

# Walking Your Fields®

**Welcome** to the fourth issue of *Walking Your Fields®* newsletter for the 2014 growing season. On behalf of your DuPont Pioneer Agronomy team, we will be producing this newsletter on a monthly basis through to October. For more detailed agronomic information please feel free to contact your local Pioneer Hi-Bred sales representative or check out [www.pioneer.com](http://www.pioneer.com).

## Clubroot Update

Clubroot is a soil-borne disease of cruciferous crops and weeds, caused by *Plasmodiophora brassicae*, a pathogen that induces gall formation on infected roots of susceptible plants. Clubroot was first reported in Western Canada in canola fields in the Edmonton area in 2003. Since 2003, additional canola fields in Alberta have been identified with clubroot every year. Although the majority of the fields infected with clubroot are in Alberta, there are fields in Saskatchewan and Manitoba where clubroot spores have been found. Clubroot in canola is an economical disease of great importance as it can cause up to 80% yield loss in infected canola fields.

In June 2014, a new clubroot pathotype was identified in the Edmonton area. The new clubroot pathotype is "limited to very few fields and patches within those fields" says Curtis Rempel, Vice President of Crop Production and Innovation with the Canola Council of Canada. It has now been confirmed that this particular pathotype has evolved to be able to overcome all current commercially available clubroot resistant canola hybrids including Pioneer clubroot protector hybrids.

Clubroot is mainly spread through the movement of soil containing the long-lived resting spores that are released into the soil when the galls decay. As the leader in clubroot resistant hybrids, Pioneer is dedicated to working with growers to maximize the use of existing tools until new tools can be developed in the coming years. What can you do to protect your crop from clubroot?

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JULY 2014 Volume 24 Issue 4



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## 1. Early Identification

Scout fields regularly and carefully from late rosette through podding. Because clubroot symptoms on canola plants can look similar to environmental or other disease symptoms, proper diagnosis should always include an examination of the roots of plants. If you are not sure if you have clubroot, then look for plants that look like they are prematurely drying down, similar to what you would see with blackleg or sclerotinia and examine the roots for evidence of gall formation. Typically, field entrances and low lying areas would be the areas where clubroot would first appear in the field, but it is possible for clubroot to show up anywhere. If you suspect you may have clubroot, the Canola Council of Canada recommends the following scouting process:

- Start at the field entrance: Pull up 10 random plants, remove the soil and examine roots for evidence of galls.
- Walk 10 paces into the crop and pull another 10 plants.
- Turn 90 degrees and walk another 10 paces. Sample this way in a zig-zag pattern until 100 plants have been sampled. Record the percentage of infected plants.



*Canola with small developing clubroot galls. Source: Stephen Strelkov*

## 2. Avoid Soil Movement As Much As Possible

Cleaning soil from equipment helps avoid the movement of soil from infested to non-infested fields. If you don't have clubroot on your farm, the greatest risk of infestation comes from soil on equipment that was previously used off-farm. If you have found, or are concerned that you may have clubroot on a particular field, sanitation when leaving that field is critical to reduce spread throughout the rest of the farm.

Other smart practices include:

- Practice soil conservation on your fields to reduce the movement of soil.

- Avoid the use of straw, hay, green feed, silage and manure from infested fields or fields that are suspected to contain clubroot infected soils.
- Avoid the use of farm saved seed from fields that have been identified to contain clubroot. Soil may be present on the seed as it is harvested and you would be at risk of planting clubroot containing soil particles with the seed in a new field. Clubroot moves with the soil regardless of the crop being grown.

## 3. Grow Clubroot Resistant Canola Hybrids In Both Infected And Clean Fields

Pioneer Protector® Clubroot resistant hybrids such as 45H29 and 45H33 provide multi-race resistance, and a high level of resistance to clubroot races 2, 3, 5, 6 and 8. The use of a clubroot resistant canola hybrid will effectively reduce the incidence and severity of gall formation in clubroot affected fields, protecting yield and reducing the number of resting spores re-introduced into the soil.

## 4. Rotate To Non-Host Crops

Tight canola rotations can increase the rate of spore build-up once the disease is present in a field. Tight canola rotations can also increase the selection pressure on the clubroot pathogen to develop the ability to overcome the resistance in current clubroot resistant canola hybrids. Because clubroot is also able to infect host weeds, good weed management of host weeds is essential to maximize the reduction of viable spore numbers between subsequent crops. It is recommended that at least two years of alternate crops be seeded before canola is seeded again on fields with known clubroot infection.

