean of the yellow checks, CDC Golden and Agassiz. The line has good lodging resistance, better than the checks while having a medium-long vine length, taller than the checks. CDC 3525-5 is powdery mildew resistant with fair mycosphaerella blight resistance and fair fusarium wilt resistance, similar to the checks. The line has a medium maturity, two days later than Agassiz and three days later than CDC Golden. CDC 3525-5 has a medium seed weight, slightly greater than the checks and a round seed shape, similar to the checks. The seed has a moderate protein concentration, similar to the checks. Developed by Crop Development Centre, University of Saskatchewan, Saskatoon, Sask.

CDC 4061-4 – This yellow cotyledon, semi-leafless field pea variety features an improved yield — 116 percent — compared to the mean of the yellow checks, CDC Golden and Agassiz. The line has good lodging resistance, better than the checks and a medium-long vine length,

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PGDC VARIETY REGISTRATION RECOMMENDATIONS (CON'T)

taller than the checks. CDC 4061-4 is powdery mildew resistant, with fair mycosphaerella blight resistance, similar to the checks and fair fusarium wilt resistance. This line is rated as medium maturity, three days later than the check cultivar Agassiz, and four days later than CDC Golden. CDC4061-4 has a medium seed weight, similar to Agassiz, slightly greater than CDC Golden. The seed shape is round, the same as CDC Golden, but more round than Agassiz. The line has a moderate protein concentration, similar to the checks. Developed by Crop Development Centre, University of Saskatchewan, Saskatoon, Sask.

P0520-116 - This yellow cotyledon field pea variety has improved yields over the check varieties. P0520-116 yield was 10 percent higher than Agassiz and 14 percent higher than CDC Golden over 22 station-years in the 2014-2015 field pea cooperative registration test. P0520-116 has larger seeds than the check varieties. The line has good lodging resistance, similar to the check varieties, and is resistant to powdery mildew, as are the check varieties. P0520-116 is similar to the check varieties in other important characteristics. Like the check varieties, P0520-116 is not resistant to fusarium wilt. Developed by Agriculture and Agri-Food Canada Lacombe Research Centre, Lacombe, Alta.

P0521-109 is a yellow cotyledon field pea. This line yielded eight percent higher than Agassiz and 14 percent higher than CDC Golden over 24 station-years in the 2011-2012 field pea cooperative registration test. P0521-109 has good lodging resistance and is powdery mildew resistant. P0521-109 has significantly larger seeds than the check varieties. It is not resistant to fusarium wilt, which is similar to the check varieties. Developed by Agriculture and Agri-Food Canada Lacombe Research Centre, Lacombe, Alta.

RYE

RT212 (KWS Bono) – Hybrid fall rye line. Breeding Institution or Canadian Representative: KWS LOCHOW GMBH (Germany). Supported for full registration in 2016.

WHEAT

BW488 – Spring wheat line developed by the University of Saskatchewan. Canada Western Red Spring class. Features midge resistant Sm1 gene and solid stem. Supported for full registration in 2016.

BW968 - Spring wheat line developed by the Agriculture and Agri-Food Canada – Swift Current. Canada Prairie Spring Red / Canada Northern Hard Red class. Supported for full registration in 2016.

BW986 - Spring wheat line developed by the University of Alberta. Canada Western Red Spring class. Supported for full registration in 2016.

BW1005 – Spring wheat line developed by the University of Saskatchewan. Canada Western Red Spring class. Supported for full registration in 2016.

BW1011 - Spring wheat line. Breeding Institution or Canadian Representative: Syngenta Canada Inc. Canada Western Red Spring class. Supported for full registration in 2016.

BW1013 - Spring wheat line developed by the Agriculture and Agri-Food Canada – Brandon. Canada Western Red Spring class. Supported for full registration in 2016.

BW1016 - Spring wheat line developed by the Agriculture and Agri-Food Canada – Brandon. Canada Western Red Spring class. Supported for full registration in 2016.

PT250 - Spring wheat line developed by the Agriculture and Agri-Food Canada – Swift Current. Canada Western Red Spring class. Supported for full registration in 2016.

HY2013 - Spring wheat line. Registered as SY Rowyn. Breeding Institution or Canadian Representative: Syngenta Canada Inc. Canada Prairie Spring Red class. Supported for full registration in 2016.

HY2003 - Spring wheat line developed by P. Hucl, Crop Development Centre, University of Saskatchewan. Canada Northern Hard Red class. Imidazolinone tolerant. Contains midge resistant Sm1 gene. Supported for full registration in 2016.

ELGIN ND – Spring wheat line. Breeding Institution or Canadian Representative: FP Genetics Inc. Canada Northern Hard Red class. Supported for full registration in 2016.

FALLER - Spring wheat line. Breeding Institution or Canadian Representative: Seed Depot. Canada Northern Hard Red class. Supported for full registration in 2016.

PROSPER - Spring wheat line. Breeding Institution or Canadian Representative: Seed Depot. Canada Northern Hard Red class. Supported for full registration in 2016.

SPARROW 2014-2 – Spring wheat line. Breeding Institution or Canadian Representative: KWS UK. Canada Western Special Purpose (CWSP) class. Supported for full registration in 2016.

ALDERON 2014-4 – Spring wheat line. Breeding Institution or Canadian Representative: KWS UK. Canada Western Special Purpose (CWSP) class. Supported for interim registration in 2016.

CHARING 2014-8 – Spring wheat line. Breeding Institution or Canadian Representative: KWS UK. Canada Western Special Purpose (CWSP) class. Supported for interim registration in 2016.

W522 – Winter wheat line developed by University of Manitoba. Canada Western Red Winter (CWRW) class. Supported for full registration in 2016.

W526 – Winter wheat line developed by Agriculture and Agri-Food Canada – Lethbridge. Canada Western Red Winter (CWRW) class. Supported for full registration in 2016.

W535 – Winter wheat line developed by University of Manitoba. Canada Western Special Purpose (CWSP) class. Supported for interim registration in 2016.

W538 – Winter wheat line developed by University of Manitoba. Canada Western Special Purpose (CWSP) class. Supported for interim registration in 2016.

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PGDC VARIETY REGISTRATION RECOMMENDATIONS (CON'T)

GP151 – Spring wheat line developed by Agriculture and Agri-Food Canada – Lethbridge. Canada Western Red Winter (CWRW) class. Supported for full registration in 2016.

GP184 – Spring wheat line. Breeding Institution or Canadian Representative: Western Feed Grain Development Co-op. Canada Western Special Purpose (CWSP) class. Supported for full registration in 2016.

DT862 – Low cadmium durum wheat line with solid stem, developed by Agriculture and Agri-Food Canada – Swift Current. Canada Western Amber Durum (CWAD) class. Supported for full registration in 2016.

DT863 – Low cadmium durum wheat line developed by Agriculture and Agri-Food Canada – Swift Current. Canada Western Amber Durum (CWAD) class. Supported for full registration in 2016.

DT583 – Low cadmium durum wheat line developed by University of Saskatchewan. Canada Western Amber Durum (CWAD) class. Supported for full registration in 2016.

PROPOSED LIST OF VARIETY REGISTRATION CANCELLATIONS

The Canadian Food Inspection Agency (CFIA) in consultation with the Canadian Grain Commission (CGC) has adopted a protocol for the cancellation of variety registrations upon request of the variety's Canadian representative and breeder.

Under this new, extended protocol, a three-year notification of cancellation period will apply to varieties of all crop kinds except hybrid canola and rapeseed. Hybrid canola and rapeseed will require a one year notification period.

This timeline enables the Canadian representative and breeder to ensure that seed stocks of the variety have been cleared from the market and that growers have been duly notified, well in advance, in order to clear seed stocks in farmers' operations.

This will help farmers to plan for the future and minimize any financial risk to their businesses. Notifications will be posted Aug. 1 in each calendar year and the notification period is from that date forward.

The CFIA and CGC are committed to communicating to farmers well before varieties are cancelled.

Standardizing the period of cancellation will help to prevent financial risk to farmers by avoiding the planting of varieties of field crops, which will no longer be registered for sale in Canada.

Variety registration cancellation for cause, such as non-compliance, fraud or loss of varietal integrity, is not part of this policy and remains an enforcement tool available to the registrar of the CFIA's Variety Registration Office.

The CFIA publishes the Proposed List of Variety Registration Cancellations with the date of cancellation. The list is revised annually on Aug. 1, and released by the VRO. The CGC revises their Variety Designation Lists throughout the year as changes occur.

Crop Kind	Variety	Reg. #	Date Registered	Date Posted	Date of Cancellation
Oilseed soybean	0800RR*	6248	2007-04-04	2014-08-01	2017-08-01
Oilseed soybean	CeryxRR*	6262	2007-04-13	2014-08-01	2017-08-01
Oilseed soybean	Lanark*	6141	2006-05-24	2014-08-01	2017-08-01
Oilseed soybean	Moncalm*	6140	2006-05-24	2014-08-01	2017-08-01
Oilseed soybean	Renfrew*	6249	2007-04-04	2014-08-01	2017-08-01
Oilseed soybean	Storm	6447	2008-04-24	2014-08-01	2017-08-01
Manteca type field bean	Prim	4691	1998-03-05	2014-08-01	2017-08-01
Green field pea	Venture	5152	2000-06-14	2014-08-01	2017-08-01
Oilseed Flax	CDC Arras	4753	1998-05-19	2014-08-01	2017-08-01
Oilseed Flax	Flanders	3090	1989-04-14	2014-08-01	2017-08-01
Oilseed Flax	Somme	3091	1989-04-14	2014-08-01	2017-08-01
Spring canola	46A76	4924	1999-05-05	2014-08-01	2017-08-01
Field green pea	Nitouche	4900	1999-04-14	2015-08-01	2018-08-01
Red Mexican type field bean	AC Scarlet	5217	2000-11-30	2015-08-01	2018-08-01
Pinto type field bean	AC Pintoba	4668	1998-01-16	2015-08-01	2018-08-01
Black type field bean	Carmen Black	6886	2010-09-23	2015-08-01	2018-08-01
Yellow field pea	AC Melfort	4861	1999-02-10	2015-08-01	2018-08-01
Spring Oat	AC Rebel	4705	1998-03-09	2015-08-01	2018-08-01
Two-Row Spring Barley	AC Bountiful	5028	1999-12-07	2015-08-01	2018-08-01

* Plant with novel trait or derived from plant with novel trait.

NEW PROTOCOLS TO BE IMPLEMENTED IN 2017

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"We also had some conversations with the Pest Management Regulatory Agency (PMRA). They had flagged some concerns about environmental health and safety so we decided as an industry that we should be proactive in addressing stewardship (concerns)…."

Once the need for safety protocols had been identified, program promoters began an industry-wide consultation to identify stakeholders and determine how the program should be designed and implemented.

Hurst described the consultation process as comprehensive and inclusive, taking all stakeholders' interests and concerns into consideration.

"We tried to ensure that we had all of the various stakeholders involved," he said.

"We probably could have delivered the program a lot sooner if the stakeholder consultations hadn't been so comprehensive," he added.

The process resulted in a system that is more robust than it would have been otherwise. The new protocols have been thoroughly scrutinized and beta-tested and are understood and endorsed by all stakeholder groups.

Prior to finalizing the standards, a pre-audit program was offered in 2014 and 2015.

Pre-audits involved a site visit by an accredited program auditor, an assessment of facilities and operational procedures, and identification of areas that would require improvements or upgrades.

Of the 489 pre-audits performed, about one half involved pedigreed seed growers, said Hurst.

"Basically, the pre-audits allowed managers to get a better understanding and a better level of comfort with what we have developed in terms of seed treatment standards," he said.

"It also gave them a better idea of how their operations stacked up … Overall, I think it was a nice opportunity for any facility to get a free gap assessment of their operations."

According to Hurst, about one-third of the 489 operations that requested a pre-audit were already close to achieving full compliance with the proposed standards.

Facilities that participated in the pre-audit program will be required to undergo a full audit in 2017.

But many of those operators will need to make only minor modifications to their facilities and practices to ensure compliance.

Hurst said it is difficult to estimate how many seed treatment facilities will earn accreditation under the program.

However, he expects that most of the facilities that participated in the pre-audit program will seek full accreditation.

"We did have a little bit of difficulty getting a clear number on just how many commercial operations were out there," he said.

"That said, there were slightly less than 500 that went through the pre-audit process … so I would suspect that a large portion of that group would also choose to go through the full accreditation process."

WORK UNDERWAY ON WHEAT RESEARCH CLUSTER

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- improved resistance to disease with a special emphasis on prominent wheat diseases such as fusarium head blight, rust, ergot, and for eastern Canadian varieties, powdery mildew, and;
- strong straw with good lodging resistance.

Other breeding priorities include:

- Pre-harvest sprouting resistance that will provide grade protection;
- Improved winter survival for winter wheats;
- The development of new solid stemmed varieties for sawfly resistance in western Canada;
- The development of western Canadian varieties that offer resistance to the orange wheat blossom midge ;
- Early maturing western Canadian varieties;
- Eastern Canadian spring wheat varieties that offer higher and more consistent protein levels.

The funding organization noted that the development of new breeding tools aimed at accelerating the wheat breeding process, such as marker validation, would also be considered eligible.

Genetic disease control was identified as an issue of utmost importance to the producers of Canada with a special emphasis on resistance to fusarium head blight.

Efforts that target wheat yield improvement through genetics are aiming for a one percent per year yield increase for wheat classes that have a strong focus on quality requirements and two percent per year yield increase for other wheat classes.

In the area of wheat-specific agronomy, high priority research goals include:

- Management and production practices to mitigate diseases, specifically fusarium head blight, ergot, leaf diseases and seedling/root rot diseases;
- Development of predictive models for wheat diseases such as fusarium head blight, rust, ergot and mildew;
- Studies aimed at quantifying the environmental and economic value of wheat in rotation and encouraging its presence as a key part of a healthy crop rotation, with research focused on crops of economic value to producers, and;
- Studies that examine variety specific responses to inputs and management practices.

SASKATCHEWAN PEDIGREED SEED GROWERS

DIRECTORY OF CROP VARIETIES

This list was prepared by the Canadian Seed Growers Association. It includes varieties eligible for sale in Canada and seed crops issued certificates as of Nov. 3, 2016. CSGA assumes no responsibility for errors or omissions. Varieties followed by an asterisk include reconstituted flax varieties and midge tolerant wheat varieties that are subject to additional certification requirements, ACRs, such as post harvest testing. For all varieties in this list, the pedigreed class code is listed after the grower's phone number. S = Select, F = Foundation, R = Registered, C = Certified.

ALFALFA

3010

Marchildon, Vince & Daniel	Zenon Park	306-767-2455			C

ALGONQUIN

Ag-Vision Seeds Ltd.	Carrot River	306-768-3335			C
Le Bras, Mart & Evan	Arborfield	306-769-8506			C
Marchildon, Joel	Zenon Park	306-812-8419			C
Marchildon, Vince & Daniel	Zenon Park	306-767-2455			C
Stewart, Ryan	Carrot River	306-768-2259			C
Weighill, Ron	Carrot River	306-768-3560			C
Wildeman, Maurice Don	Lanigan	306-365-4395			C

DOMINATOR

Marchildon, Joel	Zenon Park	306-812-8419			C

PHABULOUS

Ag-Vision Seeds Ltd.	Carrot River	306-768-3335	F		C

PICKSEED 2065MF

Trawin Seeds	Melfort	306-752-4060			C

BARLEY

AAC CONNECT

Lung Seeds Ltd.	Lake Lenore	306-368-2414	F		
Wylie, Leslie Dale	Biggar	306-948-2807	F		

AAC SYNERGY

Ardell, Terrence, Michael, Joanne, Theresa & Joshua	Vanscoy	306-668-4415			C
Berscheid, K.N.& B.& E.K. &S.& C. & Y.	Lake Lenore	306-368-2602			C
Cay, Randy D.	Kinistino	306-864-3696			C
Crosson, Lorne & Will & Lee & Glen	Welwyn	306-645-3337			C
Etter, James Raymond	Richardson	306-536-0380			C
Fraser, Scott & Shawn	Pambrun	306-741-0475			C
Friesen, Greg & Brea; Leavins, Brent & Betty Mae	Elrose	306-378-4839			C
Hardy, Allan W. & Dale & Evan	Grenfell	306-697-3128			C
Hetland, Bill & Bohachewski, Joe	Naicam	306-874-5694			C
Hyndman, Neil S.	Balcarres	306-331-8168			C
Johnson, Oscar Stuart & Lee Stuart	Margo	306-324-4315			C
Laxdal, Glen M. & Blyth, Danny, Wayne, Richard, Quinn, Darryl & Bolt, Glen A.	Wynyard	306-554-2078			C
McDougall, Ken & Craig	Moose Jaw	306-693-3649			C
Seed Source Inc.	Archerwill	306-323-4402			C
Smith, Wayne D.	Limerick	306-263-4944			C
Syngenta Canada Inc. (Cereals)	Melfort	306-752-5397		R	
Syngenta Canada Inc. (Cereals)	Melfort	306-752-5397		R	
Tomtene, Steven & Slind, Daniel	Birch Hills	306-749-3447			C
Wylie, Leslie Dale	Biggar	306-948-2807			C

AC METCALFE

Ardell, Terrence, Michael, Joanne, Theresa & Joshua	Vanscoy	306-668-4415		R	
Berscheid, K.N.& B.& E.K. &S.& C. & Y.	Lake Lenore	306-368-2602	S	F	
Beuker, Allan Daniel & Wilbur A.	Melfort	306-752-4810			C
Booy, Jerry N. & Murray T. & Darcy K.	Glaslyn	306-342-2058			C
Boyd, Clare W. & Dale A.	Melfort	306-752-2564		R	C
Boyes, Douglas John	Kelvington	306-327-4980		R	
Edmunds, Greg & Glen	Tisdale	306-873-4780		R	C
Edwards, Lawrence R. & Donna & Jeff & Mike	Nokomis	306-528-2140			C
Fedoruk, Rod M.& Cathy	Kamsack	306-542-4235			C
Fraser, Scott & Shawn	Pambrun	306-741-0475	S	F	
Frederick, Blaine	Watson	306-287-3977		R	C
Gaertner, Lyle	Tisdale	306-873-4936			C
Hardy, Allan W. & Dale & Evan	Grenfell	306-697-3128			C
Heavin, G. Harvey & G. Ryan	Melfort	306-752-4171	F		C
Heavin, Milton Russell	Melfort	306-752-4071			C
Hetland, Bill & Bohachewski, Joe	Naicam	306-874-5694			C
Klemmer, Richard	Nipawin	306-862-3874			C
Laxdal, Glen M. & Blyth, Danny, Wayne, Richard, Quinn, Darryl & Bolt, Glen A.	Wynyard	306-554-2078	S	F	R
Luck, Lorne C. & Landis	Tisdale	306-873-4111			C
Lung Seeds Ltd.	Lake Lenore	306-368-2414		R	
Lutzer, Albert & Latrace, Jim	Lumsden	306-530-8433		R	
Medernach, Louis J., Kim L. & Kyle	Cudworth	306-256-3991		R	
Novak, Orrin	Kuroki	306-338-2021		R	C
Ostafie, Robert	Canora	306-563-6244	F		C
Pastl, Glenn A.	Watson	306-287-4243			C
Pratchler, John & Leander	Muenster	306-682-3317			C
Rempel, Blair Allan	Nipawin	306-862-3573			C
Rugg, Robert B., John Barry & Brian R.	Elstow	306-257-3638			C
Seed Source Inc.	Archerwill	306-323-4402			C
Seidle, Edward & Brett & Cameron J. & Mervyn Anthony	Medstead	306-342-4377		R	C
Sopel, Calvin & Arlene	Ituna	306-795-3617			C
South, Winston & Richard & Bradley	Melfort	306-752-9840	S		
Trowell, Kenneth & Larry & Nathan	Saltcoats	306-744-2687	S	R	C
Wiens, Brennan R.	Herschel	306-377-2002			C
Woroschuk, Andrew	Calder	306-742-4682		R	C
Youzwa, Donald	Nipawin	306-862-5690		R	C
Zwingli, James Trent & Shelley	Melfort	306-752-4224			C

AC RANGER

Ardell, Terrence, Michael, Joanne, Theresa & Joshua	Vanscoy	306-668-4415	S	F	

AC ROSSER

Pogu, Jean	Duck Lake	306-467-4903		R	

BENTLEY

Cay, Randy D.	Kinistino	306-864-3696			C
Yauck, Kevin Rodney	Govan	306-484-4555			C

BRAHMA

Proven Seed/ Crop Production Services (Canada) Inc.	High River	403-603-6011		R	C

CDC ASCENT

Tomtene, Steven & Slind, Daniel	Birch Hills	306-749-3447	S		
Van Burck, Hans, Marianne & Mira	Star City	306-863-4377	S		

CDC AUSTENSON

Ardell, Terrence, Michael, Joanne, Theresa & Joshua	Vanscoy	306-668-4415		R	
Buziak, Ronald Charles	Mayfair	306-445-6556			C
Dutton, David H.& George	Paynton	306-895-4306		R	C
Ennis, Garnet, Neil & Schmidt, Jordan	Glenavon	306-429-2793		R	
Fedoruk, Michael J.	Kamsack	306-542-4235		R	C
Fedoruk, Rod M.& Cathy	Kamsack	306-542-4235			C
Girodat, Gerald	Shaunavon	306-297-2563			C
Goossen, Mathew	Stenen	306-547-7432			C
Kerber, Greg	Rosthern	306-232-4474		R	
Larsen, Lyle L.	Aylsham	306-862-7333		R	
Sayers, Charlie Joseph	Delmas	306-445-6522		R	
Seidle, Edward & Brett & Cameron J. & Mervyn Anthony	Medstead	306-342-4377		R	
Trawin Seeds	Melfort	306-752-4060		F	C
Van Burck, Hans, Marianne & Mira	Star City	306-863-4377	S	R	
Wilfing, Raymond John & Ryan John	Meadow Lake	306-236-6811			C
Woroschuk, Andrew	Calder	306-742-4682			C

CDC BOW

Berscheid, K.N.& B.& E.K. &S.& C. & Y.	Lake Lenore	306-368-2602	S	F	
Booy, Jerry N. & Murray T. & Darcy K.	Glaslyn	306-342-2058		R	
Fedoruk, Rod M.& Cathy	Kamsack	306-542-4235		F	
Friesen, Greg & Brea; Leavins, Brent & Betty Mae	Elrose	306-378-4839		F	
Gregoire, Denis & Rory & Brandon	North Battleford	306-445-5516	S		
Hanley, Erwin & Priscilla	Regina	306-586-4509		R	
Heavin, Milton Russell	Melfort	306-752-4071	S		
Laxdal, Glen M. & Blyth, Danny, Wayne, Richard, Quinn, Darryl & Bolt, Glen A.	Wynyard	306-554-2078	S		
Medernach, Louis J., Kim L. & Kyle	Cudworth	306-256-3991	S	F	
South, Winston & Richard & Bradley	Melfort	306-752-9840	S		
Tebbutt, Gregg & Blake D.	Nipawin	306-862-9730		F	R
Thompson, Jan Harris	Naicam	306-874-7138	S		
Tomtene, Steven & Slind, Daniel	Birch Hills	306-749-3447	S	F	

CDC CARTER

Pender, Joseph M.	Saskatoon	306-374-4933			C

CDC CLEAR

Tomtene, Steven & Slind, Daniel	Birch Hills	306-749-3447	S	R	

CDC COPELAND

Ackerman, Patrick	Chamberlain	306-638-3177	S		C
Ardell, Terrence, Michael, Joanne, Theresa & Joshua	Vanscoy	306-668-4415		F	R
Berscheid, K.N.& B.& E.K. &S.& C. & Y.	Lake Lenore	306-368-2602		F	R C
Beuker, Allan Daniel & Wilbur A.	Melfort	306-752-4810			R
Booy, Jerry N. & Murray T. & Darcy K.	Glaslyn	306-342-2058			C
Denis, Michel P. & Marc	St. Denis	306-258-2219			R
Dutton, David H.& George	Paynton	306-895-4306	S		C
Edmunds, Greg & Glen	Tisdale	306-873-4780			C
Etter, James Raymond	Richardson	306-536-0380			C
Fedoruk, Michael J.	Kamsack	306-542-4235		R	C
Fraser, Scott & Shawn	Pambrun	306-741-0475			C
Frederick, Blaine	Watson	306-287-3977		R	C
Friesen, Greg & Brea; Leavins, Brent & Betty Mae	Elrose	306-378-4839			C
Gerry , Greg	Creelman	306-457-2220			C
Gregoire, Denis & Rory & Brandon	North Battleford	306-445-5516	S	R	
Heavin, Larry N. & L. Warren	Melfort	306-752-4020	S		C
Heggie, Robert Thomas	Leross	306-675-4920		R	
Hetland, Bill & Bohachewski, Joe	Naicam	306-874-5694			C
Johnson, Oscar Stuart & Lee Stuart	Margo	306-324-4315		R	
Kerber, Greg	Rosthern	306-232-4474			C
Labrecque, Roger	Saskatoon	306-373-9379			C
Laforge, Troy	Swift Current	306-773-0924			C
Lung Seeds Ltd.	Lake Lenore	306-368-2414			C
Lutzer, Albert & Latrace, Jim	Lumsden	306-530-8433		R	
Mayerle, Erwin D.	Tisdale	306-873-4261			C
Medernach, Louis J., Kim L. & Kyle	Cudworth	306-256-3991		R	C
Novak, Orrin	Kuroki	306-338-2021		R	C
Novak, Roy	Wadena	306-338-2608			C
Olson, Lyndon, Lynnell, Alica & Bryon	Archerwill	306-323-4912		F	
Ostafie, Robert	Canora	306-563-6244	S	R	C
Rude, Stanley	Naicam	306-874-2359	S	R	C
Rugg, Robert B., John Barry & Brian R.	Elstow	306-257-3638	S		C
Sandercock, Eric M.	Balcarres	306-334-2958			C
Sayers, Charlie Joseph	Delmas	306-445-6522		R	
Seed Source Inc.	Archerwill	306-323-4402		R	
Seidle, Edward & Brett & Cameron J. & Mervyn Anthony	Medstead	306-342-4377		F	R C
Shewchuk, Stan & Lorne & Terry & Adam & Michael	Blaine Lake	306-497-2800	S	R	C
Smysniuk, Delon	Ituna	306-795-7691			C
Sopatyk, Jeffery & Patti	Saskatoon	306-227-7867		R	C
Stauber, Clayton & Lori	Stewart Valley	306-773-7907			C

Tebbutt, Gregg & Blake D.	Nipawin	306-862-9730			R	
Toman, Rick & Randy	Guernsey	306-365-8386				C
Trawin Seeds	Melfort	306-752-4060	S		R	C
Trowell, Kenneth & Larry & Nathan	Saltcoats	306-744-2687	S	F	R	C
Van Burck, Hans, Marianne & Mira	Star City	306-863-4377	S	F		C
Wakefield, Kristopher & Laurie G. & Monica	Maidstone	306-893-2984		F		C
Wiens, Steven & Shammy	Wymark	306-773-9547				C
Wilfing, Raymond John & Ryan John	Meadow Lake	306-236-6811				C
Wylie, Leslie Dale	Biggar	306-948-2807			R	
Yauck, Kevin Rodney	Govan	306-484-4555				C
Zwingli, James Trent & Shelley	Melfort	306-752-4224				C
CDC FIBAR						
Hetland, Bill & Bohachewski, Joe	Naicam	306-874-5694	S	F		
Tomtene, Steven & Slind, Daniel	Birch Hills	306-749-3447			R	
CDC HILOSE						
Tomtene, Steven & Slind, Daniel	Birch Hills	306-749-3447			R	
CDC KINDERSLEY						
Van Burck, Hans, Marianne & Mira	Star City	306-863-4377	S	F		
Woroschuk, Andrew	Calder	306-742-4682			R	
CDC MAVERICK						
Ardell, Terrence, Michael, Joanne, Theresa & Joshua	Vanscoy	306-668-4415	S			C
Fedoruk, Michael J.	Kamsack	306-542-4235		F		C
Hicks, Dale & Barry	Mossbank	306-867-8674				C
Kerber, Greg	Rosthern	306-232-4474			R	C
Trawin Seeds	Melfort	306-752-4060	S			C
Van Burck, Hans, Marianne & Mira	Star City	306-863-4377	S	F	R	
CDC MCGWIRE						
Pender, Richard Joseph	Saskatoon	306-651-4680		F	R	C
Van Burck, Hans, Marianne & Mira	Star City	306-863-4377		F		
CDC PLATINUM STAR						
Tomtene, Steven & Slind, Daniel	Birch Hills	306-749-3447			R	
Wylie, Leslie Dale	Biggar	306-948-2807			R	
CDC POLAR STAR						
Lung Seeds Ltd.	Lake Lenore	306-368-2414				C
CDC RATTAN						
Hetland, Bill & Bohachewski, Joe	Naicam	306-874-5694	S	F		
CHAMPION						
Proven Seed/ Crop Production Services (Canada) Inc.	High River	403-603-6011			R	C
CLAYMORE						
Proven Seed/ Crop Production Services (Canada) Inc.	High River	403-603-6011			R	
LEGACY						
Cay, Randy D.	Kinistino	306-864-3696				C
Fenton, Gerald A. & Robin Paul	Tisdale	306-873-5438	S	F		C
Hetland, Bill & Bohachewski, Joe	Naicam	306-874-5694	S	F		
Latrace, Bill	Caronport	306-693-2626				C
NEWDALE						
Trowell, Leslie	Saltcoats	306-744-2684		F		
Van Burck, Hans, Marianne & Mira	Star City	306-863-4377				C
OREANA						
Proven Seed/ Crop Production Services (Canada) Inc.	High River	403-603-6011	S		R	
BEANS						
CDC WM-2						
Walker, Wes & David	Outlook	306-873-7733			R	
PINTO						
AGT Foods	Regina	306-525-4490				C
BIRDSFOOT TREFOIL						
LEO						
Ag-Vision Seeds Ltd.	Carrot River	306-768-3335				C
BROMEGRASS						
AC KNOWLES						
Ag-Vision Seeds Ltd.	Carrot River	306-768-3335				C
AC ROCKET						
Proven Seed/ Crop Production Services (Canada) Inc.	High River	403-603-6011				C

ARMADA						
Trawin Seeds	Melfort	306-752-4060				C
CARLTON						
Hochbaum, Jack	Wilkie	306-843-2054				C
SIGNAL						
Ag-Vision Seeds Ltd.	Carrot River	306-768-3335				C
Pliska, Ricky	Dorintosh	306-236-3329				C
CANARYGRASS						
CDC BASTIA						
Ackerman, Patrick	Chamberlain	306-638-3177			R	
Nakonechny, Donald , Coral & Lance	Ruthilda	306-932-4409				C
Woroschuk, Andrew	Calder	306-742-4682				C
CANARYSEED						
CANTATE						
Hansen, James S.	Yellow Grass	306-465-2525				C
CDC CALVI						
Clancy, Kenneth	Carrot River	306-768-2902				C
Dangstorp, Brian & Perry	Redvers	306-452-3443				C
Fast, Walter J. & Linda	Kindersley	306-463-3626				C
Greenshields, Grant & Jim & Callie	Semans	306-524-4339			R	
Herle, Gregory & Andrew E.	Wilkie	306-843-2934			R	
Johnson, Oscar Stuart & Lee Stuart	Margo	306-324-4315			R	C
Klym, Roy	Regina	306-543-5052				C
Lung Seeds Ltd.	Lake Lenore	306-368-2414			R	
Novak, Orrin	Kuroki	306-338-2021				C
Simpson, Jamie P.	Moose Jaw	306-693-9402				C
Wiens, Brennan R.	Herschel	306-377-2002				C
CHICKPEAS						
CDC CONSUL						
Forer, Tim & Denise	Avonlea	306-868-4433			R	
CDC LEADER						
Latrace, Bill	Caronport	306-693-2626				C
Watson, Wayne Donald & Calvin & Mark	**Avonlea**	**306-868-4402**			R	C
CDC ORION						
Forer, Tim & Denise	Avonlea	306-868-4433				C
Fox, Myles & Trena	Gravelbourg	306-648-2800				C
Reisner, Cecil & Barry	Limerick	306-263-2139			R	C
CDC PALMER						
Reisner, Cecil & Barry	Limerick	306-263-2139	S	F	R	
Watson, Wayne Donald & Calvin & Mark	Avonlea	306-868-4402	S	F		
CLOVER						
AURORA						
Silcox, James	Nipawin	306-768-7710				C
FABA BEANS						
CDC SNOWDROP						
Bryant, Lee & Phyl & Vern &Carol	Battleford	306-937-3565	S	F		
Denis, Michel P. & Marc	St. Denis	306-258-2219				C
Herle, Gregory & Andrew E.	Wilkie	306-843-2934				C
Huber, Daniel & Rebecca	Landis	306-658-4200				C
Palmier, Maurice, Jason & Anita	Lafleche	306-472-5917				C
Petruic, Cameron L., Judy & Nick	Avonlea	306-868-2294	S	F		
Reisner, Cecil & Barry	Limerick	306-263-2139	S	F		
Shewchuk, Stan & Lorne & Terry & Adam & Michael	Blaine Lake	306-497-2800	S	F		C
CDC SSNS-1						
Axten, Derek	Minton	306-969-2110				C
SNOWBIRD						
Cay, Randy D.	Kinistino	306-864-3696				C
Crosson, Lorne & Will & Lee & Glen	Welwyn	306-645-3337			R	C
Mayerle, Kris	Tisdale	306-873-4261			R	C
Trawin Seeds	Melfort	306-752-4060			R	C
TABOAR						
Campbell, Hugh	Qu'appelle	306-699-2967			R	
Mayerle, Garry D.	Tisdale	306-873-5993				C

