

# Varieties of grain crops 2003

## Crop Production Areas



The cropland of Saskatchewan has been divided into four areas based roughly on climate, vegetation and soil type. The relative yields of crop varieties tend to vary from area to area. In choosing a variety, farmers will want to consider the yields in their area and special requirements such as early maturity, disease resistance or sawfly resistance.

**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 sawflies may be problems in the western and central sections of the area. Cereal rust may be a problem in the southeastern section.

**Area 3:** 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 northwestern and northeastern sections.

**Area 4:** Rainfall is usually adequate for crop production. However, early fall frosts and wet harvest weather 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.

## Table of Contents

### Cereal Crops

Wheat . . . . .	4
Winter Wheat . . . . .	6
Rye . . . . .	6
Triticale . . . . .	6
Malting Barley . . . . .	8
Feed & Food Barley . . . . .	10
Oat . . . . .	11

### Other Crops

Buckwheat, Caraway, Fenugreek Canary Seed, Coriander, Safflower . . . . .	12
---	----

### Oilseed Crops

Argentine Canola . . . . .	13
Polish Canola . . . . .	14
Mustard . . . . .	15
Sunflower (Oilseed) . . . . .	16
Flax . . . . .	16

### Pulse Crops

Lentil . . . . .	17
Dry Bean . . . . .	17
Field Pea . . . . .	18
Chickpea . . . . .	19
Fababean . . . . .	20

### Production Information

Seed Facts . . . . .	21
Breeding Institutions and Seed Distributors . . . . .	22

## Symbols Used in 2003 Seed Guide:

- ^ Variety may not be described in 2004
- Insufficient test data to describe
- ☉ Plant Breeders' Rights at time of printing
- \* Applied for PBR protection at time of printing

### Abbreviations used:

Relative maturity: VE = Very Early, E = Early, M = Medium,  
L = Late, VL = Very Late  
Resistance: VG = Very Good, G = Good, F = Fair, P = Poor,  
VP = Very Poor  
n/a = not applicable  
Seed size: S = Small, M = Medium, L = Large

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# Testing varieties in Saskatchewan

By Saskatchewan Agriculture, Food and Rural Revitalization

The performance of crop varieties is tested regularly at a number of locations across Saskatchewan. Data from these trials are summarized and interpreted by the Saskatchewan Advisory Council on Grain Crops every year.

The trials are conducted by researchers from plant breeding institutions. The most recently registered varieties and promising experimental lines that might become registered are compared to standard varieties.

Wheat, oat, barley and flax varieties are grown at all locations, while canola, mustard, field pea, lentil, bean and chickpea are tested in those regions where they are best adapted. Information on sunflower production is received from trials conducted under the auspices of the Saskatchewan Sunflower Committee.

The reaction of varieties to diseases and seed treatment recommendations are updated and forwarded to the Grain Crops Council by pathologists who meet as members of the Plant Disease Sub-council of the Council on Crop Protection.

Variety trials are grown both on farmers' fields and research stations. Multiple small plots of the various varieties are sown and harvested with small-scale press-drills and combines.

## Relative yield of varieties

Grain yield results from the interplay of genetic factors and non-genetic factors. Variety trials are designed to measure the differences among varieties that are due to genetic causes. It is important to minimize variability due to non-genetic factors such as soil type, nutrients, moisture, weeds, diseases, and other pests.

Experimental designs using replication (repeated plantings of the varieties) and randomization (the position of the varieties within the test are assigned by chance) are then used to estimate the precision with which the genetic factors can be measured. Yield potential of a variety is estimated by measuring the weight of grain produced per unit area.

Comparisons among varieties for yield potential involves an evaluation of both their absolute amounts of grain and their relative yield. Relative yield is the yield of one variety expressed as a percentage of a second variety.

Yields obtained in these trials are not identical to those obtained under

commercial production conditions. However, the average yield for these varieties, obtained over a number of years at several locations, would remain in relatively the same ratio regardless of whether the grain yields were measured in small plots or large-scale fields.

Relative yields are the best estimates of expected yield advantage in the areas indicated. They are more reliable than estimates based on data from a single test or from a single location. Farmers should be aware, however, that actual yields within an area, or in a particular year, may vary substantially from the average figures reported because of natural variability.

## Relative Maturity

### Ratings

Relative maturity ratings are average number of days from seeding to swathing ripeness. The actual number of days to reach maturity depends on local climate and to some extent on management practices.

Some of the following tables 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). Medium applies to the most widely grown check variety which appears at the top of each table. The limits for each category vary from crop to crop. In barley, for example, Harrington would be medium with L and E

varieties plus or minus 1-2 days, and VL and VE varieties beyond these.

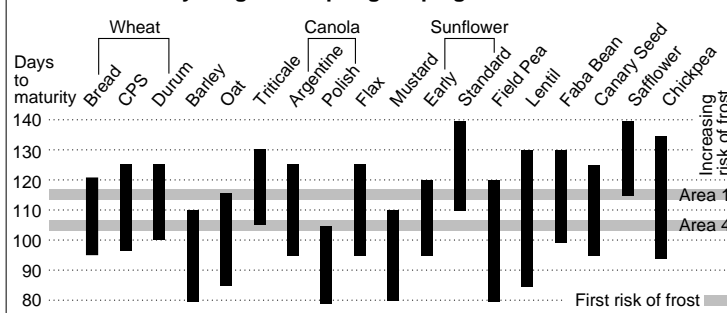
### Comparisons

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.

Maturity is measured from seeding to swathing ripeness. 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 environment factors. Not all crops have a wide area of adaptation.

Relative maturity ranges for spring crops grown in Saskatchewan



# Plant Disease Resistance

Resistance to the most important diseases in western Canada is generally assessed in each crop before the variety is registered. 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 very poor (VP), poor (P), fair (F), good (G), very good (VG). 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 make-up and/or differences in the genetic make-up of the pathogen that causes the disease. However, the genetic make-up of a pathogen can change over time, and 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.

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 make-up 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 good 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.

Current commercial chickpea varieties such as Sanford and Dwelley have some resistance to the disease. This resistance weakens as plant development nears the flowering stage. Cool, moist environmental conditions favour the disease, and 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 these conditions, varieties such as Sanford and Dwelley do not show good resistance to ascochyta and can be 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.

## What is Plant Breeders' Rights

Plants Breeders' Rights provides a way to 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. This encourages additional investment in improved crop varieties for Canadian farmers.



Plants Breeders' Rights for crop variety developers are comparable in many ways to patent protection in other areas. When a plant breeder develops a new variety for use in Canada, he 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;

- 1) the written permission of the breeder or his agent and;
- 2) payment of a royalty to the breeder or his agent. Under PBR, farmers are allowed to save seed of the variety for their own use, on their own farms.

Varieties protected by Plant Breeders' Rights are identified with the PBR logo above.

Further information on Plant Breeders' Rights can be obtained from the Plant Breeders' Rights Office, tel. (613) 225-2342, fax (613)228-6629.

# Cereal Crops

## Wheat

### Main characteristics of varieties

Variety	Years tested	Area 1	Area 2	Area 3	Area 4	Irrigation	Relative Maturity in days	Protein	Lodging	Shattering	Sprouting	Resistance To *						
												Stem Rust	Leaf Rust	Loose Smut	Bunt	Leaf Spot	Fusarium Head Blight	
<b>Bread Wheat</b>		Yield as % of AC Barrie																
AC Barrie ☼	10	100	100	100	100	100	100	14.7	G	G	G	G	P	G	G	P	F	
AC Abbey ☼	7	99	94	95	95	98	-1	-0.8	F	G	P	G	P	F	G	P	P	
CDC Bounty	5	105	103	105	107	—	-1	-0.1	F	G	F	G	F	G	F	P	F	
AC Cadillac ☼	7	100	103	102	101	98	-1	-0.2	F	G	F	G	G	VG	VG	P	F	
AC Cora	8	99	97	94	95	92	-2	-0.3	F	G	F	G	VG	G	G	P	F	
Columbus^	5	—	94	93	—	84	+3	-0.2	F	F	VG	F	P	F	VG	P	P	
AC Domain^	6	96	94	94	86	89	-2	+0.1	G	G	VG	G	G	VG	F	VP	P	
AC Eatonia	7	92	94	90	84	—	0	+0.2	P	G	VG	F	P	F	G	P	—	
AC Elsa ☼	7	102	104	105	98	97	-1	-0.1	F	G	F	G	G	G	G	F	P	
Harvest *	3	103	98	105	97	—	-1	-0.4	VG	G	VG	G	G	G	G	P	VP	
AC Intrepid ☼	5	101	100	105	102	102	-3	-0.3	G	G	P	G	G	F	G	P	P	
Journey *	3	103	96	100	92	—	+2	+0.3	VG	G	F	G	G	F	G	F	F	
Katepwa^	9	97	94	92	93	89	-2	-0.5	F	G	F	G	VP	G	G	P	F	
Laura^	8	100	103	98	95	82	+1	-0.4	F	G	F	G	G	F	P	P	P	
Lovitt	2	108	98	100	101	—	-1	+0.1	G	G	VG	G	G	G	F	—	P	
AC Majestic	8	93	97	97	96	86	+2	-0.2	G	F	VG	G	P	F	G	F	F	
McKenzie	5	107	105	102	96	109	-1	-0.5	F	G	G	G	VG	VP	VG	P	F	
Prodigy	5	103	104	106	99	—	+1	+0.4	G	F	G	G	G	F	VG	P	VP	
AC Splendor	8	91	92	95	92	89	-4	+0.4	F	G	F	G	G	F	G	VP	P	
Superb *	3	111	107	112	107	—	+4	-0.2	G	G	G	G	F	F	G	VP	F	
CDC Teal	7	98	100	103	96	96	-2	-0.1	G	G	P	G	G	G	F	P	VP	
5500HR ☼	4	98	98	99	99	—	+1	-0.4	F	G	F	F	G	P	G	P	F	
5600HR ☼	5	99	100	99	102	—	+2	-0.5	G	G	F	F	G	G	G	P	P	
5601HR *	3	94	94	95	107	—	+2	-0.1	G	G	F	G	G	P	G	P	F	
Alsen ☼	0	—	—	—	—	—	+4	—	G	G	—	G	G	P	G	P	F+	
<b>Canada Prairie Spring - Red Seeded*</b>																		
AC Crystal ☼	10	118	120	116	118	111	+3		VG	G	P	G	P	P	VG	F	VP	
AC Foremost	5	119	122	118	116	109	+2		VG	G	F	G	P	P	VG	P	VP	
AC Taber	5	117	122	118	114	116	+4		VG	G	P	G	F	P	VG	F	VP	
5700PR ☼	4	115	117	121	123	117	+2		VG	G	P	G	F	P	VG	P	VP	
5701PR *	3	107	112	110	—	—	+2		G	G	P	G	VG	P	F	F	P	
<b>Canada Prairie Spring - White Seeded*</b>																		
AC Karma^	8	117	122	119	121	110	+2		G	G	P	G	p	P	VG	P	P	
AC Vista ☼	8	119	124	123	121	114	+1		G	G	F	G	P	P	VG	P	VP	
AC2000	4	109	111	110	109	104	+3		VG	G	F	F	P	F	VG	P	P	
<b>Hard White Wheat</b>																		
Kanata *	3	94	89	92	93	—	-2	+0.1	G	G	G	F	G	F	P	P	F	
Snowbird *	3	103	97	103	99	—	+2	-0.5	G	G	G	G	VG	G	F	P	F	
<b>Canada Western Extra Strong*</b>																		
Amazon *	5	102	102	105	105	—	+2	-1.1	F	G	P	G	G	VG	F	F	P	
AC Corinne	5	99	101	102	106	—	+3	-1.1	F	G	P	G	G	VG	F	P	P	
AC Glenavon *	4	101	103	104	110	—	+2	-1.3	F	G	P	G	G	VG	F	P	P	
Glenlea	8	102	105	108	112	—	+2	-1.4	F	G	P	G	F	VG	F	P	P	
CDC Rama	3	108	103	108	110	—	+2	-0.2	F	G	P	G	G	VG	G	P	F	
<b>Durum Wheat</b>		Yield as % of Kyle																
Kyle	13	100	100	100	100	100	+3	13.8	P	VG	F	VG	VG	P	VG	P	VP	
AC Avonlea ☼	9	105	106	109	—	106	+2	+0.1	F	VG	F	VG	VG	P	VG	P	VP	
AC Melita^	6	95	96	101	—	110	+1	-0.2	F	VG	F	VG	VG	P	VG	VP	VP	
AC Morse ☼	8	104	103	109	—	111	+3	-0.1	G	VG	F	VG	VG	VP	VG	VP	VP	
AC Napoleon *	4	104	105	109	—	—	+2	-0.4	F	VG	F	VG	VG	P	VG	P	VP	
AC Navigator ☼	5	104	101	97	—	—	+3	-0.3	G	VG	F	VG	VG	VP	VG	VP	VP	
Sceptre^	11	96	97	99	103	118	0	-0.6	G	VG	P	VG	VG	P	VG	P	VP	

\* Includes direct and indirect comparisons with AC Barrie

## Wheat (Continued from page 4)

### Additional Information

All varieties of common wheat are compared to **AC Barrie**.