It will be important to ensure that you are not moving soil between fields. If travelling out to a field, leave your vehicle on the side of the road to avoid driving into a field. By avoiding the movement of your vehicle between fields, you remove the risk of your vehicle transporting clubroot infected soil. If you are walking in customers fields, wear disposable footwear covers that you dispose of on the edge of the field so that you do not transport soil from one field to another on your footwear. If you are collecting plant / soil samples from an clubroot infected area, immediately bag all materials (and wash the tools that may have been used to collect the plant / soil materials) to be avoid the spread of soil.

For more agronomic information on clubroot disease in canola and best management practices visit [www.pioneer.com/clubroot](http://www.pioneer.com/clubroot) or [www.clubroot.ca](http://www.clubroot.ca)

# CLUBROOT MANAGEMENT IN CANOLA



PREVENT  
INFESTATION



PRACTICE  
ROTATION



PROTECT  
FIELDS



## PREVENT INFESTATION

- Avoid infection every year with each crop through good stewardship practices
  - Clean and disinfect equipment, vehicles and boots
  - Practice soil conservation to reduce soil movement
  - Avoid use of straw, hay, green feed, silage and manure from infested or suspect areas
  - Avoid use of seed of any crop (for example wheat seed) harvested from infected field
  - Keep host weeds in check



## PRACTICE ROTATION

- Rotate crops to manage spore loads – the longer the rotation the better
- Scout fields regularly and carefully



## PROTECT FIELDS

- Plant Clubroot resistant canola - Pioneer® hybrids with the Pioneer Protector® clubroot resistance trait in both infected and clean fields



Consult with your Pioneer Hi-Bred sales representative  
to build a plan for your fields.

[pioneer.com/clubroot](http://pioneer.com/clubroot)



# What You Don't See *Can* Hurt You.

According to the Alberta Canola Producer's Association, cutworms are in a cycle of abundance on the Prairies.

One of the biggest challenges with cutworms is that they are difficult to scout because they usually feed at night, and go underground during the day. DuPont Pioneer staff have observed areas of significant cutworm damage in all 3 Western Provinces and recommend that growers across the Prairies check emerged canola crops for bare patches, holes or notches in foliage, and clipped plants — telltale signs of cutworm feeding.

In 2014, DuPont Crop Protection introduced a new option to help canola growers protect their valuable canola crops. DuPont™ Lumiderm™ insecticide seed treatment is the first-ever canola seed treatment that controls cutworms and provides improved consistency of flea beetle control across a broad range of environmental conditions. With its powerful residual control, Lumiderm™ is the next big leap in early season crop protection, designed to get seedlings off to a strong start.

According to Rob Garland, Pioneer Hi-Bred sales representative in Moose Jaw, SK, Lumiderm™ offers great value for growers in his area. "In 2013, I did Product Knowledge Plots (PKP) in some of my fields, says Garland. Our yield was 5.3 bushels higher on the Lumiderm™ side – that was much better than even the 1.3 bushel yield difference that early research suggested."

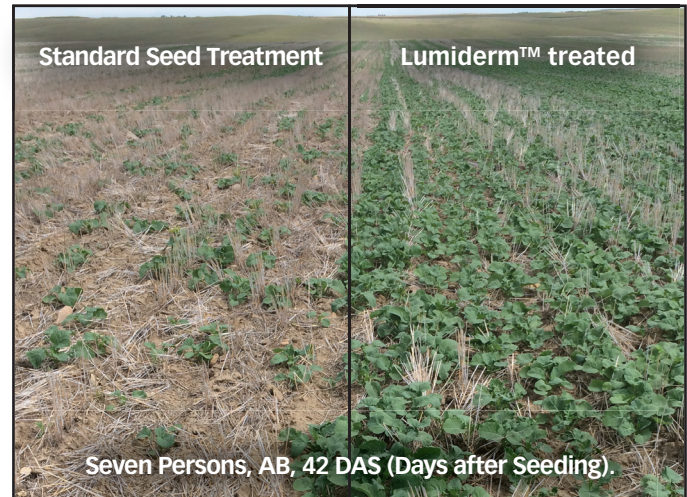
"I realized this is a no-brainer for my customers because it's going to put more money in their pocket. Another reason I recommend Lumiderm™ is because in our area, lentils, pulses and peas are higher in rotation. With those crops we tend to have higher probability of cutworms in our area. It's a good decision."



