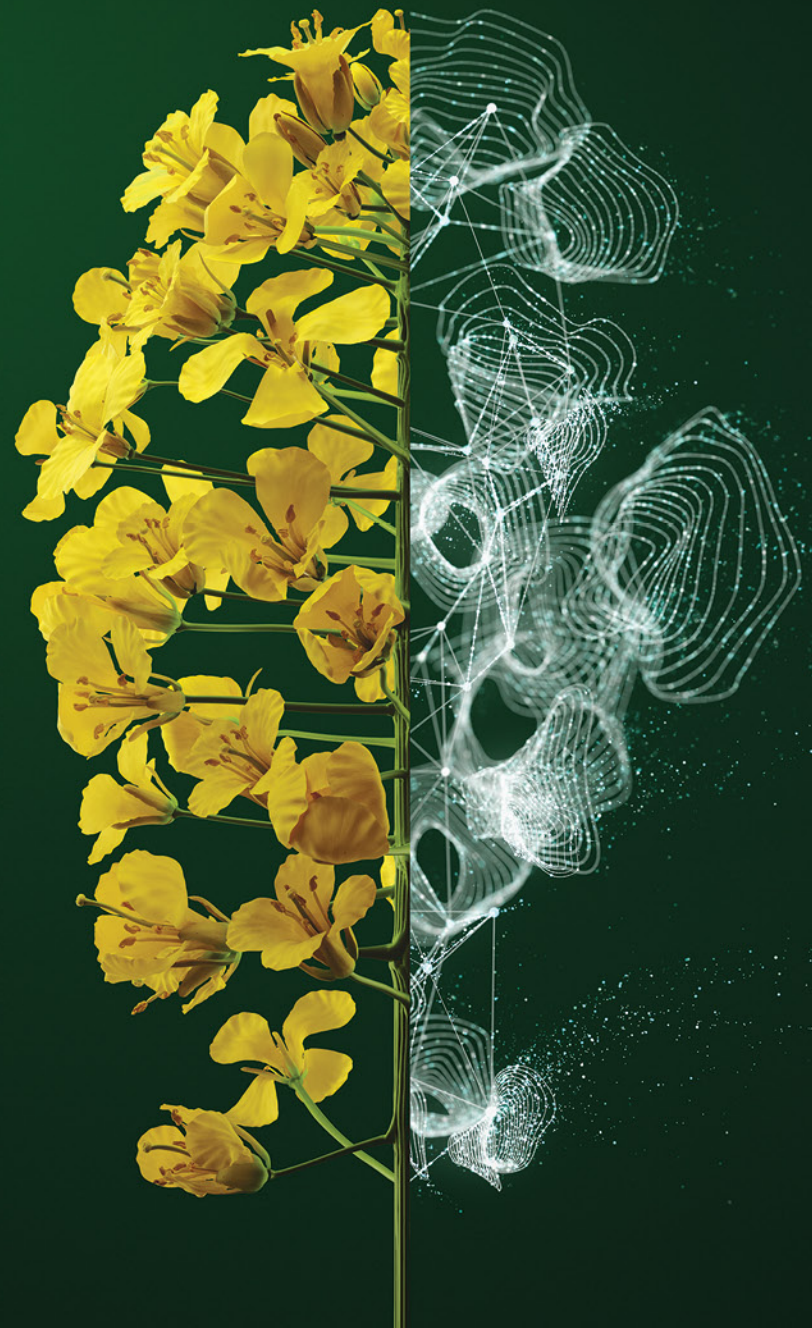
PIONEER®

Pioneer's Diverse Platforms & Focus on Protector Traits



Kristie Sundeen – Pioneer Field Agronomist

12/7/2021 – Virtual MN Canola Symposium

CORTEVA™ agriscience

Herbicide Platforms Available thru Pioneer

Pioneer Protector® Brand canola hybrid portfolio has the most diverse canola portfolio available in the market today!

Weed Resistance management is strength within our portfolio with high yields, consistent performance, and Pioneer Protector® traits being available within all herbicide systems.