Several new races of leaf rust capable of overcoming leaf rust resistance gene Lr 16 have multiplied rapidly. If varieties rated poor or very poor for leaf rust are sown in southeastern Saskatchewan, early seeding may minimize risk of crop losses.

Durum wheat varieties are more susceptible than CWRS varieties to Fusarium Head Blight and CPS varieties are intermediate.

All varieties have moderately good resistance to common root rot.

Seed of varieties rated poor and very poor for bunt and loose smut should be treated. Please refer to the **Seed Facts** section of this pamphlet or **Guide to Crop Protection, 2003**.

Most of the varieties have been rated for their relative resistance to pre-harvest sprouting. During wet harvest weather grades drop more rapidly due to sprouting in swathed than in standing crops.

### Canada Western Red Spring Wheat

**Alsen** has improved resistance to Fusarium Head Blight and an interim registration which may expire in 2003.

Seed of the new varieties **Harvest**, **Journey**, **Lovitt**, and **5601HR** will not be available in 2003.

Limited quantities of seed of the new varieties **5600HR** and **Superb** will be available in 2003.

**AC Abbey** is resistant to the wheat stem sawfly, has semidwarf stature and an awned head. **AC Eatonia** is resistant to wheat stem sawfly.

**AC Cadillac** and **CDC Bounty** have large seed size and an exceptionally heavy test weight.

**McKenzie** has an awned head and may also be identified by a purplish stem. **Prodigy** has an awned head and exceptionally heavy test weight. **Superb** has an awned head, and very large seeds. **Superb** has shorter stature than **AC Barrie** and **Katepwa**.

### Canada Prairie Spring Wheat

**AC Vista** and **AC2000** have higher protein content, and stronger gluten than **AC Karma**. Limited quantities of seed of **5701PR** will be available in 2003.

**AC Crystal**, **5700PR** and **5701PR** have improved quality compared to **AC Foremost** and **AC Taber**.

### Canada Western Extra Strong

Seed of **CDC Rama** will not be available in 2003. Limited quantities of seed of **Amazon**, **AC Corinne**, and **AC Glenavon** will be available in 2003.

### Canada Western Amber Durum

All durum varieties are susceptible to two new races of loose smut. Seed can be treated to provide control. See the **Seed Facts** section for details.

**Kyle** receives better grades than other varieties even under adverse harvesting conditions.

**AC Avonlea** has shorter stronger straw than **Kyle**. **AC Avonlea** has higher pigment content in the grain than other varieties.

**AC Morse** has short strong straw like **Sceptre**, and has lower test weight than **Kyle**.

**AC Napoleon** has shorter and stronger straw than **Kyle** and low test weight.

**AC Navigator** has extra strong gluten properties and semidwarf stature. It may be grown only under contract with the Canadian Wheat Board and Saskatchewan Wheat Pool.

### Soft White Spring Wheat

**AC Reed** and **AC Phil** are moderately resistance to shattering, powdery mildew, and common root rot, moderately susceptible to leaf and stem rust, and susceptible to common bunt. **AC Phil**, generally, has less black point than **AC Reed**. **AC Nanda** has improved resistance to common bunt, powdery mildew, and black point. It yields about the same as **Fielder** and is 2 days later maturing. Limited seed of **AC Nanda** will be available in 2003. Soft-white spring wheats are susceptible to pre-harvest sprouting.

## Winter Wheat

### Main characteristics of varieties

Variety	Years tested	— Grain Yield as a % CDC Kestrel —			Resistance to				
		Areas 1 and 2	Areas 3 and 4	Irrigation	Lodging	Winter Damage	Stem Rust	Leaf Rust	Bunt
CDC Kestrel	12	100	100	100	G	G	P	P	P
AC Bellatrix	4	101	97	—	G	G	VP	P	G
CDC Clair	12	100	102	97	G	G	P	P	P
CDC Osprey	12	100	100	91	G	G	P	P	P
CDC Harrier	9	103	98	106	G	G	G	P	P
CDC Falcon	8	99	93	114	VG	G	VG	G	P
CDC Raptor	7	100	100	108	VG	G	VG	G	P
CDC Buteo	5	96	97	109	G	G	G	G	P
McClintock	5	98	99	109	G	F	VG	VG	P

## Rye

### Main characteristics of varieties

Variety	Years tested	Yield as a % of Prima				Maturity	Resistance to			
		Area 1	Area 2	Area 3	Area 4		Winter Killing	Shattering	Lodging	Stem Smut
Prima	22	100	100	100	100	M	VG	F	F	G
AC Rifle	13	112	94	93	—	M	VG	VG	VG	G
AC Remington	3	128	100	99	—	M	VG	VG	G	—

### Additional information:

**Gazelle** is the only registered variety of spring rye. **Danko** and **Kodiak** are very susceptible to winter killing in Saskatchewan and therefore should only be considered for production using some form of tillage conservation.

## Triticale

### Main characteristics of varieties

Variety	Years Tested	Yield as a % of AC Certa					Test Wt kg hl <sup>-1</sup>	Maturity	Resistance to				
		Area 1	Area 2	Area 3	Area 4	Irrigation <sup>x</sup>			Lodging	Stem rust	Leaf rust	Bunt	Root rot
AC Certa	11	100	100	100	—	100	74	M	G	VG	VG	VG	G
AC Alta	11	105	104	98	—	109	68	L	G	VG	VG	VG	F
AC Copia	13	99	99	95	—	99	72	M	G	VG	VG	VG	F
Pronghorn	11	98	102	102	—	107	69	E	G	VG	VG	VG	F
Sandro	8	106	103	100	—	—	73	E	G	VG	VG	VG	G
AC Ultima	7	106	104	102	—	—	70	E	G	VG	VG	VG	F

x Relative Yields under irrigation are based on limited data

### Additional Information

Triticale matures one to two days later than **AC Crystal** CPS wheat, therefore it should be planted as early as possible. Some cultivars of triticale will mature very late in Area 4. The seeding rate for triticale should be at least 30 per cent more than that of CWRS wheat to obtain the same number of plants per square foot. Susceptibility to Fusarium Head Blight is at least as great in triticale as in wheat. **AC Ultima** is a new cultivar of spring triticale. It has improved Hagberg Falling Number.

Winter triticale has winter hardiness equal to that of winter wheat. **Pika** and **Bobcat** are the only cultivars of winter triticale available. **Bobcat** is awnletted with shorter and stronger straw than **Pika**.

# Wheat Stem Sawfly

**Area of Infestation:** In 2002 sawfly (*Cephus cinctus* Nort.) damage to wheat occurred over a large area of south central Saskatchewan (extending as far north as Unity and Wilkie) and southern Alberta. Sawfly are expected to be a major pest again in 2003.

**Symptoms:** The wheat appears to be lodged. On close examination, the stems are cut near ground level or detach easily when tugged. A stem split lengthwise reveals an abundance of frass, powdery waste from the sawfly. The subcrown internode contains the sawfly larva in its cocoon.

**Life Cycle:** To survive the winter, the larva spins its cocoon in the wheat stem below the soil surface. Early June to mid-July the following year, the sawfly emerge as a wasp-like insect. It finds a tender elongating portion of a wheat stem, saws a tiny hole, and deposits an egg inside the stem wall.



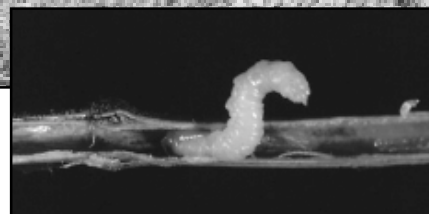
The egg hatches and the larva feeds on the inside wall of the stem. At maturity the larva girdles the stem above the sub-crown internode. The larva makes a plug in the stem just below the cut on the stem, and encloses itself in a cocoon.

**Damage:** Girdling weakens the stem so it easily falls over, making it difficult to harvest which results in a yield loss. Another source of yield loss is from the sawfly feeding on the inside of the stem which reduces the number of seeds per head and seed plumpness.

**Sawfly Control:**  
**Resistant Varieties**  
CWRS Two solid stem varieties are available, AC Eatonia and AC Abbey

Sawfly feed easily throughout the length of regular hollow stem varieties. Sawfly resistant varieties have solid stems that are filled with pith, especially in the lower part. The pith slows the movement of the sawfly larvae, many dying before they reach the sub-crown internode. As a result, there is much less cutting in sawfly resistant varieties. The reduction in cutting also depends on the growing season. Formation of pith is depressed when the conditions during stem growth are cloudy. Under those conditions a solid stem variety may have more cutting than desirable.

**Considerations for Use of Resistant Varieties**  
Sawfly resistant varieties are lower yielding than hollow stem varieties.



The farmer must weigh potential income loss from sawfly damage of hollow stem cultivars against the financial loss from growing a lower yielding sawfly-resistant variety.

**Alternate varieties:** A sawfly resistant wheat variety (solid stemmed) may be grown on a field until the sawfly level is reduced, then grow a hollow stem variety until an increase in cutting is observed.

**Border Planting of Resistant Variety**  
Sawfly inhabit the native grasses in uncultivated areas around a field. If the source of sawfly is adjacent uncultivated land or an adjacent wheat field, a border of a sawfly resistant variety may be planted around a field containing a non-resistant variety. The border should be from the same wheat class. The sawfly is a weak flyer so most will lay their eggs in this border strip which reduces the damage to the non-resistant variety.

**Mixtures** of resistant and non-resistant wheat varieties may be tried. Another consideration may be to grow durum wheat which is generally cut less by the sawfly than hollow stemmed wheats. In 2001, durum wheat was cut almost as severely as hollowed stemmed wheat in some areas.

**Agronomic Practices:**  
Sawfly damage can be reduced by:

- crop rotations with non-host crops such as lentils, peas, canola, mustard, oats, barley and rye. Barley and rye can be slightly infected.
- swathing before the stems are cut
- using pick-up reels
- delayed planting

**Insecticide:** Insecticides are not practical for effective control of sawfly.

**Parasite:** The natural parasite, Bracon cephi, eats the larvae. A build-up of the parasite reduces sawfly damage and plugs available for the next growing season. The problem is that the parasite takes a couple of seasons to build up, while the sawfly damage is already taking its toll.