FESCUE

SW MINTO						
Ag-Vision Seeds Ltd.	Carrot River	306-768-3335		F		

FLAX

AAC BRAVO						
Boyd, Clare W. & Dale A.	Melfort	306-752-2564			R	
Fedoruk, Rod M.& Cathy	Kamsack	306-542-4235		F	R	C
Fenton, Gerald A. & Robin Paul	Tisdale	306-873-5438	S	F	R	
Hyndman, Neil S.	Balcarres	306-331-8168				C
Smith, Ron T.W. & Barb A.	Limerick	306-263-4944				C
Yauck, Kevin Rodney	Govan	306-484-4555				C
AC NUGGET						
Mac Gregor, Robert C.	Garrick	306-276-2384		F		
CDC BETHUNE* Subject to Additional Certification Requirements						
Allan, Raymond N. & Ruth	Corning	306-224-4666			R	
Amos, K. Wayne	Oxbow	306-483-2963			R	
Beuker, Allan Daniel & Wilbur A.	Melfort	306-752-4810				C
Fritzler, Baine A. & Brenda D. & Adam A.	Govan	306-484-2010				C
Lung Seeds Ltd.	Lake Lenore	306-368-2414			R	
Lung, Leonard & D. & B.	Lake Lenore	306-368-2224			R	
Needham, Reginald R.	Oxbow	306-483-5052				C
Sandercock, Eric M.	Balcarres	306-334-2958			R	
Trowell, Kenneth & Larry & Nathan	Saltcoats	306-744-2687			R	
CDC GLAS* Subject to Additional Certification Requirements						
Beuker, Allan Daniel & Wilbur A.	Melfort	306-752-4810				C
Fraser, Edward H. & Glen & Dale	Yarbo	306-745-3830				C
Fritzler, Baine A. & Brenda D. & Adam A.	Govan	306-484-2010		F		C
Gaertner, Lyle	Tisdale	306-873-4936			R	
Gregoire, Denis & Rory & Brandon	North Battleford	306-445-5516				C
Heggie, Kyle Robert	Leross	306-675-4920				C
Latrace, Bill	Caronport	306-693-2626			R	
Lung Seeds Ltd.	Lake Lenore	306-368-2414				C
Ostafie, Robert	Canora	306-563-6244			R	C
Shewchuk, Stan & Lorne & Terry & Adam & Michael	Blaine Lake	306-497-2800		F	R	
Stokke, Shane T.	Watrous	306-946-4044				C
CDC MELYN						
Mac Gregor, Robert C.	Garrick	306-276-2384	S			
CDC NEELA						
Simpson, Greg J.	Moose Jaw	306-693-9402			R	
CDC PLAVA						
Bryant, Lee & Phyl & Vern &Carol	Battleford	306-937-3565	S			
Hanley, Erwin & Priscilla	**Regina**	**306-586-4509**			R	
Mayerle, Garry D.	**Tisdale**	**306-873-5993**		F		
Rugg, Robert B., John Barry & Brian R.	**Elstow**	**306-257-3638**	S	F		
Trowell, Kenneth & Larry & Nathan	**Saltcoats**	**306-744-2687**		F		
Van Burck, Hans, Marianne & Mira	**Star City**	**306-863-4377**	S			
Yauck, Kevin Rodney	**Govan**	**306-484-4555**	S	F		
CDC SANCTUARY* Subject to Additional Certification Requirements						
Gilmour, Ronald W.	Craik	306-734-7727				C
Noble, Garry	Mossbank	306-354-2679			R	
Palmier, Maurice, Jason & Anita	Lafleche	306-472-5917				C
Schmeling, Donald H.	Riceton	306-530-1052	S	F	R	
CDC SORREL* Subject to Additional Certification Requirements						
Allan, John Garth	Corning	306-457-2629				C
Allan, John Richard	Corning	306-457-7310			R	C
Altwasser, Rodney & Allen R.& Dean	Yellow Grass	306-465-2727				C
Berscheid, K.N.& B.& E.K. &S.& C. & Y.	Lake Lenore	306-368-2602			R	
Boyd, Clare W. & Dale A.	Melfort	306-752-2564			R	
Catherwood, James	Calgary	403-836-9699			R	
Fenton, Gerald A. & Robin Paul	Tisdale	306-873-5438	S	F	R	
Heggie, Kyle Robert	Leross	306-675-4920				C
Hetland, Bill & Bohachewski, Joe	Naicam	306-874-5694	S			C
Latrace, Bill	Caronport	306-693-2626			R	
Novak, Orrin	Kuroki	306-338-2021			R	C
Ostapovitch, F.g. & Glen	Theodore	306-647-2205			R	

Reisner, Cecil & Barry	Limerick	306-263-2139				C
Rugg, Robert B., John Barry & Brian R.	Elstow	306-257-3638			R	
Trawin Seeds	Melfort	306-752-4060				C
PRAIRIE BLUE						
Willner, Brady E.	Davidson	306-567-4613				C
PRAIRIE SAPPHIRE						
Gizen, Jason	Prelate	306-628-8127			R	
PRAIRIE THUNDER						
Fedoruk, Rod M.& Cathy	Kamsack	306-542-4235				C
VT50						
Proven Seed/ Crop Production Services (Canada) Inc.	High River	403-603-6011	S			
WESTLIN 60						
Proven Seed/ Crop Production Services (Canada) Inc.	High River	403-603-6011	S			
WESTLIN 72						
Kasko, F. John	Prince Albert	306-764-2875			R	
Proven Seed/ Crop Production Services (Canada) Inc.	High River	403-603-6011	S	F	R	

HEMP

CFX-1						
Hemp Genetics International Inc.	Saskatoon	604-882-4936				C
GRANDI						
Hemp Genetics International Inc.	Saskatoon	604-882-4936				C
Hemp Genetics International Inc.	Saskatoon	604-882-4936		F	R	
HEMPNUT						
Campbell, Hugh	Qu'appelle	306-699-2967		F		C
Terramax Holdings Corp.	Qu'appelle					C
KATANI						
Hemp Genetics International Inc.	Saskatoon	604-882-4936				C
Hemp Genetics International Inc.	Saskatoon	604-882-4936			R	
Mayerle, Kris	Tisdale	306-873-4261				C
PICOLO						
Hemp Genetics International Inc.	Saskatoon	604-882-4936			R	C

LENTILS

CDC DAZIL						
Clark, Shaun & Gilchrist, Armand & Gibbings, Neil	Rosetown	306-831-8963	S			
Straub, Lorne A.	Pense	306-345-2390				C
CDC GREENLAND						
Nakonechny, Donald , Coral & Lance	Ruthilda	306-932-4409				C
Palmier, Maurice, Jason & Anita	Lafleche	306-472-5917				C
Willner, Brady E.	Davidson	306-567-4613				C
CDC GREENSTAR						
Ellert, David & Christopher	Rockglen	306-476-7623				C
Fraser, Scott & Shawn	Pambrun	306-741-0475			R	
Heatcoat, Brady & Amy	Assiniboia	306-642-7674				C
Klym, Roy	Regina	306-543-5052	S	F		
Laforge, Troy	Swift Current	306-773-0924				C
Lutzer, Albert & Latrace, Jim	Lumsden	306-530-8433				C
Mattus , Ronald	Chaplin	306-395-2652				C
McDougall, Ken & Craig	Moose Jaw	306-693-3649	S	F	R	C
Moen, Jim	Cabri	306-587-2214		F		C
Nakonechny, Donald , Coral & Lance	Ruthilda	306-932-4409	S			
Petruic, Cameron L., Judy & Nick	Avonlea	306-868-2294			R	
Printz, Gerald & Kurt	Gravelbourg	306-648-3511				C
Reisner, Cecil & Barry	Limerick	306-263-2139				C
Simpson, Jamie P.	Moose Jaw	306-693-9402	S		R	C
Smith, Ron T.W. & Barb A.	Limerick	306-263-4944				C
CDC IMAX						
Crone, Vaughn & Tammie	Moose Jaw	306-691-5284			R	
Willner, Brady E.	Davidson	306-567-4613				C
CDC IMPALA						
Fenton, Gerald A. & Robin Paul	Tisdale	306-873-5438				C
CDC IMPOWER						
Garratt, Lyle C. & K.c.	Milestone	306-436-2178				C
McDougall, Ken & Craig	Moose Jaw	306-693-3649				C
Petruic, Cameron L., Judy & Nick	Avonlea	306-868-2294		F		
Thoroughgood, Paul	Moose Jaw	306-692-4251			R	
Wiens, Brennan R.	Herschel	306-377-2002				C

CDC IMPROVE						
Schmeling, Donald H.	Riceton	306-530-1052	S			C
CDC IMPULSE						
Anderson, Trevor Ward	Frontier	306-296-2104			R	
Barlow, Bradley L.	Griffin	306-861-6110	S			
Clark, Shaun & Gilchrist, Armand & Gibbings, Neil	Rosetown	306-831-8963	S	F		
Craswell, Raymond W., Kevin A. & David M.	Strasbourg	306-725-3236	S			
Denis, Michel P. & Marc	St. Denis	306-258-2219				C
Fraser, Scott & Shawn	Pambrun	306-741-0475			R	
Girodat, Gerald	Shaunavon	306-297-2563			R	
Gizen, Jason	Prelate	306-628-8127	S			
Hansen, James S.	Yellow Grass	306-465-2525			R	C
Labrecque, Roger	Saskatoon	306-373-9379				C
McDougall, Ken & Craig	Moose Jaw	306-693-3649	S	F	R	
Nakonechny, Donald , Coral & Lance	Ruthilda	306-932-4409	S	F		
Reisner, Cecil & Barry	Limerick	306-263-2139	S	F	R	
Rugg, Robert B., John Barry & Brian R.	Elstow	306-257-3638				C
Schmeling, Donald H.	Riceton	306-530-1052	S			
Simpson, Trevor W.	Moose Jaw	306-693-9402	S			C
Sopatyk, Jeffery & Patti	Saskatoon	306-227-7867	S	F	R	
Straub, Lorne A.	Pense	306-345-2390		F		
Watson, Wayne Donald & Calvin & Mark	Avonlea	306-868-4402			R	
Wiens, Brennan R.	Herschel	306-377-2002	S			
Willner, Lorne E.	Davidson	306-567-4613	S			
CDC IMVINCIBLE						
Garratt, Lyle C. & K.c.	Milestone	306-436-2178				C
Rogg, Paul A.	Pennant	306-626-3236				C
Watson, Wayne Donald & Calvin & Mark	Avonlea	306-868-4402				C
CDC KERMIT						
Day, Ryan	Rouleau	306-527-6673			R	
Simpson, Jamie P.	**Moose Jaw**	**306-693-9402**				C
CDC KR-2						
Sopatyk, Jeffery & Patti	Saskatoon	306-227-7867	S	F		
CDC MARBLE						
Greenshields, Grant & Jim & Callie	Semans	306-524-4339				C
Simpson, Trevor W.	Moose Jaw	306-693-9402				C
Yauck, Kevin Rodney	Govan	306-484-4555			R	
CDC MAXIM						
Amos, K. Wayne	Oxbow	306-483-2963				C
Catherwood, James	Calgary	403-836-9699			R	
Craswell, Raymond W., Kevin A. & David M.	Strasbourg	306-725-3236			R	C
Crone, Vaughn & Tammie	Moose Jaw	306-691-5284				C
Floberg, Barry & Delana & Devin & Brandon	Shaunavon	306-297-2087				C
Fraser, Scott & Shawn	Pambrun	306-741-0475			R	
Huber, Daniel & Rebecca	Landis	306-658-4200				C
Keyser, Robert Sean	Cupar	306-723-4949			R	
Laxdal, Glen M. & Blyth, Danny, Wayne, Richard, Quinn, Darryl & Bolt, Glen A.	Wynyard	306-554-2078			R	C
Lutzer, Albert & Latrace, Jim	Lumsden	306-530-8433			R	
McDougall, Ken & Craig	Moose Jaw	306-693-3649			R	C
Palmier, Maurice, Jason & Anita	Lafleche	306-472-5917				C
Schmeling, Donald H.	Riceton	306-530-1052				C
Sopatyk, Jeffery & Patti	Saskatoon	306-227-7867			R	
Straub, Lorne A.	Pense	306-345-2390				C
Veikle, Lorne A. & Carl E. & G. & J.& Brennan	Cut Knife	306-398-4714			R	C
Wiens, Brennan R.	Herschel	306-377-2002				C
Wiens, Steven & Shammy	Wymark	306-773-9547				C
Wylie, Leslie Dale	Biggar	306-948-2807				C
CDC PERIDOT						
Yauck, Kevin Rodney	Govan	306-484-4555			R	
CDC PROCLAIM						
Ardell, Terrence, Michael, Joanne, Theresa & Joshua	Vanscoy	306-668-4415			R	
Clark, Shaun & Gilchrist, Armand & Gibbings, Neil	Rosetown	306-831-8963			R	
Etter, James Raymond	Richardson	306-536-0380			R	

Fast, Walter J. & Linda	Kindersley	306-463-3626			R	
Fraser, Scott & Shawn	Pambrun	306-741-0475			R	
Friesen, Greg & Brea; Leavins, Brent & Betty Mae	Elrose	306-378-4839			R	
Heatcoat, Brady & Amy	Assiniboia	306-642-7674				C
Herle, Gregory & Andrew E.	Wilkie	306-843-2934			R	
Kemper, Kenneth W. & Armella	Humboldt	306-682-3570	S			
Kemper, Russell & Donna	Fulda	306-682-4929	S			
Lutzer, Albert & Latrace, Jim	Lumsden	306-530-8433			R	
Mattus, Ronald	Chaplin	306-395-2652				C
McDougall, Ken & Craig	Moose Jaw	306-693-3649	S	F	R	
Nakonechny; Donald, Coral & Lance	Ruthilda	306-932-4409			R	
Simpson, Trevor W.	Moose Jaw	306-693-9402	S			C
Smith, Ron T.W. & Barb A.	Limerick	306-263-4944		F		
Sopatyk, Jeffery & Patti	Saskatoon	306-227-7867	S	F	R	
Stauber, Clayton & Lori	Stewart Valley	306-773-7907			R	
CDC QG-2						
Klym, Roy	Regina	306-543-5052				C
CDC REDCLIFF						
Craswell, Raymond W., Kevin A. & David M.	**Strasbourg**	**306-725-3236**			R	
CDC REDMOON						
Ackerman, Patrick	**Chamberlain**	**306-638-3177**	S			
Clark, Shaun & Gilchrist, Armand & Gibbings, Neil	**Rosetown**	**306-831-8963**	S	F		
Fraser, Scott & Shawn	**Pambrun**	**306-741-0475**	S	F		
McDougall, Ken & Craig	**Moose Jaw**	**306-693-3649**	S	F		
Simpson, Jamie P.	**Moose Jaw**	**306-693-9402**			R	
Willner, Lorne E.	**Davidson**	**306-567-4613**	S			
CDC SCARLET						
Printz, Gerald & Kurt	Gravelbourg	306-648-3511				C
INDIAN HEAD						
Simpson, Trevor W.	Moose Jaw	306-693-9402			R	
MUSTARD						
AAC ADAGIO						
Fraser, Scott & Shawn	Pambrun	306-741-0475				C
Fritzler, Baine A. & Brenda D. & Adam A.	Govan	306-484-2010				C
AC PENNANT						
Proven Seed/Crop Production Services (Canada) Inc.	High River	403-603-6011		F		C
AC VULCAN						
Fraser, Scott & Shawn	Pambrun	306-741-0475		F		
ANDANTE						
Fraser, Scott & Shawn	**Pambrun**	**306-741-0475**				C
Fritzler, Baine A. & Brenda D. & Adam A.	**Govan**	**306-484-2010**		F		C
Proven Seed/ Crop Production Services (Canada) Inc.	**High River**	**403-603-6011**				C
CENTENNIAL						
Fritzler, Baine A. & Brenda D. & Adam A.	**Govan**	**306-484-2010**				C
CUTLASS						
Proven Seed/Crop Production Services (Canada) Inc.	High River	403-603-6011				C
FORGE						
Proven Seed/Crop Production Services (Canada) Inc.	High River	403-603-6011				C
OATS						
AAC ORAVENA						
Fedoruk, Rod M.& Cathy	Kamsack	306-542-4235			R	
AC MORGAN						
Beuker, Allan Daniel & Wilbur A.	Melfort	306-752-4810	S	F		C
Gaertner, Lyle	Tisdale	306-873-4936			R	
Lepp, Milton & Elden; & Neufeld, M.	Hepburn	306-254-4243				C
Pogu, Jean	Duck Lake	306-467-4903				C
Rempel, Blair Allan	Nipawin	306-862-3573				C
Robinson, Oren A., Marlene & Wade	Landis	306-658-4755			R	
Seidle, Edward & Brett & Cameron J. & Mervyn Anthony	Medstead	306-342-4377			R	C
Wilfing, Raymond John & Ryan John	Meadow Lake	306-236-6811			R	C

CDC BALER						
Lueke, Dennis	Humboldt	306-682-5170				C
Trawin Seeds	Melfort	306-752-4060				C
CDC BOYER						
Stoll, Douglas John, Joan & Lyndon	Delisle	306-493-2534			R	
CDC DANCER						
Jones, Bradley, Wanda & Tennille	Wadena	306-338-2381			R	C
CDC HAYMAKER						
Ardell, Terrence, Michael, Joanne, Theresa & Joshua	Vanscoy	306-668-4415	S		R	C
Axten, Derek	Minton	306-969-2110			R	
Berscheid, K.N.& B.& E.K. &.S.& C. & Y.	Lake Lenore	306-368-2602		F		
Fedoruk, Michael J.	Kamsack	306-542-4235			R	
Fedoruk, Rod M.& Cathy	Kamsack	306-542-4235			R	
Hicks, Dale & Barry	Mossbank	306-867-8674				C
Pogu, Jean	Duck Lake	306-467-4903			R	
Trawin Seeds	Melfort	306-752-4060			R	
CDC MINSTREL						
Berscheid, K.N.& B.& E.K. &.S.& C. & Y.	Lake Lenore	306-368-2602		F		
Frederick, Blaine	Watson	306-287-3977				C
Jones, Bradley, Wanda & Tennille	Wadena	306-338-2381	S	F	R	
Shewchuk, Stan & Lorne & Terry & Adam & Michael	Blaine Lake	306-497-2800				C
Van Burck, Hans, Marianne & Mira	Star City	306-863-4377				C
CDC MORRISON						
Olson, Lyndon, Lynnell, Alica & Bryon	Archerwill	306-323-4912		F		
CDC NASSER						
Trowell, Leslie	Saltcoats	306-744-2684			R	
CDC NORSEMAN						
Dear, Jonathon	Hepburn	306-947-4740			R	
Jones, Bradley, Wanda & Tennille	Wadena	306-338-2381	S		R	
Ostafie, Robert	Canora	306-563-6244	S		R	
Rempel, Blair Allan	Nipawin	306-862-3573			R	
Stoll, Douglas John, Joan & Lyndon	Delisle	306-493-2534		F		
Tomtene, Steven & Slind, Daniel	Birch Hills	306-749-3447	S			
Trowell, Leslie	Saltcoats	306-744-2684			R	
CDC RUFFIAN						
Berscheid, K.N.& B.& E.K. &.S.& C. & Y.	Lake Lenore	306-368-2602			R	
Boyd, Clare W. & Dale A.	Melfort	306-752-2564				C
Fedoruk, Rod M.& Cathy	Kamsack	306-542-4235				C
Fenton, Gerald A. & Robin Paul	Tisdale	306-873-5438	S			C
Frederick, Blaine	Watson	306-287-3977			R	C
Gellner, Clayton S.	Southey	306-726-4323				C
Heggie, Kyle Robert	Leross	306-675-4920				C
Kerber, Greg	Rosthern	306-232-4474				C
Lueke, Dennis	Humboldt	306-682-5170				C
Pogu, Jean	Duck Lake	306-467-4903				C
Seed Source Inc.	Archerwill	306-323-4402			R	C
Van Burck, Hans, Marianne & Mira	Star City	306-863-4377			R	
CDC SO-I						
Toman, Rick & Randy	Guernsey	306-365-8386				C
Wilfing, Raymond John & Ryan John	Meadow Lake	306-236-6811				C
Winterhalt, Tim	Unity	306-228-3170				C
CS CAMDEN						
Frederick, Blaine	Watson	306-287-3977			R	C
Hetland, Bill & Bohachewski, Joe	Naicam	306-874-5694	S	F	R	
Johnson, Oscar Stuart & Lee Stuart	Margo	306-324-4315				C
Lung Seeds Ltd.	Lake Lenore	306-368-2414				C
Mayerle, Kris	Tisdale	306-873-4261				C
Trawin Seeds	Melfort	306-752-4060		F	R	
Trowell, Leslie	Saltcoats	306-744-2684			R	
LEGGETT						
Ardell, Terrence, Michael, Joanne, Theresa & Joshua	Vanscoy	306-668-4415		F	R	
Fenton, Gerald A. & Robin Paul	Tisdale	306-873-5438				C
SUMMIT						
Ardell, Terrence, Michael, Joanne, Theresa & Joshua	Vanscoy	306-668-4415		F		C
Fedoruk, Rod M.& Cathy	Kamsack	306-542-4235				C
Frederick, Blaine	Watson	306-287-3977				C

Ostafie, Robert	Canora	306-563-6244				C
Trowell, Leslie	Saltcoats	306-744-2684		F	R	
TRIACTOR						
Mayerle, Kris	Tisdale	306-873-4261				C

AAC ARDILL						
Ardell, Terrence, Michael, Joanne, Theresa & Joshua	Vanscoy	306-668-4415	S	F		C
Hanley, Erwin & Priscilla	Regina	306-586-4509				C
Hicks, Dale & Barry	Mossbank	306-867-8674			R	
Kaeding, Warren	Churchbridge	306-896-2647	S	F		
McDougall, Ken & Craig	Moose jaw	306-693-3649				C
Sorgard, Graham	Churchbridge	306-896-2236			R	
Wilfing, Raymond John & Ryan John	Meadow lake	306-236-6811	S	F	R	
AAC CARVER						
Crosson, Lorne & Will & Lee & Glen	Welwyn	306-645-3337	S	F	R	
Fedoruk, Michael J.	Kamsack	306-542-4235	S			
Hyndman, Glen	Balcarres	306-331-8168			R	
Kemper, Russell & Donna	Fulda	306-682-4929	S			
Trowell, Leslie	Saltcoats	306-744-2684	S	F		
AAC COMFORT						
Petruic, Cameron L., Judy & Nick	Avonlea	306-868-2294	S			
AAC LACOMBE						
Klym, Dustin	**Regina**	**306-543-5052**			R	C
Klym, Tyler	**Regina**	**306-543-5052**			R	C
Sopatyk, Jeffery & Patti	**Saskatoon**	**306-227-7867**			R	
Winterhalt, Tim	**Unity**	**306-228-3170**			R	C
AAC LISCARD						
Kaeding, Warren	Churchbridge	306-896-2647		F		
ABARTH						
Fedoruk, Rod M.& Cathy	Kamsack	306-542-4235				C
Frederick, Blaine	Watson	306-287-3977			R	C
Herle, Gregory & Andrew E.	Wilkie	306-843-2934	S			C
Laxdal, Glen M. & Blyth, Danny, Wayne, Richard, Quinn, Darryl & Bolt, Glen A.	Wynyard	306-554-2078	S	F		
Sayers, Charlie Joseph	Delmas	306-445-6522				C
Sorgard, Graham	Churchbridge	306-896-2236			R	
Veikle, Lorne A. & Carl E. & G. & J.& Brennan	Cut Knife	306-398-4714	S			C
Wilfing, Raymond John & Ryan John	Meadow Lake	306-236-6811	S			C
Woods, Dale Arthur	Rocanville	306-645-4423			R	
AGASSIZ						
AGT Foods	Regina	306-525-4490				C
Blenkin, Darren	Sintaluta	306-727-2222				C
Mayerle, Erwin D.	Tisdale	306-873-4261				C
CDC AMARILLO						
Allan, John Garth	Corning	306-457-2629			R	C
Allan, John Richard	Corning	306-457-7310				C
Allan, Raymond N. & Ruth	Corning	306-224-4666				C
Amos, K. Wayne	Oxbow	306-483-2963			R	C
Ardell, Terrence, Michael, Joanne, Theresa & Joshua	Vanscoy	306-668-4415		F		C
Berscheid, K.N.& B.& E.K. &.S.& C. & Y.	Lake Lenore	306-368-2602				C
Beuker, Allan Daniel & Wilbur A.	Melfort	306-752-4810				C
Blenkin, Darren	Sintaluta	306-727-2222				C
Bodnaryk, John E.	Rhein	306-273-4263				C
Booy, Jerry N. & Murray T. & Darcy K.	Glaslyn	306-342-2058				C
Bryant, Lee & Phyl & Vern &Carol	Battleford	306-937-3565			R	
Buziak, Ronald Charles	Mayfair	306-445-6556			R	C
Cay, Randy D.	Kinistino	306-864-3696			R	C
Clark, Shaun & Gilchrist, Armand & Gibbings, Neil	Rosetown	306-831-8963				C
Cresswell, Gordon B. & Bryan & Mark	Tisdale	306-873-5360				C
Dear, Jonathon	Hepburn	306-947-4740				C
Denis, Michel P. & Marc	St. Denis	306-258-2219				C
Edwards, Lawrence R. & Donna & Jeff & Mike	Nokomis	306-528-2140	S			C
Fast, Walter J. & Linda	Kindersley	306-463-3626				C

Fedoruk, Rod M.& Cathy	Kamsack	306-542-4235			R	C
Fenton, Gerald A. & Robin Paul	Tisdale	306-873-5438	S	F	R	
Friesen, Kevin G.	Laird	604-882-4936				C
Fritzler, Baine A. & Brenda D. & Adam A.	Govan	306-484-2010				C
Girodat, Gerald	Shaunavon	306-297-2563			R	C
Goossen, Mathew	Stenen	306-547-7432				C
Greenshields, Grant & Jim & Callie	Semans	306-524-4339				C
Heavin, G. Harvey & G. Ryan	Melfort	306-752-4171	S		R	
Heavin, Milton Russell	Melfort	306-752-4071	S			
Hetland, Bill & Bohachewski, Joe	Naicam	306-874-5694	S	F		C
Klemmer, Richard	Nipawin	306-862-3874			R	
Klym, Roy	Regina	306-543-5052				C
Labrecque, Roger	Saskatoon	306-373-9379				C
Littman, Larry W. & Allan Blake & L.Robert & Adam	Saltcoats	306-783-2512	S			
Luck, Lorne C. & Landis	Tisdale	306-873-4111			R	
Mayerle, Erwin D.	Tisdale	306-873-4261	S			C
McCarthy, Brent	Corning	306-224-4848				C
McDougall, Ken & Craig	Moose Jaw	306-693-3649	S	F	R	C
Moroz, Troy	Pelly	306-595-4622				C
Nakonechny, Donald , Coral & Lance	Ruthilda	306-932-4409	S			C
Reisner, Cecil & Barry	Limerick	306-263-2139			R	C
Rempel, Blair Allan	Nipawin	306-862-3573	S	F		C
Rude, Stanley	Naicam	306-874-2359	S	F		C
Rugg, Robert B., John Barry & Brian R.	Elstow	306-257-3638	S	F	R	
Sayers, Charlie Joseph	Delmas	306-445-6522			R	
Seed Source Inc.	Archerwill	306-323-4402		F		C
Shewchuk, Stan & Lorne & Terry & Adam & Michael	Blaine Lake	306-497-2800		F		
Sopatyk, Jeffery & Patti	Saskatoon	306-227-7867				C
Tebbutt, Gregg & Blake D.	Nipawin	306-862-9730	S	F	R	C
Tomtene, Steven & Slind, Daniel	Birch Hills	306-749-3447				C
Trawin Seeds	Melfort	306-752-4060	S	F		C
Veikle, Lorne A. & Carl E. & G. & J.& Brennan	Cut Knife	306-398-4714				C
Wakefield, Kristopher & Laurie G. & Monica	Maidstone	306-893-2984			R	C
Watson, Wayne Donald & Calvin & Mark	Avonlea	306-868-4402			R	C
Wiens, Steven & Shammy	Wymark	306-773-9547				C
Wilfing, Raymond John & Ryan John	Meadow Lake	306-236-6811	S	F	R	
Willner, Brady E.	Davidson	306-567-4613			R	
Winterhalt, Tim	Unity	306-228-3170				C
Yauck, Kevin Rodney	Govan	306-484-4555				C
Youzwa, Donald	Nipawin	306-862-5690		F	R	
CDC ATHABASCA						
Berscheid, K.N.& B.& E.K. &S.& C. & Y.	Lake Lenore	306-368-2602	S			
Bryant, Lee & Phyl & Vern &Carol	Battleford	306-937-3565	S			
Fedoruk, Rod M.& Cathy	Kamsack	306-542-4235	S			
Klym, Roy	Regina	306-543-5052	S			
Seymour, Glen Patrick, Donne, Kyle, & Kelly	Stewart Valley	306-778-2344		F		
Woods, Dale Arthur	Rocanville	306-645-4423	S			
CDC BLAZER						
Boldt, Garry	Osler	306-239-2071	S			
Dutton, David H.& George	Paynton	306-895-4306	S			
CDC CENTENNIAL						
Ostafie, Brendan	Canora	306-563-6244			R	
Tebbutt, Gregg & Blake D.	Nipawin	306-862-9730				C
CDC DAKOTA						
Dutton, David H.& George	Paynton	306-895-4306	S			C
CDC GREENWATER						
Amos, K. Wayne	Oxbow	306-483-2963			R	
Berscheid, K.N.& B.& E.K. &S.& C. & Y.	Lake Lenore	306-368-2602	S	F	R	
Beuker, Allan Daniel & Wilbur A.	Melfort	306-752-4810			R	
Booy, Jerry N. & Murray T. & Darcy K.	Glaslyn	306-342-2058			R	
Clark, Shaun & Gilchrist, Armand & Gibbings, Neil	Rosetown	306-831-8963		F	R	
Cresswell, Gordon B. & Bryan & Mark	Tisdale	306-873-5360			R	
Fedoruk, Michael J.	Kamsack	306-542-4235			R	

Greenshields, Grant & Jim & Callie	Semans	306-524-4339			R	
Gregoire, Denis & Rory & Brandon	North Battleford	306-445-5516	S	F		
Hetland, Bill & Bohachewski, Joe	Naicam	306-874-5694	S	F	R	
Jones, Bradley, Wanda & Tennille	Wadena	306-338-2381	S	F	R	
Klemmer, Richard	Nipawin	306-862-3874			R	
Laforge, Troy	Swift Current	306-773-0924			R	
Lutzer, Albert & Latrace, Jim	Lumsden	306-530-8433		F		
McCarthy, Brent	Corning	306-224-4848			R	
McDougall, Ken & Craig	Moose Jaw	306-693-3649	S	F	R	
Medernach, Louis J., Kim L. & Kyle	Cudworth	306-256-3991			R	
Petruic, Cameron L., Judy & Nick	Avonlea	306-868-2294	S		R	
Sayers, Charlie Joseph	Delmas	306-445-6522			R	
Sopatyk, Jeffery & Patti	Saskatoon	306-227-7867			R	
Veikle, Lorne A. & Carl E. & G. & J.& Brennan	Cut Knife	306-398-4714			R	
Veikle, Lynne, Marshall & Jason	Cut Knife	306-398-2923			R	
Watson, Wayne Donald & Calvin & Mark	Avonlea	306-868-4402			R	
CDC INCA						
Ardell, Terrence, Michael, Joanne, Theresa & Joshua	Vanscoy	306-668-4415	S	F		
Barlow, Bradley L.	Griffin	306-861-6110	S			
Berscheid, K.N.& B.& E.K. &S.& C. & Y.	Lake Lenore	306-368-2602	S	F		
Bews, W. Kenneth & Brent W.	Eatonia	306-967-2440	S	F	R	
Bryant, Lee & Phyl & Vern &Carol	Battleford	306-937-3565		F		
Clark, Shaun & Gilchrist, Armand & Gibbings, Neil	Rosetown	306-831-8963	S	F		
Dutton, David H.& George	Paynton	306-895-4306	S			
Fraser, Scott & Shawn	Pambrun	306-741-0475	S	F		
Fritzler, Baine A. & Brenda D. & Adam A.	Govan	306-484-2010		F		
Girodat, Gerald	Shaunavon	306-297-2563		F		
Greenshields, Grant & Jim & Callie	Semans	306-524-4339		F		
Klym, Roy	Regina	306-543-5052	S			
Laxdal, Glen M. & Blyth, Danny, Wayne, Richard, Quinn, Darryl & Bolt, Glen A.	Wynyard	306-554-2078	S			
McDougall, Ken & Craig	Moose Jaw	306-693-3649	S	F		
Nakonechny, Donald , Coral & Lance	Ruthilda	306-932-4409	S	F		
Ostafie, Brendan	Canora	306-563-6244	S	F		
Reisner, Cecil & Barry	Limerick	306-263-2139	S	F		
Rugg, Robert B., John Barry & Brian R.	Elstow	306-257-3638	S	F		
Seymour, Glen Patrick, Donne, Kyle, & Kelly	Stewart Valley	306-778-2344			R	
Smith, Ron T.W. & Barb A.	Limerick	306-263-4944		F		
Thompson, Jan Harris	Naicam	306-874-7138	S			
Veikle, Lorne A. & Carl E. & G. & J.& Brennan	Cut Knife	306-398-4714		F		
Watson, Wayne Donald & Calvin & Mark	Avonlea	306-868-4402	S	F		
Yauck, Kevin Rodney	Govan	306-484-4555	S	F		
CDC JASPER						
Fedoruk, Rod M.& Cathy	Kamsack	306-542-4235	S			
CDC LIMERICK						
Ardell, Terrence, Michael, Joanne, Theresa & Joshua	Vanscoy	306-668-4415		F	R	
Dutton, David H.& George	Paynton	306-895-4306			R	C
Greenshields, Grant & Jim & Callie	Semans	306-524-4339				C
Gregoire, Denis & Rory & Brandon	North Battleford	306-445-5516	S		R	C
Hetland, Bill & Bohachewski, Joe	Naicam	306-874-5694	S	F	R	
Johnson, Oscar Stuart & Lee Stuart	Margo	306-324-4315				C
Keyser, Robert Sean	Cupar	306-723-4949				C
Lawrence, Jim	Colonsay	306-255-2723				C
Lung Seeds Ltd.	Lake Lenore	306-368-2414				C
Novak, Orrin	Kuroki	306-338-2021				C
Petruic, Cameron L., Judy & Nick	Avonlea	306-868-2294	S		R	
Veikle, Lorne A. & Carl E. & G. & J.& Brennan	Cut Knife	306-398-4714				C
CDC MEADOW						
Allan, Raymond N. & Ruth	Corning	306-224-4666				C
Ardell, Terrence, Michael, Joanne, Theresa & Joshua	Vanscoy	306-668-4415			R	