Cutworm larvae can eat stems close to the soil surface, resulting in plants that are completely cut off, and are left wilting on top of the ground. Photo courtesy of DuPont Crop Protection, 2014.

"If we've got this tool at our disposal, and it will reduce insect pressure and increase yield, it makes good sense to use it. It takes some of the gamble out of planting the crop," adds Garland.

Cutworm larvae can eat stems close to the soil surface, resulting in plants that are completely cut off, and are left wilting on top of the ground. If 25% to 30% of the stand is reduced, a foliar spray may be necessary to stop further damage.



Lumiderm™ helps get your seedlings off to a strong start, for a better harvest down the road. Photo courtesy of DuPont Crop Protection, 2014.

"Cutworms can cause severe damage before growers even realize they are actively feeding on a canola crop, and then to catch them in action growers need to spray at night, and risk killing the good bugs with the bad," says Lisa Power, Product Manager, Integrated Seed & Crop Protection Solutions, DuPont.

"With Lumiderm™, growers can expect up to 35 days protection from cutworm after their canola is seeded – which will carry the crop through the critical stages of seedling growth, says Power. "And, as every grower knows, a better start brings a better harvest!"

If you have experienced cutworm damage in your canola this spring, talk to your Pioneer Hi-Bred sales representative now to book your canola seed for next year treated with Lumiderm™.

# Soybean Leaf Disease Identification

As soybean acres grown across Western Canada continue to increase, so does the threat of disease pressure appearing in these fields. Many bacterial and fungal leaf diseases are currently present in Manitoba soybean fields. These diseases may reduce yield through loss of leaf area, reduced photosynthesis, early senescence and poor seed quality. However, these diseases are strongly influenced by environmental conditions and in some cases are difficult to predict. Some of these soybean leaf diseases are manageable, but often can be difficult to correctly diagnose. Conditions vary for each disease. However, proper identification is important to properly manage these threats. The following is a brief overview of several soybean leaf diseases to help identify and manage these threats in Western Canada.



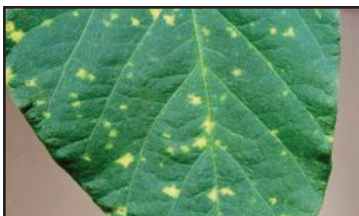
## **Cercospora Leaf Blight:**

Symptoms begin in the upper canopy as small to larger irregular purple discolored patches. As the disease progresses, affected leaves turn leathery with a dark purple appearance with bronze highlights. Warm, wet conditions favor disease development from R3-R6. Scout in areas of field where moisture persists due to extended heavy dews.



## **Bacterial Blight:**

Bacterial blight exhibits angular lesions with reddish-brown centers and water-soaked margins surrounded by yellow halos on the mid to upper canopy. Lesions grow together to produce large, irregular shaped necrotic areas, which dissolve, causing leaves to appear tattered. It frequently appears in cool, wet conditions – often following wind events. High temperature reduces disease development. Scout fields that receive heavy rains.



## **Downy Mildew:**

Lesions appear on the upper surface of young leaves as irregular, pale green to light yellow spots, which grow to pale to bright yellow spots. Older lesions are brown with yellowish margins. Most commonly found in upper canopy under humid conditions with extended periods of leaf wetness and mild temperatures. Check plants in areas where moisture collects for extended periods from R3-R6 following frequent rains.



## **Bean Pod Mottle Virus:**

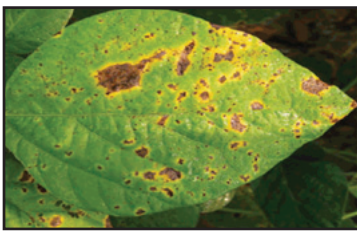
Leaves are distorted and wrinkled with mottled color pattern, most evident on newest leaves. Virus is primarily transmitted by the bean leaf beetle. The disease appears in cool climates during periods of active plant growth. Warm weather will hide symptoms. To scout, check field edges for symptoms. Early planted fields may be at highest risk.