**Websites:**  
[www.gov.mb.ca/agriculture/crops/insects/fad20s00.html](http://www.gov.mb.ca/agriculture/crops/insects/fad20s00.html)  
<http://itsd-s3.agric.gov.ab.ca/pests/insects/62010240.html>  
[www.agr.gov.sk.ca](http://www.agr.gov.sk.ca)

# Malting Barley

## Main characteristics of varieties

Category* and variety	—Yield as % of Harrington—								----- Resistance to -----									
	Years Tested	Rough or			Relative				Straw ‡	Lodging	Net			Loose Smut	Other smuts	Root Rot	Stem Rust	Fusarium ♦
		2 or 6 row	smooth awns	Area 1	Area 2	Area 3	Area 4	maturity rating *			Blotch	Scald	Rot					
<b>Malting acceptance: Recommended</b>																		
Harrington	15	2	R	100	100	100	100	M	N	F	VP	P	P	P	F	P	F+	
CDC Kendall ☉	10	2	R	101	112	114	118	M	N	G	F	P	P	P	F	G	F	
Merit ☉	8	2	R	107	124	125	125	L	N	F	F	P	P	G	F	G	F	
AC Metcalfe ☉	10	2	R	102	110	112	115	M	N	G	F	P	VG	F	F	G	F	
CDC Stratus	10	2	R	101	114	118	120	M	N	G	F	P	F	F	F	G	F	
Stein	15	2	R	105	107	113	115	M	N	F	F	P	P	G	P	G	F	
B1602	11	6	R	89	107	107	116	M	N	G	F	P	P	G	VG	G	VP	
Excel	8	6	S	102	113	119	119	M	N	VG	F	P	P	G	G	G	VP	
Legacy ☉	4	6	S	110	112	108	124	M	N	G	F	P	P	F	G	G	P	
Robust	7	6	S	88	105	111	108	M	N	G	F	P	P	F	G	G	VP	
CDC Sisler ☉	8	6	S	100	110	119	118	M	N	F	P	P	P	P	F	G	F	
<b>Malting acceptance: Under test</b>																		
AC Bountiful	9	2	R	105	115	121	118	M	N	G	G	P	VG	VG	F	G	F+	
Calder *	3	2	R	—	129	116	—	M	N	F	G	F	VG	VG	F	G	F	
CDC Copeland ☉	6	2	R	109	119	123	124	M	N	G	F	P	P	F	F	F	F+	
CDC Goodale *	3	2	R	—	122	115	—	M	N	F	F	P	G	G	F	F	F	
Newdale *	4	2	R	118	125	123	127	M	N	G	F	P	P	F	F	G	F	
CDC Select ☉	5	2	R	104	117	115	122	M	N	G	F	P	F	F	F	F	P	
CDC Battleford ☉	4	6	S	110	124	118	133	M	N	G	G	P	VP	G	F	G	P	
CDC Tisdale *	4	6	S	107	115	107	117	M	N	G	G	P	P	G	F	G	VP	
CDC Yorkton ☉	6	6	S	99	114	121	130	M	N	G	G	P	P	G	F	G	P	

\* Relative maturity: The relative maturity of the check, Harrington, is M (on average, 91 days from seeding to swathing ripeness)

‡ N = normal, SD = semi-dwarf,

♣ These categories are established annually by the Malting Barley Industry Group (Call 1-800-275-4292 for more information)

♦ F+ indicates that these lines have superior resistance to those rated F but not enough to rate G

### Lines Under Evaluation of 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 subsequently brewed. The beer is then given the ultimate test – a taste panel. This process will normally take a minimum of three years. A crop grown in 2003 will be malted in January-February, 2004. It will be brewed in May-June, 2004, aged and tasted in October-November 2004.

### Additional Information:

Growers are reminded that the industry is cautious about using new varieties.

Growers are cautioned that malting varieties, especially two rows, are very susceptible to sprouting.





# Feed and Food Barley

## Main characteristics of varieties

Category and variety	— Yield as % of Harrington —								----- Resistance to -----								
	Years 2 or 6 Tested row		Rough or smooth awns	Area 1	Area 2	Area 3	Area 4	Relative maturity rating *	Straw ‡	Net Lodging	Blotch	Scald	Loose Smut	Other smuts	Root Rot	Stem Rust	Fusarium Head Blight ◆
	9	2	R	106	114	117	117	M	N	G	P	G	P	G	F	G	F+
<b>Feed</b>																	
CDC Dolly	9	2	R	106	114	117	117	M	N	G	P	G	P	G	F	G	F+
CDC Fleet	10	2	R	89	97	101	102	VE	N	VG	F	G	P	VP	P	G	F+
CDC Helgason ☞	5	2	R	107	117	119	120	M	N	G	G	P	VG	G	F	F	P
Niobe *	3	2	R	—	111	106	—	M	N	F	F	P	P	G	P	G	F
Xena ☞	6	2	R	113	127	133	129	M	N	G	F	P	P	VG	F	G	F
AC Harper ☞	10	6	S	107	116	121	117	M	N	G	F	G	P	F	F	G	VP
AC Lacombe ☞	12	6	S	101	117	120	121	M	N	G	F	F	P	VG	F	G	VP
AC Rosser ☞	10	6	S	114	129	131	134	M	N	G	F	VP	P	VG	G	G	VP
Stander ☞	10	6	S	94	116	124	128	M	N	VG	F	P	P	P	G	G	VP
Trochu *	5	6	S	97	119	119	136	M	N	F	P	F	P	G	G	G	VP
<b>Hulless</b>																	
CDC Dawn	10	2	R	96	105	121	104	M	N	F	F	G	P	F	F	G	F+
CDC Freedom	8	2	R	90	100	104	102	M	N	G	F	P	—	G	P	G	F+
CDC Gainer	9	2	R	87	96	100	101	M	N	F	F	G	P	F	F	G	F
HB 805	4	2	R	95	108	113	108	L	N	F	F	P	F	G	F	F	n/a
CDC McGwire ☞	7	2	R	97	111	112	114	M	N	G	VG	G	P	G	G	F	F
Phoenix^	10	2	R	82	93	88	—	M	N	G	P	P	P	F	G	P	F+
CDC Speedy^	4	2	R	73	91	103	93	VE	N	G	F	G	P	P	F	G	F+
Tercel	9	2	R	90	95	98	99	M	N	F	P	P	P	F	F	G	P
AC Bacon	8	6	R	92	107	109	110	M	N	G	P	G	P	F	F	G	F
Falcon^ ☞	10	6	S	70	90	88	95	M	SD	VG	F	G	P	F	F	G	VP
Peregrine ☞	6	6	R	71	80	87	90	M	SD	VG	F	F	P	P	G	G	VP
<b>Intensive Management</b>																	
CDC Bold	5	2	R	114	125	128	131	L	SD	G	P	G	P	VG	G	G	P
CDC Thompson^	10	2	R	89	98	97	101	VE	SD	VG	F	G	F	F	F	G	F
CDC Earl	10	6	R	99	111	110	120	L	SD	VG	G	G	P	G	G	G	VP
Kasota	8	6	S	97	106	109	108	E	SD	G	F	G	P	G	P	G	VP
Mahigan	8	6	S	106	112	114	115	E	SD	VG	F	G	P	G	P	G	VP
Niska	6	6	S	105	120	123	129	L	SD	F	P	P	P	G	P	G	VP
Vivar	5	6	R	114	119	115	133	L	SD	G	F	P	F	G	F	G	VP

\* Relative maturity: The relative maturity of the check, Harrington, is M (on average, 91 days from seeding to swathing ripeness)

‡ N = normal, SD = semi-dwarf,

◆ F+ indicates that these lines have superior resistance to those rated F but not enough to rate G

## Forage Barley

**AC Ranger, AC Hawkeye, and Westford** are six row varieties marketed as forage barley.

### Hulless

In hulless varieties the hull is left in the field, therefore, comparable yields are 9-12 percent lower. Hulless seed is more susceptible to damage than hulled seed, so handling should be minimized.

### Hulless Waxy

**CDC Alamo, CDC Candle, HB803 and Merlin** are waxy starch varieties for specialty markets. For further information contact Agricore United.

## Feed and Food Barley (Cont'd)

### Irrigation

Under irrigation, disease resistance, straw strength and maturity are more critical. Growers should select early, strong-strawed, disease resistant varieties and should consider semi-dwarf varieties.

### General Comments

A race of stem rust which attacks all of our previously resistant varieties is present in the eastern prairies and the northern great plains. This race has not reached high levels but if conditions are favorable, it could become a problem. Early sowing is the only practical measure which can be taken at this time.

Of the current two-rowed varieties, only **CDC McGwire** has good field resistance to all races of net blotch. Therefore, growers who must plant barley on barley stubble should either select six-rowed varieties which are more tolerant or the above mentioned two-rowed variety.





Most of the available varieties are susceptible to one or more types of smut. Therefore, seed should be treated on a regular basis.

Harvesting grain over 16 percent moisture and then using aeration bins for drying can lead to sprouting and embryo death. Seed with reduced germination is undesirable for seeding or malting purposes.

Two-rowed barley varieties are generally more resistant to shattering than are six-row varieties.

## Oat

### Main characteristics of varieties

Variety	Years Tested	Area				Test wt. (g/0.5L)	% Hull	% Plump	Maturity Rating*	Resistance to			
		1	2	3	4					Lodging	Stem Rust	Leaf Rust	Smut
Calibre	13	100	100	100	100	250	22.9	44	M	G	VP	VP	P
AC Assiniboia 	11	92	99	95	95	240	22.9	74	M	VG	VG	VG	VG
Boudrias# *	4	80	88	89	91	263	NA	16	L	G	VG	VG	VG
CDC Boyer	11	99	104	100	99	236	22.6	81	E	G	VG	F	P
CDC Dancer 	5	99	103	100	100	257	19.2	80	M	G	VG	VP	VG
Derby	13	100	101	103	103	251	22.2	74	M	G	VP	VP	P
SW Exactor 	6	97	108	105	101	241	25.0	44	L	VG	VP	VP	F
AC Gwen#	5	67	74	76	70	278	NA	11	L	G	VG	VG	VG
Kaufmann *	5	93	98	97	90	250	22.1	85	L	F	VG	VG	VG
AC Morgan *	6	102	112	110	111	242	24.2	63	M	VG	VP	VP	F
CDC Orrin *	4	103	109	115	109	257	22.5	81	L	G	VP	VP	VG
CDC Pacer	9	101	109	108	103	245	23.7	71	M	G	VP	VP	F
Pinnacle *	6	108	117	110	108	245	23.1	80	VL	G	G	VG	VG
Ronald *	5	91	99	98	100	253	21.8	62	L	VG	VG	VG	VG
Triple Crown 	9	95	105	108	108	238	24.7	67	L	VG	VP	F	P

\* Maturity rating: M = 96 days

# Hulless variety

### Additional information:

AC Assiniboia has brown hulls.

**HULLESS OAT:** The hull is part of normal oat yield, thus hulless types yield less. They are difficult to handle and should be stored at less than 12 per cent moisture.

CDC Baler, CDC Bell, and Murphy are annual forage oat varieties available for production in Saskatchewan.

# Other Crops

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## Canary Seed

The seed of annual canarygrass, more commonly called canary seed, is used as food for caged and wild birds. Three registered varieties are available. **Elias** and **Keet** are similar in yield, but **Keet** is earlier maturing and more resistant to lodging. Seeds and plants of **CDC Maria** do not have the small sharp hairs that cause irritation when canary seed is threshed and handled. Canary seed plants have a dense shallow root system and growing the crop on sandy soils is therefore not recommended. Canary seed may be grown successfully on stubble, providing adequate moisture is available for rapid germination and emergence. The maturity requirements are equal to wheat.

Planting should occur at the same optimum date as spring wheat at 34 kg/ha (30 lb/ac) (germination greater than 85 per cent). Early seeding may lower yields in some cases. Plant the seed 3.5 to 5 cm deep into a firm seedbed.

Fertilizer requirements are similar to those for cereal crops.

Canary seed is subject to damage by English grain aphid and bird cherry-oat aphid. Aphid populations build up rapidly on leaves, stems and head of the plant in 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 per cent 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 canary seed. Damage may occur at populations below these levels.

Canary seed leaf mottle is a foliar disease that can cause yield losses. Leaf mottle is caused by a fungus, *Septoria triseti*, that only affects canary seed. 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.

Canary seed should not be seeded on land that was treated with trifluralin or ethalfluralin the previous year.

Canary seed is resistant to shattering. It may be straight-combined or swathed when fully matured.

For more information on canary seed, consult the SAFRR publication, *Canary Seed in Saskatchewan*.