Fedoruk, Rod M. & Cathy	Kamsack	306-542-4235			R	
Fenton, Gerald A. & Robin Paul	Tisdale	306-873-5438	S	F	R	
Floberg, Barry & Delana & Devin & Brandon	Shaunavon	306-297-2087				C
Hyndman, Glen	Balcarres	306-331-8168				C
Klym, Roy	Regina	306-543-5052				C
Lawrence, Jim	Colonsay	306-255-2723				C
Ostafie, Brendan	Canora	306-563-6244				C
Palmier, Maurice, Jason & Anita	Lafleche	306-472-5917			R	C
Sandercock, Eric M.	Balcarres	306-334-2958				C
Trawin Seeds	Melfort	306-752-4060			R	
Wilfing, Raymond John & Ryan John	Meadow Lake	306-236-6811		F	R	
CDC MOSAIC						
Greenshields, Grant & Jim & Callie	Semans	306-524-4339			R	
CDC PATRICK						
Watson, Wayne Donald & Calvin & Mark	Avonlea	306-868-4402				C
CDC RAEZER						
Fraser, Edward H. & Glen & Dale	Yarbo	306-745-3830			R	C
Gregoire, Denis & Rory & Brandon	North Battleford	306-445-5516				C
Heavin, Larry N. & L. Warren	Melfort	306-752-4020	S		R	
Heavin, Milton Russell	Melfort	306-752-4071	S			
Jones, Bradley, Wanda & Tennille	Wadena	306-338-2381	S	F	R	
Ostafie, Brendan	Canora	306-563-6244				C
Rude, Stanley	Naicam	306-874-2359				C
Veikle, Lorne A. & Carl E. & G. & J. & Brennan	Cut Knife	306-398-4714				C
CDC SAFFRON						
Huber, Daniel & Rebecca	Landis	306-658-4200				C
Klym, Roy	Regina	306-543-5052				C
Laxdal, Glen M. & Blyth, Danny, Wayne, Richard, Quinn, Darryl & Bolt, Glen A.	Wynyard	306-554-2078		F	R	C
Rice, Haydon	Asquith	306-381-3617				C
Shewchuk, Stan & Lorne & Terry & Adam & Michael	Blaine Lake	306-497-2800			R	
Woods, Dale Arthur	Rocanville	306-645-4423			R	
Wylie, Leslie Dale	Biggar	306-948-2807				C
Youzwa, Donald	Nipawin	306-862-5690				C
CDC SPECTRUM						
Amos, K. Wayne	Oxbow	306-483-2963	S			
Ardell, Terrence, Michael, Joanne, Theresa & Joshua	Vanscoy	306-668-4415	S	F		
Berscheid, K.N.& B.& E.K. &S.& C. & Y.	Lake Lenore	306-368-2602	S			
Blyth, Richard	Wynyard	306-554-2078		F		
Bryant, Lee & Phyl & Vern &Carol	Battleford	306-937-3565	S			
Clark, Shaun & Gilchrist, Armand & Gibbings, Neil	Rosetown	306-831-8963	S			
Cresswell, Gordon B. & Bryan & Mark	Tisdale	306-873-5360	S			
Denis, Michel P. & Marc	St. Denis	306-258-2219	S			
Dutton, David H.& George	Paynton	306-895-4306	S			
Fast, Walter J. & Linda	Kindersley	306-463-3626	S			
Fedoruk, Michael J.	Kamsack	306-542-4235	S			
Fedoruk, Rod M.& Cathy	Kamsack	306-542-4235	S			
Fenton, Gerald A. & Robin Paul	Tisdale	306-873-5438	S			
Kemper, Kenneth W. & Armella	Humboldt	306-682-3570	S			
Kemper, Russell & Donna	Fulda	306-682-4929	S			
Klemmer, Richard	Nipawin	306-862-3874	S			
Laxdal, Glen M. & Blyth, Danny, Wayne, Richard, Quinn, Darryl & Bolt, Glen A.	Wynyard	306-554-2078	S			
Littman, Larry W. & Allan Blake & L.Robert & Adam	Saltcoats	306-783-2512	S			
Mattus , Ronald	Chaplin	306-395-2652	S			
McDougall, Ken & Craig	Moose Jaw	306-693-3649	S			
Moen, Jim	Cabri	306-587-2214	S			
Peifer, Denton M.	Nipawin	306-862-3437		F		
Reisner, Cecil & Barry	Limerick	306-263-2139	S			
Seed Source Inc.	Archerwill	306-323-4402	S			
Seymour, Glen Patrick, Donne, Kyle, & Kelly	Stewart Valley	306-778-2344		F		

Shewchuk, Stan & Lorne & Terry & Adam & Michael	Blaine Lake	306-497-2800	S			
Sopatyk, Jeffery & Patti	Saskatoon	306-227-7867	S			
Tebbutt, Gregg & Blake D.	Nipawin	306-862-9730	S			
Veikle, Lorne A. & Carl E. & G. & J.& Brennan	Cut Knife	306-398-4714	S			
Veikle, Lynne, Marshall & Jason	Cut Knife	306-398-2923	S			
Wilfing, Raymond John & Ryan John	Meadow Lake	306-236-6811	S			
Willner, Lorne E.	Davidson	306-567-4613	S			
Youzwa, Donald	Nipawin	306-862-5690	S			
CDC SPRUCE						
Berscheid, K.N.& B.& E.K. &S.& C. & Y.	Lake Lenore	306-368-2602	S			C
Cresswell, Gordon B. & Bryan & Mark	**Tisdale**	**306-873-5360**	S			
Dutton, David H.& George	**Paynton**	**306-895-4306**	S			
Gregoire, Denis & Rory & Brandon	**North Battleford**	**306-445-5516**	S			
Klemmer, Richard	**Nipawin**	**306-862-3874**	S			
Medernach, Louis J., Kim L. & Kyle	**Cudworth**	**306-256-3991**	S			
Rude, Stanley	**Naicam**	**306-874-2359**	S			
Veikle, Lynne, Marshall & Jason	**Cut Knife**	**306-398-2923**	S			
Youzwa, Donald	**Nipawin**	**306-862-5690**	S			
CDC STRIKER						
Veikle, Lorne A. & Carl E. & G. & J.& Brennan	Cut Knife	306-398-4714			R	
CDC TUCKER						
Trowell, Leslie	Saltcoats	306-744-2684	S		R	
REDBAT 88						
Ardell, Terrence, Michael, Joanne, Theresa & Joshua	Vanscoy	306-668-4415			R	
RAPE						
RED RIVER 1861						
Proven Seed/CPS Genetics (Hybrid Canola) (Sk Acct)	Lethbridge	403-336-4826				C
RUGBY						
Fenton, Gerald A. & Robin Paul	Tisdale	306-873-5438		F		C
RYE						
GAZELLE						
Moroz, Troy	Pelly	306-595-4622		F		
Trawin Seeds	Melfort	306-752-4060				C
HAZLET						
Ostafie, Robert	Canora	306-563-6244	S			C
Tanner, David A. & Hazel	Regina	306-757-7012			R	
RYEGRASS						
JAMES						
Ag-Vision Seeds Ltd.	Carrot River	306-768-3335				C
SOYBEANS						
AAC EDWARD						
Amos, K. Wayne	Oxbow	306-483-2963	S			
BARRON R2X						
Ackerman, Patrick	Chamberlain	306-638-3177			R	
Dangstorp, Brian & Perry	Redvers	306-452-3443			R	
Elmy, Robert W., Kevin & Christina	Saltcoats	306-744-2779	S		R	
Gerry, Greg	Creelman	306-457-2220			R	
Hyndman, Glen	Balcarres	306-331-8168			R	
Lutzer, Albert & Latrace, Jim	Lumsden	306-530-8433			R	
MAHONY R2						
Dangstorp, Brian & Perry	Redvers	306-452-3443				C
Elmy, Robert W., Kevin & Christina	Saltcoats	306-744-2779				C
Gerry, Greg	Creelman	306-457-2220				C
MCLEOD R2						
Gerry, Greg	Creelman	306-457-2220				C
Lutzer, Albert & Latrace, Jim	Lumsden	306-530-8433				C
NSC EXP114 RRX2						
Woods, Dale Arthur	Rocanville	306-645-4423			R	
NSC WATSON RR2Y						
FP Genetics	Regina	306-791-0500				C

TIMOTHY

TIMOTHY

BARPENTA						
Ag-Vision Seeds Ltd.	Carrot River	306-768-3335				C
BASHO						
Chun Hua, Cao	Carrot River	306-768-2843				C
GRINDSTAD						
Proven Seed/ Crop Production Services (Canada) Inc.	Regina	306-569-5027				C
TRYGGVE						
Ag-Vision Seeds Ltd.	Carrot River	306-768-3335	F			

TRITICALE

TRITICALE

BREVIS						
Ellert, David & Christopher	Rockglen	306-476-7623			R	C
BUNKER						
Trawin Seeds	Melfort	306-752-4060			R	
LUOMA						
Elmy, Robert W., Kevin & Christina	Saltcoats	306-744-2779				C
TAZA						
Girodat, Gerald	Shaunavon	306-297-2563			R	

WHEAT

WHEAT

5604HR CL						
Proven Seed/ Crop Production Services (Canada) Inc.	High River	403-603-6011				C
5605HR CL						
Proven Seed/ Crop Production Services (Canada) Inc.	High River	403-603-6011				C
5700PR						
Proven Seed/ Crop Production Services (Canada) Inc.	High River	403-603-6011			R	C
AAC BRANDON						
Ackerman, Patrick	Chamberlain	306-638-3177				C
Allan, Raymond N. & Ruth	Corning	306-224-4666				C
Ardell, Terrence, Michael, Joanne, Theresa & Joshua	Vanscoy	306-668-4415	S			C
Berscheid, K.N.& B.& E.K. &.S.& C. & Y.	Lake Lenore	306-368-2602			R	C
Beuker, Allan Daniel & Wilbur A.	Melfort	306-752-4810				C
Blenkin, Darren	Sintaluta	306-727-2222				C
Boyes, Douglas John	Kelvington	306-327-4980				C
Cresswell, Gordon B. & Bryan & Mark	Tisdale	306-873-5360				C
Crosson, Lorne & Will & Lee & Glen	Welwyn	306-645-3337				C
Dutton, David H.& George	Paynton	306-895-4306				C
Edmunds, Greg & Glen	Tisdale	306-873-4780			R	C
Edwards, Lawrence R. & Donna & Jeff & Mike	Nokomis	306-528-2140			R	
Fedoruk, Michael J.	Kamsack	306-542-4235				C
Fedoruk, Rod M.& Cathy	Kamsack	306-542-4235				C
Fraser, Edward H. & Glen & Dale	Yarbo	306-745-3830				C
Frederick, Blaine	Watson	306-287-3977				C
Goossen, Mathew	Stenen	306-547-7432				C
Greenshields, Grant & Jim & Callie	Semans	306-524-4339			R	
Gregoire, Denis & Rory & Brandon	North Battleford	306-445-5516				C
Heavin, Larry N. & L. Warren	Melfort	306-752-4020	S	F	R	
Heavin, Milton Russell	Melfort	306-752-4071			R	
Heggie, Robert Thomas	Leross	306-675-4920				C
Hetland, Bill & Bohachewski, Joe	Naicam	306-874-5694	S			C
Huber, Daniel & Rebecca	Landis	306-658-4200				C
Keyser, Robert Sean	Cupar	306-723-4949				C
Klemmer, Richard	Nipawin	306-862-3874				C
Laxdal, Glen M. & Blyth, Danny, Wayne, Richard, Quinn, Darryl & Bolt, Glen A.	Wynyard	306-554-2078		F	R	
Lepp, Milton & Elden; & Neufeld, M.	Hepburn	306-254-4243				C
Lung Seeds Ltd.	Lake Lenore	306-368-2414				C
Lutzer, Albert & Latrace, Jim	Lumsden	306-530-8433				C
Medernach, Louis J., Kim L. & Kyle	Cudworth	306-256-3991				C
Megli, Wayne	Carrot River	306-768-2991				C
Moroz, Troy	Pelly	306-595-4622				C
Ostafie, Robert	Canora	306-563-6244	S			C
Rempel, Blair Allan	Nipawin	306-862-3573			R	C

Rude, Stanley	Naicam	306-874-2359				C
Sayers, Charlie Joseph	Delmas	306-445-6522				C
Seed Source Inc.	Archerwill	306-323-4402				C
Shewchuk, Stan & Lorne & Terry & Adam & Michael	Blaine Lake	306-497-2800		F		C
Smysniuk, Delon	Ituna	306-795-7691				C
Sorgard, Graham	Churchbridge	306-896-2236				C
South, Winston & Richard & Bradley	Melfort	306-752-9840	S			
Tebbutt, Gregg & Blake D.	Nipawin	306-862-9730				C
Tomtene, Steven & Slind, Daniel	Birch Hills	306-749-3447				C
Trowell, Kenneth & Larry & Nathan	Saltcoats	306-744-2687	S			C
Willner, Brady E.	Davidson	306-567-4613				C
AAC CABRI						
Fast, Walter J. & Linda	Kindersley	306-463-3626		F		
Nakonechny, Donald , Coral & Lance	Ruthilda	306-932-4409	S	F		
Reisner, Cecil & Barry	Limerick	306-263-2139	S	F		
AAC CAMERON - CARBERRY* Subject to Additional Certification Requirements						
Berscheid, K.N.& B.& E.K. &.S.& C. & Y.	Lake Lenore	306-368-2602			R	
Cay, Randy D.	Kinistino	306-864-3696	S	F		C
Lung Seeds Ltd.	Lake Lenore	306-368-2414			R	
Mayerle, Kris	Tisdale	306-873-4261	S	F	R	C
Seed Source Inc.	Archerwill	306-323-4402			R	
AAC CHIFFON						
Edwards, Lawrence R. & Donna & Jeff & Mike	Nokomis	306-528-2140				C
Herle, Gregory & Andrew E.	Wilkie	306-843-2934				C
Mattus , Ronald	Chaplin	306-395-2652				C
AAC CONGRESS						
Petruic, Cameron L., Judy & Nick	Avonlea	306-868-2294	S	F		
Simpson, Trevor W.	Moose Jaw	306-693-9402	S			
AAC CONNERY						
Crosson, Lorne & Will & Lee & Glen	Welwyn	306-645-3337		F		
Fedoruk, Rod M.& Cathy	Kamsack	306-542-4235			R	
Frederick, Blaine	Watson	306-287-3977				C
Kemper, Russell & Donna	Fulda	306-682-4929				C
Veikle, Lorne A. & Carl E. & G. & J.& Brennan	Cut Knife	306-398-4714	S			
Winterhalt, Tim	Unity	306-228-3170			R	
AAC CURRENT						
Barlow, Bradley L.	Griffin	306-861-6110				C
Fast, Walter J. & Linda	Kindersley	306-463-3626				C
Fraser, Scott & Shawn	Pambrun	306-741-0475				C
Printz, Gerald & Kurt	Gravelbourg	306-648-3511				C
AAC ELIE						
Blenkin, Darren	Sintaluta	306-727-2222				C
Bodnaryk, John E.	Rhein	306-273-4263				C
Boyd, Clare W. & Dale A.	Melfort	306-752-2564				C
Crosson, Lorne & Will & Lee & Glen	Welwyn	306-645-3337				C
Danielson, Lionel & Bonnie	Norquay	306-594-2173				C
Edmunds, Greg & Glen	Tisdale	306-873-4780				C
Gregoire, Denis & Rory & Brandon	North Battleford	306-445-5516				C
Herle, Gregory & Andrew E.	Wilkie	306-843-2934				C
Hyndman, Glen	Balcarres	306-331-8168				C
Kasko, F. John	Prince Albert	306-764-2875				C
Lung Seeds Ltd.	Lake Lenore	306-368-2414				C
Stokke, Shane T.	Watrous	306-946-4044				C
Winterhalt, Tim	Unity	306-228-3170				C
Wylie, Leslie Dale	Biggar	306-948-2807				C
AAC INDUS						
Nakonechny; Donald, Coral & Lance	Ruthilda	306-932-4409		F		
Veikle, Lorne A. & Carl E. & G. & J.& Brennan	Cut Knife	306-398-4714	S	F		
AAC INNOVA						
Winterhalt, Tim	Unity	306-228-3170		F		
AAC JATHARIA - CARBERRY* Subject to Additional Certification Requirements						
Amos, K. Wayne	Oxbow	306-483-2963			R	
Ardell, Terrence, Michael, Joanne, Theresa & Joshua	Vanscoy	306-668-4415			R	

Greenshields, Grant & Jim & Callie	Semans	306-524-4339			R	C
Lawrence, Jim	Colonsay	306-255-2723			R	
Reisner, Cecil & Barry	Limerick	306-263-2139			R	
Rugg, Robert B., John Barry & Brian R.	Elstow	306-257-3638	S	F	R	
Seed Source Inc.	Archerwill	306-323-4402			R	
Shewchuk, Stan & Lorne & Terry & Adam & Michael	Blaine Lake	306-497-2800	S	F	R	
Sopel, Calvin & Arlene	Ituna	306-795-3617				C
Stoll, Douglas John, Joan & Lyndon	Delisle	306-493-2534			R	
Thompson, Jan Harris	Naicam	306-874-7138		F		
Tomtene, Steven & Slind, Daniel	Birch Hills	306-749-3447	S			C
Trawin Seeds	Melfort	306-752-4060			R	
AAC MARCHWELL - AAC RAYMORE*	Subject to Additional Certification Requirements					
Altwasser, Rodney & Allen R.& Dean	Yellow Grass	306-465-2727				C
Amos, K. Wayne	Oxbow	306-483-2963				C
Ardell, Terrence, Michael, Joanne, Theresa & Joshua	Vanscoy	306-668-4415				C
Axten, Derek	Minton	306-969-2110			R	
Catherwood, James	Calgary	403-836-9699			R	
Fast, Walter J. & Linda	Kindersley	306-463-3626			R	
Fowler, Edith	Central Butte	306-796-4652				C
Fox, Myles & Trena	Gravelbourg	306-648-2800				C
Fraser, Scott & Shawn	Pambrun	306-741-0475		F		C
Garratt, Lyle C. & K.c.	Milestone	306-436-2178			R	C
Gizen, Jason	Prelate	306-628-8127				C
Klym, Roy	Regina	306-543-5052				C
Lutzer, Albert & Latrace, Jim	Lumsden	306-530-8433			R	
Mattus , Ronald	Chaplin	306-395-2652				C
Needham, Reginald R.	Oxbow	306-483-5052				C
Palmier, Maurice, Jason & Anita	Lafleche	306-472-5917				C
Printz, Gerald & Kurt	Gravelbourg	306-648-3511				C
Reisner, Cecil & Barry	Limerick	306-263-2139				C
Smith, Ron T.W. & Barb A.	Limerick	306-263-4944			R	
Stirton, Brian James	Moose Jaw	306-693-2310				C
Yauck, Kevin Rodney	Govan	306-484-4555			R	
AAC PARAMOUNT						
Nakonechny, Donald , Coral & Lance	Ruthilda	306-932-4409	S			
AAC PENHOLD						
Booy, Jerry N. & Murray T. & Darcy K.	Glaslyn	306-342-2058			R	C
Dear, Jonathon	Hepburn	306-947-4740				C
Fedoruk, Michael J.	Kamsack	306-542-4235			R	C
Fritzler, Baine A. & Brenda D. & Adam A.	Govan	306-484-2010	S			
Gerry , Greg	Creelman	306-457-2220				C
Goossen, Mathew	Stenen	306-547-7432	S		R	C
Hyndman, Glen	Balcarres	306-331-8168				C
Proven Seed/ Crop Production Services (Canada) Inc.	High River	403-603-6011				C
Rude, Stanley	Naicam	306-874-2359				C
Rugg, Robert B., John Barry & Brian R.	Elstow	306-257-3638				C
Wilfing, Raymond John & Ryan John	Meadow Lake	306-236-6811				C
Woods, Dale Arthur	Rocanville	306-645-4423			R	
AAC PREVAIL - CDC PLENTIFUL*	Subject to Additional Certification Requirements					
Barlow, Bradley L.	Griffin	306-861-6110			R	
Bodnaryk, John E.	Rhein	306-273-4263			R	
Bryant, Lee & Phyl & Vern &Carol	Battleford	306-937-3565			R	
Clark, Shaun & Gilchrist, Armand & Gibbings, Neil	Rosetown	306-831-8963			R	
Olson, Lyndon, Lynnell, Alica & Bryon	Archerwill	306-323-4912		F		
Sopatyk, Jeffery & Patti	Saskatoon	306-227-7867	S		R	
Sopel, Calvin & Arlene	Ituna	306-795-3617			R	
Tomtene, Steven & Slind, Daniel	Birch Hills	306-749-3447			R	
Yauck, Kevin Rodney	Govan	306-484-4555			R	
AAC RAYMORE						
Axten, Derek	Minton	306-969-2110			R	
Garratt, Lyle C. & K.c.	Milestone	306-436-2178			R	
Palmier, Maurice, Jason & Anita	Lafleche	306-472-5917				C
AAC REDBERRY						
Boyd, Clare W. & Dale A.	Melfort	306-752-2564			R	
AAC REDWATER						
Goossen, Mathew	Stenen	306-547-7432				C

Sorgard, Graham	Churchbridge	306-896-2236				C
Tebbutt, Gregg & Blake D.	Nipawin	306-862-9730				C
Van Burck, Hans, Marianne & Mira	Star City	306-863-4377	S	F	R	
AAC SPITFIRE						
Altwasser, Rodney & Allen R.& Dean	Yellow Grass	306-465-2727		F		C
Barlow, Bradley L.	Griffin	306-861-6110			R	C
Bews, W. Kenneth & Brent W.	Eatonia	306-967-2440	S			C
Clark, Shaun & Gilchrist, Armand & Gibbings, Neil	Rosetown	306-831-8963				C
Dear, Jonathon	Hepburn	306-947-4740			R	C
Dowdeswell, Donald D.	Pennant	306-626-3388			R	
Fast, Walter J. & Linda	Kindersley	306-463-3626		F		C
Fox, Myles & Trena	Gravelbourg	306-648-2800				C
Fraser, Scott & Shawn	Pambrun	306-741-0475	S	F		C
Friesen, Greg & Brea; Leavins, Brent & Betty Mae	Elrose	306-378-4839				C
Girodat, Gerald	Shaunavon	306-297-2563			R	
Gizen, Jason	Prelate	306-628-8127			R	C
Hanley, Erwin & Priscilla	Regina	306-586-4509				C
Kemper, Kenneth W. & Armella	Humboldt	306-682-3570				C
Kemper, Russell & Donna	Fulda	306-682-4929				C
McDougall, Ken & Craig	Moose Jaw	306-693-3649	S			
Moen, Jim	Cabri	306-587-2214	S	F		C
Nakonechny, Donald , Coral & Lance	Ruthilda	306-932-4409	S	F		C
Petruic, Cameron L., Judy & Nick	Avonlea	306-868-2294	S	F	R	C
Printz, Gerald & Kurt	Gravelbourg	306-648-3511				C
Reisner, Cecil & Barry	Limerick	306-263-2139			R	
Simpson, John W.	Moose Jaw	306-693-9402			R	
Sopatyk, Jeffery & Patti	Saskatoon	306-227-7867		F		
Stauber, Clayton & Lori	Stewart Valley	306-773-7907				C
Watson, Wayne Donald & Calvin & Mark	Avonlea	306-868-4402			R	C
Willner, Brady E.	Davidson	306-567-4613			R	
Willner, Lorne E.	Davidson	306-567-4613	S			
AAC VIEWFIELD						
Fedoruk, Rod M.& Cathy	Kamsack	306-542-4235		F		
Hyndman, Neil S.	Balcarres	306-331-8168		F		
Wakefield, Kristopher & Laurie G. & Monica	Maidstone	306-893-2984		F		
Woods, Dale Arthur	Rocanville	306-645-4423		F		
AAC W1876						
Crosson, Lorne & Will & Lee & Glen	Welwyn	306-645-3337	S	F		C
Fedoruk, Michael J.	Kamsack	306-542-4235		F		C
Reisner, Cecil & Barry	Limerick	306-263-2139				C
Yauck, Kevin Rodney	Govan	306-484-4555	S		R	C
AC ANDREW						
Dutton, David H.& George	Paynton	306-895-4306	S			C
Frederick, Blaine	Watson	306-287-3977				C
Herle, Gregory & Andrew E.	Wilkie	306-843-2934		F	R	C
Maze, Gary Keith	Unity	306-398-2637				C
Nakonechny, Donald , Coral & Lance	Ruthilda	306-932-4409	S			C
Straub, Lorne A.	Pense	306-345-2390				C
AC INTREPID						
Illingworth, Hazel V. & Todd Douglas	North Battleford	306-445-5630			R	C
AC NAVIGATOR						
Proven Seed/ Crop Production Services (Canada) Inc.	High River	403-603-6011				C
BRIGADE						
Boyd, William R. & Regan	Eston	306-962-3526	S			
Floberg, Barry & Delana & Devin & Brandon	Shaunavon	306-297-2087				C
Proven Seed/ Crop Production Services (Canada) Inc.	High River	403-603-6011	S	F	R	C
Proven Seed/ Crop Production Services (Canada) Inc.	High River	403-603-6011	S	F	R	C
BW479 - SY433*	Subject to Additional Certification Requirements					
Crosson, Lorne & Will & Lee & Glen	Welwyn	306-645-3337			R	
Mayerle, Erwin D.	Tisdale	306-873-4261			R	
Syngenta Canada Inc. (Cereals)	Melfort	306-752-5397		F		
Tomtene, Steven & Slind, Daniel	Birch Hills	306-749-3447			R	
Yauck, Kevin Rodney	Govan	306-484-4555			R	

WHEAT

BW488 - CDC BRADWELL* Subject to Additional Certification Requirements						
Clark, Shaun & Gilchrist, Armand & Gibbings, Neil	Rosetown	306-831-8963	S			C
Reisner, Cecil & Barry	Limerick	306-263-2139	S			
Smith, Ron T.W. & Barb A.	Limerick	306-263-4944	S			
Yauck, Kevin Rodney	Govan	306-484-4555	S			
CARBERRY						
Allan, Raymond N. & Ruth	Corning	306-224-4666				C
Ennis, Garnet, Neil & Schmidt, Jordan	Glenavon	306-429-2793			R	
Gerry , Greg	Creelman	306-457-2220				C
Heavin, G. Harvey & G. Ryan	Melfort	306-752-4171				C
Lung Seeds Ltd.	Lake Lenore	306-368-2414				C
Medernach, Louis J., Kim L. & Kyle	Cudworth	306-256-3991			R	
Ostapovitch, F.g. & Glen	Theodore	306-647-2205	S			C
Rude, Stanley	Naicam	306-874-2359				C
Schmeling, Donald H.	Riceton	306-530-1052			R	
CARDALE						
Ardell, Terrence, Michael, Joanne, Theresa & Joshua	Vanscoy	306-668-4415		F		C
Cay, Randy D.	Kinistino	306-864-3696			R	C
Fedoruk, Rod M.& Cathy	Kamsack	306-542-4235				C
Fenton, Gerald A. & Robin Paul	Tisdale	306-873-5438			R	
Klemmer, Richard	Nipawin	306-862-3874				C
Lueke, Dennis	Humboldt	306-682-5170				C
Mayerle, Erwin D.	Tisdale	306-873-4261				C
Sorgard, Graham	Churchbridge	306-896-2236				C
Tebbutt, Gregg & Blake D.	Nipawin	306-862-9730				C
Van Burck, Hans, Marianne & Mira	Star City	306-863-4377			R	
Yauck, Kevin Rodney	Govan	306-484-4555				C
CDC ABOUND						
Proven Seed/ Crop Production Services (Canada) Inc.	High River	403-603-6011		F	R	C
CDC ALLOY						
Clark, Shaun & Gilchrist, Armand & Gibbings, Neil	Rosetown	306-831-8963	S			C
Craswell, Raymond W., Kevin A. & David M.	Strasbourg	306-725-3236	S	F		
Fraser, Scott & Shawn	Pambrun	306-741-0475	S	F		
Fritzler, Baine A. & Brenda D. & Adam A.	Govan	306-484-2010	S			
Girodat, Gerald	Shaunavon	306-297-2563		F		
Klym, Roy	Regina	306-543-5052	S			
Petruic, Cameron L., Judy & Nick	Avonlea	306-868-2294		F		
Smith, Ron T.W. & Barb A.	Limerick	306-263-4944	S	F		
Straub, Lorne A.	Pense	306-345-2390	S	F		
CDC BRADWELL						
Smith, Ron T.W. & Barb A.	Limerick	306-263-4944	S			
CDC CARBIDE - CDC VIVID* Subject to Additional Certification Requirements						
Lutzer, Albert & Latrace, Jim	Lumsden	306-530-8433			R	
Proven Seed/ Crop Production Services (Canada) Inc.	High River	403-603-6011	S	F	R	C
Sopatyk, Jeffery & Patti	Saskatoon	306-227-7867			R	
CDC DESIRE						
Etter, James Raymond	Richardson	306-536-0380				C
Gellner, Clayton S.	Southey	306-726-4323				C
McDougall, Ken & Craig	Moose Jaw	306-693-3649				C
Willner, Brady E.	Davidson	306-567-4613				C
CDC DYNAMIC						
Proven Seed/ Crop Production Services (Canada) Inc.	High River	403-603-6011	S	F		
CDC FORTITUDE						
Fast, Walter J. & Linda	Kindersley	306-463-3626			R	
Proven Seed/ Crop Production Services (Canada) Inc.	High River	403-603-6011	S	F	R	C
Proven Seed/ Crop Production Services (Canada) Inc.	High River	403-603-6011	S	F	R	C
CDC HUGHES - CARDALE* Subject to Additional Certification Requirements						
Proven Seed/ Crop Production Services (Canada) Inc.	High River	403-603-6011		F		

CDC LANDMARK - AAC VIEWFIELD* Subject to Additional Certification Requirements						
Cay, Randy D.	Kinistino	306-864-3696	S	F		
Charabin, Dale Kenneth & Ryan & Neil & Eric	North Battleford	306-445-2939	S	F		
Clark, Shaun & Gilchrist, Armand & Gibbings, Neil	Rosetown	306-831-8963	S			
Fedoruk, Rod M.& Cathy	Kamsack	306-542-4235	S			
Fenton, Gerald A. & Robin Paul	Tisdale	306-873-5438	S	F		
Fraser, Edward H. & Glen & Dale	Yarbo	306-745-3830		F		
Herle, Gregory & Andrew E.	Wilkie	306-843-2934		F		
Hetland, Bill & Bohachewski, Joe	Naicam	306-874-5694	S			
Hyndman, Neil S.	Balcarres	306-331-8168		F		
Laxdal, Glen M. & Blyth, Danny, Wayne, Richard, Quinn, Darryl & Bolt, Glen A.	Wynyard	306-554-2078	S	F		
Littman, Larry W. & Allan Blake & L.Robert & Adam	Saltcoats	306-783-2512	S			
McCarthy, Brent	Corning	306-224-4848		F		
Ostafie, Robert	Canora	306-563-6244	S			
Tomtene, Steven & Slind, Daniel	Birch Hills	306-749-3447	S			
Trowell, Leslie	Saltcoats	306-744-2684	S			
Van Burck, Hans, Marianne & Mira	Star City	306-863-4377	S	F		
Wakefield, Kristopher & Laurie G. & Monica	Maidstone	306-893-2984	S	F		
Wilfing, Raymond John & Ryan John	Meadow Lake	306-236-6811	S			
Woods, Dale Arthur	Rocanville	306-645-4423	S	F		
CDC ORIGIN						
Tomtene, Steven & Slind, Daniel	Birch Hills	306-749-3447				C
CDC PLENTIFUL						
Boyd, Clare W. & Dale A.	Melfort	306-752-2564				C
Buziak, Ronald Charles	Mayfair	306-445-6556				C
Craswell, Raymond W., Kevin A. & David M.	Strasbourg	306-725-3236		F		
Fedoruk, Michael J.	Kamsack	306-542-4235				C
Fedoruk, Rod M.& Cathy	Kamsack	306-542-4235			R	
Fenton, Gerald A. & Robin Paul	Tisdale	306-873-5438	S	F		C
Heggie, Kyle Robert	Leross	306-675-4920				C
Herle, Gregory & Andrew E.	Wilkie	306-843-2934			R	C
Hyndman, Glen	Balcarres	306-331-8168				C
Kerber, Greg	Rosthern	306-232-4474				C
Kondratowicz, Frank	Unity	306-228-3684				C
Laxdal, Glen M. & Blyth, Danny, Wayne, Richard, Quinn, Darryl & Bolt, Glen A.	Wynyard	306-554-2078		F		C
Mayerle, Erwin D.	Tisdale	306-873-4261				C
McDougall, Ken & Craig	Moose Jaw	306-693-3649				C
Ostafie, Robert	Canora	306-563-6244			R	
Shewchuk, Stan & Lorne & Terry & Adam & Michael	Blaine Lake	306-497-2800				C
Smith, Ron T.W. & Barb A.	Limerick	306-263-4944			R	
Sorgard, Graham	Churchbridge	306-896-2236				C
Van Burck, Hans, Marianne & Mira	Star City	306-863-4377	S	F	R	
Wilfing, Raymond John & Ryan John	Meadow Lake	306-236-6811	S	F	R	
CDC PRECISION						
Fast, Walter J. & Linda	Kindersley	306-463-3626	S			
Mayell, Calvin J.	Assiniboia	306-642-3120	S			
McDougall, Ken & Craig	Moose Jaw	306-693-3649	S			
Moen, Jim	Cabri	306-587-2214	S			
Reisner, Cecil & Barry	Limerick	306-263-2139	S			
Rennick, Joe R. & William J.	Milestone	306-436-4353	S			
Seymour, Glen Patrick, Donne, Kyle, & Kelly	Stewart Valley	306-778-2344	S	F		
Watson, Wayne Donald & Calvin & Mark	Avonlea	306-868-4402	S			
CDC SILEX						
Kennett, Brian Guy	Manor	306-448-4813			R	
CDC STANLEY						
Proven Seed/ Crop Production Services (Canada) Inc.	High River	403-603-6011		F		C
Winterhalt, Tim	Unity	306-228-3170				C
CDC TITANIUM - STETTLER* Subject to Additional Certification Requirements						
Blenkin, Darren	Sintaluta	306-727-2222				C
Dear, Jonathon	Hepburn	306-947-4740			R	