## **Frog Eye Leaf Spot:**

Lesions appear as small round gray spots with dark reddish-brown borders on upper leaf surface. The disease occurs after warm humid weather. Scout for the disease in areas where heavy dews collect over extended time from R3-R6 or following frequent rains. This pathogen is rarely observed in Manitoba





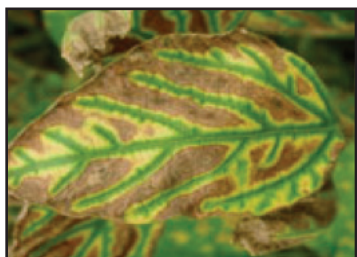
### Septoria Brown Spot:

Lesions are small irregular-shaped dark brown spots and often begin in lower canopy. Nearby lesions often grow together and form larger necrotic areas. Infected leaves quickly turn chlorotic and fall from plant. Warm and wet weather favor disease development, which is also restricted during hot, dry conditions. Scout for from R2-R6.



### Soybean Mosaic Virus (SMV):

Leaves are distorted, wrinkled and puckered in a mosaic pattern. These symptoms are most commonly found on newest leaves. Plant stunting is apparent. The virus is transmitted to plants by numerous species of aphids. It appears more prominently during cool growing conditions. Hot weather masks symptoms. SMV may show up throughout the season. Check plants along field edges.



### Sudden Death Syndrome (SDS):

Leaves of infected plants initial show scattered yellow spots between veins. These lead to yellow/brown inter-veinal streaks while veins remain green. Leafs eventually drop but petioles remain on the stem. Root rot may also accompany SDS. This disease favors wet saturated soils and very cool temperatures before or during flowering. Increased soil compaction, excessive soil fertility and presence of Soybean Cyst Nematode also increases severity. Check plants near saturated areas and in fertile fields from R1-R6. This disease is not commonly found in Western Canada.

## Non-Disease Symptoms

Some in-field symptoms often appear similar to foliar diseases. A few of these issues are displayed below. Careful attention to properly identify the symptoms cause will help make better decision to manage these issues. Scouting for these, along with other issues, can be planned for using the Soybean Scouting Calendar found at: <https://www.pioneer.com/home/site/us/agronomy/crop-management/soybean-scouting-calendar/>



### Sun Scald



### Iron Deficiency Chlorosis

# Management of White Mold in Soybean Production

White mold, also known as sclerotinia stem rot, has spread in recent years throughout many northern soybean growing regions, including Western Canada. This is partly due to cultural practices that accelerate soybean canopy development. These practices, including early planting and narrow rows, are also proven to increase soybean yields. This presents a dilemma for growers – should they manage their crop to maximizing yield, or reduce white mold incidence? To answer the question, growers must understand the factors that affect white mold development and potential severity.

## White Mold Risk Factors

**Geography** – White mold is a perennial problem in northern states of the U.S. and in Canada due to cool, moist conditions in July that coincide with soybean flowering. These conditions are ideal for disease development.

**Climate** – Cool and moist conditions at flowering favor white mold development. More important than general climatic conditions is the microclimate beneath the soybean canopy. For this reason, dense soybean canopies can be more disease-prone than more open canopies.

**Field History** – Once white mold has occurred in a field, it is nearly impossible to eradicate it. White mold has at least 400 alternate plant hosts, including many common weeds and crops. In addition, long-term survival structures of this organism (sclerotia) ensure that inoculum is always available to attack the next soybean crop should conditions allow.

## Disease Description and Lifecycle

White mold persists in soybean fields over time as sclerotia (Figure 1). These dark, irregularly shaped bodies about 1/4 to 1/2 inch long are formed within the white, cottony growth both inside and outside the stem.



Figure 1. White mold sclerotia on soybean stem.

Sclerotia contain food reserves and survive for years in the soil; they eventually germinate, producing millions of spores beneath the plant canopy. White mold spores are not able to invade plants directly, but must colonize dead plant tissue before moving into the plant. Senescing flowers provide a ready source of dead tissue for preliminary colonization. From these senescing flowers in the branch axils or stuck to developing pods, the fungus spreads to healthy tissue. Stem lesions develop and may eventually be overgrown with white mold. The disease then spreads directly from plant to plant by contact with this moldy tissue.

Wet, cool conditions are required throughout the disease cycle, including germination of the sclerotia in the soil, spore release, infection of soybean flowers by spores and spread of white mold from plant to plant.