## Safflower

Safflower is an annual oilseed or birdseed crop which can be grown successfully in the Brown soil zone. Safflower must be sown early (late April).

**Saffire** matures in about 120 days. Seed 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 advisable.

**AC Stirling** has acceptable birdseed quality and higher oil content compared to **Saffire**. **AC Sunset** has the earliness of **Saffire** combined with higher oil content and resistance to Sclerotinia head rot.

## 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. For more information, consult the SAFRR publication, *Caraway in Saskatchewan*.

## 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.

## 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 to swaths. For more information consult the SAFRR publication, *Coriander in Saskatchewan*.

# Oilseed Crops

## Argentine Canola

Main characteristics of varieties

Variety	— Yield as a % of AC Excel (years in test) —				Average Maturity In Days	— Resistance To —		Varietal Kind***	Herbicide Tolerance****
	Area 2	Area 3	Area 4	Average % Oil*		Lodging	Blackleg**		
AC Excel	100 (7)	100 (7)	100 (7)	46.8	98	G	F	OP	—
1492	118 (4)	125 (5)	123 (4)	45.8	99	VG	F	HYB	—
1604	115 (3)	—	—	49.3	101	VG	G	OP	CL
1812	111 (4)	120 (3)	—	47.4	100	G	G	S	RR
215CL	—	100 (3)	—	48.4	100	G	F	OP	CL
23-38 *	103 (4)	107 (3)	—	47.9	97	G	G	OP	RR
243CL	—	99 (3)	—	46.98	100	G	F	OP	CL
2573	130 5	139 4	129 3	47.6	97	VG	VG	HYB	LL
2663	126 5	137 4	150 3	48.3	96	G	VG	HYB	LL
2733	123 (3)	130 (3)	—	48.4	95	G	G	HYB	LL
289CL	—	110 (3)	—	47.4	98	G	VG	OP	CL
3235 	104 (6)	103 (6)	102 (4)	46.6	96	G	G	OP	RR
34-55 *	108 (4)	114 (4)	113 (3)	47.8	99	VG	G	OP	RR
35-85 *	114 (3)	120 (3)	—	47.1	102	G	VG	OP	RR
45A51 	110 (3)	109 (3)	115 (3)	45.8	102	G	F	OP	RR
45A54 	114 (3)	102 (3)	—	46.1	97	G	VG	OP	RR
45A55 	108 (4)	120 (4)	101 (3)	46.7	96	G	VG	OP	RR
45H21	130 (3)	153 (3)	142 (3)	48.2	97	G	VG	HYB	RR
46A65 	112 (6)	114 (7)	115 (5)	47.5	98	F	VG	OP	—
46A73 	101 (3)	115 (3)	—	46.2	102	G	G	OP	CL
46A76 	134 (3)	128 (3)	—	46.9	100	VG	VG	OP	CL
499RR	102 (4)	122 (4)	—	47.3	98	G	VG	HYB	RR
505RR	—	139 (3)	—	48.1	100	VG	VG	HYB	RR
519RR	—	129 (3)	—	48	100	VG	VG	HYB	RR
811RR	114 (3)	130 (3)	—	47.7	98	G	VG	OP	RR
Agassiz	103 (4)	108 (4)	107 (3)	44	102	G	F	OP	—
Ascent	99 (4)	108 (4)	—	46.8	98	G	F	OP	—
Canterra 1867	93 (3)	103 (4)	—	46.7	97	G	F	OP	RR
Conquest	103 (3)	106 (3)	—	46.8	98	VG	VG	OP	RR
DS-Roughrider *	100 (5)	107 (5)	97 (3)	49.3	98	G	F	OP	RR
EAGLE 	—	114 (3)	—	45.6	97	G	G	OP	—
Foremost 	131 (4)	117 (3)	—	47.4	101	VG	VG	OP	—
Heritage	95 (3)	99 (4)	—	45.4	97	F	G	OP	RR
Hi-Q 	114 (3)	111 (3)	—	46.8	99	VG	VG	OP	—
Hudson 	117 (3)	116 (3)	—	45.5	96	G	G	OP	—
HYLITE 225RR	106 (4)	109 (4)	105 (3)	48.1	97	G	G	OP	RR
Hyola 401	102 (3)	121 (3)	107 (3)	44	98	G	P	HYB	—
HY-PER Star 100	113 (5)	119 (6)	121 (3)	45.8	100	VG	G	HYB	—
IMPULSE	108 (3)	121 (4)	112 (3)	45.3	100	G	VG	OP	—
Kelsey	91 (3)	101 (3)	—	47.8	97	G	G	OP	RR
LBD279	—	109 (3)	—	48.5	99	G	G	OP	—
LBD561RR	97 (3)	109 (3)	—	46.8	98	G	G	OP	RR
LBD612RR	112 (3)	130 (3)	—	47.8	98	G	G	OP	RR
LBD799RR	103 (3)	114 (3)	—	46.3	99	G	G	S	RR
LoLinda 	—	96 (3)	—	45.7	99	G	G	OP	—
Prairie 715RR	97 (3)	—	—	47	98	G	VG	OP	RR
Q2 	106 (5)	117 (5)	106 (5)	46	102	G	VG	OP	—
Sentry	97 (5)	101 (5)	—	44.4	98	G	VG	OP	—
Skyhawk 	—	122 (3)	—	44.9	97	G	VG	OP	—

## Argentine Canola (continued)

### Main characteristics of varieties

Variety	—Yield as a % of AC Excel (years in test) —			Average % Oil*	Average Maturity In Days	—Resistance to —		Varietal Kind***	Herbicide Tolerance****
	Area 2	Area 3	Area 4			Lodging	Blackleg**		
SP Admirable RR	105 (3)	136 (4)	122 (3)	46	100	VG	G	S	RR
SP Armada	90 (3)	120 (4)	95 (3)	47.2	98	VG	VG	OP	—
SP Banner *	—	128 (3)	—	48.2	98	VG	VG	OP	RR
SP Bucky *	—	110 (3)	—	48.8	99	F	VG	OP	RR
SW 5001	115 (3)	122 (3)	—	46	101	VG	VG	HYB	—
SW ARROW *	105 (3)	108 (4)	—	44.2	97	F	F	OP	RR
SW D5113 RR	111 (3)	126 (3)	129 (3)	47	98	G	G	HYB	RR
SW GladiatoRR	—	121 (3)	115 (3)	45.4	97	VG	G	S	RR
SW Razor	—	125 (3)	—	45.2	98	VG	G	S	RR
SW RideR	108 (3)	121 (3)	116 (5)	45.9	99	G	F	S	RR
Thunder	101 (3)	106 (3)	—	46.3	99	G	G	OP	—

\* Dry basis

\*\* A minimum of three years between canola crops (four year rotation) is essential to reduce the incidence of blackleg.

\*\*\* OP = open-pollinated; HYB = hybrid; S = synthetic

\*\*\*\* Herbicide tolerance: RR = Roundup Ready, LL = Liberty Link, CL = Clearfield.

**Note:** In most instances, only new varieties are tested each year. Therefore, comparisons should only be made between the check variety (**AC Excel**) and the variety of interest.

## Polish Canola

### Main characteristics of varieties

Variety	—Yield as % of AC Parkland (years in test) —			Average % Oil*	Average Maturity in Days	—Resistance to —		Varietal Kind**
	Area 2	Area 3	Area 4			Lodging	White rust	
AC Parkland	100 (9)	100 (10)	100 (8)	44.3	85	G	VG	OP
1007	104 (3)	106 (3)	—	44.5	85	VG	G	S
1000 SP	102 (3)	98 (4)	—	44.4	84	F	G	S
41P55	108 (6)	111 (6)	110 (5)	42.9	84	F	F	OP
ACS-C7	99 (3)	108 (4)	—	44.8	85	F-G	VG	S
AC Sunbeam	102 (9)	104 (9)	106 (8)	43.6	83	G	VG	OP
Cash	97 (3)	109 (3)	110 (3)	43.9	84	G	F	S
FAIRVIEW	104 (3)	107 (3)	—	44.3	85	G	G	S
Hysyn 110	108 (7)	111 (7)	119 (7)	43.0	84	G	F	S
Hysyn 111	105 (4)	107 (5)	116 (3)	42.8	86	G	G	S
Reward	104 (9)	103 (10)	102 (8)	44.4	84	F	VG	OP
WESTWIN	105 (3)	109 (3)	106 (3)	44.6	84	G	G	S

\* Dry basis

\*\* OP = open-pollinated; S = synthetic

**Note:** In most instances, only new varieties are tested each year. Therefore, comparisons should only be made between the check variety (**AC Parkland**) and the variety of interest.

A minimum of three years between canola crops (four year rotation) is essential to reduce the incidence of blackleg.

### Additional Information:

#### 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. Argentine varieties yield more than Polish varieties. Blackleg disease, which is now wide spread in Saskatchewan, can cause severe yield losses in varieties that have poor (P) resistance. 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. Late maturing varieties should therefore be planted early to reduce green seed counts. All Argentine varieties are susceptible to Sclerotinia stem rot. The control of herbicide tolerant canola volunteers requires good agronomic practice such as proper crop and herbicide rotation. Please note that only new varieties are tested each year and therefore most varieties have not been tested in the same year. Varietal comparisons should therefore **ONLY** be made between the check variety (**AC Excel**) and the variety of interest.

## Canola (continued)

### Polish Canola

Polish varieties mature approximately two weeks earlier than Argentine varieties and are therefore less likely to produce green seed. Polish varieties are more heat and drought tolerant than Argentine varieties. They are also more shatter resistant than Argentine varieties and are therefore well suited to straight combining. All Polish varieties are susceptible to Sclerotinia stem rot. **ACS-C7** has fair (F) resistance to blackleg; all other Polish varieties have poor (P) resistance. 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. Please note that only new varieties are tested each year. Therefore most varieties have not been tested in the same year. Varietal comparisons should therefore ONLY be made between the check variety (**AC Parkland**) and the variety of interest.

### *Brassica juncea* Canola

*Brassica juncea* canola is a new class of canola that is adapted to the brown and dark brown soil zones (Areas 1 and 2). It has very good resistance to blackleg and exhibits better heat and drought tolerance than other canolas.

*B. juncea* canola has shattering resistance similar to Polish canola. Currently all production is contracted and only two varieties are available: **Arid** and **Amulet**.

### Specialty Oil Rapeseed and Canola

Argentine type, high erucic acid rapeseed (HEAR) varieties have been developed for special industrial oil markets. These varieties can be lower yielding than conventional open-pollinated canola varieties but have very good blackleg resistance. Low linolenic acid Argentine type canola varieties have also been developed as a premium vegetable oil for human consumption. Information on the contract production of these specialty oil rapeseed and canola varieties should be obtained from companies that contract such production.

### Irrigation

Argentine varieties respond well to irrigation. Only varieties that are highly resistant to lodging and blackleg should be grown under these conditions. Irrigation may delay maturity by one week or more under certain conditions.

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## Mustard

Main characteristics of varieties

Type & Variety	Years Tested	Yield as % of AC Pennant	Protein % seed	Mucilage <sup>1</sup> cS*ml g <sup>-1</sup>
<i>Yellow</i>				
AC Pennant	12	100	34.6	35.6
AC Base	9	101	34.4	33.2
Tilney	12	95	35.0	38.9
Viscount	12	92	35.3	43.8
Andante	4	98	35.4	46.2

### *Oriental*

	Years Tested	Yield as % of Cutlass	Fixed oil % seed	Volatile oil <sup>2</sup> mg g <sup>-1</sup> seed
Cutlass	21	100	41.3	9.9
Forge	17	96	38.6	10.3
AC Vulcan	12	101	40.8	11.0

### *Brown*

Commercial	21	90	37.9	8.6
Duchess*	5	92	38.1	8.5

<sup>1</sup> mucilage in centi Stoke per 1g seed

<sup>2</sup> volatile oil as allyl isothiocyanate

Seed quality data based on three years of testing for yellow mustard and four years for oriental and brown mustard.