Hall, Norman & Ernie	Wynyard	306-554-3122				C
Heavin, G. Harvey & G. Ryan	Melfort	306-752-4171				C
Proven Seed/ Crop Production Services (Canada) Inc.	High River	403-603-6011		F	R	C
Proven Seed/ Crop Production Services (Canada) Inc.	High River	403-603-6011	S	F	R	C
Sopatyk, Jeffery & Patti	Saskatoon	306-227-7867				C
CDC UTMOST - HARVEST* Subject to Additional Certification Requirements						
Ardell, Terrence, Michael, Joanne, Theresa & Joshua	Vanscoy	306-668-4415	S	F	R	
Buziak, Ronald Charles	Mayfair	306-445-6556				C
Cay, Randy D.	Kinistino	306-864-3696				C
Charabin, Dale Kenneth & Ryan & Neil & Eric	North Battleford	306-445-2939			R	C
Clark, Shaun & Gilchrist, Armand & Gibbings, Neil	Rosetown	306-831-8963			R	
Craswell, Raymond W., Kevin A. & David M.	Strasbourg	306-725-3236			R	
Denis, Michel P. & Marc	St. Denis	306-258-2219			R	
Fedoruk, Michael J.	Kamsack	306-542-4235				C
Hetland, Bill & Bohachewski, Joe	Naicam	306-874-5694				C
Kerber, Greg	Rosthern	306-232-4474				C
Laxdal, Glen M. & Blyth, Danny, Wayne, Richard, Quinn, Darryl & Bolt, Glen A.	Wynyard	306-554-2078				C
Littman, Larry W. & Allan Blake & L.Robert & Adam	Saltcoats	306-783-2512				C
McCarthy, Brent	Corning	306-224-4848				C
Ostafie, Robert	Canora	306-563-6244				C
Seed Source Inc.	Archerwill	306-323-4402				C
Shwaga, Jeff W.	Wroxton	306-742-4590			R	
Sorgard, Graham	Churchbridge	306-896-2236				C
Tebbutt, Gregg & Blake D.	Nipawin	306-862-9730				C
Van Burck, Hans, Marianne & Mira	Star City	306-863-4377				C
Veikle, Lorne A. & Carl E. & G. & J.& Brennan	Cut Knife	306-398-4714			R	
Wakefield, Kristopher & Laurie G. & Monica	Maidstone	306-893-2984		F	R	C
Wilfing, Raymond John & Ryan John	Meadow Lake	306-236-6811			R	C
Wylie, Leslie Dale	Biggar	306-948-2807			R	
CDC VERONA						
Watson, Wayne Donald & Calvin & Mark	Avonlea	306-868-4402	S	F	R	C
CDC VIVID						
McDougall, Ken & Craig	Moose Jaw	306-693-3649		F	R	
ELGIN ND						
Danielson, Lionel & Bonnie	Norquay	306-594-2173				C
Fedoruk, Rod M.& Cathy	Kamsack	306-542-4235				C
Fenton, Robin Paul	Tisdale	306-873-3234				C
Frederick, Blaine	Watson	306-287-3977				C
Lueke, Dennis	Humboldt	306-682-5170				C
Mayerle, Erwin D.	Tisdale	306-873-4261				C
Sayers, Charlie Joseph	Delmas	306-445-6522				C
Sorgard, Graham	Churchbridge	306-896-2236				C
Tebbutt, Gregg & Blake D.	Nipawin	306-862-9730				C
Wylie, Leslie Dale	Biggar	306-948-2807				C
EMERSON						
Fedoruk, Rod M.& Cathy	Kamsack	306-542-4235			R	C
Petruic, Cameron L., Judy & Nick	Avonlea	306-868-2294	S		R	
Sorgard, Graham	Churchbridge	306-896-2236				C
EUROSTAR						
Fraser, Scott & Shawn	Pambrun	306-741-0475				C
FALLER						
Blenkin, Darren	Sintaluta	306-727-2222				C
Crosson, Lorne & Will & Lee & Glen	Welwyn	306-645-3337				C
Kemper, Russell & Donna	Fulda	306-682-4929				C
FIELDSTAR - WASKADA* Subject to Additional Certification Requirements						
Bryant, Lee & Phyl & Vern &Carol	Battleford	306-937-3565				C
GLENN						
Blenkin, Darren	Sintaluta	306-727-2222				C
Sorgard, Graham	Churchbridge	306-896-2236				C
GOODEVE - AC INTREPID* Subject to Additional Certification Requirements						
Cay, Randy D.	Kinistino	306-864-3696				C

Denis, Michel P. & Marc	St. Denis	306-258-2219					C
Fenton, Gerald A. & Robin Paul	Tisdale	306-873-5438		F	R		C
Gaertner, Lyle	Tisdale	306-873-4936					C
Klemmer, Richard	Nipawin	306-862-3874					C
INFINITY							
Yauck, Kevin Rodney	Govan	306-484-4555					C
KWS SPARROW - KWS CHARING* Subject to Additional Certification Requirements							
Hanley, Erwin & Priscilla	Regina	306-586-4509		F			
Van Burck, Hans, Marianne & Mira	Star City	306-863-4377	S	F			
Veikle, Lorne A. & Carl E. & G. & J.& Brennan	Cut Knife	306-398-4714	S				
LILLIAN							
Watson, Wayne Donald & Calvin & Mark	Avonlea	306-868-4402			R		
MOATS							
Amos, K. Wayne	Oxbow	306-483-2963					C
Floberg, Barry & Delana & Devin & Brandon	Shaunavon	306-297-2087					C
Fraser, Scott & Shawn	Pambrun	306-741-0475					C
McDougall, Ken & Craig	Moose Jaw	306-693-3649	S	F	R		C
Watson, Wayne Donald & Calvin & Mark	Avonlea	306-868-4402					C
MUCHMORE							
Frederick, Blaine	Watson	306-287-3977					C
PARATA							
Mac Gregor, Robert C.	Garrick	306-276-2384	S				
PASTEUR							
Blenkin, Darren	Sintaluta	306-727-2222					C
Crone, Vaughn & Tammie	Moose Jaw	306-691-5284					C
McDougall, Ken & Craig	Moose Jaw	306-693-3649					C
Toman, Rick & Randy	Guernsey	306-365-8386					C
Van Burck, Hans, Marianne & Mira	Star City	306-863-4377					C
SADASH							
Fritzler, Baine A. & Brenda D. & Adam A.	Govan	306-484-2010	S				
Toman, Rick & Randy	Guernsey	306-365-8386					C
Wakefield, Kristopher & Laurie G. & Monica	Maidstone	306-893-2984					C
Wilfing, Raymond John & Ryan John	Meadow Lake	306-236-6811					C
Winterhalt, Tim	Unity	306-228-3170					C
SHAW - AC DOMAIN* Subject to Additional Certification Requirements							
Fritzler, Baine A. & Brenda D. & Adam A.	Govan	306-484-2010					C
Hicks, Dale & Barry	Mossbank	306-867-8674					C
Huber, Daniel & Rebecca	Landis	306-658-4200					C
Medernach, Louis J., Kim L. & Kyle	Cudworth	306-256-3991					C
Pratchler, John & Leander	Muenster	306-682-3317					C
Pratchler, Leander	Muenster	306-682-3317					C
Shwaga, Jeff W.	Wroxton	306-742-4590					C
Sopel, Calvin & Arlene	Ituna	306-795-3617					C
Willner, Brady E.	Davidson	306-567-4613			R		C
Willner, Lorne E.	Davidson	306-567-4613		F			
Woroschuk, Andrew	Calder	306-742-4682					C
Yauck, Kevin Rodney	Govan	306-484-4555					C
STETTLER							
Dutton, David H.& George	Paynton	306-895-4306					C
STRONGFIELD							
Catherwood, James	Calgary	403-836-9699			R		
Floberg, Barry & Delana & Devin & Brandon	Shaunavon	306-297-2087					C
Forer, Denise	Avonlea	306-868-4433					C
Forer, Tim	Avonlea	306-868-4433					C
Lutzer, Albert & Latrace, Jim	Lumsden	306-530-8433					C
Miller, Neil, Jarrod, Sean & Bruce	Avonlea	306-868-7822					C
Watson, Wayne Donald & Calvin & Mark	Avonlea	306-868-4402					C

SY SLATE							
Syngenta Canada Inc. (Cereals)	Melfort	306-752-5397		F			
SY087							
Syngenta Canada Inc. (Cereals)	Melfort	306-752-5397	S	F			
SY637							
Syngenta Canada Inc. (Cereals)	Melfort	306-752-5397		F	R		
SY995							
Syngenta Canada Inc. (Cereals)	Melfort	306-752-5397	S	F			
TRANSCEND							
Clark, Shaun & Gilchrist, Armand & Gibbings, Neil	Rosetown	306-831-8963					C
Craswell, Raymond W., Kevin A. & David M.	Strasbourg	306-725-3236				R	C
Floberg, Barry & Delana & Devin & Brandon	Shaunavon	306-297-2087					C
Fraser, Scott & Shawn	Pambrun	306-741-0475	S	F			C
Gellner, Clayton S.	Southey	306-726-4323				R	
Girodat, Gerald	Shaunavon	306-297-2563				R	C
Gizen, Jason	Prelate	306-628-8127					C
Herle, Gregory & Andrew E.	Wilkie	306-843-2934					C
Klym, Roy	Regina	306-543-5052					C
McCarthy, Brent	Corning	306-224-4848					C
McDougall, Ken & Craig	Moose Jaw	306-693-3649					C
Palmier, Maurice, Jason & Anita	Lafleche	306-472-5917					C
Petruic, Cameron L., Judy & Nick	Avonlea	306-868-2294					C
Reisner, Cecil & Barry	Limerick	306-263-2139				R	C
Sand, Evan	Limerick	306-263-4944					C
Smith, Kyle	Limerick	306-263-4944					C
Smith, Ron T.W. & Barb A.	Limerick	306-263-4944					C
Smith, Wayne D.	Limerick	306-263-4944					C
Straub, Lorne A.	Pense	306-345-2390					C
UNITY - WASKADA* Subject to Additional Certification Requirements							
Needham, Reginald R.	Oxbow	306-483-5052					C
VESPER - WASKADA* Subject to Additional Certification Requirements							
Gerry , Greg	Creelman	306-457-2220					C
Rempel, Blair Allan	Nipawin	306-862-3573					C
WASKADA							
Allan, John Garth	Corning	306-457-2629					C
Allan, John Richard	Corning	306-457-7310				R	

WHEATGRASS

AC GOLIATH							
Trawin Seeds	Melfort	306-752-4060					C
GREENLEAF							
Ag-Vision Seeds Ltd.	Carrot River	306-768-3335					C
KIRK							
Hochbaum, Jack	Wilkie	306-843-2054					C
Rempel, Blair Allan	Nipawin	306-862-3573					C
REVENUE							
Ag-Vision Seeds Ltd.	Carrot River	306-768-3335					C

Government of Saskatchewan

Varieties of Grain Crops 2017

Table of Contents

Symbols and Abbreviations Used:

§ Variety may not be described in 2018

--- Insufficient test data to describe
n/a = Not applicable

Applied for PBR protection at time of printing (UPOV'91)
Plant Breeders' Rights (UPOV'78) at time of printing
Plant Breeders' Rights (UPOV'91) at time of printing

Relative maturity: VE = Very Early, E = Early, M = Medium, L = Late, VL = Very Late

Agronomic Rating: VG = Very Good, G = Good, F = Fair, P = Poor, VP = Very Poor

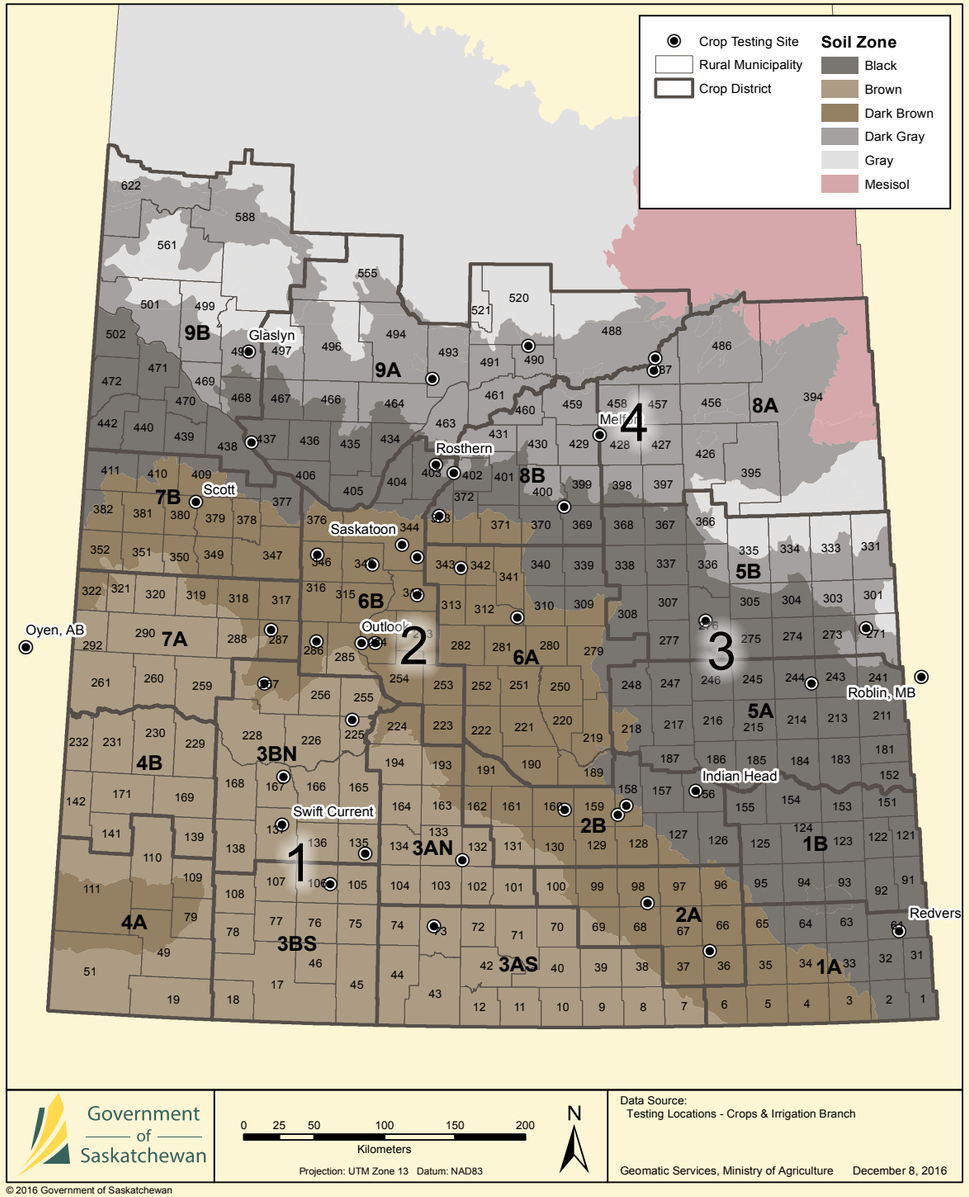
Disease Resistance: R = Resistant, MR = Moderately Resistant, I = Intermediate Resistance, MS = Moderately Susceptible, S = Susceptible

Accessing Public Release Varieties

Breeder seed of public release varieties is available to anyone (including farmers and seed growers) for multiplication, increase and marketing. There are no royalties or seed marketing agency fees attached to use or sale of seed produced from Breeder seed of public release varieties. While subsequent seed production may be Pedigreed, this is the buyer's choice and the buyer may increase the seed of public release varieties in any way he/she wishes (only pedigreed seed can be sold by variety name, for most major crop kinds). To purchase Breeder seed of public release varieties, contact the breeding institution listed in the Breeding Institution and Seed Distributors listings on pages 30-32.

Legal Disclaimer

Regional Variety Testing Locations



The cropland of Saskatchewan has been divided into four areas based roughly on agro-climatic conditions. Crop yields can vary from area to area. In choosing a variety, producers will want to consider the yield data in combination with marketing and agronomic factors.

Area 1: Drought is a definite hazard and high winds are common. Sawfly outbreaks often occur in this area. Cereal rust may be a problem in the southeastern section.

Area 2: Drought and sawfly may be problems in the western and central sections of the area. Cereal rust may be a problem in the southern section.

Area 3: Sawfly can also be a problem. Drought is not as likely to be a problem in this area, particularly in the east. Cereal rust may occur in the eastern portion. The frost-free period can be fairly short in the northern section.

Area 4: Rainfall is usually adequate for crop production. However, early fall frosts and wet harvest conditions are frequent problems.

Note About Dividing Lines:

The dividing lines do not represent distinct changes over a short distance. The change from one area to another is gradual.

Regional Variety Testing is Saskatchewan relies on support from many organizations including:

Saskatchewan Pulse Growers

Saskatchewan Winter Cereals Development Commission

Saskatchewan Oat Development Commission

SaskWheat Development Commission

SaskFlax

SaskBarley Development Commission

canola 2015 Performance Trials

SaskSeed Saskatchewan Seed Growers Association

Government of Saskatchewan

The Saskatchewan Advisory Council on Grain Crops (SACGC) and the Saskatchewan Variety Performance Group (SVPG) coordinate, supervise and review the collection, analysis and reporting of information in this booklet. Membership consists of representatives from:

- Saskatchewan Ministry of Agriculture
- Seed Companies
- Saskatchewan Seed Growers Association
- Crop Commissions
- Agriculture and Agri-Food Canada
- Crop Development Centre
- University of Saskatchewan
- Saskatchewan Crop Insurance Corporation

SACGC and SVPG gratefully acknowledge the contributions of all individuals and organizations involved in the generation and publication of this information.

Testing Varieties in Saskatchewan

By Saskatchewan Ministry of Agriculture

Regional testing of crop varieties is conducted to provide producers with information on the agronomic performance of varieties under different agro-climatic conditions. Saskatchewan producers will continue to have the opportunity to evaluate the newest grain crop varieties and their suitability for production in different regions of the province.

The Saskatchewan Ministry of Agriculture provides $100,000 toward a testing program that is based on industry-government partnership. An entry fee system is used, in which variety owners or companies with the distribution rights to a particular variety pay a portion of the cost of having the variety tested. The Saskatchewan Seed Growers' Association, Saskatchewan Wheat Development Commission, Saskatchewan Barley Development Commission, Saskatchewan Oat Development Commission and SaskFlax collectively provide $75,000 to the core program. Supplementary funds enhance the core program.

Technical and in-kind support is also provided by Agriculture and Agri-Food Canada, Saskatchewan Crop Insurance Corporation and The Western Producer, publisher of the *2017 SaskSeed Guide*.

A long-term database is maintained to provide comparisons to a commonly grown check variety. The data include information on yield, various agronomic factors and certain market-related traits.

The Saskatchewan Variety Performance Group (SVPG) administers the program for spring cereals and flax. SVPG is composed of representatives from seed industry, producers, breeders and government.

SeCan Association administers the funds for SVPG. Crop coordinators manage the data and provide expertise for their respective crops.

The results of the testing are reviewed by the Saskatchewan Advisory Council on Grain Crops (SACGC), which also updates disease and other agronomic information, and approves the data prior to inclusion in this publication.

The Saskatchewan Ministry of Agriculture grant also provides some support to programs that test pulses, sunflower and canaryseed. The testing information from these crops is included in this publication.

Relative yield of varieties

Trials are conducted using uniform protocols and standard check varieties. Data are collected from as many sites as are available and statistically analyzed. Results in this publication are aggregated over a number of years and on an area basis for most crops.

Grain yield is a function of genetic and non-genetic factors. Variety trials are designed to measure the yield differences that are due to genetic causes. It is important to minimize variability due to non-genetic factors such as moisture, temperature, transpiration, weeds, diseases and other pests. Experimental design uses replication (repeated plantings of the varieties) and randomization (the position of the varieties within the test is assigned by chance) to estimate the precision with which the genetic factors can be measured.

Relative yield is the yield of one variety expressed as a percentage of the check variety. Yields obtained in these trials are not identical to those obtained in commercial production. However, the relative ranking of these varieties compared to the check variety, obtained over a number of years at several locations, would remain the same regardless of whether the grain yield was measured in small plots or large-scale fields. Relative yield is the best estimate of expected yield advantage in the areas indicated.

Testing Pulse Crops

In 2016, the Saskatchewan Pulse Growers and the pulse breeding program at the Crop Development Centre (CDC), University of Saskatchewan, continued a 5-year agreement, with a budget of $160,000 per year, to conduct the pulse crop regional variety trials in Saskatchewan. The CDC collaborates with researchers at several locations to conduct the trials, including Agriculture and Agri-Food Canada research stations, provincial Agri-ARM sites, and the Canada-Saskatchewan Irrigation Diversification Centre. The project collects data on varieties from the CDC program, as well as those arising from other public or private pulse breeding programs. Since 2006, field pea, lentil, chickpea, dry bean and faba bean variety trials were conducted at 3-15 locations per crop in their target areas of adaptation in Saskatchewan. (Source: CDC)

Relative Maturity

Ratings

Maturity is measured from seeding to swathing ripeness. The actual number of days to reach maturity depends on local climatic conditions and, to some extent, on management practices.

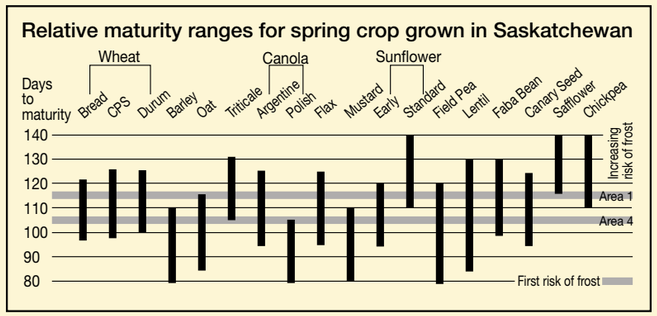
Some of the tables in this booklet express the relative maturity in days while others use a five-category scale: VE, E, M, L and VL (very early, early, medium, late, very late). The limits for each category can vary from crop to crop. In barley, for example, AC Metcalfe would be M, with L and E varieties plus or minus 1-2 days, and VL and VE varieties beyond this range.

Comparisons

The relative maturity of varieties of different crops is important when making plans for seeding.

The table below compares the relative maturity ranges for crops grown in Saskatchewan. Within each crop there are early and late maturing varieties. Whether a crop matures before the first killing frost depends on seeding date, management practices and environmental factors. Not all crops have a wide area of adaptation.

It is noted that climatic conditions can cause a wide variability in crop maturity.



Plant Disease Resistance

By Saskatchewan Ministry of Agriculture

Resistance to the most important diseases in Western Canada is assessed in most crops as part of the variety registration process. The methods used to assess resistance in each crop are different. In some cases, spores of the pathogen are applied to plants in the greenhouse or in the field. In other cases, assessment is based on naturally occurring infection in the field. Each variety is rated on a five-point scale of Resistant (R), Moderately Resistant (MR), Intermediate Resistance (I), Moderately Susceptible (MS) and Susceptible (S). New varieties are not tested side-by-side with all existing varieties.

Because of variation in disease levels from year to year, each new variety is assigned a rating relative to a few existing varieties that serve as disease level standards or checks. Varieties differ in resistance because of differences in their genetic makeup and/or differences in the genetic makeup of the pathogen that causes the disease. However, the genetic makeup of a pathogen can change over time and can enable the pathogen to overcome the resistance in a variety. In such cases, a variety with good resistance can quickly display poor resistance to a particular disease. Unfortunately, because not all varieties are tested side-by-side every year, the ratings of older varieties may be less reliable.

Preserving the efficacy of disease resistance genes in current crop varieties is the most economical method of plant disease control. Disease resistance can be prolonged with good agronomic and integrated pest management practices. Crop type, variety and fungicide rotation are important methods of preserving the effectiveness of disease resistance genes and fungicides. Disease resistance genes usually become ineffective due to short rotations and the prolonged use of one crop variety on a large acreage.

A number of factors can affect the level of disease symptoms observed at a given location in a given year. Environmental conditions such as moisture and temperature, the genetic makeup of both the variety and the pathogen, and the amount of the pathogen present can all affect the level of disease. Although a variety with fair resistance can show disease symptoms under favourable conditions, a susceptible variety would have much more disease under the same conditions.

For example, ascochyta blight of chickpea is a very aggressive fungal disease. It can completely kill susceptible varieties within two weeks of symptoms first appearing. Chickpea varieties currently grown commercially in Saskatchewan have intermediate (I) ascochyta blight ratings. This resistance weakens as plant development nears the flowering stage. Cool, moist environmental conditions favour the disease; if these conditions persist early in the growing season, the disease symptoms can occur much earlier than the flowering stage. This is especially true on chickpea grown outside the Brown Soil Zone (the area of best adaptation) or on heavy textured soils such as clays and clay loams.

In the past, infected chickpea varieties lacking resistance to ascochyta blight could become defoliated, with girdled branches and dead plants. If conditions turn warm and dry, the diseased plants can re-grow from auxiliary nodes, often producing flowers and pods. However, these late pods and seeds will most likely be frozen in the first fall frost and have no commercial value.

Fusarium Damaged Kernels

By Mitchell Japp, Saskatchewan Agriculture

Fusarium head blight has recently become more common in Saskatchewan. Producers will get the level of fusarium damaged kernels (FDK) and perhaps also DON (deoxynivalenol) on their grain from the elevator. However, fusarium infection levels are needed to determine seed quality.

FDK does not provide the whole story regarding fusarium infection. FDK is a measure of grain quality, not seed quality. Seed can be infected by fusarium even when FDK are not present.

Fusarium spp. can infect the plant at different stages of the kernel development. Early infection may lead to an aborted floret, while later infection may leave spores on the kernel without showing visual symptoms. Tombstone kernels (FDK) are infected in between those extremes.

Because there is no correlation between FDK and fusarium infection of the seed, FDK cannot be used to predict fusarium infection levels. A disease test is needed to determine if seed has *Fusarium* spores on it that could cause seedling blight or root rot.

Fusarium infection on the seed can sometimes be managed with a seed treatment. *Fusarium graminearum* is particularly aggressive for fusarium head blight so recommendations are to prevent its introduction into new areas.

In areas where *F. graminearum* has not become established, seed with more than 5% *F. graminearum* is not recommended for planting. Seed with 2-5% *F. graminearum* should be treated with an appropriate seed treatment.

In areas where *F. graminearum* is established, a seed treatment should be used when total *Fusarium* species is greater than 10%.

If seed is tested early in winter, germination should be retested again in the spring, especially if disease is present. Germination can decrease during storage.

For more information, refer to the Saskatchewan Agriculture publication *Seed-Borne Diseases of Cereal Crops.*

What Are Plant Breeders' Rights?

By Mitchell Japp, Saskatchewan Agriculture

The goal of Plant Breeders' Rights (PBR) legislation is to encourage investment and development in the crops sector. There are many ways to accomplish this, but UPOV-based PBR balances the interests of the farmer and the breeder. This gives the farmer fair access to the use of purchased seed, and the breeder can expect a royalty from every new farmer buying seed of the breeder's variety.

The royalty and protections under PBR assure that companies and institutions that invest in plant breeding are able to keep reasonable control of their varieties and secure fair compensation for their efforts. Some of the benefits of PBR include:

- Access to new and improved plant varieties, improving the bottom line for producers. Enhanced protection under the revised PBR will encourage the release of new varieties from other countries (once registered in Canada), as well as stimulate increased investments in variety development here in Canada.
- Farmers are allowed to save seed for their own use, on their own farms, if the original seed was obtained legitimately.
- No negative impacts for those who legitimately purchase seed.

When a plant breeder develops a new variety for use in Canada they may apply under the *Plant Breeders' Rights Act* to obtain certain controls over the multiplication and sale of the seed of that variety. Sale, trade or any other transfer of the seed for propagation purposes is prohibited by law without the written permission of the breeder or their agent.

> UPOV is the International Union for the Protection of New Varieties of Plants. In order to be a member, a country must have legislation that aligns with a ratified UPOV convention. There are 74 UPOV member countries, 55 of which have ratified UPOV'91 compliant legislation.

Varieties protected by PBR are identified with one of two logos. Varieties protected prior to Feb. 27, 2015, are identified by:

PBR
Progress through Research

and those protected after Feb. 27, 2015, are identified by:

91
Progress Through Research
Le progrès grâce à la recherche

Varieties previously protected by PBR remain under the same rules as before. Varieties protected since Feb. 27, 2015, are protected under the new PBR act.

The new PBR act extends the right of the breeder giving them further opportunity to protect their variety and be sure that those who are benefitting from the technology are paying for it.

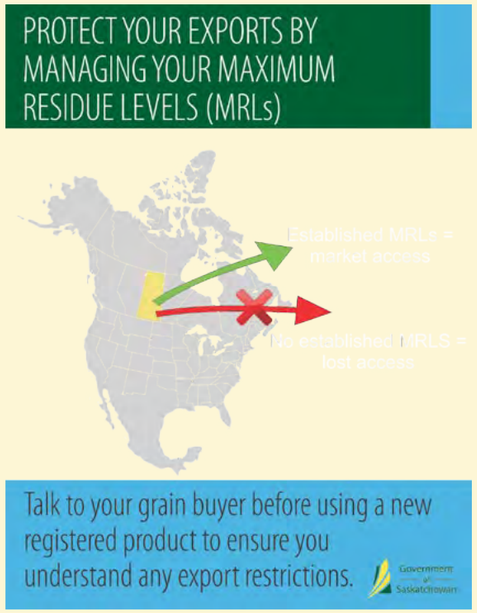
It has always been illegal to sell seed without consent of the breeder. Now, it will also be illegal to purchase seed, meaning both the seller and purchaser can be liable if the seed sale is not approved. To be sure, the best way to know if the seed being purchased is an approved sale is to purchase certified seed. Producers should look for the blue certified seed tag and keep it in their records as long as they grow grain derived from that original seed purchase.

The first 10 years of Canada's PBR act brought improved access to varieties, new investment in varieties, and new and improved genetics for farmers. With the new PBR, producers will benefit from greater access to new varieties for the crops they grow, and breeders will be able to better protect the investment made in the development of new varieties so they can continue to develop new varieties.

For more information visit *www.pbrfacts.ca* or contact the PBR Office at 613-773-7188.

Maximum Residue Limits

Maximum Residue Limits are the level of pesticide residues permitted in the harvested crop, including imported food. Each country, establishes its own MRLs, including Canada.
MRLs are set for each pesticide registered in Canada. Sometimes MRLs in Canada differ from those in export markets or may not exist in export markets for certain pesticides. Agricultural exports may be tested by importing countries for residues of unregistered products, excess residues of registered products or unregistered uses.
For more information, visit keepingitclean.ca.



Managing Fusarium Head Blight in Durum Wheat

By Yuefeng Ruan, AAFC and Ron DePauw, SeCan

Fusarium head blight (FHB) has become the number one enemy of durum wheat production in Canada. By providing information on durum wheat variety response to fusarium head blight, this article complements the Saskatchewan Agriculture information. Readers are encouraged to visit: *www.saskatchewan.ca*.

Fusarium is a very complex pathogen. FHB is caused by several species of *Fusarium*. Some *Fusarium* species infect all cereal grains and some forage grasses. Some *Fusarium species* can survive on both living plant material and debris of plants.

Fusarium sporulation and cereal head infection is favoured by moist conditions during flowering. Symptoms may occur over the entire head or on just a few spikelets. Infected kernels (known as fusarium damaged kernels or FDK) may become shrivelled and light weight resulting in loss of grain yield. The infected kernels may contain mycotoxins that are harmful to humans and animals. The primary mycotoxin is deoxynivalenol (DON, also known as vomitoxin), produced primarily by *Fusarium graminearum*. There is an association of FDK to mycotoxin level but the relationship is environmentally dependent. Consequently, FDK is a grading factor for all small grains.

Grades 1 and 2 of Canada Western Amber Durum (CWAD) are permitted only up to 0.5% FDK. Grades 3 and 4 of CWAD may have only up to 2% FDK, while grade 5 may have only 4% FDK.

Disease management of FHB requires an integrated strategy. There are several management practices that can be helpful in reducing losses caused by FHB. These practices are aimed at reducing disease risk and include:

1. resistant cultivars
2. cultural practices
3. fusarium forecasting
4. chemical control

Growers will experience the greatest benefits when multiple practices are used together instead of alone and should never rely on a single management practice to control FHB.

Genetic variation for resistance to FHB is limited in tetraploid wheat, which includes durum wheat, compared to the variation in hexaploid wheat. Genetic studies have detected genetic effects on virtually every chromosome. The effects are generally small and often additive or cumulative. There are multiple mechanisms of resistance including resistance to initial infection of a floret, resistance to *Fusarium* spread within the head, detoxification of mycotoxin (DON), and escape such as flowering within the boot.

Classifying symptoms of FHB is based on incidence, severity, FDK, and DON. Incidence rates the number of heads displaying infections of at least one floret per 100 heads. Severity estimates the average percentage of the head displaying infections in the same 100 heads. A disease index is constructed by multiplying incidence by severity. A harvested sample from this same plot is threshed. The percentage FDK is calculated based on weight of damaged kernels as a proprtion of the whole sample. DON is measured on a representative grain sample from this plot. DON is generally measured with an ELISA test or some other biochemical test.

The durum varieties range from susceptible to moderately susceptible. However, some of the moderately susceptible varieties express better resistance. Additional data on the response of the more recently registered durum cultivars is being collected through the Saskatchewan Variety Performance Group trials.