Roundup Ready® CANOLA

Clearfield® Production System for Canola

LIBERTY LINK®

COMING SOON –

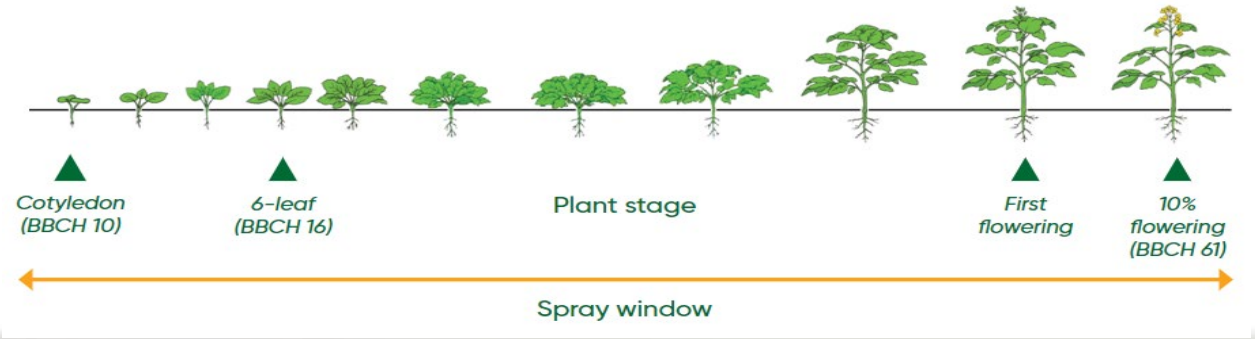
Optimum® GLY HERBICIDE TOLERANCE

What is Optimum® GLY?

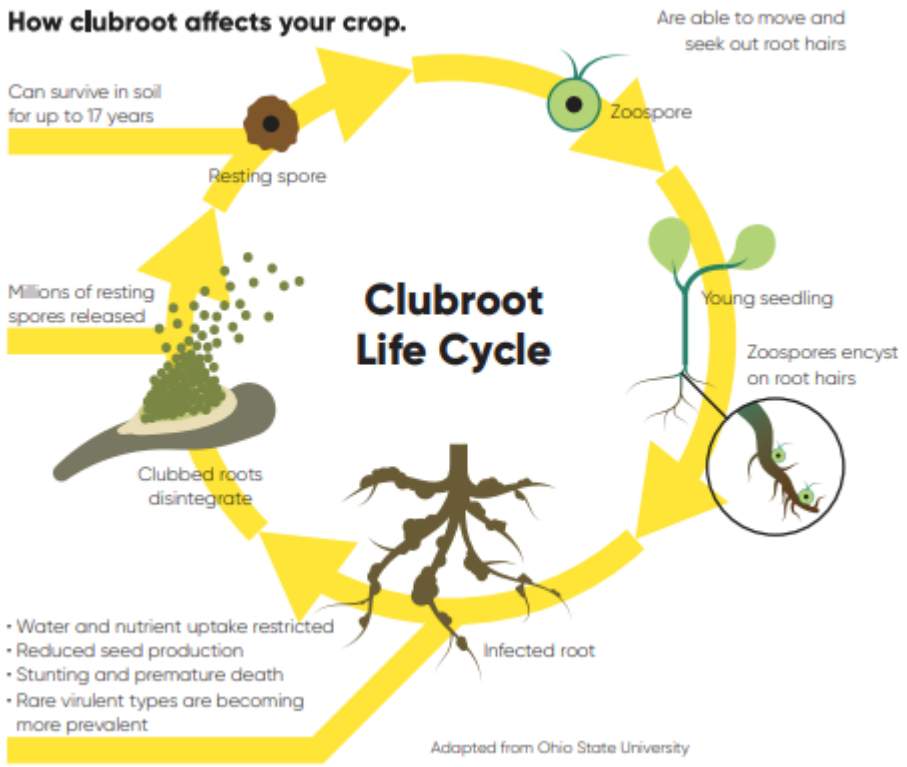
Optimum GLY HERBICIDE TOLERANCE

- Corteva's proprietary glyphosate tolerance trait
  - Improve crop safety
  - Excellent weed control system
  - Greater application flexibility

Stage	Roundup Ready	TruFlex	Optimum GLY
Emergence – 6 leaf	11 oz/ac + 11 oz/ac OR Max 16 oz/ac single app	Max 44 oz/ac single app	Max 44 oz/ac single app
Emergence – First flower	N/A	22 oz/ac + 22 oz/ac	22 oz/ac + 22 oz/ac



Pioneer Protector® Clubroot



It's never to early to start protecting your crop from clubroot.

- Clubroot is caused by a fungal-like microorganism, clubroot is a soil-borne disease that results in distinctive club-like/gall symptoms forming on plant roots.
- It is spread via infested soil moving from field to field. Infested soil can move as soil tags on farm equipment, or by wind and water erosion.

How to spot clubroot

Scout fields throughout the season and pull up roots to look for characteristic galls.