### Additional Information:

Mustard is grown in the drier regions of Saskatchewan due to the better seed quality obtained under these conditions. Saskatchewan is the primary producer of mustard in Canada and produces condiment mustard for export around the world. Oriental and brown mustard (*Brassica juncea*) are usually swathed when at least 25 per cent of the seeds have begun to change colour.

Straight combining is also possible, as both types of mustard have good seed shatter resistance. Straight combining is preferred for yellow mustard, *Sinapis alba*, as the stubble is usually shorter and does not anchor the lighter, fluffy swaths. It is important to check for proper seed maturity, as green seed is a major downgrading factor. Yellow mustard varieties mature in approximately 90 to 92 days, brown varieties in 85 days and oriental varieties mature in 86 to 88 days. Top grades of mustard are obtained when seeds are well matured; have good colour, with minimal damage; and are free of seeds from volunteer canola plants and weed seeds such as cow cockle.

Mustard is generally grown under contract, with varieties specified by the contracting companies to meet specific quality requirements for processing. Yellow mustard has a high protein content with newer varieties (**Viscount** and **Andante**) also having high mucilage content. **Forge** and **AC Vulcan** have high volatile oil content, a desirable trait for oriental mustard, as is the low fixed oil content. The brown mustard variety **Duchess** was registered in 2002. Average yields of yellow mustard were 17 per cent lower than oriental mustard yields over 12 years of testing from 1991-2002. Differences in seed yield between the different types of mustard are normally compensated for by price.

All mustard varieties have very good resistance to blackleg disease. The oriental type varieties **AC Vulcan** and **Cutlass** are resistant to white rust (staghead) while **Forge** and the brown mustard varieties **Commercial Brown** and **Duchess** are highly susceptible.

# Sunflower

## Main characteristics of varieties

### Oilseed

Variety	Years Tested	Yield as % of		Average Maturity in days	Oil %*
		IS 6111	100		
IS 6111	12	100	122	46.5	
63A70	4	110	124	49.5	

\* Dry basis

### Oilseed (EMSS)

Variety	Years Tested	Yield as % of ffg 150		
		IS 6111	100	Average Maturity in days
P6150	10	100	113	46.6
63A21	4	112	114	47.2

### Confection

Variety	Years Tested	Yield as % of		Average Maturity in days	Seed size % over 20/64
		IS 6111	100		
IS8048	4	94	125	61.2	

## 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.

The earlier maturing, short stature (EMSS) varieties are adapted to production in most areas of Saskatchewan.










The Saskatchewan Sunflower Committee has been conducting trials in Saskatchewan for the purpose of registration and demonstration since 1983.

Varieties that have been tested in official Saskatchewan Sunflower Committee trials for three years and are registered for production in Canada are placed on this list.

The Committee has been testing NuSun, a sunflower with a fatty acid profile desired by major frying companies. There will be additional acres of oilseed sunflower required to address the increased birdseed market.

# Flax

## Main characteristics of varieties

Variety	Years tested	Yield as a % of Vimy				Irrigation	Maturity**	Seed size	Resistance to Lodging
		Area 1	Area 2	Area 3	Area 4				
Vimy	16	100	100	100	100	100	M	L	P
CDC Arras	8	104	106	104	104	103	M	L	F
CDC Bethune 	8	112	117	114	116	111	L	M	G
AC Carnduff 	7	84	92	101	93	112	M	M	G
AC Emerson	8	96	96	95	93	98	M	L	F
Flanders	11	94	98	96	99	108	L	S	G
AC Hanley *	5	—	98	99	—	—	M	M	G
AC Lightning *	6	101	102	107	91	111	L	M	G
Macbeth *	5	—	97	96	—	111	L	M	G
AC McDuff 	7	93	95	97	94	102	VL	M	VG
CDC Mons	4	—	103	112	—	—	L	S	G
NorLin	16	91	96	96	99	105	M	M	G
CDC Normandy	8	99	100	101	104	105	M	M	F
Somme 	10	94	97	98	97	109	M	M	F
Taurus 	6	98	102	110	—	115	M	M	G
CDC Valour 	6	98	103	94	95	93	E	M	G
AC Watson 	6	94	97	102	102	104	M	M	G
<b>Solin</b> 									
1084 	6	93	94	95	106	99	M	M	G
2047 *	4	—	93	115	—	—	M	M	G

\* Data from Regional and COOP Yield Trials.

\*\* Relative Maturity: The relative maturity of the check, Vimy, is M (on average 103 days from seeding to swathing ripeness).

## Additional Information:

All varieties are resistant to rust and moderately resistant to Fusarium wilt. **AC Hanley, AC Lightning, Macbeth, CDC Mons** and **Linola™ 2047** are newly registered varieties. **AC Hanley** is distributed by SeCan Association, **AC Lightning** by Canterra Seeds Ltd., **Macbeth** by AgricoreUnited/Proven Seeds, **CDC Mons** by Quality Assured Seeds and **Linola™ 2047** by Proven Seeds. No seed is available for **CDC Mons** in 2003.

**Solin** is defined as a type of flax with less than five per cent linolenic acid in its oil and having a yellow seed coat. Solin varieties produce food quality oil and, as such, cannot be sold in traditional flax markets. **Linola™ 1084, Linola™ 2047** are available only for contract production.

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.



# Pulse Crops

## Lentil

### Main characteristics of varieties

Market class	Variety	Years tested*	— Yield % of Laird —			Height (cm)	Days to flower	Maturity rating	— Resistance to —			Seed weight (g/1000)
			Areas 1-2	Areas 3-4	Ascochyta blight				Anthracnose	Cotyledon colour		
Large green	Laird	8	100	100	41	53	VL	VP	VP	yellow	67	
	CDC Glamis	7	111	106	39	54	VL	G	VP	yellow	60	
	CDC Grandora	6	109	110	40	53	VL	G	VP	yellow	69	
	CDC Sovereign	6	116	109	40	52	L	G	P	yellow	66	
	CDC Sedley	5	118	106	39	51	M	F	VP	yellow	68	
	CDC Plato	4	130	120	38	52	ML	G	P	yellow	64	
Medium green	CDC Richlea	7	133	111	35	50	M	VP	VP	yellow	51	
	CDC Vantage	7	134	123	33	49	M	G	VP	yellow	52	
Small green	Eston	7	116	103	30	48	E	VP	VP	yellow	33	
	CDC Milestone	8	136	124	31	49	E	G	VP	yellow	37	
French green	CDC LeMay	4	120	115	35	48	E	F	VP	yellow	32	
	common	4	116	109	32	49	E	P	VP	yellow	31	
Small red	Crimson	5	118	109	29	49	E	VP	VP	red	35	
	CDC Blaze	4	124	115	30	47	E	G	P	red	34	
	CDC Redcap	6	127	115	30	49	E	G	F	red	35	
	CDC Redwing	6	122	112	30	50	E	G	VP	red	38	
	CDC Robin	5	136	113	30	49	E	G	G	red	30	

\* Coop and Regional Trials in Saskatchewan since 1995. Direct comparisons to Laird.

### Additional Information:

**Indianhead** lentil is a black-seeded variety released for green manure use. **CDC Matador** is a brown-seeded variety with yellow cotyledons. Seed supplies are limited for **CDC LeMay** and **CDC Plato**.

Detailed agronomic information may be found in the **Pulse Production Manual** available from the Saskatchewan Pulse Growers.

## Dry Bean

### Main characteristics of varieties

Variety	Type	Years tested*	— Yield as % of CDC Pintium —			Days to flower	Maturity	Pod clearance (%)	Seed weight (g/1000)	Growth** habit
			Irrigation	Area 2	Area 3					
CDC Pintium	pinto	6	100	100	100	50	E	80	350	I
Othello	pinto	6	96	96	89	52	L	51	323	III
CDC Pinnacle	pinto	5	102	103	98	53	L	67	352	III
CDC Altiro	pinto	6	102	86	77	47	E	64	357	III
CDC Camino	pinto	6	97	86	76	52	L	81	323	I
CDC Minto	pinto	4	99	—	93	51	L	62	410	III
Earliray	pinto	5	82	89	80	50	E	65	349	I
AC Polaris	great northern	4	106	71	94	52	L	70	310	III
CDC Crocus	great northern	6	104	99	81	47	E	59	355	III
CDC Nordic	great northern	6	77	79	68	52	L	62	319	I
CDC Polar Bear	great northern	4	98	87	77	52	L	65	339	III
US 1140	great northern	6	88	87	81	51	L	53	289	III
CDC Rosalee	pink	4	100	97	85	50	L	65	247	III
Viva	pink	4	94	102	80	51	L	50	242	III
AC Redbond	small red	4	100	97	85	51	L	65	290	II
CDC Espresso	black	6	55	78	66	47	M	87	191	I
CDC Nighthawk	black	5	62	61	67	58	L	77	165	II
UI906	black	5	93	96	71	60	L	76	148	II

\* Coop and regional trials grown in narrow rows

\*\* Growth habit: I - determinate bush; II - indeterminate bush; III - indeterminate vine.

# Field Pea

## Main characteristics of varieties

Variety	Years tested*	Yield % Alfetta			Leaf type**	Relative maturity	Vine Length (cm)	Mycosphaerella blight	Powdery mildew	Seed coat breakage	Resistance to			Seed coat dimpling***	Green seed coats****	Seed weight g/1000
		1,2 & South 3	North 3 & 4	Irrigation							Lodging	Bleaching				
<b>Food Type Yellow Seed</b>																
Alfetta 🌱	8	100	100	100	SL	M	60	P	P	F	F	n/a	F	G	290	
AC Melfort 🌱	4	98	86	87	SL	M	70	F	VG	F	F	n/a	G	F	240	
Badminton	4	107	102	—	SL	E	65	P	P	G	F	n/a	F	G	250	
Carneval 🌱	7	89	85	107	SL	M	75	F	P	F	G	n/a	—	—	230	
CDC Handel	5	112	99	112	SL	L	75	P	VG	G	F	n/a	G	F	220	
CDC Mozart	6	114	106	114	SL	M	70	F	VG	G	F	n/a	G	F	230	
CDC Minuet	5	109	108	—	SL	M	70	F	VG	F	F	n/a	G	F	190	
Cobra	4	99	94	—	SL	M	75	P	P	G	F	n/a	F	F	240	
Croma 🌱	5	101	100	—	SL	E	70	P	P	G	F	n/a	G	G	300	
Delta 🌱	4	101	98	—	SL	E	70	P	P	G	F	n/a	—	—	250	
DS Admiral *	5	101	110	87	SL	E	80	F	VG	G	G	n/a	G	G	240	
DS Stalwarth	4	97	95	103	SL	M	80	P	VG	G	F	n/a	G	G	240	
Eclipse 🌱	5	111	110	116	SL	M	80	F	VG	G	G	n/a	F	G	250	
Grande 🌱	7	93	91	93	N	L	90	F	P	G	F	n/a	G	F	220	
Integra 🌱	4	85	100	—	SL	E	75	F	P	G	G	n/a	F	F	280	
Mandy	4	88	94	96	SL	M	60	P	P	F	F	n/a	—	—	270	
Miami *	5	102	102	—	SL	E	80	P	P	F	G	n/a	G	F	240	
Nicole 🌱	4	106	105	—	SL	M	65	P	P	F	F	n/a	G	G	260	
SW Belfield*	3	113	127	117	SL	E	70	P	P	F	F	n/a	F	G	220	
SW Bravo 🌱	4	88	95	—	SL	E	75	F	P	G	G	n/a	G	G	260	
SW Circus *	3	107	120	108	SL	E	75	F	P	F	G	n/a	F	G	220	
SW Capri *	4	102	108	—	SL	E	75	F	P	F	G	n/a	F	G	210	
SW Prize *	3	102	108	—	SL	E	80	F	P	G	G	n/a	G	G	240	
SW Salute *	4	114	115	—	SL	E	75	P	VG	F	F	n/a	F	F	220	
SWING 🌱	5	95	99	—	SL	E	75	F	P	VG	G	n/a	G	G	250	
<b>FOOD TYPE GREEN SEED</b>																
AC Advantage 🌱	4	79	68	—	SL	L	60	F	VG	G	P	F	F	n/a	270	
CDC Montero	5	99	95	—	SL	M	80	F	VG	G	F	F	F	n/a	230	
CDC Striker	3	101	97	—	SL	M	80	F	P	VG	G	G	G	n/a	230	
CDC Verdi	5	90	73	—	SL	L	75	F	P	G	F	G	F	n/a	200	
Cruiser	4	91	87	—	SL	M	75	F	P	VG	F	G	G	n/a	200	
DS Dominator *	3	86	67	—	SL	L	65	F	VG	G	G	F	F	n/a	230	
Espace 🌱	4	96	101	—	SL	M	75	P	P	F	G	F	F	n/a	230	
Logan	4	85	86	—	SL	E	75	P	P	F	G	G	F	n/a	180	
Madoc 🌱	5	95	98	104	SL	E	70	P	P	F	F	F	F	n/a	250	
Majoret 🌱	5	79	75	95	SL	M	60	P	P	G	G	F	—	n/a	250	
Millenium 🌱	5	103	97	—	SL	E	65	P	P	F	F	F	F	n/a	260	
Nitouche 🌱	6	91	95	92	SL	M	75	F	P	G	G	G	F	n/a	250	
Scuba 🌱	4	82	87	—	SL	E	80	P	P	F	F	F	F	n/a	230	
SW Parade 🌱	4	97	88	113	SL	M	70	F	VG	G	F	F	G	n/a	220	
Toledo 🌱	4	87	95	—	SL	M	70	P	P	G	G	F	F	n/a	280	
Venture *	4	97	88	—	SL	E	75	P	P	G	F	F	F	n/a	220	
<b>MAPLE</b>																
CDC Acer	2	112	101	—	SL	L	60	F	VG	G	F	n/a	VG	F	140	
CDC April	4	82	70	—	SL	L	60	F	P	G	F	n/a	—	n/a	140	
CDC Vienna	5	86	81	—	SL	L	60	F	P	G	F	n/a	—	n/a	170	
Courier 🌱	3	94	90	—	SL	M	75	F	P	F	P	n/a	VG	F	210	
Whero	3	60	57	—	N	L	110	P	P	G	P	n/a	—	n/a	210	
<b>SILAGE</b>																
CDC Sonata	3	109	100	—	N	L	85	F	VG	F	F	n/a	F	F	220	
Trapper	7	74	73	—	N	L	95	P	P	F	P	n/a	—	—	140	
Victoria	7	80	77	—	N	M	85	P	P	F	P	n/a	—	—	190	