Additional Information:

- Fusarium Head Blight Fact Sheet at *www.saskatchewan.ca*
- Fusarium Resources at Saskatchewan Wheat Development Commission website. Sask Wheat launched weather-based fusarium head blight (FHB) risk maps in 2015. The purpose of the risk maps is to keep producers updated, in near-real-time, about the risk of FHB in wheat in their respective areas of the province so that they may best plan their management strategies: *www.saskwheatcommission.com*
- FHB Management in Wheat and Barley by Marcia McMullen, NDSU, 2015 conference proceedings: *www.usask.ca/soilsncrops*
- Fusarium Head Blight of Barley and Wheat, Alberta Agriculture and Forestry: *www1.agric.gov.ab.ca*
- For tips on how to manage the disease, view the video – "Stop Fusarium Before it Stops You." For a more detailed (30 minute) presentation, see "Fusarium Management.": *www.youtube.com*
- Comprehensive information on managing fusarium in wheat and barley, published by the American Phytopathological Socieity. Fusarium Head Blight - US Wheat and Barley Scab Initiative: *scabusa.org*

CEREAL CROPS

Wheat

Main Characteristics of Varieties

Category and Variety	Years Tested	Yield (%) Area 1 & 2	Yield (%) Area 3 & 4	Yield (%) Irrigation	Protein	Resistance To[2] Lodging	Sprouting	Stem Rust	Leaf Rust	Stripe Rust	Loose Smut	Bunt	Leaf Spot	FHB	Head Awnedness	Rel. Maturity (days)	Seed Weight (mg)	Volume Wt.[3] (kg/hL)	Ht. (cm)
CWRS[1]		--- Relative to Carberry ---														---- Relative to Carberry ----			
Carberry	6	100	100	100	14.6	VG	F	MR	R	MR	MR	R	MS	MR	Y	100	34.5	79.0	83
AAC Bailey §	5	98	100	---	+0.1	P	G	R	R	---	MS	MR	I	I	N	-3	+1.4	-2.2	+16
CDC Bradwell	3	100	107	---	0.0	VG	F	MR	R	MS	MR	R	MS	I	Y	-1	-1.2	+0.5	+9
AAC Brandon	5	106	106	---	-0.4	G	P	R	R	MR	MR	S	I	MR	Y	0	+0.5	-0.1	0
AAC Cameron VB	3	109	118	---	-0.8	G	F	MR	MR	S	S	R	I	I	Y	-2	+3.2	-0.5	+18
Cardale	5	99	101	---	-0.1	F	G	R	R	S	I	MR	MS	MR	Y	0	-0.7	-1.1	+2
Coleman	4	96	95	---	-0.1	VP	P	MR	R	MR	S	S	MS	MR	Y	-3	-2.3	+0.3	+17
AAC Connery	3	99	100	---	+0.5	G	G	R	MR	R	MR	I	I	MR	N	-2	+0.9	-0.8	+5
AAC Elie	5	105	105	---	-0.2	G	F	R	R	MR	I	I	I	I	Y	0	+0.3	0.0	-1
Glenn	6	101	102	102	-0.4	F	F	R	R	MR	I	I	I	I	Y	-1	-0.1	+2.6	+11
CDC Go	5	95	102	---	0.0	G	P	R	I	MR	MS	I	S	MS	Y	-3	+2.3	-1.9	+7
Go Early	3	95	101	---	+0.4	P	VP	MR	MR	I	MS	MR	S	I	Y	-4	+0.2	-2.5	+16
Goodeve VB	6	101	107	---	0.0	G	G	MR	MR	I	MR	S	MS	S	N	-4	-0.6	-2.0	+9
Harvest[4]	6	94	103	---	-0.3	G	VG	R	MR	MR	MR	S	MS	S	N	-3	-2.8	-1.6	+10
CDC Hughes VB	2	101	113	---	-0.3	F	VG	MR	MR	---	MR	MS	I	I	Y	-1	+1.9	+0.5	+2
Infinity §	6	100	106	---	-0.1	F	G	MR	MR	MS	MR	MR	MS	S	N	-3	-4.0	-1.7	+12
AC Intrepid §	6	96	105	---	-0.2	F	P	MR	MR	MR	I	MR	MS	MS	N	-5	+3.2	-1.8	+11
AAC Jatharia VB	3	110	117	---	-0.1	F	G	I	R	I	S	MS	I	I	Y	-1	+1.2	+0.8	+16
CDC Kernen §	6	100	103	101	0.0	F	P	MR	MR	I	R	I	MS	I	Y	0	-0.2	-1.7	+17
CDC Landmark VB	2	111	115	---	-0.2	G	VG	R	MS	MR	MR	MS	I	I	Y	-1	+0.8	+0.9	+5
Lillian[4]	6	93	96	---	+1.0	P	G	MR	R	R	I	MR	MR	S	N	-2	0.0	-2.7	+12
CDC VR Morris	5	108	106	---	-0.2	F	P	MR	R	---	I	I	I	MR	N	-1	-0.2	-1.0	+13
Muchmore	6	102	98	102	-0.4	VG	G	R	R	MR	MR	R	MS	MS	Y	-1	+0.1	-1.0	-4
CDC Plentiful	5	105	104	---	-0.2	G	P	R	R	MR	R	I	I	MR	N	-3	-1.5	-0.6	+10
AAC Prevail VB	4	112	108	---	-0.5	F	G	MR	R	R	S	S	MS	I	N	-1	-0.3	-1.1	+21
AAC Redberry	2	106	108	---	-0.1	F	G	R	R	R	R	I	MS	I	Y	-3	-0.8	+1.0	+6
AAC Redwater	5	102	101	---	+0.1	F	VG	R	R	MR	MS	I	MS	I	Y	-5	-3.0	-1.5	+9
Shaw VB	6	112	114	103	-0.7	F	G	R	MR	I	S	MR	MS	MS	N	-1	+0.5	-0.5	+20
SY Slate	2	103	110	---	0.3	P	P	MR	R	MR	MS	S	MS	I	Y	-2	+0.4	-0.7	+8
CDC Stanley	6	102	105	100	-0.1	G	G	R	MR	I	MR	S	I	MS	N	-2	-1.1	-1.7	+13
Stettler	6	105	107	100	+0.2	F	G	MR	MS	MR	R	MR	MS	MS	Y	-1	-1.4	-1.1	+7
Thorsby	3	102	102	---	+0.1	F	F	MR	R	R	I	S	MS	I	N	-3	+1.0	-1.1	+14
CDC Thrive §	6	102	102	103	-0.1	P	F	MR	I	I	MR	I	I	MS	N	-2	-0.7	-1.2	+17
CDC Titanium VB	4	108	110	---	+0.6	P	P	I	R	R	MS	I	MS	MR	Y	-3	+1.3	-0.2	+11
Unity VB[4]	6	107	113	---	-0.6	P	VG	MR	R	MS	MS	R	I	I	Y	-2	-1.7	+0.4	+14
CDC Utmost VB	6	108	112	107	-0.4	F	G	MR	R	I	MS	S	I	MS	N	-3	-0.1	-1.6	+12
Vesper VB	6	108	113	---	-0.7	P	F	MR	R	S	I	S	I	I	Y	-3	+1.8	-0.5	+13
AAC Viewfield	3	109	105	---	-0.4	VG	G	R	MR	R	S	MR	I	I	Y	-1	-1.6	+0.8	-3
AAC W1876	3	98	98	---	+0.2	F	F	MR	R	I	I	I	MS	I	Y	0	-0.6	-0.8	+3
Waskada	6	108	107	---	-0.2	P	VG	R	I	MS	MR	R	MS	MR	Y	-1	-1.0	+0.3	+16
WR859CL	6	101	101	102	-0.1	F	G	MR	R	I	R	R	MS	MR	Y	-2	-2.6	-1.1	+7
SY433 §	5	96	101	---	-0.3	P	VG	R	R	---	I	S	I	MR	Y	-1	+0.9	-1.2	+18
SY479 VB	2	93	102	---	+0.5	G	VG	I	R	S	MS	R	MS	I	Y	-2	-1.3	-0.2	+18
SY637	2	99	104	---	+0.4	F	---	MR	R	MR	MS	MR	I	MR	Y	0	-0.8	0.0	+15
5604HR CL §	6	95	99	107	-0.4	G	G	R	R	---	MS	I	MS	I	Y	-4	-3.3	-0.9	+12
5605HR CL	4	104	106	---	+0.1	F	---	MS	R	MR	R	MR	MS	MR	Y	-2	-0.6	+0.4	+14

Wheat (cont'd)

Category and Variety	Years Tested	Yield (%) Area 1 & 2	Yield (%) Area 3 & 4	Yield (%) Irrigation	Protein	Resistance To[2] Lodging	Sprouting	Stem Rust	Leaf Rust	Stripe Rust	Loose Smut	Bunt	Leaf Spot	FHB	Head Awnedness	Rel. Maturity (days)	Seed Weight (mg)	Volume Wt.[3] (kg/hL)	Ht. (cm)
CPSR[1]		--- Relative to Carberry ---														---- Relative to Carberry ----			
Conquer VB[4]	5	117	125	---	---	VP	P	R	MR	MR	MS	R	I	MS	Y	-1	+8.3	+1.9	+8
AAC Crossfield	1	121	113	---	-1.7	F	---	R	MR	R	MS	I	I	I	Y	-2	+1.4	-2.3	-1
AAC Crusader §	5	107	115	---	-1.4	P	VP	R	R	MR	MR	I	MS	I	Y	-2	+1.1	-3.1	0
AC Crystal[5] §	6	111	118	100	---	G	P	R	MS	S	MS	R	I	S	Y	+1	+5.6	-1.3	+1
Enchant VB	5	109	117	---	-1.6	P	VG	MR	R	S	MR	R	MS	S	Y	-1	+9.5	-1.4	+9
AAC Entice	1	122	110	---	-1.3	P	---	R	R	R	MS	I	MS	I	Y	-2	+0.6	-2.9	+2
AAC Foray VB	4	116	121	---	-2.0	F	P	MR	R	I	MS	I	MS	I	Y	0	+7.0	-1.5	+6
AAC Penhold	4	108	112	---	-0.9	VG	VG	MR	R	MR	I	R	I	MR	Y	-2	+5.0	-0.1	-9
SY Rowyn	1	101	107	---	-1.3	F	---	R	R	MR	I	S	I	MR	Y	0	-2.6	-0.1	-5
AAC Ryley	5	103	110	---	-1.3	P	G	R	R	S	I	R	MS	MS	Y	-2	+7.1	-5.1	+2
AAC Tenacious VB	4	100	107	---	-1.9	VP	G	MR	R	R	R	MR	MS	R	Y	-1	-0.2	+0.1	+20
CDC Terrain	2	117	113	---	-1.4	P	G	MR	R	R	MR	MR	I	MS	Y	0	+4.1	-2.7	+4
SY985	5	107	115	---	-1.5	P	P	R	R	---	R	MR	I	I	Y	-2	+1.8	-1.9	+1
SY995	4	114	116	---	-2.3	G	P	MR	R	MR	S	MR	MS	MS	Y	0	+0.7	-3.7	0
5700PR	5	107	113	106	---	VG	F	R	I	S	MS	R	MS	MS	Y	-1	+5.5	0.0	-4
CNHR[1]																			
AAC Concord	2	106	105	---	-0.1	P	F	R	R	R	I	MR	I	MS	N	-2	+3.3	-1.5	+15
Elgin ND	1	114	121	---	-1.0	F	---	I	R	MR	---	S	I	I	Y	-1	-1.6	-0.5	+9
Faller	1	117	119	---	-2.4	F	F	I	MR	MS	---	I	MS	I	Y	-1	+2.8	-1.2	+4
Prosper	1	115	121	---	-2.6	F	---	MR	MR	S	---	I	I	I	Y	0	+3.0	-1.7	+4
CWSWS[1]																			
AC Andrew	5	129	136	---	---	VG	P	MR	MS	I	S	S	---	I	Y	+2	-1.4	-5.0	+3
AAC Chiffon	5	136	137	---	-5.0	P	VP	S	I	MR	S	S	---	S	Y	+1	+2.5	-4.1	+12
AAC Indus	2	130	124	---	-3.9	VG	P	S	I	R	S	MS	MS	MS	Y	+5	+2.3	-3.2	+8
AAC Paramount	1	134	126		-4.5	VG	VP	I	I	R	MR	S	I	MS	Y	+1	+1.4	-2.9	+8
Sadash	5	136	136	---	---	VG	P	MR	I	R	I	S	---	S	Y	+3	0.0	-3.0	+6
CWSP[1]																			
AAC Awesome	1	137	130	---	-5.0	F	---	R	MR	R	I	I	I	I	Y	0	+5.2	-1.5	+6
Charing	1	134	128	---	-3.6	VG	---	-	MR	R	-	-	MR	-	N	+5	+1.4	-3.6	-2
AAC Innova	5	128	132	---	-4.2	G	VP	MR	R	R	S	S	I	S	Y	+1	-0.1	-5.3	+4
CDC Kinley	2	102	111	---	-0.1	G	P	I	MR	I	MS	MR	I	I	Y	-1	+0.4	0.0	+7
CDC NRG003	5	119	123	---	---	F	G	R	MS	---	MS	R	S	MS	Y	-1	+3.4	-4.1	+2
NRG010 §	5	120	127	---	---	F	F	R	R	R	MS	R	MS	I	Y	+2	+0.3	-4.3	+5
AAC NRG097	4	115	120	---	-3.3	P	F	MR	R	S	I	R	I	I	Y	0	+3.7	-2.0	+1
Pasteur	5	126	132	---	-2.5	VG	G	MR	R	MR	MS	S	I	I	N	+3	+1.4	-1.2	+3
AAC Proclaim §	5	116	125	---	-3.3	P	G	MR	R	MS	MR	S	I	MR	Y	0	-0.3	-0.6	+14
Sparrow VB	1	137	131	---	-3.7	VG	---	MR	R	MR	-	I	I	-	N	+4	-1.6	-3.6	0
CDC Throttle	2	123	123	---	-2.5	P	VP	MR	MR	I	MR	I	S	I	Y	+1	+5.4	-0.8	+3
SY087	4	113	123	---	-1.4	F	F	MR	MR	MR	MS	MR	I	MR	Y	0	+5.3	-0.8	+5
WFT603	3	110	117	---	-2.5	VP	F	I	I	MR	I	R	I	MR	Y	+4	+7.2	-1.9	+10
CWHWS[1]																			
AAC Iceberg	4	100	96	---	-0.5	F	P	R	R	I	MS	MR	MS	I	Y	-1	+0.1	-0.9	+4
AAC Whitefox	3	104	106	---	-1.0	F	F	MR	MR	MS	MS	MS	MS	I	N	-2	-0.4	-0.3	+17
Whitehawk	5	99	95	---	-1.0	F	G	I	R	MS	I	MS	MS	MS	N	-2	-4.1	-0.7	+12
CDC Whitewood	4	95	94	---	-0.3	F	G	MR	MR	I	S	S	MS	I	Y	0	-1.8	-1.4	+4
Varieties that have been registered with class to be determined by the Canadian Grain Commission[1]																			
AAC Tradition	2	106	107	---	-0.5	F	VG	R	MR	MS	MR	I	I	Y	+1	+2.2	+1.4	+8	

[1] Includes direct and indirect comparisons with **Carberry**.
[2] Resistance ratings: R = Resistant; MR = Moderately Resistant; I = Intermediate Resistance; MS = Moderately Susceptible; S = Susceptible.
[3] multiply by 0.8 = lbs per bushel.
[4] Effective August 1, 2018, the Canadian Grain Commission will move these varieties to another class.
[5] Effective August 1, 2019, the Canadian Grain Commission will move these varieties to another class.
VB = varietal blend.

Durum Wheat

Category and Variety	Years Tested	Yield (%) Area 1 & 2	Yield (%) Area 3 & 4	Yield (%) Irrigation	Protein	Resistance To[1] Lodging	Sprouting	Stem Rust	Leaf Rust	Stripe Rust	Loose Smut	Bunt	Leaf Spot	FHB	Head Awnedness	Rel. Maturity (days)	Seed Weight (mg)	Volume Wt.[2] (kg/hL)	Ht. (cm)
CWAD		--- Relative to Strongfield ---														-- Relative to Strongfield --			
Strongfield	6	100	100	100	14.4	P	F	R	R	MR	S	MR	I	S	Y	105	42.1	79.2	89
CDC Alloy	2	111	114	---	-0.5	F	F	MR	R	R	I	R	MS	MS	Y	+1	-0.5	+1.2	+4
Brigade	5	107	113	110	-1.1	F	F	R	R	MR	S	R	I	MS*	Y	+3	+1.4	+0.6	+9
AAC Cabri	3	107	102	104	-0.3	P	F	MR	R	R	MR	R	I	MS	Y	+1	-0.1	+0.8	+3
CDC Carbide VB	3	108	108	105	-0.3	P	P	R	R	R	MS	R	MS	MS	Y	0	-1.2	+0.2	+1
AAC Congress	2	110	109	---	-0.5	P	P	MR	R	R	MR	R	MS	MS	Y	+1	-1.1	+0.4	+3
CDC Credence	1	106	115	---	-0.8	F	---	MR	R	MR	MR	MR	I	MS*	Y	+1	-0.1	+0.1	+7
AAC Current	5	101	97	94	0.0	F	P	R	R	MR	MS	MR	I	MS	Y	0	-0.8	+1.0	+4
CDC Desire	5	101	100	104	-0.2	F	G	R	R	MR	MS	R	I	S	Y	-2	-3.0	-0.1	0
AAC Durafield	4	102	105	112	-0.2	P	F	R	R	MR	S	R	I	S	Y	0	-0.5	+0.2	0
CDC Dynamic	2	111	111	---	-0.1	F	F	MR	R	MR	I	R	I	MS	Y	0	-0.2	+1.0	+2
Enterprise	5	102	103	106	-0.2	P	G	R	R	R	MS	MR	I	MS	Y	0	-3.2	+0.6	+2
Eurostar	5	99	104	102	-0.5	P	F	R	R	R	S	R	I	MS	Y	+2	+0.6	+0.8	+4
CDC Fortitude	4	105	103	100	-0.3	F	F	MR	R	R	MS	R	MS	MS	Y	+1	-2.0	+0.1	-1
AAC Marchwell VB	4	99	104	90	-0.1	P	P	R	R	R	MR	R	MS	MS	Y	0	-2.7	-0.6	0
AC Navigator	6	98	89	---	-0.6	F	G	R	R	R	MS	R	S	S	Y	+2	+1.2	-0.1	-8
CDC Precision	2	113	116	---	-0.7	G	F	MR	R	R	MS	R	MS	MS	Y	0	-0.2	+1.2	+4
AAC Raymore	5	95	99	93	+0.2	P	F	R	R	MR	MS	MR	I	S	Y	-1	+1.8	-0.1	0
AAC Spitfire	3	109	112	111	-0.6	G	P	R	R	R	MS	R	MS	S	Y	0	+0.8	-0.4	-2
AAC Stronghold	1	104	105	---	-0.4	VG	---	R	R	MR	R	I	I	MS	Y	+2	+2.5	+0.9	-2
Transcend	5	102	105	93	-0.3	F	G	R	R	R	S	R	I	MS*	Y	+2	-1.4	0.0	+8
CDC Verona	5	101	106	103	-0.3	G	F	R	R	R	MS	R	MS	MS	Y	+2	+0.1	-0.2	+1
CDC Vivid	5	103	101	108	-0.3	G	F	R	R	MR	I	R	I	S	Y	0	-0.6	-0.2	0

[1] Resistance ratings: R = Resistant; MR = Moderately Resistant; I = Intermediate Resistance; MS = Moderately Susceptible; S = Susceptible.
[2] multiply by 0.8 = lbs per bushel.
VB = varietal blend.
* See additional information on page 11.

WHEAT ADDITIONAL INFORMATION

Producers are strongly encouraged to use a combination of the Canadian Food Inspection Agency's List of Registered Varieties (*www.inspection.gc.ca)* and the Canadian Grains Commission's Variety Designation Lists (*www.grainscanada.gc.ca)* to determine the registration and grade eligibility status of varieties.

Grain yield, protein content, time to maturity, seed weight, volume weight and plant height of all varieties of common wheat and durum wheat are compared to **Carberry** and **Strongfield**, respectively. In 2016, the spring wheat varieties supported for registration since 2011 were grown in replicated trials at 14 locations and compared to **Carberry**. Spring wheat varieties registered prior to 2010 have been compared indirectly to **Carberry** using a long-term comparison to **AC Barrie** and **Katepwa**.

Most varieties have been rated for their relative resistance to pre-harvest sprouting. Under wet post-maturity conditions, varieties rated poor have a reduced ability to retain high Hagberg Falling Number values relative to those rated good or very good. Varieties with high test weight retain grade better under adverse harvest weather than those with low test weight. During wet harvest weather, grades drop more rapidly due to sprouting in swathed than in standing crops.

New races of leaf rust and stripe rust continue to evolve. Therefore, the rust resistance in varieties may change from year to year. The seed guide contains the most up-to-date information on rust resistance in current varieties. Early seeding may minimize risk of crop losses for varieties sown in southeastern Saskatchewan that are rated poor or very poor to leaf rust. Field scouting throughout the growing season is encouraged so that timely corrective action can be undertaken if required.

All varieties are at least moderately resistant to shattering. All varieties have moderately good resistance to common root rot.

Seed of varieties rated moderately susceptible and susceptible for bunt and loose smut should be treated with a recommended fungicide. Please refer to the Seed Facts section of this booklet or *Guide to Crop Protection*.

All wheat and durum varieties exhibit similar susceptibility to ergot infestation.

CANADA WESTERN RED SPRING (CWRS)

AAC Cameron VB, **Goodeve VB**, **CDC Hughes VB**, **AAC Jatharia VB**, **CDC Landmark VB**, **AAC Prevail VB**, **Shaw VB**, **CDC Titanium VB**, **Unity VB**, **CDC Utmost VB**, **Vesper VB**, **SY479 VB** are CWRS midge tolerant varieties. They contain the same "*Sm1*" gene for tolerance. To manage against the buildup of midge resistance to the *Sm1* gene, an interspersed refuge is used commercially. These varieties are not immune to wheat midge and can suffer some midge damage when high midge infestation levels occur. More information on midge tolerant wheat cultivars and interspersed refuge can be found at: *www.midgetolerantwheat.ca*.

Seed of new varieties **CDC Bradwell**, **Go Early**, **SY479 VB** and **SY637** will be available in 2017. Seed of new varieties **CDC Hughes VB**, **CDC Landmark VB**, **AAC Redberry**, **SY Slate** and **AAC Viewfield** will be available in limited quantities fall 2017.

AAC W1876 may only be grown under contract in the Warburtons Identity Preserved Program managed by Paterson Grain and Richardson Pioneer.

CDC Abound, **CDC Imagine**, **CDC Thrive**, **WR859CL**, **5604HR CL**, and **5605HR CL** are tolerant to the CLEARFIELD® herbicides Adrenalin SC and Altitude FX.

WHEAT ADDITIONAL INFORMATION (CONT'D)

CANADA PRAIRIE SPRING RED (CPSR)

Conquer VB, **Enchant VB**, **AAC Tenacious VB** and **AAC Foray VB** are CPSR midge tolerant varieties using the same *Sm1* gene as in the CWRS varieties and will be marketed with an interspersed refuge (see above).

SY Rowyn will be available 2017. Seed of new varieties **AAC Crossfield**, **AAC Entice** and **CDC Terrain** will be available in fall 2017.

CANADA NORTHERN HARD RED (CNHR)

Seed of variety **AAC Concord** will be available in limited quantities fall 2017.

AAC Concord has a solid stem which can provide protection against the wheat stem sawfly.

CANADA WESTERN HARD WHITE SPRING (CWHWS)

Varieties in the Hard White market class are intended for whole wheat bread and Yellow Alkaline Noodle markets.

CANADA WESTERN SOFT WHITE SPRING (CWSWS)

Soft white spring wheat may be used as a feedstock in the production of ethanol. Soft white spring wheat varieties are susceptible to pre-harvest sprouting. The leaf spot pathogens that affect other wheat classes also affect soft white cultivars and therefore recommendations for leaf spot control are similar.

Seed of **AAC Indus** will be available spring 2018. Limited seed of **AAC Paramount** will be available fall 2018.

CANADA WESTERN SPECIAL PURPOSE (CWSP)

Sparrow VB is a CWSP midge tolerant variety using the same *Sm1* gene as in the CWRS varieties and will be marketed with an interspersed refuge (see above).

Varieties in the Special Purpose market class have no defined quality attributes and may have specific end-uses. Most varieties are intended for ethanol and livestock feed purposes. Producers are encouraged to contact the variety distributor or developer regarding uses of these varieties.

Seed of **Charing**, **Sparrow VB**, **SY087** and **WFT603** will be available 2017. Limited seed of new varieties **CDC Throttle** and **CDC Kinley** will be available fall 2017.

CLASS TO BE DETERMINED BY CANADIAN GRAIN COMMISSION

Some varieties have received registration have not yet been placed into a wheat class by the Canadian Grain Commission.

AAC Tradition was developed for organic cropping systems.

CANADA WESTERN AMBER DURUM (CWAD)

AAC Cabri, **CDC Fortitude** and **AAC Raymore** have a solid stem with resistance to the wheat stem sawfly.

CDC Carbide VB and **AAC Marchwell VB** are CWAD midge tolerant varieties using the same *Sm1* gene as in the CWRS varieties and will be marketed with an interspersed refuge (see above).

Seed of new varieties **CDC Credence** and **AAC Stronghold** will not be available in 2017. Limited quantities of seeds of varieties **AAC Cabri**, **AAC Congress**, **CDC Alloy**, **CDC Dynamic** and **CDC Precision** will be available in fall 2017.

CWAD varieties are generally more susceptible than CWRS varieties to fusarium head blight (FHB). Growing varieties with improved resistance is recommended to reduce infection and disease propagule production as part of an integrated management strategy. Although no varieties are resistant, **Brigade**, **Transcend** and **CDC Credence** generally express lower FHB symptoms compared to other cultivars in the class. Mycotoxin (DON) production by FHB fungi is generally lower for **Transcend**.

All durum varieties are susceptible to two new races of loose smut.

Wheat Classes Changes

By Mitchell Japp, Saskatchewan Agriculture

The Canadian Grain Commission (CGC) has initiated a Canadian Wheat Class Modernization consultation, which will use new quality standards (established in May 2015) to review the suitability of all western Canadian wheat varieties for their current market classification. The review was in part due to some concerns about declining gluten strength in Canadian wheat shipments.

The observed weaker gluten strength was due to a number of factors, including the predominance of some varieties that were on the lower end of the range of gluten strength for CWRS. Customers require higher gluten strength from CWRS for their products to perform consistently. CGC reviewed the quality standards expected for CWRS (Canada Western Red Spring) and CPSR (Canada Prairie Spring Red) wheat classes so the performance of those classes are more consistent with customer expectations.

The wheat class review was comprehensive. The initial 29 varieties will be moved out of CWRS and CPSR Aug. 1, 2018.

As part of the review, CGC has already initiated changes to wheat classes (Aug. 1, 2016). Canada Western General Purpose (CWGP) was eliminated and all varieties in that class are in the new Canada Western Special Purpose (CWSP) class. Canada Western Interim Wheat (CWIW) was eliminated and all varieties in that class are in the new Canada Northern Hard Red (CNHR) class. Canada Western Feed class was eliminated.

CNHR is the designated class for the 29 varieties proposed to be moved out of CWRS and CPSR.

In 2016, a review of varieties where data is lacking on gluten strength was initiated. Up to two years of data will be collected; producers will be notified of any class designation changes. One additional variety, **AC Crystal**, has been identified, so far and will move out of CPSR Aug. 1, 2019.

The varieties includes 25 CWRS and five CPSR varieties, but only five appear in the *2017 Varieties of Grain Crops* – **Harvest**, **Lillian** and **Unity VB** in CWRS, **Conquer VB** and **AC Crystal** in CPSR.

For farmers growing one of the varieties that will be moved to a new class, these varieties can continue to be grown, but after Aug. 1, 2018 they will not be eligible for the CWRS or CPSR classes. After Aug. 1, 2019, **AC Crystal** will not be eligible for CPSR.

> Producers are strongly encouraged to use the Canadian Grain Commission's Variety Designation Lists (*www.grainscanada.gc.ca*) that indicate the varieties belonging to each class of wheat in Canada, and the complete list of varieties being designated to another class, effective Aug. 1, 2018 and beyond. For complete and up-to-date information on the Canadian Wheat Class Modernization initiative, visit CGC's website. It is also recommended producers use the Canadian Food Inspection Agency's List of Registered Varieties (*www.inspection.gc.ca*) to determine registration status of varieties.

Winter Wheat

Main Characteristics of Varieties

Category and Variety	Years Tested	Yield (%) Area 1 & 2	Yield (%) Area 3 & 4	Protein (%)	Winter Survival	Resistance To[2] Lodging	Stem Rust	Leaf Rust	Stripe Rust	Bunt	FHB	Head Awnedness	Relative Maturity	Seed Weight (mg)	Volume Wt.[3] (kg/hL)	Height (cm)
CWRW[1]		-- Relative to CDC Buteo --											------- Relative to CDC Buteo -------			
CDC Buteo	16	100	100	12.3	VG	F	I	I	S	S	MR	Y	M	32.8	81.0	91
CDC Chase	5	110	109	+0.3	F	F	R	R	MR	S	MS	Y	M	-0.5	-0.2	+3
AAC Elevate ✪	6	109	104	-0.1	G	VG	MR	I	MS	MR	I	Y	M	+4.3	-2.2	-7
Emerson	5	105	95	+0.4	G	G	R	I	MR	S	R	Y	M	-4.1	-0.8	-5
Flourish	8	101	101	+0.3	F	VG	I	I	I	MR	S	Y	E	+2.3	-1.7	-11
AAC Gateway	6	101	101	+0.5	F	VG	MR	I	MR	S	I	Y	M	-0.1	-1.5	-14
AAC Goldrush ✪	4	113	120	+0.2	VG	G	MR	R	I	S	I	Y	M	+0.3	-1.7	-4
Moats	9	108	101	+0.4	G	F	R	R	MR	MS	S	Y	M	-0.3	-0.4	+1
Radiant	16	103	101	-0.3	VG	VG	S	S	MS	S	S	Y	L	+1.7	-1.9	0
AAC Wildfire ✪	5	116	117	0.0	VG	G	S	I	R	MR	MR	Y	VL	+2.6	-1.2	-5
CWSP[1]																
Accipiter	7	110	106	-0.9	G	VG	R	I	S	S	MS	Y	M	-1.1	-0.9	-7
Broadview §	6	97	100	-0.8	G	G	R	R	S	S	S	Y	E	-1.5	-1.6	-10
CDC Falcon	16	103	98	-0.8	F	VG	MR	MR	S	S	S	Y	E	-3.0	-1.9	-16
AAC Icefield ✪	4	119	95	-0.9	F	VG	MR	R	R	S	MS	Y	M	-1.7	-1.5	-10
Peregrine	7	114	110	-1.0	VG	F	I	MR	MR	S	I	Y	M	+0.6	-1.0	+6
Pintail	5	109	110	-1.7	VG	G	MS	MS	MR	S	S	N	M	-4.2	-3.4	-3
CDC Ptarmigan	10	113	113	-2.0	G	F	S	S	S	S	I	N	M	0.0	-4.6	+2
Sunrise	6	114	118	-1.2	G	G	MR	MR	MR	S	---	Y	M	-1.0	-4.4	-2
Swainson	6	118	115	-0.5	F	F	R	R	MR	S	---	Y	M	+3.4	-2.6	+5

[1] Includes direct and indirect comparisons with **CDC Buteo**
[2] Resistance ratings: R = Resistant; MR = Moderately Resistant; I = Intermediate Resistance; MS = Moderately Susceptible; S = Susceptible.
[3] Multiply by 0.8 = lbs per bushel

ADDITIONAL INFORMATION

Winter wheat can be grown successfully in most areas if seeded into standing stubble within the optimal seeding date period (generally before Sept. 15) and if there is adequate snowfall.

Winter wheat will often escape fusarium head blight and wheat midge damage if recommended seeding dates are followed.

Radiant and **AAC Elevate** have tolerance to the wheat curl mite vector that transmits Wheat Streak Mosaic Virus. To preserve the effectiveness of this wheat curl mite tolerance gene, agronomic practices that eliminate the “green bridge” of plant material that serves as a reservoir for mites should be followed whenever possible.

AAC Wildfire expresses tolerance to Biotype 1 of the Russian wheat aphid.

The new CWSP variety **AAC Icefield** has a hard white kernel. It has been granted interim registration to facilitate market research. **AAC Icefield** expresses high milling yield of very white flour and good gluten strength at lower protein concentrations that may be of interest in some niche markets.
CDC Ptarmigan has a soft white kernel. **Sunrise** has a soft red kernel. **Radiant** and **AAC Wildfire** express bronze chaff at maturity.

The awnless head of **CDC Ptarmigan** and **Pintail** may improve palatability when harvested for forage or silage.

Seed of the new variety **AAC Elevate** is expected to be available in fall 2017. Seed of the new varieties **AAC Wildfire**, **AAC Goldrush** and **AAC Icefield** will not be available in 2017.

Rye

Main Characteristics of Varieties

Variety	Years Tested	Yield (%) Area 1 & 2	Yield (%) Area 3 & 4	Protein (%)	Resistance To[1] Winter Survival	Lodging	Shattering	Ergot	Heading Date (days)[2]	Maturity (days)[3]	Seed Weight (mg)	Volume Weight (kg/hL)[4]	Height (cm)	Falling Number (seconds)
		------ Relative to Hazlet ------							----------	----------	Relative to Hazlet		----------	
Open-Pollinated Varieties														
Hazlet	13	100	100	10.9	VG	G	VG	MS	June 8	August 3	37.1	73.6	103	166
Prima	26	82	93	0.6	VG	F	F	MS	0	-3	-4.4	-1.2	+12	+55
Hybrid Varieties														
Bono	4	124	123	-1.3	VG	VG	---	MS	+1	0	-5.3	-1.2	-11	+121
Brasetto	5	116	122	-1.0	VG	VG	---	MS	0	+1	-3.9	-1.7	-9	+107
Guttino	5	115	127	-0.9	VG	VG	---	MS	+1	0	-4.6	-0.9	-12	+148

[1] Resistance ratings: R = Resistant; MR = Moderately Resistant; I = Intermediate Resistance; MS = Moderately Susceptible; S = Susceptible.
[2] Average heading date relative to **Hazlet**. Flowering typically occurs 7-14 days after heading, depending on weather conditions.
[3] Average maturity date relative to **Hazlet**. Wet and cool conditions can prolong maturity beyond these dates.
[4] Multiply by 0.8 = lbs per bushel.