Pioneer Protector® Clubroot

Leading the Industry in Clubroot Resistance

- Corteva Agriscience developed and commercialized the first clubroot resistance hybrid in 2009 through Pioneer.
- Today, we offer a portfolio of CR hybrids with different sources of clubroot resistance and continue advancing new sources of clubroot resistance in our hybrids to help manage the growing threat.

Products available with Pioneer Protector® Clubroot trait packages:

P501L

LIBERTY LINK PROTECTOR

NEW P506ML

LIBERTY LINK PROTECTOR

45CM39

Roundup Ready PROTECTOR

NEW P505MSL

LIBERTY LINK PROTECTOR PROTECTOR

NEW 45H42

Roundup Ready PROTECTOR

Pioneer Protector® Sclerotinia

Sclerotinia susceptible and non-susceptible

Non-resistant 55% infection

Sclerotinia resistant 13% infection

Photo, courtesy of Pioneer® Canada, showing infected stems ripened prematurely.

Leading the Industry in Sclerotinia Resistance

- Corteva Agriscience developed and commercialized the first Sclerotinia resistance hybrid in 2008.

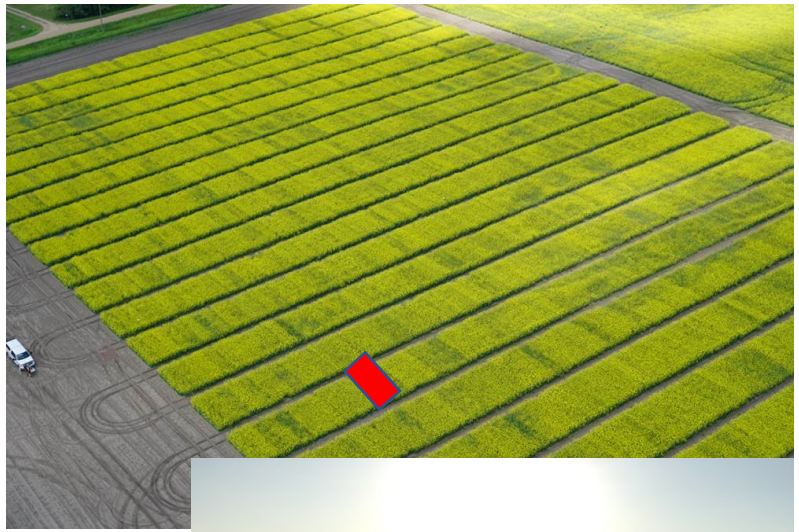
Benefits of Seeding Canola with Pioneer Protector® Sclerotinia Trait

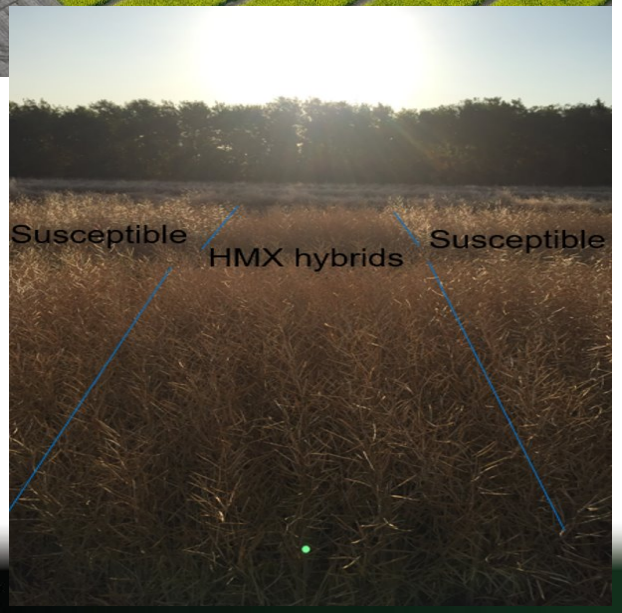
- Reduction in Incidence by over 60%
- Peace of Mind that provides increased flexibility and insurance when timing fungicide applications.
- Convenience of Sclerotinia protection that is planted with the seed.
- Season-Long Control of an in-plant trait that provides protection regardless of weather patterns throughout the entire growing season.
- Management tool to help manage risk of Sclerotinia infection over large acres.