\* Coop and regional trials in Saskatchewan.

\*\*N-normal leaf type; SL-semi-leafless.

\*\*\*Seed coat dimpling: VG=0-5%; G=6-20%; F=21-50%.

\*\*\*\*Green seed coats: Good = 0-10%; Fair = 11-25%.

Relative ratings for disease, seed coat breakage, lodging, bleaching (for green seed varieties), seed coat dimpling, and green seed coats (for yellow seed varieties): VG-very good; G-good; F-fair; P-poor; VP-very poor

Detailed agronomic information may be found in the **Pulse Production Manual** available from the Saskatchewan Pulse Growers.

## Chickpea - Kabuli

Main characteristics of varieties

Variety	Years tested	Yield (% Sanford)		Leaf type*	Ascochyta blight**	Height (cm)	Days to flower	Maturity***	Seed weight (g/1000)
		Area 1	Area 2						
Sanford	7	100	100	U	VP	49	56	L	425
Amit (B-90)	5	128	139	F	F	46	55	M	265
CDC ChiChi	4	115	120	F	P	45	53	M	385
CDC Chico	7	136	147	F	P	45	51	E	265
CDC Diva	4	104	117	U	VP	43	52	M	490
CDC Xena	6	115	135	U	VP	44	52	M	470
CDC Yuma	7	113	116	F	P	47	53	L	410
Dwellely	3	86	88	U	VP	45	57	VL	490
Evans	4	90	98	U	VP	50	53	L	430

## Chickpea - Desi

Main characteristics of varieties

	Years tested	Yield (% Myles)		Leaf type*	Ascochyta blight**	Height (cm)	Days to flower	Maturity***	Seed weight (g/1000)	Seed shape****	Seed coat color*****
		Area 1	Area 2								
Myles	7	100	100	F	F	41	50	E	200	A	T
CDC Anna	5	108	111	F	F	42	52	M	210	P	T
CDC Desiray	6	96	107	F	F	37	49	E	210	P	LT
CDC Nika	5	95	103	F	F	39	50	M	320	P	T

\* Leaf type: F=fern; U=unifoliate

\*\* Ascochyta blight ratings: F - fair; P - poor, VP - very poor

\*\*\* Maturity will be delayed in areas with a cool moist summer, especially on clay soils.

\*\*\*\* Seed shape: P = plump; A = angular

\*\*\*\*\* Seed coat color: T = tan; LT = light tan

### Additional Information

Kabuli chickpea is best adapted to stubble or summerfallow production in the Brown soil zone. Desi chickpea is best adapted to stubble production in the Brown and Dark Brown soil zones. Chickpea is a deep-rooted crop, which is efficient in water uptake. Planting on clay soils, regardless of soil zone, increases the risk of prolonged vegetative growth and failure to mature on time. This risk can be reduced by planting on sandier, drought prone soils. Chickpea will tolerate light frosts in the spring. Desi varieties can be seeded in late April or early May. Kabuli varieties should be planted between early to mid May into a warm seedbed, preferably at least 10°C average soil temperature at

depth of seeding. This means that kabuli varieties are often later maturing.

**Ascochyta blight** can completely destroy a chickpea crop. Varieties listed in the recommendation tables differ in their resistance from “Very Poor” to “Poor” to “Fair”; none are rated as “Good”. To date, fern-leaf varieties tend to develop less ascochyta blight than unifoliate-leaf varieties. Susceptibility to the disease increases at the flowering and early podding stage. Field scouting for disease symptoms should begin in early June and continue throughout the growing season. Scouting should concentrate on areas where the risk of early infection is higher, e.g. fields adjacent to previous chickpea crops, where plant densities are higher, and

in higher moisture areas. Scouting field margins is not sufficient. Fungicide application(s) may be necessary to protect crops. Disease risk is greater under conditions of frequent showers and/or heavy dew, and for varieties rated as Poor or Very Poor. Ascochyta blight is seed-borne and stubble-borne, therefore, growers should use seed with ascochyta blight levels as close to 0% as possible, and plant chickpea in the same field no more than once in four years.

Chickpea requires planting equipment with a seed-feeding mechanism capable of handling large seeds. Chickpea seeds are highly susceptible to damage and should be handled gently at all times. Seed treatment with Apron FL/ Allegiance FL (metalaxyl) for seed

## Chickpea (Continued from page 19)

rot diseases is strongly recommended for kabuli varieties, and may be required for desi varieties if conditions favour seed rotting diseases. Seed treatment with Crown (carbathiin and thiabendazole) is strongly recommended for both desi and kabuli varieties to reduce the severity of seed-borne ascochyta blight. Plant chickpea seeds

approximately 6 cm deep. Seeding rates vary with seed size; target 4 plants/ft<sup>2</sup>. Desi varieties are generally earlier maturing and higher yielding compared to the currently available kabuli varieties. The chickpea crop has stiff stems and can be swathed or straight cut at maturity. Thresh kabuli varieties gently to avoid seed splitting. All **kabuli** chickpea varieties listed have normal ("ram's

head") seed shape, with the exception of **Amit** which has a round seed shape.

Certified Seed of **CDC Yuma, CDC Xena, CDC Chico, CDC Desiray, CDC Diva, CDC Anna, and CDC Nika** will be available in 2003.

For more details on production consult the *Pulse Production Manual*, published by the Saskatchewan Pulse Growers.

## Faba Bean

Main characteristics of varieties

Variety	Years tested	—Yield as % of Outlook—		Maturity in days	Seed weight (g/1000)
		(Northeast) Dryland	(South-central) Irrigated		
Outlook	15	100	100	109	360
Aladin	15	104	110	112	400
CDC Blitz	6	101	105	109	410
CDC Fatima	8	100	104	105	520
Cresta	3	92	101	105	630
Orion	6	95	94	103	350
Scirocco	3	96	110	107	550

## Additional Information

Faba bean should be seeded early (late April to early May). It is best adapted to irrigated areas in the Dark Brown Soil Zone and the portion of the Black Soil Zone with the longest growing season.

Seed supplies of **CDC Blitz, Scirocco** and **Cresta** are limited.

Faba bean is a legume and thus is able to fix nitrogen from the air, provided the seed is inoculated with the proper bacteria prior to planting. Faba bean requires a specific strain of inoculum.

The Advisory Council on Grain Crops, a committee of the Saskatchewan Agricultural Services Co-ordinating Committee (SASCC), supervises, co-ordinates and reviews the collection, analysis and reporting of information in this pamphlet.

Membership of the Advisory Council on Grain Crops consists of representatives from:

- Agriculture and Agri-Food Canada
- Saskatchewan Agriculture and Food
- University of Saskatchewan
- Crop Development Centre
- Saskatchewan Wheat Pool
- Canadian Seed Trade Association
- Saskatchewan Seed Growers' Association
- Saskatchewan Association of Rural Municipalities
- Farmers
- Saskatchewan Irrigation Development Centre
- Representatives from Saskatchewan Seed Distributing Companies

The Advisory Council on Grain Crops gratefully acknowledges the contributions of Saskatchewan Agriculture and Food, Agriculture and Agri-Food Canada, the University of Saskatchewan, the Crop Development Centre, Saskatchewan Wheat Pool and all others who were involved in the research and analysis which led to the recommendations made in this publication.

## Contributing Agencies



Agriculture and Agri-Food Canada    Agriculture et Agroalimentaire Canada

# Seed Facts

## Pedigreed Seed

Use certified seed regularly, especially when changing to a different variety. This assures that the seed has high genetic purity, high germination and is relatively free from weeds and other crop seeds. Some pedigreed seed may be paid for by an over-quota delivery of commercial grain. Ask your elevator agent or seed dealer for details.

## Reuse of Hybrid Variety Seed

Seed grown from a hybrid variety (regardless of crop or variety) should not be reused since a 20 to 25 percent 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 will 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 seed standards.**

## Seed Treatment

Use of seed from cereal crops infected with *Fusarium* 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.

Smuts that attack wheat, barley, oat and rye can be controlled by chemical seed treatment. If seed from a crop in which bunt or smut was observed must be used for seed, seed treatment should be considered. **If the presence of smut is uncertain, varieties rated VERY POOR should be treated every year, those rated POOR every second year and those rated FAIR 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 and bunt) are carried on the outside of the seed and can be controlled by non-systemic seed treatments containing maneb or thiram.

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 dressing is a convenient alternative to on-farm seed treatment.

Various fungicides have been registered for the control of seedling diseases. Flax, canola, rye and winter wheat seed should be treated to promote good seedling growth.

Wireworms, which attack all grain crops, and flea beetles, which attack canola and mustard, can be controlled by seed treatment with insecticides. At the time of publication, the insecticide lindane was no longer registered for flea beetle control, but alternatives are available.

Read the label carefully before using any seed treatment or insecticide. Information on their use and recommended rates is found in the *Guide to Crop Protection 2003* (SAFRR publication). Carryover stocks of treated seed should be tested for germination before using. 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 five per cent seed infection is acceptable in the Brown and Dark Brown Soil Zones, but zero per cent is desirable in the Black Soil Zone. In pea, up to 10 per cent seed infection with ascochyta is acceptable. In chickpea, zero per cent 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. **A seed treatment for ascochyta-infected lentil seed is now available and is recommended if seed infection levels approach five per cent.**

## 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 per cent ergot is considered poisonous and should not be used for food. Details of this disease are found in *Ergot of Grains and Grasses* (Agriculture and Agri-Food Canada Publ. 1438).

## Seed Inoculation

Legume crops obtain much of their nitrogen (N) 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 which is stored damp or tough may be low in germination.** Grain which will be used for seed should be dried, if necessary, soon after harvest. The drying temperature should be below 37 degrees celsius for batch driers and 43 degrees celsius 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.