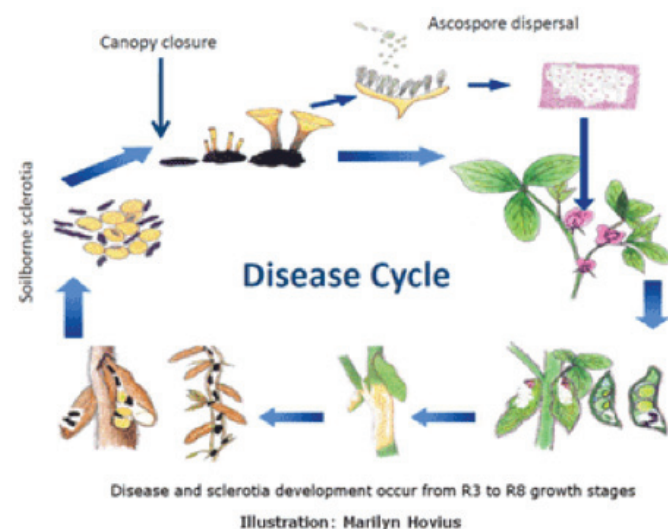


Figure 2. White mold disease cycle. Illustration by Marilyn Hovius.

## Cultural Practices for White Mold Management

No single management practice is likely to control white mold when the growing environment favors the disease. Rather, the most effective approach is one that integrates both cultural and chemical control tactics.

**Soybean Variety Selection** – There is no absolute genetic resistance available to white mold – all varieties can get the disease under severe pressure – but differences in tolerance exist between varieties. Choosing varieties that rate high for

tolerance is an important management practice in areas that commonly encounter white mold.

**Crop Rotation** – Rotation with a non-host crop is an effective means of reducing disease pressure in a field. Non-host crops include corn, sorghum, and small grains. Because sclerotia survive for up to 10 years in the soil, rotation is only a partial solution.

**Weed Management** - White mold's 400+ plant hosts include many broadleaf weeds. Host weeds that are also common weed species throughout soybean growing areas are lambs quarters, ragweed, pigweed and velvetleaf. In addition to acting as host to the disease, weeds can also increase canopy density, which favors disease development.

**Zero Tillage May Minimize Disease** - Sclerotia germinate from the top 2 inches of soil. Below that depth, they can remain dormant for up to 10 years. Because of this longevity in the soil, it is difficult to devise a strategy to control white mold with tillage. Deep tillage buries sclerotia from the soil surface but may also bring prior sclerotia into their zone of germination. If the disease is new to a field and a severe outbreak has occurred, a deep tillage followed by zero tillage or shallow tillage for many years may help.

**Limiting Dense Canopy Formation** - In areas of high risk, cultural practices that encourage early, dense canopy development may need to be avoided. This includes early planting, narrow rows, and excessive plant populations. To limit overly dense soybean canopies and maintain maximum yield, avoid rows spaced less than 15 inches apart and seeding rates greater than 150,000 seeds per acre.



Figure 3. White mold infection.

## Foliar Fungicide Applications for White Mold Management

Despite the best use of cultural practices to limit the incidence of white mold, weather and other conditions conducive to disease development may still cause heavy infestations. In cases of high disease risk, a foliar application of a chemical product may help reduce disease severity and protect soybean yield. Conditions that favor disease development include:

- Weather – predicted to be cool ( $< 30^{\circ}\text{C}$ ) and wet, with high relative humidity
- Field – a moist soil surface
- Crop – a relatively large or dense crop canopy

### Application Timing

Optimum application time of fungicides for white mold control in soybeans is approximately the R1 growth stage, also known as the beginning bloom or first flower stage. For Western Canada, the R1 stage coincides with the first 2 weeks of July

Fungicides have little activity on established disease and must be applied prior to white mold invasion of senescing flowers. Applications made just prior to pathogen invasion have helped reduce disease severity in some studies. Because soybeans normally flower for 30 days or more (R1 to R5) and fungicides for white mold control have maximum residual activity of about 2 weeks, a second application may become necessary if conducive environmental conditions persist into midsummer.

One drawback to subsequent or late (R3) fungicide application is the potential for reduced canopy penetration. Though soybeans grown in 30-inch rows at moderate seeding rates may allow for good penetration of the lower canopy at R1, spray coverage of the lower nodes becomes increasingly difficult with continued vegetative growth. The lower canopy can remain relatively wet or humid, providing the appropriate environment for white mold development. Thus, it is essential for spray droplets to reach the lower two-thirds of the soybean canopy in order to obtain satisfactory disease control. To enhance coverage of the lower canopy, use the highest carrier rate that is practical – about 20 to 30 gallons per acre for ground application.



# Corn Grain Handling and Storage Tips Webinar

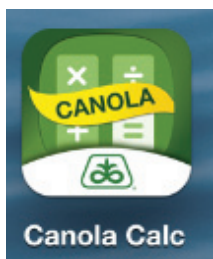
John Gnadke, Harvest Management and Grain Quality Consultant, will be conducting two teleconferences on August 12th and August 14th from 7:30am-9:00am MST. Please select one of the teleconferences to attend.