RYE ADDITIONAL INFORMATION

Fall rye is much more cold tolerant than winter wheat or winter triticale, with field survival being approximately 30-100% better than winter wheat for current fall rye varieties.

A major factor in marketing rye grain into the milling market is sprouting. This is generally measured using the Hagberg falling number test and is measured in seconds. Typically, a falling number of 180 seconds or greater is preferred by the rye milling market. Falling number is heavily influenced by moisture around harvest time, and producers must make sure rye is harvested in a timely manner, similar to wheat crops. There is considerable variation in fall rye varieties for falling number; this must be considered if the milling market is the targeted end-user for rye grain.

Very little recent information on shattering in rye has been obtained, as it has not been observed in field trials recently, thus no information is available for recently released varieties.

Triticale

Main Characteristics of Varieties

Variety	Years Tested	Yield (%) Area 1 & 2	Yield (%) Area 3	Test Weight (kg/hL)	Seed Weight (mg)	Height (cm)	Maturity	Resistance To[1] Lodging	Stem Rust	Leaf Rust	Bunt	Root Rot	Ergot	FHB
Spring Habit		---------- Relative to AC Ultima ----------												
AC Ultima	20	100	100	70.1	44.0	101	104	G	R	R	R	I	MS	I
Brevis	9	110	110	+3.7	-3.0	-7	+1	VG	R	R	R	---	I	I
Bunker	4	92	---	+3.0	+1.1	+5	+1	G	MR	R	R	I	I	MR
AAC Delight ✪	4	101	---	+1.7	-0.1	-2	+2	VG	R	R	R	---	I	I
Pronghorn	20	98	100	-0.3	+0.5	+7	+2	G	MR	R	R	I	I	MR
Sunray	6	104	99	-1.7	-4.4	-1	+1	G	R	R	R	---	MR	MS
Taza	4	106	---	-0.5	-1.9	+6	+2	G	R	R	R	---	I	S
Tyndal	4	99	---	+1.8	-3.2	-6	0	G	R	R	R	---	---	MS
Winter Habit		---------- Relative to Pika ----------												
Pika	6	100	100	68	---	125	E	F	---	---	---	---	---	---
Luoma	5	100	96	-1.0	---	+1	L	F	---	---	---	---	---	---
Metzger	5	96	101	-1.0	---	-14	E	G	---	---	---	---	---	---

[1] Resistance ratings: R = Resistant; MR = Moderately Resistant; I = Intermediate Resistance; MS = Moderately Susceptible; S = Susceptible.

ADDITIONAL INFORMATION

Spring triticale matures 2-4 days later than **AC Andrew** CWSWS wheat; therefore it should be planted as early as possible. Newer triticale varieties yield 2 to 10% higher than **AC Andrew**. Susceptibility to fusarium head blight is at least as great in triticale as in wheat. **AC Ultima** has an improved Hagberg Falling Number. **Brevis** has shorter and stronger straw. **AAC Delight**, **Tyndal** and **Bunker** are spring forage types, and, along with **Taza**, have reduced awns.

Winter triticale has winter hardiness equal to that of winter wheat. **Luoma** and **Metzger** have reduced awns. **Metzger** is shorter with stronger straw.

All triticale cultivars are susceptible to ergot infection and similar in reaction. Severe infestation of ergot can occur in any of the available cultivars if environmental conditions are favourable. **Sunray** represents an improvement in ergot resistance.

Malting Barley

Main Characteristics of Varieties

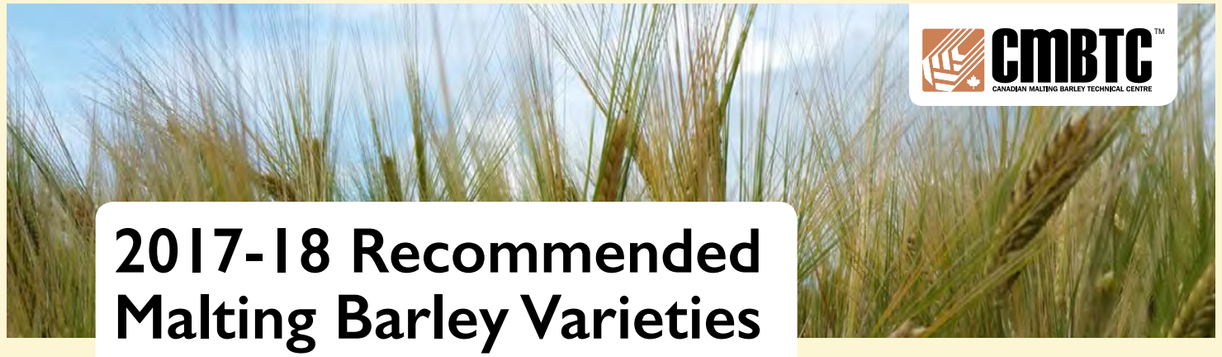
Category[1] and Variety	Years Tested	2 or 6 Row	Awns[2]	Yield (% AC Metcalfe) Area 1 & 2	Yield (% AC Metcalfe) Area 3 & 4	Relative Maturity[3]	Resistance To[4] Lodging	Netted Net Blotch[5]	Spotted Net Blotch[5]	Spot Blotch	Scald	Loose Smut	Other Smuts	Root Rot	Stem Rust	FHB
Malting Acceptance: Recommended																
AC Metcalfe	11	2	R	100	100	M	G	S	I	I	MS	R	I	I	MR	I
Bentley	7	2	R	113	112	L	G	MS	R	I	MS	MS	MR	I	MR	MS
CDC Copeland	8	2	R	107	108	M	G	I	I	S	MS	MS	I	I	MR	I
CDC Kindersley	7	2	R	105	107	E	G	MS	MR	I	S	S	R	I	MR	I
Newdale	6	2	R	112	113	M	G	I	MR	I	MS	S	MR	MR	MR	I
CDC PolarStar[7]	7	2	R	104	99	M	F	S	MR	MS	S	S	R	MS	S	MR
AAC Synergy	7	2	R	118	118	M	G	MR	R	R	S	S	I	I	MR	MS
Celebration	7	6	S	109	107	M	VG	S	MR	MR	S	R	R	MS	I	MS
Legacy	6	6	S	104	101	M	G	S	MR	MR	MS	I	MR	MR	MR	MS
Tradition	5	6	S	112	107	M	VG	S	I	MR	MS	S	MR	MR	MR	S
Other[6]																
CDC Bow	5	2	R	116	111	M	VG	S	MR	I	MS	S	I	MS	MR	MS
Cerveza	7	2	R	113	117	M	G	MS	MR	R	S	R	R	I	MR	I
CDC Fraser	4	2	R	113	116	M	G	MR	R	MR	MS	R	R	MS	MR	MR
Harrington	11	2	R	95	89	M	F	S	MS	S	MS	MS	MS	I	MS	MR
CDC Landis	7	2	R	109	109	M	G	I	R	I	S	S	MR	MS	MR	MR
Major	7	2	R	112	115	M	G	I	MR	MR	S	R	MR	MS	MR	I
CDC Meredith	7	2	R	114	112	L	G	MS	R	MS	MS	R	MR	I	MR	I
Merit 57	7	2	R	109	107	L	G	MS	R	MS	I	S	I	MR	I	MS
CDC PlatinumStar[7]	5	2	R	105	104	M	F	I	MR	S	S	S	R	S	I	MR
CDC Anderson	7	6	R	107	108	M	G	MS	MR	R	MS	MR	R	I	I	I
CDC Battleford	6	6	S	108	108	M	G	MS	R	R	MS	MS	MR	MR	MR	S
Lacey	4	6	S	101	101	M	G	S	I	MR	MS	I	MR	MR	MR	S

[1] These categories are established annually by the Canadian Malting Barley Technical Centre (Call 204-984-4399 for more information).
[2] R=Rough, S=Smooth
[3] Relative maturity: The relative maturity of the check, **AC Metcalfe**, is M (on average, 91 days from seeding to swathing ripeness).
[4] Resistance ratings: R = Resistant; MR = Moderately Resistant; I = Intermediate; MS = Moderately Susceptible; S = Susceptible.
[5] There are two forms of net blotch, netted (*Pyrenophora teres f. teres*) and spotted (*Pyrenophora teres f. maculata*). Generally, in Saskatchewan the netted form is more prevalent.
[6] Although not on the CMBTC list, a malting barley market may exist for these varieties.
[7] **CDC PolarStar** and **CDC PlatinumStar** are available only through a closed loop Identity Preserved program offered by Prairie Malt Limited/Sapporo Breweries and their agents.

ADDITIONAL INFORMATION

Growers are reminded that the malting and brewing industry is cautious about using new varieties. Growers are cautioned that most malting varieties, especially two-row barley, are more susceptible to sprouting.

Lines Tested for Malting and Brewing Quality
Small scale tests are a good measure of malting potential, but are not sufficient to determine the commercial acceptability of malting varieties. Final acceptance is given only after two years of successful plant scale evaluation. Several carload lots of barley are malted and brewed. The beer is then given the ultimate test – a taste panel. This process normally takes a minimum of three years since a crop grown in one year will be malted in January-February, brewed in May-June, and aged and tasted in October-November of the following year.



CMBTC™ CANADIAN MALTING BARLEY TECHNICAL CENTRE

2017-18 Recommended Malting Barley Varieties

The following varieties of two-row and six-row malting barley are registered with the Canadian Food Inspection Agency (CFIA) based on good agronomic properties and malting quality criteria. These varieties have been pilot scale tested by the CMBTC and exhibit good malting and brewing characteristics. In addition to market opportunities, seeding decisions should be based on agronomic considerations and feedback from your grain company representative, local elevator operators or malting companies. Visit the CMBTC website at **www.cmbtc.com** for detailed pilot malting and brewing data.

Two-Row Varieties

VARIETY	MARKET COMMENTS
CDC Copeland[1]	Established Demand
AC Metcalfe[1]	Established Demand
AAC Synergy[4]	Growing Demand
Bentley[2]	Limited Demand
Newdale[3]	Limited Demand
CDC PolarStar[2]	Limited Demand
CDC Kindersley[1]	Under Commercial Market Development

For Bentley or Newdale contracting opportunities contact Canada Malting Company. For CDC PolarStar (and CDC PlatniumStar) contracting opportunities contact Prairie Malt-Cargill.

The CMBTC and its members recommend:

- Talk with your local malting barley buyer about opportunities in your area to grow and market two-row and six-row malting barley varieties.
- Use certified seed to ensure varietal purity, reduce disease incidence and increase the likelihood of selection for malt.

Six-Row Varieties

VARIETY	MARKET COMMENTS
Legacy[3]	Limited Demand
Tradition[3]	Limited Demand
Celebration[2]	Limited Demand

New Varieties in Development

The following varieties have been registered with CFIA and are undergoing seed propagation. Both varieties have been pilot scale tested at the CMBTC and exhibit good quality characteristics suitable for all malt and adjunct brewing styles.

VARIETY	COMMENTS
AAC Connect[2]	Two-Row - Undergoing seed propagation
CDC Bow[1]	Two-Row - Undergoing seed propagation

The following companies have pedigreed seed distribution rights for those varieties that are footnoted:

1 – SeCan	2 – CANTERRA SEEDS
3 – FP Genetics	4 – Syngenta

Questions? Call your selector, seed company, grain handling company or contact the CMBTC.

cmbtc.com

Canada

Peter Watts - Managing Director
Tel: 204-983-1981 E-mail: pwatts@cmbtc.com

Dr. Yueshu Li - Director of Malting & Brewing Operations
Tel: 204-984-0561 E-mail: yli@cmbtc.com

Feed and Food Barley

Main Characteristics of Varieties

Category and Variety	Years Tested	2 or 6 Row	Awns[1]	Yield (% AC Metcalfe) Area 1 & 2	Yield (% AC Metcalfe) Area 3 & 4	Relative Maturity[2]	Resistance To[3] Lodging	Netted Net Blotch[4]	Spotted Net Blotch[4]	Spot Blotch	Scald	Loose Smut	Other Smuts	Root Rot	Stem Rust	FHB
Hulled																
Altorado	4	2	R	117	111	M	VG	S	MR	MS	S	MR	MR	MR	MR	I
CDC Austenson	7	2	R	118	121	M	G	MS	R	MR	S	S	R	I	I	I
Brahma	7	2	R	114	115	M	G	S	I	S	MS	MS	R	MR	MS	I
Canmore	6	2	R	113	117	L	G	MS	MR	I	MR	R	R	I	MS	I
Champion	8	2	R	117	117	M	G	S	I	MS	S	S	R	MR	I	I
Claymore	5	2	R	119	117	L	VG	S	I	I	S	S	R	I	MR	I
CDC Coalition	7	2	R	111	114	M	VG	S	MR	I	MS	R	MR	I	MR	I
CDC Cowboy	6	2	R	99	105	L	F	I	MR	I	MS	MS	MR	I	MR	MR
CDC Dolly	11	2	R	103	103	E	G	S	MS	MS	I	S	I	I	MS	MR
Gadsby	7	2	R	110	110	M	F	MS	MR	S	R	R	R	I	MR	I
CDC Helgason	7	2	R	105	106	M	G	MR	MR	I	MS	R	MR	I	I	MS
CDC Maverick	6	2	S	98	98	M	F	I	MR	I	MS	S	R	I	MR	MR
McLeod	6	2	R	108	114	M	G	S	I	S	MS	S	R	I	MS	I
Oreana	5	2	R	117	112	L	VG	S	MR	I	S	S	R	I	I	S
CDC Trey	5	2	R	104	110	M	G	I	R	I	MS	MS	R	MR	MR	I
Amisk	6	6	SS	113	116	M	G	I	MR	MR	I	S	MS	MS	MR	S
Chigwell	7	6	S	107	111	M	G	I	MR	MR	MR	MS	R	S	S	S
Muskwa	6	6	S	113	110	M	G	MS	MR	I	MR	MS	R	MS	MR	S
AC Rosser	11	6	S	115	115	M	G	I	MR	MR	S	MS	MR	MR	MR	S
Sundre	5	6	S	120	116	L	G	MS	I	I	R	MS	R	MS	I	S
Hulless																
CDC Ascent	3	2	R	101	101	M	G	S	MR	I	MS	MR	MR	I	S	MR
CDC Carter	7	2	R	94	99	M	G	I	MR	I	MS	R	R	S	I	I
CDC Clear	7	2	R	96	103	L	G	MS	R	I	MS	R	R	I	MR	MR
CDC McGwire	8	2	R	98	99	M	G	I	MR	I	I	MS	MR	MR	I	MR
Taylor	7	2	R	82	87	M	VG	MS	MR	I	S	R	I	MS	MR	MR

[1] R = Rough, S = Smooth, SS = Semi-Smooth

[2] Relative maturity: The relative maturity of the check, **AC Metcalfe**, is M (on average, 91 days from seeding to swathing ripeness).

[3] Resistance ratings: R = Resistant; MR = Moderately Resistant; I = Intermediate; MS = Moderately Susceptible; S = Susceptible.

[4] There are two forms of net blotch: netted (*Pyrenophora teres f. teres*) and spotted (*Pyrenophora teres f. maculata*). Generally, in Saskatchewan the netted form is more prevalent.

ADDITIONAL INFORMATION

Most available varieties are susceptible to one or more types of smut. Therefore, seed of susceptible varieties should be treated with a registered fungicide on a regular basis.

Harvesting grain over 16% moisture and then using aeration bins for drying can lead to sprouting and embryo death. Seed with reduced germination is undesirable for seed or malting.

Two-row barley varieties are generally more resistant to shattering than six-row varieties.

Forage Barley

Desperado and **AC Ranger** are six-row forage varieties. **CDC Cowboy** and **CDC Maverick** are two-row forage varieties.

Hulless

In hulless varieties the hull is left in the field, therefore, comparable yields are 9-12% lower. Hulless seed is more susceptible to damage than hulled seed, so handling should be minimized.

Hulless Food

CDC Fibar and **CDC Rattan** are high beta-glucan, waxy starch varieties. **CDC Hilose** is a high beta-glucan, high amylose starch variety. All are available for specialty markets. **CDC Carter**, **CDC McGwire** and **Roseland** are two-row, normal starch, hulless barleys suitable for food use.

Irrigation

Disease resistance, straw strength and maturity are more critical when barley is grown under irrigation. Growers should select early, strong-strawed, disease-resistant varieties.

Oat

Main Characteristics of Varieties

Variety	Years Tested	Yield (% CDC Dancer) Area 1 & 2	Yield (% CDC Dancer) Area 3 & 4	Test Weight (g/0.5L)	% Hull	Hull Colour	% Plump	Relative Maturity[1]	Height (cm)	Resistance To[2] Lodging	Stem Rust	Crown Rust	Smut
CDC Dancer	8	100	100	253	19.8	White	86	M	103	G	I	I	R
SW Betania	7	105	105	245	22.0	White	82	M	97	G	S	MS	MR
CDC Big Brown	7	106	106	256	20.4	Tan	88	L	101	G	MS	R	R
CDC Boyer	8	99	100	232	23.3	White	85	M	105	G	I	I	MS
CS Camden	6	114	115	242	24.3	White	82	L	94	VG	S	MS	I
Derby	8	98	102	247	22.9	White	79	M	107	G	S	S	MS
CDC Haymaker	4	91	94	225	24.9	White	87	VL	111	G	S	S	MR
AAC Justice	6	111	107	255	22.4	White	75	L	101	G	I	I	R
Leggett	7	103	104	256	22.0	White	82	L	96	G	I	R	R
Lu	6	102	103	248	25.2	Yellow	58	E	99	G	S	S	MR
CDC Minstrel	7	106	107	245	21.0	White	92	L	98	VG	I	MS	R
AC Morgan	8	104	108	236	25.1	White	82	L	101	VG	S	S	I
CDC Morrison	4	101	90	248	24.4	Yellow	83	L	95	VG	I	MS	R
CDC Nasser	7	109	107	233	21.8	White	79	VL	106	G	MS	S	R
CDC Norseman	5	111	107	241	20.0	White	81	M	102	G	S	MR	MS
ORe3541M	3	106	100	257	21.5	White	90	L	93	VG	S	R	R
ORe3542M	3	111	99	247	22.5	White	95	L	93	VG	S	R	R
CDC Orrin	6	108	109	253	23.2	White	91	L	103	G	MS	S	R
Pinnacle	8	113	109	244	23.6	White	89	VL	101	F	I	S	R
Ronald	7	96	99	249	22.4	White	74	L	97	VG	I	S	R
CDC Ruffian	7	114	110	247	20.4	White	88	L	95	G	S	I	R
CDC Seabiscuit	7	110	106	240	20.3	White	89	L	100	G	I	S	MR
Souris	7	108	103	253	21.5	White	72	M	98	VG	MR	S	R
Stride	7	110	107	255	22.9	White	80	L	103	G	I	R	R
Summit	7	104	105	256	21.6	White	81	M	94	G	I	I	R
Triactor	7	114	118	240	22.8	White	80	L	99	G	S	MR	I
Varieties being tested for adaptability in Western Canada													
Akina	2	116	111	242	22.5	White	---	M	95	G	---	R	R
Bradley	5	105	102	240	21.7	White	81	L	103	VG	MS	MS	R
Kara	2	120	114	247	23.2	White	---	M	88	G	---	MR	MR

[1] Maturity Rating M = 96 days.

[2] Resistance ratings: R = Resistant; MR = Moderately Resistant; I = Intermediate Resistance; MS = Moderately Susceptible; S = Susceptible.

ADDITIONAL INFORMATION

Although disease pressure is lower in eastern Saskatchewan than in Manitoba, crown rust races capable of attacking most varieties, except **CDC Big Brown**, **Leggett**, **CDC Norseman**, **Stride**, and **Triactor**, are increasing in southeast Saskatchewan. Recent changes in the crown rust population have resulted in the *Pc91* resistance gene being no longer effective. As such, the crown rust ratings for **AAC Justice**, **CDC Morrison** and **Souris** have been redefined. In addition, the resistance genes present in **Summit** are also losing their effectiveness and therefore the crown rust rating for this variety has also been redefined. Early seeding will reduce the likelihood of severe infection.

Producers growing oats for the milling market are advised to check the “approved” varieties list available from the various oat millers.

Feed Oat

CDC SO-I and **CDC Nasser** are specialty feed oat varieties with higher digestible energy for cattle.

Forage Oat

CDC Baler, **CDC Haymaker** and **Murphy** are forage oat varieties available for annual forage production in Saskatchewan.

Hulless Oat

Bullion and **AC Gwen** are hulless varieties available for production in Saskatchewan. The hull is part of normal oat yield, thus hulless types yield less. They are difficult to handle and store and should be stored at less than 12% moisture.

False Oats or Fatuoids

False wild oats, or fatuoids, are off-types within common oat fields that have an appearance similar to wild oat, most notably a prominent, dark awn and increased hairiness at the base of each floret. They are thought to result from the infrequent cross-pollination between common oat (*Avena sativa*) and true wild oat (*Avena fatua*). As such, their presence will likely be observed more often in fields planted from farm-saved seed. They have been reported within fields of common oat at rates up to 1% and occur within all oat varieties.

General Seed Facts

PEDIGREED SEED
Use certified seed regularly. This assures that the seed has high genetic purity, high germination and is relatively free from weeds and other crop seeds.

RE-USE OF HYBRID SEED
Seed grown from a hybrid variety (regardless of crop or variety) should not be re-used, since a 20-25% yield reduction can occur in the next generation. This reduction is due to loss of hybrid vigour and possible occurrence of male-sterile plants. Lack of uniformity for maturity and quality traits can also occur.

SEED CLEANING
Seed should be cleaned carefully to remove weed seeds, trash, small or broken kernels, ergot and sclerotia. Not all seed-cleaning plants are equipped to clean grain to acceptable seed standards.

SEED TREATMENT
Various fungicides have been registered for the control of seedling diseases caused by soil- and seed-borne pathogens.

Use of seed from cereal crops infected with *Fusarium* species may result in poor emergence. Such seed should be treated with a registered fungicide before planting. Use of infected seed may introduce fusarium diseases into unaffected areas. Tolerance for fusarium vary with species. Refer to the Saskatchewan Agriculture publication *Seed-Borne Diseases of Cereal Crops* for more information.

Smuts that attack wheat, barley, oat and rye can be controlled by seed treatment. If seed from a crop in which bunt or smut was observed must be used for seed, seed should be tested and seed treatment should be considered. If the presence of smut is uncertain, varieties rated susceptible (S) should be treated every year, those rated moderately susceptible (MS) every second year and those rated intermediate resistance (I) every third year.

Only systemic fungicides will control true loose smut of barley and wheat, and stem smut of rye. Pathogens causing the other types of smut (covered, false loose, oat smut and bunt) are carried on the outside of the seed and can be controlled by non-systemic seed treatments.

The virulent form of blackleg of canola is widespread in Saskatchewan. Seed treatment with a recommended fungicide can reduce the level of disease. Use of canola seed commercially coated with an appropriate seed treatment is a convenient alternative to on-farm seed treatment.

Wireworms that attack all grain crops, and flea beetles that attack canola and mustard, can be controlled by seed treatments containing insecticides.

Read the label carefully before using any seed treatment. Information on their use and recommended rates is found in the Saskatchewan Agriculture publication *Guide to Crop Protection*. Carryover stocks of treated seed should be tested for germination before planting. Treated seed must not be delivered to an elevator or used for feed.

SEED-BORNE DISEASES OF PULSES
Pulse growers should use seed that has been tested for seed-borne diseases such as ascochyta, anthracnose and botrytis. Tolerances for seed infection vary with the pulse crop, the disease, weather conditions of the region and the availability of a seed treatment. If infection of the crop from sources other than seed is likely, using seed with low infection levels becomes less important.

In regions with frequent rainfall and high humidity, tolerances will be lower. Thus, for ascochyta blight of lentil, use of seed with up to 5 per cent seed infection is acceptable in the Brown and Dark Brown Soil Zones, but 0 per cent is desirable in the Black Soil Zone. A seed treatment for ascochyta-infected lentil seed is available and is recommended if seed infection levels approach 5%. In pea, up to 10% seed infection with ascochyta is acceptable. In chickpea, 0% ascochyta seed infection is recommended because of the high rate of transmission of the disease from the seed to the emerging seedlings and its highly destructive nature. Refer to the Saskatchewan Agriculture publication *Seed-Borne Diseases of Pulse Crops*.

CROP ROTATION
Seeding into stubble of the same crop kind will increase disease risk, particularly in higher rainfall areas. Residue of infected crops may harbour disease pathogens. Maintain a diverse crop rotation.

ERGOT
Ergot attacks all varieties of rye, triticale, wheat and barley, as well as most common grass species. Oat is rarely attacked and all broadleaf species are immune. Grain containing 0.1% ergot is considered poisonous and should not be used for food. Refer to the Saskatchewan Agriculture publication *Ergot of Cereals and Grasses*.

SEED INOCULATION
Legume crops obtain much of their nitrogen requirement by forming a symbiotic association with soil bacteria called *Rhizobium*. These bacteria colonize the roots to form structures called nodules, where they fix nitrogen for the legume plant. To enhance nitrogen fixation, the legume crop seed should be inoculated. **Use the proper strain of bacteria specific to that crop**. For further details, consult the *Pulse Production Manual* (Saskatchewan Pulse Growers).

DAMP AND FROZEN SEED
Seed that is stored damp or tough may be low in germination and may lack adequate vigour. Grain that will be used for seed should be dried, if necessary, soon after harvest. The drying temperature should be below 37°C for batch driers and 43°C for recirculating and continuous driers. Frozen grain should always be tested for germination by a seed-testing laboratory before planting. Such grain will frequently produce a high percentage of abnormal seedlings.

WHEAT MIDGE
All wheat classes, including durum and triticale, are susceptible to wheat midge. Farmers in infested areas should be prepared to spray fields with recommended insecticides if necessary, unless varieties are midge-tolerant. Consider the use of midge-tolerant varieties. Refer to the Saskatchewan Agriculture publication *Wheat Midge*.

OTHER CROPS

BUCKWHEAT
Buckwheat is sensitive to high temperatures and dry weather conditions in the blossom stage, which can reduce seed set and yields. New self-pollinated varieties are being released. Buckwheat is very susceptible to frost at all stages of growth. Delayed seeding is advisable to avoid spring frost.

CARAWAY
Caraway is a biennial spice crop, producing seed in the second year and sometimes in the third year. Seedlings are small, slow in developing and compete poorly with weeds. The crop is usually swathed because of its indeterminate growth habit and seed shattering.

CORIANDER
Coriander is an annual spice crop. Seedlings are small, slow to develop and compete poorly with weeds. The large seeded type is earlier maturing than the small seeded type. **CDC Major** is a large-seeded coriander variety and **CDC Minor** is a small-seeded variety. The crop is usually straight-cut to avoid wind damage in swaths. For more information, consult the Saskatchewan Agriculture publication *Coriander*.

FENUGREEK
Fenugreek is a leguminous spice crop adapted to dryland conditions in the Dark Brown and Brown Soil Zones. The crop should be seeded early to avoid yield and quality loss from fall frost. Contract production is advisable, as markets are limited.

SAFFLOWER
Safflower is an annual oilseed or birdseed crop that can be grown successfully in the Brown Soil Zone. Safflower must be sown early (late April).

Saffire matures in about 120 days. Seed should be planted shallow but into a firm, moist seedbed at about 30 kg/ha (27 lbs/ac). **Saffire** has moderate resistance to sclerotinia head rot and alternaria leaf spot. Contract production is advised.

Canaryseed

Main Characteristics of Varieties

Variety	Type	Site Years Tested	Yield[1] (%)	Days to Heading	Days to Maturity	Height (cm)	Test Weight (kg/hL)[3]	Seed Weight (g/1000)
			Relative to CDC Bastia					
CDC Bastia	glabrous	48	100	57	98	99	70.7	8.0
CDC Calvi[2] ✪	glabrous	34	108	+2	+3	+5	+0.6	+0.3
Cantate	hairy	48	115	+1	+2	-3	-6.7	+0.4
Keet	hairy	48	125	+4	+4	+2	-5.8	-0.2
CDC Togo ♨ §	glabrous	48	96	+1	0	-4	-1.4	+0.5

[1] Yield data not collected by Area
[2] 2011-2016 yield data; other varieties 2007 -2016
[3] multiply by 0.8 = lb per bushel

ADDITIONAL INFORMATION

The seed of annual canarygrass, more commonly called canaryseed, is used as food for caged and wild birds. Seed hulls of **CDC Bastia**, **CDC Calvi** and **CDC Togo** do not have the small sharp hairs that cause irritation when canaryseed is threshed and handled and are called glabrous. **CDC Calvi**, a new, higher yielding glabrous variety was registered in 2013.

Canaryseed plants have a dense, shallow root system and growing the crop on sandy soils is not recommended. Canaryseed may be grown successfully on stubble, provided adequate moisture is available for rapid germination and emergence. The recommended seeding rate is 34 kg/ha (30 lb/ac) with germination greater than 85%. Reduced emergence might be expected if canaryseed is seeded below 5 cm.

Canaryseed is subject to damage by English grain aphid and bird cherry oat aphid. Aphid populations build up rapidly on the leaves, stems and head of the plant in July and August and may require an insecticide application to prevent yield loss. Information from the United States indicates that infestations of 10 to 20 aphids on 50% of the stems prior to soft dough stage may cause enough damage to warrant insecticide application. The aphids often hide in the dense head of the canaryseed plant. Damage may occur at populations below these levels.

Canaryseed leaf mottle is a foliar disease that can cause yield losses. Leaf mottle is caused by a fungus, *Septoria triseti*, that only affects canaryseed. The disease is inconspicuous at early stages because there is little visual contrast between healthy and diseased leaf area. Stubble-borne inoculum is the source of infection, thus crop rotation is key in limiting the severity of leaf mottle.

In recent years *Fusarium* spp., particularly *F. graminearum*, were commonly found in a majority of the Saskatchewan canaryseed fields surveyed. The average incidence within fields was generally low (3-4%). In most instances there were no obvious infection symptoms and seed plating was required to detect the fungus. In some cases an orange discoloration arising from *Fusarium* infection is visible on the infected panicles in the field.

Canaryseed is resistant to shattering. It may be straight-combined or swathed when fully mature. For more information on canaryseed, consult the Saskatchewan Agriculture publication *Canaryseed*.

Root Rot Complex in Pulse Crops

By Dale Risula, Saskatchewan Agriculture

In the 1970s, pulse crops on the Canadian prairies had few root rot problems, but the root rot complex was always present. With repeated pulse cultivation, root rots have become a severe constraint to production.

Fusarium spp., *Pythium* spp., *Rhizoctonia solani* and *Aphanomyces euteiches* can all cause root rot in pulse crops in Saskatchewan. The root rot pathogens are often referred to as the root rot complex, since more than one pathogen can often be identified within a single field or within a single infected root.

Fusarium spp. (*F. avenaceum* in Alberta and Saskatchewan, *F. solani* in Manitoba) is the most prevalent root rot pathogen. These fungal pathogens can survive on infected stubble residue or as resting spores (only some species) and can cause seedling diseases in many different crops. It is a weak pathogen, but present on many crops. Infection by *Fusarium* spp. is favoured by moderate soil moisture and moderate temperatures.

Pythium spp. (*P. ultimum*, *P. irregulare*, and many others), are fungal-like organisms that cause rot and seedling blight resulting in seedling death or stunted growth. The pathogen overwinters in the soil as hard walled, long-lived resting structures known as oospores. The active stage of the pathogen is the zoospore stage. Zoospores are motile spores that need wet soils to move to and infect the host. Infection of pulse crops by *Pythium* spp. is generally favoured by cool, wet soils.

Rhizoctonia solani is a fungal pathogen. Many seed treatments that are effective against *Fusarium* spp. are not effective against *Rhizoctonia solani*. Infection is favoured by warm, dry soil. If infection occurs near the soil surface, a constriction in the stem may occur. *R. solani* mainly overwinters as mycelium and has a fairly wide host range.

Aphanomyces euteiches is an oomycete (like *Pythium* spp.). It produces zoospores that need water and long-lived resting spores (oospores). Infection is favoured by warm, wet soils. Host plants are susceptible to *A. euteiches* infection throughout the entire plant lifecycle. Peas and lentils are the most susceptible to aphanomyces root rot with all varieties being susceptible. Other pulses, including faba bean, chickpea and soybean, have good partial resistance. Accurate identification of the pathogen requires a DNA-based test. *A. euteiches* has recently been identified, based on molecular assessments, as the cause of severe damage in pea and lentil across the northern Great Plains region.

Risk factors for fusarium or aphanomyces root rot

Factor	Effects
Crop history	Short rotations between susceptible hosts builds up disease innoculum.
Soil moisture	Zoospores (*Aphanomyces*) are only released in wet soil. Wet soils stress pulse plants making them more susceptible to infection by root rot causal organisms.
Soil compaction	Heavy soils are more prone to water logging and soil compaction. Soil compaction impedes root growth and aeration.
Soil pH	Acidic soils with a pH range of 5.6-6.6 increase risk of root rot.
Soil temp	Optimal temperature for infection is 24°C.
Other soil-borne pathogens	Root rot pathogens act synergistically, increasing the impact on the crop.

Disease Management

Root rots can be caused by a complex of different organisms. An integrated approach should be used to manage root rots. Disease management activities should be almost complete **BEFORE** any crop is planted.

- Plan for a diverse crop rotation (four year minimum, six years away from pea or lentil if *A. euteiches* is confirmed in a field). Alternating cereals with broadleafed crops is best. However, rotation with different pulse crops can be useful if they carry different sources of resistance.
- Use varieties most adapted to your region with traits including high yield, suitable days to harvest and good disease resistance.
- Use seed with high germination and vigour, treated & inoculated, as well as as carries minimal or no seed-borne pathogens.
- Provide isolation from last year's heavily infected fields.
- Scout fields and apply a foliar fungicide only if required.
- Minimize damage to seeds during seeding, monitor for signs of stress and follow herbicide labels. Healthy seedlings are able to better withstand infections and recover from stress.