## Production Notes

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. Refer to the SAFRR publication *Wheat Midge*.

Residue of infected crops may harbour disease pathogens. Seeding into stubble of the same crop kind will increase disease risk, particularly in higher rainfall areas.

# Breeding institutions and seed distributors of varieties listed in this publication

Crop kind, Class & Variety	Breeding Institution	Distributor	Crop kind, Class & Variety	Breeding Institution	Distributor
<b>Wheat</b>					
<b>Bread Wheat</b>					
5500HR ☼	Agripro/Agricore United	Proven Seed	Plenty	U of S - CDC	SeCan Members
5600 HR ☼	Agripro/Agricore United	Proven Seed	Sceptre	U of S - CDC	SeCan Members
5601HR	Agripro/Agricore United	Proven Seed	<b>Soft White Spring Wheat</b>		
5701PR	Agripro/Agricore United	Proven Seed	Fielder	USDA/AAFC (Lethbridge)	Public
AC Abbey ☼	AAFC (Swift Current)	Canterra Seeds	AC Nanda	AAFC (Lethbridge)	QAS
Alsen ☼		Canterra Seeds	AC Phil	AAFC (Lethbridge)	SeCan Members
AC Barrie ☼	AAFC (Swift Current)	SeCan Members	AC Reed	AAFC (Lethbridge)	SeCan Members
CDCBounty	U of S - CDC	Canterra Seeds	<b>Winter Wheat</b>		
AC Cadillac ☼	AAFC (Swift Current)	QAS	ACBellatrix	AAFC (Lethbridge)	QAS
Columbus	AAFC (Winnipeg)	SeCan Members	CDC Buteo	U of S - CDC	
AC Cora	AAFC (Winnipeg)	SeCan Members	CDC Clair	U of S - CDC	SeCan Members
AC Domain	AAFC (Winnipeg)	SeCan Members	CDC Falcon	U of S - CDC	SeCan Members
AC Eatonia	AAFC (Swift Current)	Proven Seed	CDC Harrier	U of S - CDC	SeCan Members
AC Elsa ☼	AAFC (Swift Current)	SeCan Members	CDC Kestrel	U of S - CDC	Canterra Seeds
AC Intrepid ☼	AAFC (Swift Current)	Canterra Seeds	CDC Osprey	U of S - CDC	Canterra Seeds
Harvest	AAFC (Winnipeg)	QAS	CDCRaptor	U of S - CDC	SeCan Members
Journey		Sask. Wheat Pool	McClintock		
Katepwa	AAFC (Winnipeg)	SeCan Members	<b>Winter Rye</b>		
Laura	AAFC (Swift Current)	SeCan Members	AC Remington	AAFC (Swift Current)	Proven Seed
Lovitt		Canterra Seeds	Danko		Proven Seed
AC Majestic	AAFC (Winnipeg)	SeCan Members	Kodiak	University of Alberta	Proven Seed
McKenzie	Sask. Wheat Pool	SWP/Proven Seed	Prima	AAFC (Swift Current)	SeCan Members
Prodigy	Sask. Wheat Pool	SWP/Proven Seed	AC Rifle	AAFC (Swift Current)	Proven Seed/Canterra
AC Splendor	AAFC (Winnipeg)	SeCan Members	<b>Spring Rye</b>		
Superb	AAFC (Winnipeg)	SeCan Members	Gazelle	U of S	Public
CDC Teal	U of S - CDC	QAS	<b>Triticale</b>		
<b>Canada Prairie Spring Wheat</b>			AC Alta	AAFC (Swift Current)	Progressive Seeds
5700PR ☼	Agripro/Agricore United	Proven Seed	AC Ultima	AAFC (Swift Current)	QAS
AC 2000	AAFC (Swift Current)	SeCan Members	AC Certa	AAFC (Swift Current)	Progressive Seeds
AC Crystal ☼	AAFC (Swift Current)	SeCan Members	AC Copia	AAFC (Swift Current)	QAS
AC Foremost	AAFC (Swift Current)	SeCan Members	Bobcat	AAFRD (Lacombe)	Progressive Seeds
AC Karma	AAFC (Swift Current)	SeCan Members	Pika	AAFRD (Lacombe)	Progressive Seeds
AC Taber	AAFC (Swift Current)	SeCan Members	Pronghorn	AAFRD (Lacombe)	Progressive Seeds
AC Vista ☼	AAFC (Swift Current)	QAS	Sandro	Swiss Fed Ag Res	ProMark Seed
<b>Canada Western Extra Strong</b>			<b>Barley</b>		
Amazon	University of Manitoba	Canterra Seeds	<b>Malting</b>		
AC Corinne	AAFC (Winnipeg)	QAS	B1602	Busch Ag. Res.	Sask. Wheat Pool
AC Glenavon	AAFC (Winnipeg)	SeCan Members	CDCBattleford ☼	U of S - CDC	SeCan Members
CDC Rama	U of S - CDC	QAS	Calder	AAFC (Brandon)	SeCan Members
Glenlea	University of Manitoba	Public	CDC Copeland ☼	U of S - CDC	SeCan Members
<b>Hard White Spring Wheat</b>			Excel	U of Minnesota	Proven Seed, Others
Kanata	AAFC (Winnipeg)	QAS	CDC Goodale	U of S - CDC	
ACSnowbird	AAFC (Winnipeg)	QAS	CDC Kendall ☼	U of S - CDC	Proven Seed/SWP
<b>Durum</b>			Harrington	U of S - CDC	SeCan Members
AC Avonlea ☼	AAFC (Swift Current)	QAS	Legacy ☼	Busch Ag Res.	SWP/Proven Seed
Kyle	AAFC (Swift Current)	SeCan Members	AC Metcalfe ☼	AAFC (Brandon)	SeCan Members
AC Melita	AAFC (Winnipeg)	SeCan Members	Merit ☼	Busch Ag. Res.	SWP/Proven Seed
AC Morse ☼	AAFC (Winnipeg)	SeCan Members	Newdale	AAFC (Brandon)	QAS
AC Napoleon	AAFC (Winnipeg)	Canterra Seeds	Robust	U of Minnesota	Cargill Seed, Others
AC Navigator ☼	AAFC (Swift Current)	Sask. Wheat Pool	CDC Select ☼	U of S - CDC	SWP/Proven Seed
			CDC Sisler ☼	U of S - CDC	Proven Seed
			Stein	U of S - CDC	Proven Seed
			CDC Stratus	U of S - CDC	QAS
			CDC Tisdale	U of S - CDC	QAS
			CDC Yorkton ☼	U of S - CDC	Proven Seed
			AC Bountiful	AAFC (Brandon)	QAS
			<b>Feed</b>		
			CDC Dolly	U of S - CDC	SeCan Members
			CDC Fleet	U of S - CDC	QAS
			AC Harper ☼	AAFC (Lethbridge)	SeCan Members
			CDCHelgason ☼	U of S - CDC	SeCan Members
			AC Lacombe ☼	AAFC (Lacombe)	SeCan Members
			Niobe	AAFRD (Lacombe)	SeCan Members
			AC Rosser ☼	AAFC (Brandon)	SeCan Members

AC - as a prefix to variety names Agriculture Canada (Agriculture and Agri-Food Canada)  
AAFC - Agriculture and Agri-Food Canada  
CDC - Crop Development Centre  
AAFRD - Alberta Agriculture Food and Rural Development, Lacombe, Alta.  
U - University  
U of S - University of Saskatchewan, Saskatoon  
USDA - United States Department of Agriculture  
QAS - Quality Assured Seeds  
SWP - Saskatchewan Wheat Pool

## Breeding institutions and seed distributors (continued)

Crop kind, Class & Variety	Breeding Institution	Distributor	Crop kind, Class & Variety	Breeding Institution	Distributor
Stander ☼	U of Minnesota	Sask. Wheat Pool	Ascent	DSV Canada	LiBred
Trochu	AAFRD (Lacombe)	SeCan Members	Canterra1867	IMC Cargill	Canterra Seeds
Xena ☼	Agricore/W. Plant Breeders	Proven Seed/SWP	Conquest	U of Alberta	Sask Wheat Pool
<b>Hulless</b>			DS-Roughrider	Danisco Seeds	SeCan Members
AC Bacon	AAFC (Brandon)	SeCan Members	EAGLE ☼	Svalof Weibull AB	SeCan Members
CDC Dawn	U of S - CDC	SeCan Members	Foremost ☼	DLF-Trifolium	Seed Link Inc.
Falcon ☼	AAFRD (Lacombe)	Progressive Seeds	Heritage	Monsanto Canada	ProMark,Northstar
CDC Freedom	U of S - CDC	SeCan Members	Hi-Q ☼	University of Alberta	Sask Wheat Pool
CDC Gainer	U of S - CDC	OAS	Hudson ☼	Danisco Seeds	OAS
HB805	W. Plant Breeders	Proven Seed	HYLITE 225RR	Monsanto Canada	Advanta Seeds
CDC McGwire	U of S - CDC	SeCan Members	Hyola 401	Advanta Seeds	Advanta Seeds
Peregrine	AAFRD (Lacombe)	Progressive Seeds	HY-PER Star 100	NPZ/LEMBKE	OAS
Phoenix	AAFRD (Lacombe)	Progressive Seeds/CDC	IMPULSE	Svalof Weibull AB	ProMark Seed
Speedy	U of S - CDC	OAS	Kelsey	U. of Alberta	Sask. Wheat Pool
Tercel ☼	AAFRD (Lacombe)	Progressive Seeds	LBD279	DSV Canada	LiBred
<b>Intensive Management</b>			LBD561RR	DSV Canada	LiBred
CDC Bold	U of S - CDC	Canterra Seeds	LBD612RR	DSV Canada	LiBred
CDC Earl	U of S - CDC	SeCan Members	LBD799RR	DSV Canada	LiBred
Kasota ☼	AAFRD (Lacombe)	SeCan Members	LoLinda ☼	Bonis and Company	Sask. Wheat Pool
Mahigan	AAFRD (Lacombe)	SeCan Members	OAC DYNAMITE	U of Guelph	ProMark Seed
Niska	AAFRD (Lacombe)	Canterra Seeds	Prairie 715RR	DSV Canada	Prairie Seeds
CDC Thompson	U of S - CDC	OAS	Q2 ☼	U. of Alberta	Sask. Wheat Pool
Vivar	AAFRD (Lacombe)	SeCan Members	Sentry	U of Manitoba	
<b>Oat</b>			Skyhawk ☼	DLF-Trifolium	ProMark,Northstar, Prairie
AC Assiniboia ☼	AAFC (Winnipeg)	Proven Seed	SP AdmirableRR	Sask. Wheat Pool	Sask. Wheat Pool
CDC Boyer	U of S - CDC	SeCan Members	SP Armada	Sask. Wheat Pool	Sask. Wheat Pool
Boudrias	AAFC (Lacombe)	OAS	SP Banner	Sask. Wheat Pool	Sask. Wheat Pool
Calibre	U of S - CDC	SeCan Members	SP Bucky	Sask. Wheat Pool	Sask. Wheat Pool
CDC Dancer ☼	U of S - CDC	OAS	SW 5001	Svalof Weibull AB	Sask. Wheat Pool
CDC Orrin	U of S - CDC	OAS	SW ARROW(RR)	Svalof Weibull AB	SWP/Proven Seed
Derby	U of S - CDC	Proven Seed	SW D5113RR	Svalof Weibull AB	
AC Gwen	AAFC (Winnipeg)	SeCan Members	SW GladiatoRR	Svalof Weibull AB	OAS
Kaufmann	AAFC (Lacombe)	SeCan Members	SW RazoR (RR)	Svalof Weibull AB	ProMark Seed
AC Morgan	AAFC (Lacombe)	SeCan Members	SW RideR (RR)	Svalof Weibull AB	SWP/Proven Seed
CDC Pacer	U of S - CDC	OAS	Thunder	DSV Canada	Federated Co-op
Pinnacle	AAFC (Winnipeg)	OAS	TRAILBLAZER ☼	Monsanto Canada	Monsanto Canada
Ronald	AAFC (Winnipeg)	SeCan Members	<b>Polish</b>		
SW Exactor ☼	Svalof Weibull AB	OAS	41P55	Pioneer Hi-Bred	Proven Seed
Triple Crown ☼	Svalof Weibull AB	ProMark Seed	1000 SP	Advanta Seeds	Canterra Seeds
CDC Baler	U of S - CDC	OAS	1007	Svalof Weibull AB	Canterra Seeds
CDC Bell	U of S - CDC	Proven Seed	ACS-C7	AAFC (Saskatoon)	
AC Murphy	AAFC (Lacombe)	SeCan Members	Cash	Svalof Weibull AB	ProMark Seed
<b>Canola</b>			FAIRVIEW	Svalof Weibull AB	Sask. Wheat Pool
<b>Argentine</b>			Hysyn 110	Advanta Seeds	Advanta Seeds
AC Excel	AAFC (Saskatoon)	SeCan Members	Hysyn 111	Advanta Seeds	Advanta Seeds
215CL	Advanta Seeds	Advanta Seeds	AC Parkland	AAFC (Saskatoon)	SeCan Members
243CL	Advanta Seeds	Advanta Seeds	Reward	U of Manitoba	SeCan Members
289CL	Advanta Seeds	Advanta Seeds	AC Sunbeam	AAFC (Beaverlodge)	SeCan Members
499RR	DSV Canada	Prairie Seeds	WESTWIN	Svalof Weibull AB	LiBred
505RR	Advanta Seeds	Advanta Seeds	<b>Flax</b>		
519RR	Advanta Seeds	Advanta Seeds	CDC Arras	U of S - CDC	OAS
811RR	DSV Canada	Federated Co-op	CDC Bethune ☼	U of S - CDC	SeCan Members
1492	NPZ-LEMBKE	Canterra Seeds	AC Carnduff ☼	AAFC (Morden)	SeCan Members
1604	AgriProgress	Canterra Seeds	CDC Mons	U of S - CDC	OAS
1812	DSV Canada	Canterra Seeds	AC Emerson	AAFC (Morden)	SeCan Members
23-38	Monsanto Canada	Monsanto Canada	Flanders	U of S - CDC	SeCan Members
2573	Bayer CropScience	Bayer CropScience	AC Hanley	AAFC (Morden)	SeCan Members
2663	Bayer CropScience	Bayer CropScience	AC Lightning	AAFC (Morden)	Canterra Seeds
2733	Bayer CropScience	Bayer CropScience	Linola™ 2047	CSIRO/UGG	Proven Seed
3235	Monsanto Canada	Monsanto Canada	Linola™ 1084 ☼	CSIRO/UGG	Proven Seed
34-55 ☼	Monsanto Canada	Monsanto Canada	Macbeth	AAFC (Morden)	
35-85	Monsanto Canada	Monsanto Canada	AC McDuff ☼	AAFC (Morden)	Proven Seed
45AH21	Pioneer Hi-Bred	Pioneer Hi-Bred	NorLin	AAFC (Morden)	SeCan Members
45A51 ☼	Pioneer Hi-Bred	Pioneer Hi-Bred	CDC Normandy	U of S - CDC	SeCan Members
45A54 ☼	Pioneer Hi-Bred	Pioneer Hi-Bred	Somme	U of S - CDC	SeCan Members
45A55 ☼	Pioneer Hi-Bred	Pioneer Hi-Bred	Taurus ☼	Cebeco Zaden	OAS
46A65 ☼	Pioneer Hi-Bred	Pioneer Hi-Bred	CDC Valour ☼	U of S - CDC	SeCan Members
46A73 ☼	Pioneer Hi-Bred	Pioneer Hi-Bred	Vimy	U of S - CDC	SeCan Members
46A76 ☼	Pioneer Hi-Bred	Pioneer Hi-Bred	AC Watson ☼	AAFC (Morden)	Sask. Wheat Pool
Agassiz	DSV Canada	LiBred			