Gnadke has over 40 years of experience working with multiple grain drying systems such as In-Bin, Combination, Natural Air, and Continuous flow. He's also custom designed dryer systems handling 500 bu./hr. to 10,000 bu./hr. If you have any corn grain management and handling questions, this webinar is for you.

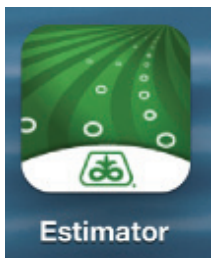
Please contact your local Pioneer Hi-Bred sales representative to reserve your spot and receive the dial-in information.

## Staying Connected With DuPont Pioneer:

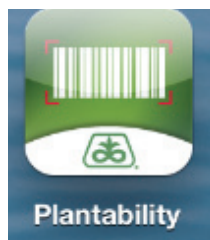
DuPont Pioneer now has FREE Applications available through the App Store on iTunes®



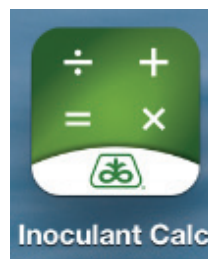
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**Encirca<sup>SM</sup>  
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### JL Agronomics Ltd.

Portage la Prairie (204) 871-0767

### Payette Seeds Ltd.

Rathwell (204) 749-2243

### Hillview Crop Solutions

Reston (204) 264-0135

### Jeremy Andres

Roblin (204) 937-8333

### Assiniboine Ag Services Inc.

Shellmouth (204) 773-6800

### Roncercay Seeds

Somerses (204) 825-7345

### Fraser Ag Services

Souris (204) 483-7333

### Marc Hutlet Seeds Ltd.

Steinbach (204) 422-5805

### Growth Science Potential Services Ltd.

Swan River (204) 734-4672

### Barry Hutchison (5204259 Manitoba Ltd.)

Virden (204) 851-6157

### C M Agra Limited

Winnipeg (204) 633-6010

## Saskatchewan

### Matthew Paysen

Avonlea / Ogema (306) 868-7791

### DJF Holdings Ltd.

Beechy (306) 859-7885

### Biggar Grain Sampling

Biggar (306) 948-2953

### Kun Ag Services

Bruno (306) 369-2728

### Jim Bletsky

Canora (306) 563-8888

### Stewart Ranches Ltd.

Carnduff / Redvers (306) 482-7472

### 49-11 Ag Ventures Inc.

Carrot River (306) 401-8900

### Kelsey Ag Ventures

Choiceland (306) 769-7887

### McCarthy Seed Farm Ltd.

Corning (306) 224-4848

### McPeck Ag Consulting Ltd.

Coronach (306) 690-4142

### Colin Schulhauser

Cupar (306) 726-7098

### Stone Farms Inc.

Davidson (306) 567-8528

### David Blais

Delmas (306) 893-7186

### DC Agro Ltd.

Dodsland (306) 932-4626

### Jamie Blacklock

Dundurn (306) 370-0495

### Camcar Enterprises Ltd.

Edam (306) 441-9772

### Mantei Seed Cleaning Ltd.

Estevan (306) 634-1294

### Jeff Kuntz

Gerald (306) 745-9170

### Hanmer Seeds Ltd.

Govan (306) 484-2261

### BG Ag Ventures Ltd.

Grenfell (306) 541-3213

### Murray Chutskoff

Kamsack (306) 542-7205

### Bryce Mandziak

Kelliher (306) 795-7510

### Brad Sauter

Kindersley (306) 460-4903

### Sproat Agro Ltd.

Kipling (306) 550-2247

### Gerwing Ag Ventures Inc.

Lake Lenore (306) 368-2622

### Andrew Monchuk

Lanigan (306) 365-7404

### Look's Custom Spraying Ltd.

Lloydminster (306) 825-0673

### Tennille Wakefield

Maidstone (306) 903-7333

### Full Throttle Farms Ltd.

Major (306) 460-0078

### Mountain View Ag Ventures

Martensville (306) 291-8744

### Christopher Lincoln

Maryfield (306) 646-2161

### Wilfing Farms Ltd.

Meadow Lake / St. Walburg  
(306) 236-6811

### Wyett Meyers

Meath Park (306) 940-7547

### Kroeker