No strong sources of resistance have been identified for any of the root rot pathogens. Research to move genes for partial resistance and/or tolerance into breeding lines are in progress. Quantitative trait loci, (QTLs) for partial resistance (tolerance) have been identified. A diverse crop rotation and vigorous, inoculated seed is currently the best way to deal with root rot.

Seedling infection can be reduced using a fungicide seed treatment with more than one mode of action. Seed treatments only protect seedlings and do not provide protection later in the growing season. Seed treatment and vigorous seed provide for rapid development of strong plants, which are better able to sustain yield under moderate disease pressure.

No fungicides are registered against *A. euteiches* on pea. Ethoboxam (Intego Solo) is registered for early season suppression of aphanomyces root rot on lentil. It is important to remember that seed treatments will only provide suppression during the seedling stage but will not provide protection as the plant matures.

Root Rot Symptoms

In the field, symptom expression is not clear-cut. Most roots are infected with a pathogen complex, making it difficult to identify which pathogen is the major cause of concern.

Root diseases reduce the plant's ability to obtain water and nutrients from the soil

Above ground symptoms include stunting, yellowing, poor root growth, little nodulation and browning of root area.

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PULSE CROPS

Lentil

Main Characteristics of Varieties

Market Class	Variety	Herbicide Tolerance[1]	Years Tested[2]	Yield (% CDC Maxim) Area 1 & 2	Yield (% CDC Maxim) Area 3 & 4	Height (cm)	Days to Flower	Maturity Rating[3]	Resistance To[4] Ascochyta Blight	Resistance To[4] Anthracnose Race 1	Seed Coat Colour	Cotyledon Colour	Seed Weight (g/1000)
Small Red	CDC Maxim	CL	10	100	100	34	51	E/M	MR	MR	gray	red	40
	CDC Cherie		5	109	106	32	51	E/M	MR	I	gray	red	39
	CDC Dazil	CL	9	104	98	33	53	E/M	MR	I	gray	red	35
	CDC Imax	CL	10	96	82	35	51	E/M	MR	I	gray	red	45
	CDC Impact	CL	6	80	76	30	47	E	MR	MS	gray	red	34
	CDC Impulse ✪	CL	7	108	95	37	52	E/M	MR	MR	gray	red	44
	CDC Proclaim ✪	CL	6	105	101	34	51	E/M	MR	MR	gray	red	40
	CDC Red Rider		6	95	85	34	52	E/M	MR	I	gray	red	45
	CDC Redberry		6	97	99	34	50	E/M	MR	MR	gray	red	42
	CDC Redcliff		7	107	103	35	51	E/M	MR	I	gray	red	38
	CDC Redcoat		6	105	93	33	50	E/M	MR	MR	gray	red	39
	CDC Redmoon ✪		6	115	102	33	52	E/M	MR	MR	gray	red	41
	CDC Scarlet		8	105	103	35	53	E/M	MR	I	gray	red	36
Extra Small Red	CDC Impala	CL	8	94	91	30	51	E	MR	MR	gray	red	31
	CDC Imperial	CL	6	84	79	30	49	E	MR	MR	gray	red	30
	CDC Redbow		6	102	99	30	49	E	MR	MR	gray	red	32
	CDC Rosebud		6	100	99	30	50	E	MR	MR	tan	red	31
	CDC Rosie		7	92	90	33	52	E/M	MR	MR	gray	red	30
	CDC Roxy ✪		6	103	102	34	53	E/M	MR	MR	gray	red	32
Large Red	CDC KR-1		10	110	92	37	52	M	MR	MR	gray	red	56
	CDC KR-2 ✪	CL	6	105	85	37	52	M	MR	MR	gray	red	55
Small Green	CDC Imvincible	CL	10	96	83	33	49	E	MR	MR	green	yellow	34
	CDC Kermit ✪		7	106	102	36	49	E/M	MR	MR	green	yellow	34
	CDC Viceroy		6	97	98	34	49	E	MR	MR	green	yellow	33
Extra Small Green	CDC Asterix		9	99	101	30	48	E	MR	I	green	yellow	26
Medium Green	CDC Imigreen	CL	7	78	71	44	50	M	MR	S	green	yellow	57
	CDC Impress	CL	6	87	71	34	50	M	MR	MS	green	yellow	52
	CDC Meteor		6	102	89	34	50	M	MR	S	green	yellow	51
	CDC Richlea		6	93	80	35	50	M	S	S	green	yellow	51
Large Green	CDC Greenland		7	89	70	38	52	M/L	MR	S	green	yellow	64
	CDC Greenstar		8	101	78	40	52	M/L	MR	I	green	yellow	73
	CDC Impower	CL	9	85	68	41	52	M/L	MR	S	green	yellow	64
	CDC Sovereign		6	83	77	40	52	L	MR	MS	green	yellow	66
French Green	CDC Marble		8	107	103	36	49	E	MR	I	green marble	yellow	34
	CDC Peridot	CL	6	84	94	37	48	E	I	MS	green marble	yellow	38
Green Cotyledon	CDC QG-1		5	80	65	42	51	M	I	I	green	green	49
	CDC QG-2		7	91	94	40	48	E	I	I	green marble	green	32
	CDC QG-3 ✪	CL	6	73	---	38	53	E/M	I	MR	green	green	46
Spanish Brown	CDC SB-3 ✪	CL	6	89	90	35	51	E	I	MR	gray dotted	yellow	38

[1] CL indicates Clearfield® tolerant variety.
[2] Co-op and Regional Trials in Saskatchewan since 2006. Comparisons to the check variety, small red lentil **CDC Maxim**.
[3] Maturity ratings: Normal maturity range in days based on May 1 seeding is E = 100, VL = 110 but maturity can be much earlier in dry years, much later in cool wet years. See Page 2 for more information on maturity range in lentil.
[4] Resistance ratings: R = Resistant; MR = Moderately Resistant; I = Intermediate Resistance; MS = Moderately Susceptible; S = Susceptible.

ADDITIONAL INFORMATION

Seed supplies may be limited for **CDC Greenstar**, **CDC Marble, CDC Scarlet** and **CDC Asterix**. Seed supplies will be limited for **CDC Impulse**, **CDC Roxy**, **CDC Proclaim**, **CDC Redmoon**, **CDC Kermit** and **CDC SB-3.**

Field Pea

Main Characteristics of Varieties

Variety	Years Tested[1]	Yield (% CDC Amarillo) 1, 2 & South 3	North 3 & 4	Irrigation	Leaf Type[2]	Relative Maturity	Lodging[3] (1-9)	Vine Length (cm)	Resistance To: Mycosphaerella Blight[4]	Powdery Mildew	Fusarium Wilt	Seed Coat Breakage	Bleaching	Seed Coat Dimpling[5]	Greenness[6]	Seed Weight (g/1000)
Yellow																
CDC Amarillo	8	100	100	100	SL	M	3.5	85	4.5	R	MR	F	n/a	F	G	230
Abarth	7	93	90	92	SL	E	3.5	75	5.0	R	I	F	n/a	G	G	280
DS Admiral §	6	78	80	80	SL	E	4.5	80	5.0	R	I	G	n/a	G	G	240
Agassiz	8	97	92	100	SL	M	4.5	85	5.0	R	I	G	n/a	F	G	230
AAC Ardill	6	103	97	87	SL	M	3.5	85	4.5	R	MR	G	n/a	G	G	230
CDC Athabasca	5	94	102	---	SL	M	3.0	85	4.5	R	I	---	n/a	F	G	300
CDC Bronco §	8	92	81	86	SL	M	4.5	75	4.5	R	I	G	n/a	G	G	230
AAC Carver	3	105	95	---	SL	E	4.0	85	5.0	R	I	---	n/a	F	G	240
CDC Centennial §	5	89	88	98	SL	E	5.5	70	5.0	R	I	G	n/a	G	F	270
Delta §	4	78	72	---	SL	E	5.5	70	5.5	S	---	G	n/a	---	---	250
Earlystar	5	92	91	---	SL	VE	5.0	80	5.0	R	I	F	n/a	G	G	210
Eclipse §	8	82	76	85	SL	M	4.0	80	5.0	R	MS	G	n/a	F	G	250
CDC Golden	8	91	81	90	SL	E	4.5	75	5.0	R	I	G	n/a	G	G	230
CDC Hornet	8	91	84	91	SL	M	4.0	85	4.5	R	I	F	n/a	G	G	220
CDC Inca	5	106	100	---	SL	M	4.0	85	4.5	R	I	G	n/a	G	F	230
AAC Lacombe	4	99	100	---	SL	M	3.5	85	5.0	R	I	F	n/a	F	F	250
CDC Meadow	8	90	87	90	SL	E	4.0	85	5.0	R	I	G	n/a	G	G	220
CDC Mozart §	7	87	79	90	SL	M	5.5	70	4.5	R	I	G	n/a	G	F	220
CDC Prosper	8	84	79	73	SL	E	4.5	80	5.0	R	MR	G	n/a	F	G	150
CDC Saffron	8	97	91	91	SL	E	4.0	80	4.5	R	I	G	n/a	F	G	250
CDC Spectrum	5	104	103	---	SL	M	3.5	85	4.5	R	I	---	n/a	G	F	240
Thunderbird	6	89	83	91	SL	M	4.0	85	5.0	R	I	G	n/a	G	F	220
CDC Treasure	8	88	87	93	SL	E	4.0	80	5.0	R	I	F	n/a	F	G	210
Green																
Cooper	8	89	80	85	SL	M	4.0	80	5.0	R	I	F	F	G	n/a	270
CDC Greenwater	7	99	91	86	SL	M	3.5	90	4.0	R	MR	G	G	F	n/a	230
CDC Limerick	8	96	89	90	SL	M	3.5	85	4.0	R	I	VG	G	G	n/a	210
CDC Patrick	8	87	84	87	SL	M	4.5	80	4.5	R	MR	G	G	G	n/a	190
CDC Pluto	6	93	82	91	SL	M	5.5	80	4.5	R	I	G	G	G	n/a	160
AAC Radius	5	78	76	---	SL	M	5.0	85	4.5	R	I	VG	G	G	n/a	230
CDC Raezer	8	82	81	94	SL	E	3.5	85	5.0	R	MR	G	G	G	n/a	220
AAC Royce	4	90	84	---	SL	M	5.0	70	5.0	R	I	F	G	---	n/a	260
CDC Sage	5	73	71	73	SL	M	4.0	80	5.0	R	MR	G	G	F	n/a	220
CDC Spruce	5	95	100	---	SL	M	4.0	85	4.5	R	I	---	G	F	n/a	240
CDC Striker	8	82	81	84	SL	M	3.5	80	4.5	S	MR	VG	G	G	n/a	240
CDC Tetris	8	90	91	88	SL	M	4.0	85	4.5	R	MR	G	F	G	n/a	210
Red																
Redbat 8	4	93	82	---	SL	M	5.0	85	5.0	R	---	---	n/a	G	n/a	200
Redbat 88	3	92	91	---	SL	M	4.5	90	4.5	R	---	---	n/a	G	n/a	190
Maple																
CDC Acer	3	84	73	---	SL	M	6.5	60	5.0	R	---	G	n/a	VG	n/a	170
CDC Blazer	2	99	92	---	SL	M	5.0	80	5.0	R	---	---	n/a	VG	n/a	190
AAC Liscard	3	92	90	---	SL	M	4.0	85	5.0	R	---	---	n/a	VG	n/a	200
CDC Mosaic	4	81	74	58	SL	M	4.0	85	4.5	R	---	G	n/a	VG	n/a	180
Dun																
CDC Dakota	7	105	99	95	SL	M	3.5	85	4.5	R	---	G	n/a	VG	n/a	205
Forage																
CDC Horizon	4	88	78	63	SL	M	4.5	100	4.5	R	---	G	n/a	G	G	170
CDC Leroy	3	82	75	75	SL	M	5.0	85	4.5	R	---	G	n/a	G	G	150
CDC Tucker	3	83	77	74	SL	M	4.0	90	4.5	R	---	G	n/a	G	F	170
40-10	3	68	65	47	N	M	8.5	130	4.5	S	---	G	n/a	G	---	140

[1] Co-op and regional trials in Saskatchewan
[2] N = normal leaf type; SL = semi-leafless
[3] Lodging score (1-9) where 1 = completely upright, 9 = completely lodged
[4] Mycosphaerella blight score (1-9) where 1 = no disease, 9 = completely blighted
[5] Seed Coat Dimpling: VG = 0-5%; G = 6-20%; F = 21-50%
[6] Greenness: Good = 0-15%; Fair = 16-40%

FIELD PEA ADDITIONAL INFORMATION

The following varieties have purple flower colour and pigmented seed coats: **CDC Acer**, **CDC Blazer**, **AAC Liscard**, **CDC Mosaic**, **CDC Dakota** and **40-10**. **CDC Acer**, **CDC Blazer**, and **CDC Mosaic** have a maple patterned seed coat, **AAC Liscard** and **40-10** have a speckled seed coat, while **CDC Dakota** has a solid dun (tan) coloured seed coat. All other varieties have white flower colour and non-pigmented seed coats.

The relative maturity of the check variety **CDC Amarillo** is M (Medium), which is on average 95 days from seeding to swathing ripeness.

For detailed production information consult the *Pulse Production Manual* published by Saskatchewan Pulse Growers.

Soybean

Main Characteristics of Varieties

Variety	Canadian Marketing Agent	Company Maturity Grouping[1]	Type[2]	Hilium Colour[3]	Years Tested	Yield (% NSC Reston R2Y)[4] South	North	Days to Maturity
NSC Reston RR2Y	NorthStar Genetics Manitoba	00.1	RR2	BL	5	100	100	121
P002T04R	DuPont Pioneer	00.2	RR1	TN	3	88	98	118
NSC Watson RR2Y	NorthStar Genetics Manitoba	000.8	RR2	IY	2	92	99	119
S0009-M2	Syngenta Canada	000.9	RR2	IY	2	93	106	119
22-60RY	DEKALB	000.9	RR2	BL	3	94	104	121
LS NorthWester	Delmar Commodities	00.2	RR2	BL	3	95	96	123
Bishop R2	SeCan	00.2	RR2	IY	5	92	100	123
23-60RY	DEKALB	00.2	RR2	BL	4	103	101	123
P006T78R	DuPont Pioneer	00.6	RR1	BR	2	104	104	124
S007-Y4	Syngenta Canada	00.5	RR2	IY	3	106	110	124
23-11RY	DEKALB	000.9	RR2	BL	3	98	99	124
McLeod R2	SeCan	00.3	RR2	BL	5	101	102	124
TH 35002R2Y	Thunder Seeds	00.2	RR2	BL	3	99	99	125
TH 33003R2Y	Thunder Seeds	00.3	RR2	BR	5	100	101	125
NSC Tilston RR2Y	NorthStar Genetics Manitoba	00.4	RR2	BL	5	98	99	125
Mahony R2	SeCan	00.3	RR2	BL	3	105	109	125
TH 32004R2Y	Thunder Seeds	00.4	RR2	BL	5	106	103	125
PS 0035 NR2	PRIDE Seeds	00.3	RR2	BL	4	101	98	125
LS 002R24N	Delmar Commodities	00.2	RR2	BL	4	103	102	125
TH 33005R2Y	Thunder Seeds	00.5	RR2	BL	4	102	100	126
Lono R2	Brett Young	00.5	RR2	BL	3	105	108	126
Akras R2	Brett Young	00.3	RR2	BL	3	104	109	126
Hero R2	SeCan	00.4	RR2	BL	3	111	105	127
HS 006RYS24	Dow Seeds	00.6	RR2	BL	4	101	96	128

[1] In North America, soybean varieties are classified into maturity groupings from 9 in southern USA to 1 or 0 in southern Ontario. 00 refers to shorter season varieties than 0 types, while 000 refers to shorter season varieties than 00 types. The decimal point notation refers to differences within a class, for example, 00.1 should be a shorter season variety than 00.2.
[2] All varieties in this table are either Roundup Ready 1 or Genuity Roundup Ready 2 Yield™
[3] Hilum is the point where a seed attaches to the pod. BR-Brown, IY-Imperfect Yellow, IB Imperfect Black, BL-Black, GR-Grey, TN-tan.
[4] South: Boissevain, Melita, Hamiota, Redvers, Halbrite, Swift Current, and Indian Head; North: Dauphin, Roblin, Outlook (irrigated and dryland), Saskatoon, Floral, Kamsack, Rosthern, Melfort, and Scott.

ADDITIONAL INFORMATION

The soybean variety trial is coordinated by Manitoba Agriculture Food and Rural Development. Mean yield of the check variety **NSC Reston R2Y** was 47 bushels/acre in 2016, 43 bu/acre in 2015, and 41 bu/acre in 2014. Typical on-farm yields are 25-30 bu/acre. Soybean is not native to the Canadian Prairies and so must be inoculated with soybean inoculant that contains *Bradyrhizobium japonicum* bacteria.

Chickpea

Main Characteristics of Varieties

Market Class	Variety	Years Tested	Yield (% Amit) Area 1[1]	Yield (% Amit) Area 2[1]	Ascochyta Blight[2]	Height (cm)	Days to Flower	Maturity	Seed Weight (g/1000)	Seed Shape[3]	Seed or Seed Coat Colour[4]
Kabuli	Amit (B-90)	15	100	100	4.5	47	56	L	258	Ro	B
	CDC Alma	8	92	91	6.3	43	54	L	364	RH	B
	CDC Frontier	15	108	104	4.5	46	56	L	349	RH	B
	CDC Leader	11	109	108	4.5	42	54	M	390	RH	B
	CDC Luna	14	97	99	5.9	40	54	M/L	369	RH	B
	CDC Orion	10	108	106	5.1	45	51	L	434	RH	B
	CDC Palmer	6	109	106	4.9	44	53	M/L	418	RH	B
Desi	CDC Consul	9	113	112	4.0	46	53	M	303	P	LT
	CDC Corinne §	14	116	111	4.2	45	56	M	245	A/P	T
	CDC Cory	8	115	108	4.3	49	57	M	270	A/P	T
	CDC Vanguard §	14	108	108	4.9	43	53	M/L	222	P	T

[1] Area 1: Brown soil zone; Area 2: Dark Brown soil zone; see map on page 2.
[2] Ascochyta Blight at pod filling period: 0-9 scale; 0 = no symptom; 9 = plants are completely blighted. Scores 4-6 are considered intermediate resistance (I).
[3] Seed shape: Ro = Round; RH = Ram-head; P = plump; A = angular
[4] Seed or seed coat colour: B = beige; LT = light tan; T = tan.

ADDITIONAL INFORMATION

Please refer to *SaskSeed Guide 2017* for pedigreed seed availability. For more details on production, consult the *Pulse Production Manual* published by the Saskatchewan Pulse Growers (*www.saskpulse.com*).

Dry Bean

Main Characteristics of Varieties

Type	Variety	Years Tested[1]	Yield (% CDC Pintium) --- Irrigation	Yield (% CDC Pintium) --- Dryland	Days to Flower	Maturity Rating[2]	% Pod Clearance[3]	Seed Weight (g/1000)	Growth Habit[4]
Pinto	CDC Pintium	15	100	100	50	E	85	350	I
	Island	9	124	111	55	M	79	355	II
	Mariah	5	114	103	55	L	82	293	II
	CDC Marmot	7	112	109	50	E	80	367	I
	Medicine Hat	3	---	110	58	M	72	360	II
	Winchester	5	116	110	52	M	82	352	II
	CDC WM-2	10	119	108	52	E	79	365	II
Navy	Envoy	15	86	84	53	M	77	184	I
	Bolt	3	---	112	58	L	82	190	II
	Lightning	7	109	92	60	L	85	175	II
	Skyline	5	74	91	57	L	80	163	I
	OAC Spark	7	90	102	55	L	81	163	I
	Portage	4	111	96	52	M	85	175	II
Great Northern	AC Polaris §	7	97	98	52	L	70	310	III
Small Red	AC Redbond	8	98	100	51	M	65	290	II
Black	CDC Blackcomb	7	115	95	56	M	85	167	II
	CDC Blackstrap	6	124	120	58	M	85	195	II
	CDC Jet	15	100	97	58	L	85	170	II
	CDC Superjet	5	136	110	58	L	85	170	II
	Carman Black §	5	125	113	59	M	88	180	II
Shiny Black	AC Black Diamond	7	102	94	54	M	70	250	II
Yellow	CDC Sol	9	111	96	58	L	78	399	I

[1] Co-op and regional trials grown in narrow rows. Direct comparisons to **CDC Pintium** since 2002.
[2] Maturity ratings based on E = 100 days; L = 110 days for May 20 planting to swathing maturity. See page 2 for more information.
[3] Pod clearance: percentage of pods that completely clear the cutterbar at time of swathing (~4 cm).
[4] Growth habit: I = Determinate bush; II = Indeterminate bush; III = Indeterminate vine.

Faba Bean

Main Characteristics of Varieties

Variety	Years Tested	Yield (% CDC Fatima)	Height (cm)	Lodging[1] (1-9)	Maturity (days)	Seed Weight (g/1000)
Coloured Flower (normal tannin)						
CDC Fatima	11	100	106	3.8	105	520
CDC Blitz §	6	101	101	3.7	109	410
Fabelle[2]	4	105	104	2.4	105	533
FB9-4	9	92	95	3.7	104	680
Florent	4	112	102	2.3	107	660
CDC SSNS-1	10	91	109	3.4	105	335
Taboar	5	96	110	3.7	107	480
Vertigo	4	110	107	3.0	106	571
186S-11	6	106	105	3.1	106	749
247-13	4	107	103	3.4	106	620
White Flower (zero tannin)						
Imposa	4	110	99	2.4	107	695
Snowbird	11	104	96	2.6	104	495
CDC Snowdrop	8	94	98	2.6	104	335
Tabasco	5	101	96	2.3	106	530

[1] Lodging score (1-9) where 1 = completely upright, 9 = completely lodged.
[2] Low vicine.

ADDITIONAL INFORMATION

Faba bean regional trials began in 2006 to accommodate growing interest in this crop as a nitrogen-fixing high-protein food and feed grain in moist areas. White-flowered types are zero tannin. All coloured flower types have seed coats that contain tannins and may be suitable for export food markets if seed size and quality match customer demand. Maturity ratings are based on days until swathing maturity but will vary depending on seeding date.

Seed Quality and Seeding Rates are Crucial to a Good Plant Stand

By Saskatchewan Ministry of Agriculture

Seed quality and seeding rates are important for establishing good plant stands and—unlike the weather—are two factors we can control. Determining the quality of the seed starts with a seed test prior to buying seed or seeding the crop. Sending a seed sample to a qualified lab can provide information on germination, vigour, diseases present, purity and thousand kernel weight (TKW). All of these factors help to inform growers of whether the seed is suitable for planting. Germination tells us how many seeds are expected to germinate and the vigour gives an indication of how well the seedlings will thrive under stressful conditions. Disease tests identify the level of seed-borne diseases in the sample and help determine whether a seed treatment is recommended. Seed with good germination and a high disease level may still be suitable for planting as long as a seed treatment that controls the disease is used.

TKW and germination are needed when calculating the seeding rate, using the following formula:

Seeding rate (kg/ha) = (target plant population/m^2) x (TKW in grams) ÷ (expected seedling survival in per cent)

Crop	Target Plant Population (per m^2)	Target Plant Population (per ft^2)	TKW (grams)
Wheat – hard red spring	250	24	31 – 38
Wheat – CPS	250	24	39 – 50
Durum	210 – 250	20 – 24	41 – 45
Wheat – SWS	210 – 250	20 – 24	34 – 36
Barley – 2 row	210 – 250	20 – 24	40 – 50
Barley – 6 row	210 – 250	20 – 24	30 – 45
Oat	215 – 320	20 – 30	30 – 45
Triticale – spring	310	29	42 – 48
Mustard & Polish Canola	70 - 100	7 – 9	2 – 3
Yellow Mustard	70 - 100	7 – 9	5 – 6.5
Argentine Canola	70 - 100	7 – 9	2.5 – 7.5
Flax	300 – 400	30 – 40	5 – 6.5
Pea	85	8	125-300
Fababean	45	4	350-425
Lentil	105 - 147	10 – 14	30 – 80
Chickpea	44	4	220 - 450

Target plant populations for various crops are shown in the adjacent table. Expected seedling survival is typically 5-20% less than the germination rate with pulses and cereals—more under ideal conditions and less under adverse conditions. For canola, expected survival rates range from 40-60%. Factors to take into account when determining the expected seedling survival are seeding date, soil temperature, moisture and texture, as well as possible soil-borne diseases and insect pressures. The amount of seed-placed fertilizer and the seeding depth are factors that can also affect seedling survival.

OILSEED CROPS

Flax

Main Characteristics of Varieties

Variety	Years Tested	Yield[1] (% CDC Bethune) Area 1 & 2	Yield[1] (% CDC Bethune) Area 3 & 4	Yield[1] (% CDC Bethune) Irrigation	Relative Maturity[2]	Seed Size[3]	Resistance To Lodging	Resistance To Powdery Mildew[4]	Resistance To Fusarium Wilt[4]
CDC Bethune	10	100	100	100	L	M	G	MR	MR
AAC Bravo	5	100	103	102	L	L	G	MR	MR
CDC Glas	5	105	110	98	L	M	VG	MR	MR
Hanley §	4	90	90	93	M	M	G	MR	R
Lightning §	6	92	92	93	L	M	G	MR	R
CDC Neela	5	103	107	101	L	M	G	MR	MR
NuLin VT50	3	100	100	98	L	S	VG	---	MR
CDC Plava	3	97	104	93	M	M	G	---	MR
Prairie Blue	4	99	92	97	L	S	VG	MR	MR
Prairie Grande	6	92	94	92	M	M	VG	MR	MR
Prairie Sapphire	5	100	100	100	L	M	G	MR	MR
Prairie Thunder	8	95	95	98	M	M	VG	MR	R
CDC Sanctuary	7	103	101	96	L	M	F	MR	MR
CDC Sorrel	8	100	101	92	L	L	G	MR	MR
Taurus §	6	94	99	94	M	M	G	R	MR
Vimy	10	94	90	85	M	L	P	MS	MR
WestLin 60	3	93	95	89	M	M	G	---	MR
WestLin 70	3	93	103	95	L	L	G	MR	MR
WestLin 71	4	94	101	102	L	M	VG	MS	MR
WestLin 72	3	102	102	96	L	S	VG	MR	MR

[1] Data from Regional and Coop yield trials.
[2] Relative maturity: The relative maturity of the check, **CDC Bethune**, is L (on average 101 days from seeding to swathing ripeness).
[3] Seed size: S = Small, M = Medium, L = Large.
[4] Disease Resistance Scale: MS = Moderately Susceptible, MR = Moderately Resistant, R = Resistant.

ADDITIONAL INFORMATION

Flax was last tested in 2016. All cultivar descriptions other than yield are based on data from the Flax Pre-registration Trials in the Prairie Provinces. All cultivars are immune to rust.

Frozen flax should be analyzed by a feed testing laboratory to determine that it is free of prussic acid before using it as a livestock feed.

The Canadian Grain Commission (CGC) advises that **CDC Arras**, **Flanders** and **Somme** will be deregistered effective August 1, 2017.

Camelina

Camelina, sometimes known as false flax, is a short-season crucifer oilseed that can be grown on a wide range of soil types. It is well adapted to dryland conditions and does not tolerate excessive soil moisture.

Camelina seed is very small (1.0g/1,000 seed) and requires shallow seeding. Reduced emergence may be expected when camelina is seeded deeper than 1.5 cm (0.5 inch).

Camelina plants are resistant to blackleg disease and flea beetles and possess good shatter resistance. Camelina may be straight-combined at full maturity or swathed when pods have turned colour from green to yellow.

Camelina is grown almost exclusively under contract; both camelina oil and meal are marketed for food, feed and industrial applications. For more information on camelina, consult the Saskatchewan Agriculture publication *Camelina*.

MIDAS™ is a spring-type camelina cultivar with high seed yield and high oil content. **MIDAS**™ grows to medium heights (65 – 85 cm), flowers, depending on the weather conditions, after about 45 days and reach maturity 85 – 100 days after emergence.

MIDAS™ possesses quantitative resistance to downy mildew. Certified seed of **MIDAS**™ will be available to producers in 2017.

Mustard

Main Characteristics of Varieties

Type and Variety	Yield[1]	Plant Height (cm)	Hydroxylbenzyl Glucosinolate (µmol/g seed)	Allyl Glucosinolate (µmol/g seed)	Mucilage[2] (cS*ml/g seed)	Resistance to White Rust[3] 2a	Resistance to White Rust[3] 2v	Fixed Oil (% seed)	Protein (% Seed)	Seed Weight (g/1000)	Maturity (days)
Yellow	(% Andante)										
Andante[4]	100	102	145	n/a	55.7	n/a		28.4	35.1	6.0	93
AAC Adagio[5]	102	103	139	n/a	96.8	n/a		30.1	33.0	5.1	94
AC Pennant[4]	99	96	148	n/a	44.7	n/a		29.5	34.3	5.7	92
Brown	(% Centennial Brown)										
Centennial Brown[4]	100	117	n/a	10.4	n/a	S	S	36.3	30.1	3.1	92
Amigo[6]	93	109	n/a	13.9	n/a	R	S	34.2	30.7	2.7	98
AAC Brown 100[7]	105	123	n/a	12.8	n/a	R	R	34.9	30.7	3.5	92
Duchess[4]	99	113	n/a	9.4	n/a	S	S	38.1	28.7	2.7	92
Oriental	(% Cutlass)										
Cutlass[4]	100	115	n/a	11.6	n/a	R	S	41.0	29.1	2.8	91
Forge[4]	97	125	n/a	12.2	n/a	S	S	38.9	29.6	2.6	92
AAC Oriental 200[7]	106	124	n/a	11.7	n/a	R	S	37.0	30.0	2.7	92
AC Vulcan[4]	98	116	n/a	12.4	n/a	R	S	40.6	29.5	2.9	91

[1] Field data not collected by area.
[2] Mucilage in yellow mustard is a measurement of viscosity of aqueous extracts from seed.
[3] Varieties are rated S (Susceptible) or R (Resistant) to White Rust strains.
[4] Data from 1999-2012 Co-operative Mustard Test. Yield % of check: 124 station years for yellow mustard, and 117 station years for brown and oriental mustard.
[5] Data from 2009-2012 Co-operative Mustard Test (29 station years).
[6] Data from 2008-2010 Co-operative Mustard Test (21 station years).
[7] Data from 2012 yield test and 2013-2015 Co-operative Mustard Test (21 station years).

ADDITIONAL INFORMATION

Three types of mustard are grown in western Canada: yellow (*Sinapis alba*), and brown and oriental (*Brassica juncea*). Mustard is typically grown under contract, where the contractor specifies the variety to be grown to meet industry specifications for product quality. All mustard varieties have good resistance to blackleg disease and mature, on average, in 91 to 98 days.

AAC Adagio is a new yellow mustard variety registered in 2014. Breeder seed of **AAC Adagio** was produced in 2013.

The three yellow mustard varieties have similar yield. A unique feature of yellow mustard is high mucilage content. Mucilage is valued by the mustard industry as a stabilizer in prepared food products. **AAC Adagio** has significantly higher mucilage content, but smaller seed size and lower protein content than **AC Pennant** and **Andante**.

Brown mustard is grown primarily for the Dijon mustard market. **AAC Brown 100** is a new brown mustard variety registered in September 2015. It has higher (5%) yield than the check variety **Centennial Brown**. **AAC Brown 100** and has significantly higher allyl glucosinolate content as well as signicantly larger seed size than **Centennial Brown**.

AAC Oriental 200, registered in October 2015, has a higher (6%) yield and significantly lower oil content than **Cutlass**. **AC Vulcan** and **Forge** have higher allyl glucosinolate content than **Cutlass** and **AAC Oriental 200**.

Canola (Small Scale Trials)

Main Characteristics of Varieties

Variety (*B. napus*)	Distributor	LONG Season Zone (8 trials) Yield (% 5440)	Maturity (days)	Lodging (1-5)	Height (cm)	MID Season Zone (15 trials) Yield (% 5440)	Maturity (days)	Lodging (1-5)	Height (cm)	SHORT Season Zone (6 trials) Yield (% 5440)	Maturity (days)	Lodging (1-5)	Height (cm)	Disease Tolerance[1]
CHECK MEAN 5440 (bu/ac)		*47*				*60*				*51*				
Clearfield														
5545 CL	BrettYoung	105	96	3.0	119	99	101	2.5	125	100	117	2.8	109	BL
CS2200 CL	CANTERRA SEEDS	95	96	3.0	119	93	102	1.9	130	97	118	2.8	107	BL
PV 200 CL	Proven Seed / CPS	103	97	3.4	113	96	101	2.5	128	90	116	3.0	106	BL
LSD (%)[2]		*13*				*12*				*10*				
Liberty Link														
5440	Bayer CropScience	100	95	1.9	117	100	100	1.1	131	100	117	2.8	103	BL
L130	Bayer CropScience	95	95	2.4	111	98	99	1.3	128	94	114	2.3	102	BL
L252	Bayer CropScience	104	96	2.9	117	108	99	1.8	124	103	118	2.5	102	BL
LSD(%)[2]		*14*				*17*				*14*				
Roundup Ready														
6074 RR	Brett Young	100	94	2.3	119	99	102	1.8	127	110	116	2.5	100	BL/S
6080 RR	Brett Young	97	93	2.5	114	100	100	1.7	123	97	118	1.3	100	BL
6076 CR	Brett Young	101	96	2.6	122	95	101	2.0	131	99	117	2.3	107	BL/CR/S
6086 CR	Brett Young	107	94	2.3	119	99	102	2.1	130	98	119	2.5	104	BL/CR
CS2000	CANTERRA SEEDS	96	97	3.9	117	99	100	2.4	128	103	118	3.5	107	BL/CR
V12-1[3]	Cargill - VICTORY	100	93	2.5	115	96	100	2.1	123	98	115	2.3	102	BL
SY 4187	Syngenta	106	97	1.8	124	102	101	1.7	134	96	116	2.3	105	BL/CR
PV 533 G	Proven Seed / CPS	99	91	2.7	116	101	98	1.6	122	99	115	2.5	101	BL
VR 9562GC	Proven Seed / CPS	104	93	2.7	123	106	99	1.8	130	94	117	2.3	105	BL/CR
74-44 BL	Dekalb	97	92	3.2	109	100	98	2.0	117	99	115	2.5	97	BL
74-54 RR	Dekalb	97	96	3.5	120	96	98	2.5	119	97	118	3.5	95	BL/CR
73-75 RR	Dekalb	94	95	3.8	113	100	99	2.4	116	94	118	2.8	96	BL
45H33	Canola Growers	101	93	2.5	120	101	99	2.0	128	97	115	3.0	109	BL/CR
CS2100	CANTERRA SEEDS	105	93	3.3	113	---	---	---	---	---	---	---	---	BL
LSD(%)[2]		*12*				*11*				*12*				

[1] Indicates genetic disease resistance with an "R" or resistant rating to BL=Blackleg, CR=Clubroot and improved tolerance to sclerotinia "S", as based on variety descriptions submitted to CFIA.
[2] LSD = least significant difference (5% level) within herbicide system.
[2] Indicates varieties with Specialty oil profiles and premiums associated with pricing. Visit *www.canolaperformancetrials.ca* for more details.