Products available with Pioneer Protector® Sclerotinia trait packages:

NEW P505MSL

What is Pioneer Protector® HARVESTMAX





- Since 1994, all breeding research has been managed in the straight cut method of harvest.
- In 2007, Pioneer had a large yield test plot location that was close to maturity that experience hail and well differentiated the hybrids for shatter. These identified hybrids were the starting material of the "HarvestMax" effort.
- **Corteva's Shatter Program**
  - Exploiting natural variation with our germplasm.
  - Using special populations to improve genetic variability
  - Precision phenotyping used to validate trait.
  - "Shatter Tolerance" – is rating of the natural genetic variation between varieties.

Pod Shatter Tolerance – “New” Rating System

- Pioneer hybrids will be scored on a 1-9 scale indicating their **relative** ability to reduce pod shatter.
- The score reflects the expected probability that pods will not shatter under normal, timely harvest conditions.
- This data is collected from multiple sites over multiple years in trials specifically designed to induce shatter and trials that shatter naturally.
- No hybrid is shatter-proof under all environment or management conditions and shatter-proof does not exist otherwise grower would not be able to combine the product.
- 1 to 9 scale
  - 1 = 100% Seed Loss
  - 9 = 0% Seed Loss

Hybrid	Herbicide Tolerant Trait	Pod Shatter Score
45M35	Round-up Ready	7
45CM39	Round-up Ready	7
45H42	Round-up Ready	5
P501L	Liberty-Link	4
P505MSL	Liberty-Link	7
P506ML	Liberty-Link	6
P508MCL	Clearfield	7
P502CL	Clearfield	4

Tips for Harvest Options

Is swathing, delay swathing or straight cutting the best option to optimize yield potential on my farm?

Plant Stand

- Proper seeding rates are required to get a good stand (6-8 plants/sq.ft.)

Insect Damage

- If there is flea beetle / other insect damage causing reduced plant stand, you may need to swath

Frost Damage

- A reduced stand due to frost damage may lead to swathing being the best option

Weed Control

- Poor weed control may cause the grower to have to swath to achieve a good dry down

Disease

- If you have disease in the crop you may have to swath to preserve yield
  - e.g., Plants with sclerotinia may experience higher levels of shatter, thus may be more suitable for swathing

Visual Assessment of Crop Stand at Swath Timing

- Is your crop well knitted?
- Crop moves as one vs individual plant movement
- Upright canopy: plants are more vulnerable to elements

Pioneer Protector® HARVESTMAX

- HarvestMax is about maximizing yield potential in your field, while maximizing the efficiency of your farm.
- Provides farmers with the options to choose to normal swath, delayed swath, or straight cut depending on their individual situation and environment.
- Our Breeding program is continuing to improve upon our shatter tolerance.

Products available with Pioneer Protector® HarvestMax Trait

NEW P505MSL — LIBERTY LINK PROTECTOR PROTECTOR

45CM39 — Roundup Ready PROTECTOR

NEW P508MCL — Clearfield PROTECTOR

NEW P506ML — LIBERTY LINK PROTECTOR

45M35 — Roundup Ready PROTECTOR

Normal swath, delayed swathing, or straight cut – YOU DECIDE!

2021 Plot Results:

PLOT NAME	LOCATION
Sundeen Plot	Brocket, ND
PLANTING DATE	**HARVEST DATE**
April 24th, 2021	August 19th, 2021

- Planted @ 435,000 seeds/A
- Received approx. 5” timely rains during growing season
- Straight cut @ harvest

ENTRY #	BRAND	PRODUCT	YIELD RANK	MOISTURE	Yield (lbs/A)	YIELD (BU/A)
1	Pioneer	P506ML	5	6.5	2690	53.8
2	Pioneer	P501L	3	6.3	2830	56.6
3	Pioneer	P505MSL	1	6.3	2940	58.8
4	Pioneer	Exp. LL	2	6.7	2930	58.6
5	InVigor	L340PC	4	7.2	2735	54.7
6	InVigor	L233P	6	6.8	2160	43.2

PLOT NAME	LOCATION
Muhs LL Canola Plot	Langdon, ND
PLANTING DATE	**HARVEST DATE**
June 16, 2021	October 5, 2021

- Planted @ 400,000 sds/A
- Swathed @ harvest

ENTRY #	BRAND	PRODUCT	YIELD RANK	MOISTURE	Yield (lbs/A)	YIELD (BU/A)
1	Pioneer	P501L	3	5.2	2385	47.7
2	Pioneer	P506ML	2	5.2	2500	50
3	Pioneer	P505MSL	1	5.2	2585	51.7

Lakeview Seed LL Canola Plots Rock Lake, ND

PLOT NAME
Cahill Plot
PLANTING DATE
May 18, 2021

LOCATION
Rock Lake, ND
HARVEST DATE
September 9, 2021

This plot location was planted at 400,000 seeds/acre. There was some pod drop observed at this location. It was straight cut for harvest.