## Breeding institutions and seed distributors (continued)

Crop kind, Class & Variety	Breeding Institution	Distributor	Crop kind, Class & Variety	Breeding Institution	Distributor
<b>Mustard</b>			CDC Vienna	U of S - CDC	Walker Seed
<b>Brown</b>			Whero	Challenge Seeds	ProMark Seed
commercial		Trade	<b>Lentil</b>		
Andante			CDC Blaze	U of S - CDC	Sask. Pulse Growers
Duchess	Proven Seed	Proven Seed	CDC LeMay	U of S - CDC	Sask. Pulse Growers
<b>Oriental</b>			CDC Plato	U of S - CDC	Sask. Pulse Growers
Cutlass	AAFC (Saskatoon)	Trade	Crimson	Public	
Forge	Colman's of Norwich	Sask. Wheat Pool	Eston	U of S - CDC	SeCan Members
AC Vulcan	AAFC (Saskatoon)	Sask. Wheat Pool	CDC Glamis	U of S - CDC	Sask. Pulse Growers
<b>Yellow</b>			CDC Grandora	U of S - CDC	Sask. Pulse Growers
AC Base	AAFC (Saskatoon)		CDC Matador	U of S - CDC	
Ochre	AAFC (Saskatoon)	Trade	CDC Milestone	U of S - CDC	Sask. Pulse Growers
AC Pennant	AAFC (Saskatoon)	Sask. Wheat Pool	Laird	U of S - CDC	SeCan Members
Tilney	Colman's of Norwich	Proven Seed	CDC Redcap	U of S - CDC	Sask. Pulse Growers
Viscount	Colman's of Norwich/UGG	Proven Seed	CDC Redwing	U of S - CDC	Sask. Wheat Pool
<b>Sunflower</b>			CDC Richlea	U of S - CDC	SeCan Members
63A21	Pioneer Hi-Bred	Pioneer Hi-Bred	CDC Robin	U of S - CDC	Sask. Pulse Growers
63A70	Pioneer Hi-Bred	Pioneer Hi-Bred	CDC Sedley	U of S - CDC	Sask. Pulse Growers
IS 6111	Interstate Seeds	Advanta Seeds	CDC Sovereign	U of S - CDC	Sask. Pulse Growers
IS 8048	Advanta Seeds	Advanta Seeds	CDC Vantage	U of S - CDC	Sask. Pulse Growers
P6150	Pioneer Hi-Bred	Pioneer Hi-Bred	<b>Faba Bean</b>		
<b>Field Pea</b>			Aladin	University of Manitoba	Public
CDC Acer	U of S - CDC	Sask. Pulse Growers	CDC Blitz	U of S - CDC	
DSAdmiral	Danisco Seeds	QAS	Cresta	Saatbau Linz	Canterra Seeds/Agriprogress Inc.
ACAdvantage ☼	AAFC Morden	Secan Members	CDC Fatima	U of S - CDC	R.Legumex/Walker S.
Alfetta ☼	Cebeco Zaden	QAS	Orion	AAFC (Lacombe)	Roger Lee, Lyster Farm
Badminton	Progene	West-Son Products Ltd.	Outlook	U of S - CDC	SeCan Members
CDC April	U of S - CDC	QAS	Scirocco	NPZ-Lembke	Agriprogress Inc.
SW Belfield	Svalof Weibull AB		<b>Dry Bean</b>		
SWBravo ☼	Svalof Weibull AB	Canterra Seeds	AC Burrito	AAFC (Harrow)	
SWCapri	Svalof Weibull	Canterra Seeds	CDC Camino	U of S - CDC	Sask. Pulse Growers
Carneval ☼	Svalof Weibull AB	Sask. Wheat Pool	CDC Crocus	U of S - CDC	Klempnauer
Carrera	Cebeco Zaden	Canseed Ltd.	Othello	USDA/ARS (Prosser, WA)	Public
SW Circus	Svalof Weibull AB		Earlray	Gen-Tec	Gen-Tec
COBRA	Danisco Seeds	Canterra Seeds	US 1140	USDA	Public
Courier ☼	N.Z. Crop & Food	Canterra Seeds	CDC Espresso	U of S - CDC	Canterra Seeds
CROMA ☼	Cebeco Zaden	Canterra Seeds	CDC Nighthawk	U of S - CDC	QAS
Cruiser	NZ Crop & Food	Canterra Seeds	CDC Nordic	U of S - CDC	Sask. Pulse Growers
Delta ☼	Cebeco Zaden	QAS	CDC Pintium	U of S - CDC	Sask. Pulse Growers
DSDominator	Danisco Seeds	QAS	GTS 523	Gen-Tec	Gen-Tec
Eclipse ☼	Cebeco Zaden	QAS	CDC Rosalee	U of S - CDC	QAS
Espace ☼	Cebeco Zaden	St. Denis Seeds AB	AC Skipper	AAFC (Lethbridge)	Klempnauer/QAS
GRANDE ☼	Svalof Weibull AB	Sask. Wheat Pool	UI 906	University of Idaho	Public
CDC HANDEL	U of S - CDC	Sask. Pulse Growers	Viva		Public
INTEGRA ☼	Cebeco Zaden	St. Denis Seeds AB	CDC Pinnacle	U of S - CDC	Sask. Pulse Growers
Logan	Proven Seed	Proven Seed	CDC Alliro	U of S - CDC	Sask. Pulse Growers
Madoc ☼		Terramax	CDC Bianca	U of S - CDC	QAS
Mandy	Mansholt	Terramax	<b>Chickpea</b>		
MAJORET ☼	Svalof Weibull AB	ProMark Seed	<b>Desi</b>		
AC Melfort ☼	AAFC Morden	Canterra Seeds	CDC Anna	U of S - CDC	Sask. Pulse Growers
Miami	Advanta Seeds.	QAS	CDC Desiray	U of S - CDC	Sask. Pulse Growers
Millenium ☼	Mansholt	Terramax	Myles	USDA/Washington State U	Public
CDC Minuet	U of S - CDC	Sask. Pulse Growers	CDC Nika	U of S - CDC	Sask. Pulse Growers
CDC Montero	U of S - CDC	Sask. Pulse Growers	<b>Kabuli</b>		
CDC MOZART	U of S - CDC	Sask. Pulse Growers	Amit (B-90)		Proven Seed
Nicole ☼	Advanta Seeds	QAS	CDC Chico	U of S - CDC	Sask. Pulse Growers
NITOUCHE ☼	DLF Trifolium (Denmark)	QAS	CDC ChiChi	U of S - CDC	Sask. Pulse Growers
SW Parade ☼	Svalof Weibull AB	Sask. Wheat Pool	CDC Diva	U of S - CDC	Sask. Pulse Growers
SW Prize	Svalof Weibull AB		Dwellely	USDA/Washington State U	Public
SWSalute	Svalof Weibull	ProMark Seed	Evans	USDA/Washington State U	Public
Scuba ☼	Advanta Seeds	QAS	Sanford	USDA/Washington State U	Public
CDC Sonata	U of S - CDC	Sask. Pulse Growers	CDC Xena	U of S - CDC	Sask. Pulse Growers
DS Stalwarth	Danisco Seeds	Secan Members	CDC Yuma	U of S - CDC	Sask. Pulse Growers
CDC Striker	U of S - CDC	Sask. Pulse Growers	<b>Canary Seed</b>		
SWING ☼	Cebeco Zaden	QAS	Elias	U of Minnesota; U of S - CDC	Public
TOLEDO ☼	Cebeco Zaden	Canterra Seeds	Keet	U of Minnesota; U of S - CDC	Public
Trapper	AAFC (Morden)	Public	CDC Maria	U of S - CDC	C. Special Crops
Venture	Axel Toft	Johnson Seeds (MB)	<b>Safflower</b>		
CDC VERDI	U of S - CDC	Sask. Pulse Growers	Saffire	AAFC (Lethbridge)	Jerry Kubic (AB)
Victoria	Svalof Weibull AB	ProMark Seed	AC Stirling	AAFC (Lethbridge)	SeCan Members
			AC Sunset	AAFC (Lethbridge)	Proven Seed