CANOLA ADDITIONAL INFORMATION

Brassica napus (Argentine Canola)

Argentine varieties mature two weeks later than Polish varieties and are therefore better suited to the mid- and long-season growing areas of Saskatchewan. Blackleg disease, which is now widespread in Saskatchewan, can cause severe yield losses in varieties that are susceptible. Argentine varieties are susceptible to seed shattering when left standing at full maturity. Later maturing varieties tend to produce higher levels of green seed under wet and cool conditions at harvest, which can cause substantial grade reductions. The control of herbicide-tolerant canola volunteers requires good agronomic practices, such as proper crop and herbicide rotations.

Brassica rapa (Polish Canola)

Polish varieties mature approximately two weeks earlier than Argentine varieties and are less likely to produce green seed. Polish varieties are more heat and drought tolerant than the Argentine type. They are also more shatter resistant than Argentine varieties and are therefore well suited to straight combining. All current Polish varieties have poor resistance to blackleg, but blackleg is less of a threat in Polish canola because of its early maturity, which tends to reduce the impact of the disease on seed yields. Three synthetic Polish varieties are **Early One**, **ACS-C29** and **Synergy**. All three varieties yield significantly more than their open-pollinated counterparts like **AC Sunbeam**. **Early One** and **ACS-C29** are available through Mastin Seeds, while **Synergy** and **AC Sunbeam** are available through SeCan. (Source: AAFC, Saskatoon)

Brassica juncea Canola

Canola quality *Brassica juncea* is a class of canola that is especially well adapted to areas where hot, dry conditions are common. It has very good resistance to blackleg and exhibits better heat and drought tolerance than other *Brassica napus* canola. All production is contracted.

XCEED Canola, available from Proven Seed, Crop Production Services in 2017, is suited to the Brown and Dark Brown growing season zones. It is compatible with the Clearfield Production System (Source: CPS).

Least Significant Difference

When comparing average zone yields for varieties in the small plot data, the least significant difference (LSD) is about 10 to 17 bu/ac. If variety A yielded 52 bu/ac. and variety B yielded 45 bu/ac., they would be considered statistically the same. This is based on a confidence level that significant differences would occur by chance less than 5% of the time. In the small plot design used, varieties were grouped by herbicide system, which means that the LSD shown strictly applies to comparisons between varieties of the same herbicide system.

More importantly, comparisons between varieties within the same herbicide system reveal only genetic differences, whereas variety comparisons between herbicide systems compare the net effect of both genetic and herbicide effects (weed control and crop tolerance).

Where can you get the Canola Performance Trial results?

Results are available through an online interactive tool at *www.canolaperformancetrials.ca*. The interactive tool allows growers to explore many agronomic factors and to search for trial data in specific geographic areas near their farming operations. Details on management, operations and environmental data for each individual site are reported online. The online tool has an economic calculator that includes the costs associated with growing the selected variety to assist growers in determining potential profitability. Data is also available in booklet form and will be distributed through various publications or can be obtained from your local agri-retailer.

Sunflower

Main Characteristics of Hybrids

Hybrid	Herbicide Tolerance	Years Tested	Yield (% 63A21)	Average Maturity (days)	Harvest Moisture (%)
Oilseed EM (Early Maturing)					
63A21		7	100	110	18.5
Honeycomb NS		3	111	106	13.3
AC Sierra		7	68	105	16.1
Oilseed (Full Season)					
Cobalt II	Clearfield ®	3	76	115	30.4
Talon	ExpressSun ®	2	92	113	30.1
8N 270	Clearfield ®	7	92	115	23.6

ADDITIONAL INFORMATION

Sunflower requires 105-125 days to mature, depending on the cultivar and the growing season. Oilseed sunflower has been grown in the Dark Brown and Black soil zones in southeastern Saskatchewan. Harvest moisture is a good indication of how quickly these hybrids will be ready to combine in the field. The EM varieties are adapted to production in most areas of Saskatchewan. **AC Sierra** is open pollinated and not a hybrid.

The Saskatchewan Sunflower Committee has been conducting trials in Saskatchewan for the purpose of registration and demonstration since 1983. Sunflowers no longer require three years of yield testing to be sold in Saskatchewan. Saskatchewan Sunflower Committee will publish results from each year. For the complete data set, please email or call Sherri Roberts with Saskatchewan Agriculture at sherri.roberts@gov.sk.ca or 306-848-2856.

Breeding Institutions and Seed Distributors of Varieties Listed in this Publication

Crop Kind, Class & Variety	Breeding Institution	Distributor
WHEAT		
Canada Western Red Spring		
AAC Bailey	AAFC (Swift Current)	CANTERRA SEEDS
CDC Bradwell	U of S - CDC	SeCan Members
AAC Brandon	AAFC (Swift Current)	SeCan Members
AAC Cameron VB	AAFC (Brandon)	CANTERRA SEEDS
Carberry	AAFC (Swift Current)	SeCan Members
Cardale	AAFC (Winnipeg)	Seed Depot
Coleman	U of Alberta	Lefsrud Seed
AAC Connery	AAFC (Swift Current)	CANTERRA SEEDS
AAC Elie	AAFC (Swift Current)	Alliance Seed
Glenn	NDSU	CANTERRA SEEDS
CDC Go	U of S - CDC	Public release U of S - CDC
Go Early	U of Alberta	Mastin Seeds
Goodeve VB	AAFC (Swift Current)	Alliance Seed
Harvest	AAFC (Winnipeg)	FP Genetics
CDC Hughes VB	U of S - CDC	Proven Seed/CPS Canada
Infinity	AAFC (Swift Current)	CANTERRA SEEDS
AC Intrepid	AAFC (Swift Current)	CANTERRA SEEDS
AAC Jatharia VB	AAFC (Brandon)	SeCan Members
CDC Kernen	U of S - CDC	CANTERRA SEEDS
CDC Landmark VB	U of S - CDC	FP Genetics
Lillian	AAFC (Swift Current)	SeCan Members
CDC VR Morris	U of S - CDC	Proven Seed/CPS Canada
Muchmore	AAFC (Swift Current)	FP Genetics
CDC Plentiful	U of S - CDC	FP Genetics
AAC Prevail VB	AAFC (Winnipeg)	Alliance Seed
AAC Redberry	AAFC (Swift Current)	Alliance Seed
AAC Redwater	AAFC (Winnipeg)	SeCan Members
Shaw VB	AAFC (Winnipeg)	SeCan Members
SY Slate	Syngenta Seeds Canada Inc.	Syngenta Canada
CDC Stanley	U of S - CDC	Proven Seed/CPS Canada
Stettler	AAFC (Swift Current)	SeCan Members
CDC Thrive	U of S - CDC	Proven Seed/CPS Canada
Thorsby	U of Alberta	CANTERRA SEEDS
CDC Titanium VB	U of S - CDC	Proven Seed/CPS Canada
Unity VB	AAFC (Winnipeg)	SeCan Members
CDC Utmost VB	U of S - CDC	FP Genetics
Vesper VB	AAFC (Winnipeg)	SeCan Members
AAC Viewfield	AAFC (Swift Current)	FP Genetics
AAC W1876	AAFC (Swift Current)	Warburtons / CANTERRA
Waskada	AAFC (Winnipeg)	SeCan Members
WR859CL	Syngenta Seeds Canada Inc.	Richardson Intl
SY433	Syngenta Seeds Canada Inc.	Syngenta Canada
SY479 VB	Syngenta Seeds Canada Inc.	Alliance Seed
SY637	Syngenta Seeds Canada Inc.	Syngenta Canada
5604HR CL	Syngenta Seeds Canada Inc.	Proven Seed/CPS Canada
5605HR CL	Syngenta Seeds Canada Inc.	Proven Seed/CPS Canada
Canada Prairie Spring Red		
Conquer VB	AAFC (Winnipeg)	CANTERRA SEEDS
AAC Crossfield	AAFC (Winnipeg)	CANTERRA SEEDS
AAC Crusader	AAFC (Winnipeg)	CANTERRA SEEDS
AC Crystal	AAFC (Swift Current)	SeCan Members
Enchant VB	AAFC (Winnipeg)	FP Genetics
AAC Entice	AAFC (Winnipeg)	Proven Seed/CPS Canada
AAC Foray VB	AAFC (Winnipeg)	SeCan Members
AAC Penhold	AAFC (Swift Current)	SeCan Members
SY Rowyn	Syngenta Seeds Canada Inc.	Alliance Seed
AAC Ryley	AAFC (Swift Current)	SeCan Members
AAC Tenacious VB	AAFC (Winnipeg)	Alliance Seed
CDC Terrain	U of S - CDC	FP Genetics
SY985	Syngenta Seeds Canada Inc.	Proven Seed / Richardson Intl
SY995	Syngenta Seeds Canada Inc.	---
5700PR	Syngenta Seeds Canada Inc.	Proven Seed/CPS Canada
Canada Northern Hard Red		
AAC Concord	AAFC (Swift Current)	CANTERRA SEEDS
Elgin ND	NDSU	FP Genetics
Faller	NDSU	Seed Depot
Prosper	NDSU	Seed Depot
Canada Western Hard White Spring		
AAC Iceberg	AAFC (Winnipeg)	Alliance Seed
AAC Whitefox	AAFC (Winnipeg)	SeCan Members
Whitehawk	AAFC (Winnipeg)	SeCan Members
CDC Whitewood	U of S - CDC	SeCan Members
Canada Western Soft White Spring		
AC Andrew	AAFC (Lethbridge)	SeCan Members
AAC Chiffon	AAFC (Lethbridge)	SeedNet Inc.
AAC Indus	AAFC (Lethbridge)	SeCan Members
AAC Paramount	AAFC (Lethbridge)	SeCan Members
Sadash	AAFC (Lethbridge)	SeCan Members
Canada Western Special Purpose		
AAC Awesome	AAFC (Lethbridge)	SeCan Members
Charing	KWS-UK	SeCan Members
AAC Innova	AAFC (Lethbridge)	Alliance Seed
CDC Kinley	U of S - CDC	Public Release U of S - CDC
CDC NRG003	U of S - CDC	CANTERRA SEEDS
NRG010	AAFC (Swift Current)	CANTERRA SEEDS
AAC NRG097	AAFC (Swift Current)	CANTERRA SEEDS
Pasteur	Wiersum Plant Breeding	SeCan Members
AAC Proclaim	AAFC (Lethbridge)	FP Genetics
Sparrow VB	KWS-UK	SeCan Members
CDC Throttle	U of S - CDC	Public Release U of S - CDC
WFT603	Western Feed Grains Co-op	Western Feed Grains Co-op
SY087	Syngenta Seeds Canada Inc.	---
Varieties that have been registered with class to be determined by the Canadian Grain Commission		
AAC Tradition	AAFC (Winnipeg)	SeCan Members
Canada Western Amber Durum		
CDC Alloy	U of S - CDC	FP Genetics
Brigade	AAFC (Swift Current)	Proven Seed/CPS Canada
AAC Cabri	AAFC (Swift Current)	SeCan Members
CDC Carbide VB	U of S - CDC	Proven Seed/CPS Canada
AAC Congress	AAFC (Swift Current)	CANTERRA SEEDS
CDC Credence	U of S - CDC	CANTERRA SEEDS
AAC Current	AAFC (Swift Current)	Alliance Seed
CDC Desire	U of S - CDC	Syngenta Canada
AAC Durafield	AAFC (Swift Current)	SeCan Members
CDC Dynamic	U of S - CDC	Proven Seed/CPS Canada
Enterprise	AAFC (Swift Current)	CANTERRA SEEDS
Eurostar	AAFC (Swift Current)	SeCan Members
CDC Fortitude	U of S - CDC	Proven Seed/CPS Canada
AAC Marchwell VB	AAFC (Swift Current)	SeCan Members
AC Navigator	AAFC (Swift Current)	Proven Seed/CPS Canada
CDC Precision	U of S - CDC	Alliance Seed
AAC Raymore	AAFC (Swift Current)	SeCan Members
AAC Spitfire	AAFC (Swift Current)	SeCan Members
Strongfield	AAFC (Swift Current)	SeCan Members
AAC Stronghold	AAFC (Swift Current)	SeCan Members
Transcend	AAFC (Swift Current)	FP Genetics
CDC Verona	U of S - CDC	Alliance Seed
CDC Vivid	U of S - CDC	Proven Seed/CPS Canada
WINTER WHEAT		
Canada Western Red Winter		
CDC Buteo	U of S - CDC	SeCan Members
CDC Chase	U of S - CDC	CANTERRA SEEDS
AAC Elevate	AAFC (Lethbridge)	SeCan Members
Emerson	AAFC (Lethbridge)	CANTERRA SEEDS
Flourish	AAFC (Lethbridge)	SeCan Members
AAC Gateway	AAFC (Lethbridge)	Seed Depot
AAC Goldrush	AAFC (Lethbridge)	FP Genetics
Moats	U of S - CDC	SeCan Members
Radiant	AAFC (Lethbridge)	CANTERRA SEEDS
AAC Wildfire	AAFC (Lethbridge)	SeCan Members
Canada Western Special Purpose		
Accipiter	U of S - CDC	SeCan Members
Broadview	AAFC (Lethbridge)	CANTERRA SEEDS
CDC Falcon	U of S - CDC	SeCan Members
AAC Icefield	AAFC (Lethbridge)	FP Genetics
Peregrine	U of S - CDC	SeCan Members
Pintail	FCDC (Lacombe)	Mastin Seeds
CDC Ptarmigan	U of S - CDC	Western Ag
Sunrise	U of S - CDC	Western Ag
Swainson	U of S - CDC	Public Release, U of S - CDC
TRITICALE		
Spring Habit		
Brevis	AAFC (Swift Current)	Wagon Wheel Seed Corp
Bunker	FCDC (Lacombe)	FP Genetics
AAC Delight	AAFC (Lethbridge)	Fabian Seed Farms
Pronghorn	FCDC (Lacombe)	Progressive Seeds
Sunray	AAFC (Lethbridge)	SeedNet Inc.
Taza	FCDC (Lacombe)	Solick Seeds
Tyndal	FCDC (Lacombe)	SeCan Members
AC Ultima	AAFC (Swift Current)	FP Genetics
Winter Habit		
Luoma	FCDC (Lacombe)	Corns Brothers Farms
Metzger	FCDC (Lacombe)	Haney Farm Ltd.
Pika	FCDC (Lacombe)	Progressive Seeds

Crop Kind, Class & Variety	Breeding Institution	Distributor
BARLEY		
Malting Two-Row		
Bentley	FCDC (Lacombe)	CANTERRA SEEDS
CDC Bow	U of S - CDC	SeCan Members
Cerveza	AAFC (Brandon)	Mastin Seeds
CDC Copeland	U of S - CDC	SeCan Members
CDC Fraser	U of S - CDC	SeCan Members
Harrington	U of S - CDC	SeCan Members
CDC Kindersley	U of S - CDC	SeCan Members
CDC Landis	U of S - CDC	Fedoruk Seeds Ltd.
Major	AAFC (Brandon)	Alliance Seed
CDC Meredith	U of S - CDC	SeCan Members
Merit 57	Busch Ag Res. Inc.	CANTERRA SEEDS
AC Metcalfe	AAFC (Brandon)	SeCan Members
Newdale	AAFC (Brandon)	FP Genetics
CDC PolarStar	U of S - CDC/Sapporo/PML	CANTERRA SEEDS
CDC PlatinumStar	U of S - CDC/Sapporo/PML	CANTERRA SEEDS
AAC Synergy	AAFC (Brandon)	Syngenta Canada
Malting Six-Row		
CDC Anderson	U of S - CDC	SeCan Members
CDC Battleford	U of S - CDC	SeCan Members
Celebration	Busch Ag Res. Inc.	CANTERRA SEEDS
Lacey	U of Minnesota	Alliance Seed
Legacy	Busch Ag Res. Inc.	Proven Seed/FP Genetics
Tradition	Busch Ag Res. Inc.	Proven Seed/FP Genetics
Hulled - Feed Two-Row		
Altorado	Highland Specialty Grains	Proven Seed/CPS Canada
CDC Austenson	U of S - CDC	SeCan Members
Brahma	Westbred, LLC.	Proven Seed/CPS Canada
Canmore	FCDC (Lacombe)	CANTERRA SEEDS
Champion	Westbred, LLC.	Proven Seed/CPS Canada
Claymore	Westbred, LLC.	Proven Seed/CPS Canada
CDC Coalition	U of S - CDC	CANTERRA SEEDS
CDC Cowboy	U of S - CDC	SeCan Members
CDC Dolly	U of S - CDC	SeCan Members
Gadsby	FCDC (Lacombe)	SeCan Members
CDC Helgason	U of S - CDC	SeCan Members
CDC Maverick	U of S - CDC	SeCan Members
McLeod	Westbred, LLC.	Proven Seed/CPS Canada
Oreana	Highland Specialty Grains	Proven Seed/CPS Canada
CDC Trey	U of S - CDC	FP Genetics
Hulled Feed Six-Row		
Amisk	FCDC (Lacombe)	SeCan Members
Chigwell	FCDC (Lacombe)	SeCan Members
Muskwa	FCDC (Lacombe)	SeedNet Inc.
AC Rosser	AAFC (Brandon)	SeCan Members
Sundre	FCDC (Lacombe)	Mastin Seeds
Hulless - Food, Malting, Feed		
CDC Ascent	U of S - CDC	SeCan Members
CDC Carter	U of S - CDC	SeCan Members
CDC Clear	U of S - CDC	SeCan Members
CDC Fibar	U of S - CDC	---
CDC Hilose	U of S - CDC	---
CDC McGwire	U of S - CDC	SeCan Members
CDC Rattan	U of S - CDC	---
Roseland	AAFC (Brandon)	Wayfinder Farms
Taylor	AAFC (Brandon)	Alliance Seed
Forage		
CDC Cowboy	U of S - CDC	SeCan Members
Desperado	AAFC (Brandon)	Alliance Seed
CDC Maverick	U of S - CDC	SeCan Members
AC Ranger	AAFC (Brandon)	FP Genetics
CANARYSEED		
CDC Bastia	U of S - CDC	Public release U of S - CDC
CDC Calvi	U of S - CDC	CANTERRA SEEDS
Cantate	J. Joordans Zaadhandel BV	Hansen Seeds
Keet	U of Minnesota; U of S - CDC	Public release U of S - CDC
CDC Togo	U of S - CDC	CANTERRA SEEDS
RYE		
Bono	KWS Lochow GMBH	FP Genetics
Brasetto	KWS Lochow GMBH	FP Genetics
Guttino	KWS Lochow GMBH	SeedNet Inc.
Hazlet	AAFC (Swift Current)	SeCan Members
Prima	AAFC (Swift Current)	SeCan Members

Crop Kind, Class & Variety	Breeding Institution	Distributor
OAT		
Hulled		
Akina	Lantmännen SW Seed	La Coop Fédérée
SW Betania	Lantmännen SW Seed	Proven Seed/CPS Canada
CDC Big Brown	U of S - CDC	SeCan Members
CDC Boyer	U of S - CDC	SeCan Members
Bradley	AAFC - ECORC	SeCan Members
CS Camden	Lantmännen SW Seed	CANTERRA SEEDS
CDC Dancer	U of S - CDC	FP Genetics/Cargill
Derby	U of S - CDC	Proven Seed/Mastin Seeds
AAC Justice	AAFC (Winnipeg)	FP Genetics
Kara	Lantmännen SW Seed	La Coop Fédérée
Leggett	AAFC (Winnipeg)	FP Genetics
Lu	AAFC (Lacombe)	SeCan Members
CDC Minstrel	U of S - CDC	FP Genetics
AC Morgan	AAFC (Lacombe)	SeCan Members
CDC Morrison	U of S - CDC	CANTERRA SEEDS
CDC Nasser	U of S - CDC	T & L Seeds
CDC Norseman	U of S - CDC	SeCan Members
ORe3541M	Oat Advantage	SeCan Members
ORe3542M	Oat Advantage	SeCan Members
CDC Orrin	U of S - CDC	FP Genetics/Cargill
Pinnacle	AAFC (Winnipeg)	FP Genetics
Ronald	AAFC (Winnipeg)	SeCan Members
CDC Ruffian	U of S - CDC	FP Genetics
CDC Seabiscuit	U of S - CDC	CANTERRA SEEDS
CDC So-I	U of S - CDC	T & L Seeds
Souris	NDSU	Seed Depot
Stride	AAFC (Winnipeg)	SeCan Members
Summit	AAFC (Winnipeg)	FP Genetics
Triactor	Lantmännen SW Seed	CANTERRA SEEDS
Hulless		
Bullion	Lantmännen SW Seed	Proven Seed/CPS Canada
AC Gwen	AAFC (Winnipeg)	SeCan Members
Forage		
CDC Baler	U of S - CDC	FP Genetics
CDC Haymaker	U of S - CDC	SeCan Members
Murphy	AAFC (Lacombe)	SeCan Members
LENTIL		
CDC Asterix	U of S - CDC	Sask. Pulse Growers
CDC Cherie	U of S - CDC	Sask. Pulse Growers
CDC Dazil	U of S - CDC	Sask. Pulse Growers
CDC Greenland	U of S - CDC	Sask. Pulse Growers
CDC Greenstar	U of S - CDC	Sask. Pulse Growers
CDC Imax	U of S - CDC	Sask. Pulse Growers
CDC Imigreen	U of S - CDC	Sask. Pulse Growers
CDC Impact	U of S - CDC	Sask. Pulse Growers
CDC Impala	U of S - CDC	Sask. Pulse Growers
CDC Imperial	U of S - CDC	Sask. Pulse Growers
CDC Impower	U of S - CDC	Sask. Pulse Growers
CDC Impress	U of S - CDC	Sask. Pulse Growers
CDC Impulse	U of S - CDC	Sask. Pulse Growers
CDC Imvincible	U of S - CDC	Sask. Pulse Growers
CDC Kermit	U of S - CDC	Sask. Pulse Growers
CDC KR-1	U of S - CDC	AGT Foods Canada
CDC KR-2	U of S - CDC	AGT Foods Canada
CDC Marble	U of S - CDC	Sask. Pulse Growers
CDC Maxim	U of S - CDC	Sask. Pulse Growers
CDC Meteor	U of S - CDC	Sask. Pulse Growers
CDC Peridot	U of S - CDC	Sask. Pulse Growers
CDC Proclaim	U of S - CDC	Sask. Pulse Growers
CDC QG-1	U of S - CDC	AGT Foods Canada
CDC QG-2	U of S - CDC	AGT Foods Canada
CDC QG-3	U of S - CDC	AGT Foods Canada
CDC Red Rider	U of S - CDC	Sask. Pulse Growers
CDC Redberry	U of S - CDC	Sask. Pulse Growers
CDC Redbow	U of S - CDC	Sask. Pulse Growers
CDC Redcliff	U of S - CDC	Sask. Pulse Growers
CDC Redcoat	U of S - CDC	Sask. Pulse Growers
CDC Redmoon	U of S - CDC	Sask. Pulse Growers
CDC Richlea	U of S - CDC	SeCan Members
CDC Rosebud	U of S - CDC	Sask. Pulse Growers
CDC Rosie	U of S - CDC	Sask. Pulse Growers
CDC Roxy	U of S - CDC	Sask. Pulse Growers
CDC SB-3	U of S - CDC	Simpson Seeds
CDC Scarlet	U of S - CDC	Sask. Pulse Growers
CDC Sovereign	U of S - CDC	Sask. Pulse Growers
CDC Viceroy	U of S - CDC	Sask. Pulse Growers
SAFFLOWER		
Saffire	AAFC (Lethbridge)	Jerry Kubic (AB)
AC Sunset	AAFC (Lethbridge)	Proven Seed/CPS Canada

Crop Kind, Class & Variety	Breeding Institution	Distributor
FLAX		
CDC Bethune	U of S - CDC	SeCan Members
AAC Bravo	AAFC (Morden)	FP Genetics
CDC Glas	U of S - CDC	SeCan Members
Hanley	AAFC (Morden)	SeCan Members
Lightning	AAFC (Morden)	CANTERRA SEEDS
CDC Neela	U of S - CDC	CANTERRA SEEDS
NuLin VT50	CPS Canada Inc.	Proven Seed/CPS Canada
CDC Plava	U of S - CDC	---
Prairie Blue	AAFC (Morden)	SeCan Members
Prairie Grande	AAFC (Morden)	SeCan Members
Prairie Sapphire	AAFC (Morden)	Alliance Seed
Prairie Thunder	AAFC (Morden)	CANTERRA SEEDS
CDC Sanctuary	U of S - CDC	SeCan Members
CDC Sorrel	U of S - CDC	SeCan Members
Taurus	Limagrain Nederland	FP Genetics
Vimy	U of S - CDC	SeCan Members
Westlin 60	CPS Canada Inc.	Proven Seed/CPS Canada
Westlin 70	CPS Canada Inc.	Proven Seed/CPS Canada
Westlin 71	CPS Canada Inc.	Proven Seed/CPS Canada
Westlin 72	CPS Canada Inc.	Proven Seed/CPS Canada
MUSTARD		
Brown		
Amigo	AAFC (Saskatoon)	Canadian Mustard Assoc.
AAC Brown 100	AAFC (Saskatoon)	Mustard 21 Canada Inc.
Centennial Brown	AAFC (Saskatoon)	Canadian Mustard Assoc.
Duchess	Colman's of Norwich	Proven Seed/CPS Canada
Oriental		
Cutlass	AAFC (Saskatoon)	Canadian Mustard Assoc.
Forge	Colman's of Norwich	Proven Seed/CPS Canada
AAC Oriental 200	AAFC (Saskatoon)	Mustard 21 Canada Inc.
AC Vulcan	AAFC (Saskatoon)	Canadian Mustard Assoc.
Yellow		
AAC Adagio	AAFC (Saskatoon)	Mustard 21 Canada Inc.
Andante	AAFC (Saskatoon)	Canadian Mustard Assoc.
AC Pennant	AAFC (Saskatoon)	Canadian Mustard Assoc.
SUNFLOWER		
Cobalt II	Nuseed Americas	Nuseed Americas
Honeycomb NS	USDA	Quarry Seed
AC Sierra	AAFC (Saskatoon)	AAFC (Indian Head)
Talon	Nuseed Americas	Nuseed Americas
63A21	Pioneer Hi-Bred	Pioneer Hi-Bred
8N 270CL DM	Mycogen Seeds	Hyland Seeds
DRY BEAN		
AC Black Diamond	AAFC (Lethbridge)	Viterra Inc.
CDC Blackcomb	U of S - CDC	Scoular
CDC Blackstrap	U of S - CDC	Scoular
Bolt	U of Guelph	---
Carman Black	AAFC (Morden)	---
Envoy	GenTec Seeds	Hensell District Co-op
Island	AAFC (Lethbridge)	Viterra Inc.
CDC Jet	U of S - CDC	B&J Martens Seeds
Lightning	U of Guelph	Hensell District Co-op
Mariah	Seminis Vegetable Seeds	CANTERRA SEEDS
CDC Marmot	U of S - CDC	Sask. Pulse Growers
Medicine Hat	Seminis Vegetable Seeds	CANTERRA SEEDS
CDC Pintium	U of S - CDC	Sask. Pulse Growers
AC Polaris	AAFC (Lethbridge)	Viterra Inc.
Portage	AAFC (Morden)	CANTERRA SEEDS
AC Redbond	AAFC (Lethbridge)	Viterra Inc.
Skyline	Globe Seeds - Netherland	Terramax
CDC Sol	U of S - CDC	Scoular
OAC Spark	U of Guelph	U of Guelph
CDC Superjet	U of S - CDC	B&J Martens Seeds
Winchester	Rogers Brothers	ADM Edible Bean Specialities
CDC WM - 2	U of S - CDC	Scoular

Abbreviations Used in this List

AC	Agriculture Canada (Agriculture and Agri-Food Canada)
AAC	Agriculture Canada (Agriculture and Agri-Food Canada)
AAFC	Agriculture and Agri-Food Canada
CDC	Crop Development Centre
CPS	Crop Production Services
FCDC	Field Crop Development Centre
NDSU	North Dakota State University
OAC	Ontario Agricultural College
SY	Syngenta Seeds Canada Inc.
U	University
U of S	University of Saskatchewan
USDA	United States Department of Agriculture

Crop Kind, Class & Variety	Breeding Institution	Distributor
FIELD PEA		
Abarth	Limagrain, Netherlands	FP Genetics
CDC Acer	U of S - CDC	Sask. Pulse Growers
DS Admiral	DL Seeds Inc.	FP Genetics
Agassiz	AAFC (Lacombe)	CANTERRA SEEDS
CDC Amarillo	U of S - CDC	Sask. Pulse Growers
AAC Ardill	AAFC	Wagon Wheel Seed Corp.
CDC Athabasca	U of S - CDC	Sask. Pulse Growers
CDC Blazer	U of S - CDC	Sask. Pulse Growers
CDC Bronco	U of S - CDC	Sask. Pulse Growers
AAC Carver	AAFC	CANTERRA SEEDS
CDC Centennial	U of S - CDC	Sask. Pulse Growers
Cooper	Limagrain Nederland	CANTERRA SEEDS
CDC Dakota	U of S - CDC	Sask. Pulse Growers
Delta	Limagrain Nederland	FP Genetics
Earlystar	AAFC (Lacombe)	CANTERRA SEEDS
Eclipse	Limagrain Nederland	FP Genetics
CDC Golden	U of S - CDC	Sask. Pulse Growers
CDC Greenwater	U of S - CDC	Sask. Pulse Growers
CDC Horizon	U of S - CDC	Sask. Pulse Growers
CDC Hornet	U of S - CDC	Sask. Pulse Growers
CDC Inca	U of S - CDC	Sask. Pulse Growers
AAC Lacombe	AAFC	SeedNet Inc.
CDC Leroy	U of S - CDC	Sask. Pulse Growers
CDC Limerick	U of S - CDC	Sask. Pulse Growers
AAC Liscard	AAFC	Wagon Wheel Seed Corp.
CDC Meadow	U of S - CDC	Sask. Pulse Growers
CDC Mosaic	U of S - CDC	Sask. Pulse Growers
CDC Mozart	U of S - CDC	Sask. Pulse Growers
CDC Patrick	U of S - CDC	Sask. Pulse Growers
CDC Pluto	U of S - CDC	Sask. Pulse Growers
CDC Prosper	U of S - CDC	Sask. Pulse Growers
AAC Radius	AAFC	Columbia Seeds
CDC Raezer	U of S - CDC	Sask. Pulse Growers
Redbat 8	U of S - CDC	ILTA Grain Inc
Redbat 88	U of S - CDC	ILTA Grain Inc
AAC Royce	AAFC	Columbia Seeds
CDC Saffron	U of S - CDC	Sask. Pulse Growers
CDC Sage	U of S - CDC	Sask. Pulse Growers
CDC Spectrum	U of S - CDC	Sask. Pulse Growers
CDC Spruce	U of S - CDC	Sask. Pulse Growers
CDC Striker	U of S - CDC	Sask. Pulse Growers
CDC Tetris	U of S - CDC	Sask. Pulse Growers
Thunderbird	AAFC (Lacombe)	CANTERRA SEEDS
CDC Treasure	U of S - CDC	Sask. Pulse Growers
CDC Tucker	U of S - CDC	Sask. Pulse Growers
40-10	DL Seeds Inc.	FP Genetics
CHICKPEA		
CDC Alma	U of S - CDC	Sask. Pulse Growers
Amit (B-90)	ARO Volcani Centre	AGT Foods Canada
CDC Consul	U of S - CDC	Sask. Pulse Growers
CDC Corinne	U of S - CDC	Sask. Pulse Growers
CDC Cory	U of S - CDC	Sask. Pulse Growers
CDC Frontier	U of S - CDC	Sask. Pulse Growers
CDC Leader	U of S - CDC	Sask. Pulse Growers
CDC Luna	U of S - CDC	Sask. Pulse Growers
CDC Orion	U of S - CDC	Sask. Pulse Growers
CDC Palmer	U of S - CDC	Sask. Pulse Growers
CDC Vanguard	U of S - CDC	Sask. Pulse Growers
FABA BEAN		
CDC Blitz	U of S - CDC	Redview Farms
CDC Fatima	U of S - CDC	Scoular
Fabelle	DL Seeds Inc.	Stamp Seeds
FB9-4	U of S - CDC	AGT Foods Canada
Florent	NPZ	DL Seeds
Imposa	Limagrain Nederland	Cyre Seed Farms
Snowbird	Limagrain Nederland	Bob Park - Lacombe, AB
CDC Snowdrop	U of S - CDC	Sask. Pulse Growers
CDC SSNS-1	U of S - CDC	Meier Brothers
Tabasco	DL Seeds Inc.	Ridell Seed Co.
Taboar	Globe Seeds - Netherland	Terramax
Vertigo	DL Seeds Inc.	---
186S-11	U of S - CDC	AGT Foods Canada
247-13	U of S - CDC	AGT Foods Canada
CAMELINA		
Midas	AAFC (Saskatoon)	Smart Earth Seeds

CANOLA

see table on page VR28

SOYBEAN

see table on page VR23

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