ENTRY #	BRAND	PRODUCT	YIELD RANK	MST.	Yield (lbs/A)	YIELD (BU/A)
1	Pioneer	P501L	4	10.7	2690	53.8
2	InVigor	L234PC	1	8.8	2840	56.8
3	Pioneer	P506ML	3	11	2710	54.2
4	Pioneer	P505MSL	2	10.1	2770	55.4

PLOT NAME
Brock Mitchell Plot
PLANTING DATE
May 31, 2021

LOCATION
Rock Lake, ND
HARVEST DATE
September 18, 2021

This plot location was planted at 6.1 lbs/acre. It was straight cut for harvest.

ENTRY #	BRAND	PRODUCT	YIELD RANK	MST.	Yield (lbs/A)	YIELD (BU/A)
1	Pioneer	P501L	3	7.0	2165	43.3
2	Pioneer	P505MSL	1	7.2	2615	52.3
3	Pioneer	P506ML	2	8.0	2345	46.9
4	InVigor	L234PC	1	7.2	2615	52.3

2021 Plot Results:

PLOT NAME	LOCATION
R. Pederson LL Canola Plot	Rolette, ND
PLANTING DATE	**HARVEST DATE**
May 14, 2021	September 4, 2021

- Planted @ 4 lbs/A
- Limited rainfall at this location during growing season
- Straight cut @ harvest
- Shatter was observed on P506ML at this location

ENTRY #	BRAND	PRODUCT	YIELD RANK	MOISTURE	Yield (lbs/A)	YIELD (BU/A)
1	Pioneer	P506ML	3	9.1	1600	32
2	Pioneer	Exp. LL	1	9.1	2050	41
3	Pioneer	P505MSL	2	8.5	1985	39.7

FIRST IMPRESSIONS ARE EVERYTHING.

PIONEER®

Lumiderm™

INSECTICIDE SEED TREATMENT

Key Grower Benefits:

- Enhanced protection against crucifer and striped flea beetles
- Control of early season cutworms in canola
- Up to 35 days of protection through the critical stages of seedling growth
- Excellent early season seedling stand establishment, vigour and biomass
- Novel class of chemistry (Group 28) for resistance management

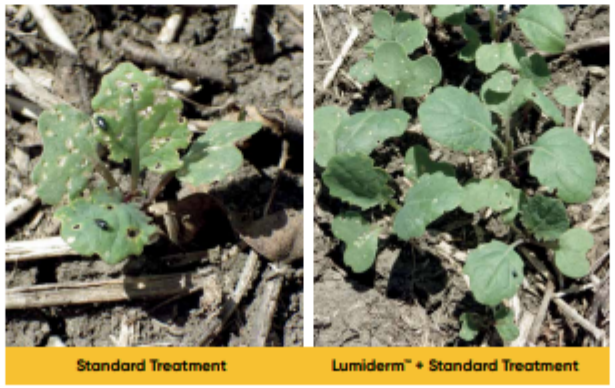
See the Lumiderm™ difference in yield increase.

- 78% occurrence of positive yield increase across Western Canada†
- 35% Less Flea Beetle Damage*
- 1.4 bu/ac higher yield**

See the Lumiderm™ difference in enhancing flea beetle protection

Crucifer and striped flea beetles can cause significant damage to canola crops. Lumiderm™ insecticide seed treatment offers enhanced protection against flea beetles, to help maximize your canola yield.

- Lumiderm™ provided a 35% reduction in flea beetle damage, 14-35 days after seeding, in 192 trials across Western Canada*
- Growers have achieved a 1.4 bu/acre advantage over the standard treatment, across Western Canada**



Standard Treatment | Lumiderm™ + Standard Treatment

Source: Lumsden, SK. 22 Days After Seeding.

See the Lumiderm™ difference in cutworm control

Cutworms are a real problem in canola production. If you're not paying close attention to your fields, they can destroy a significant portion of your crop in a matter of days.

- Cutworms are very difficult to detect since they typically live underground during the day and feed at night
- During the first 35 days of seedling growth, Lumiderm™ helps protect your canola from cutworm feeding, which can enhance early season stand establishment and crop vigour

Standard Treatment | Lumiderm™ + Standard Treatment

† Results from 55 large-scale, grower managed field trials across Western Canada in 2015.

* Source: 192 Research & Development (replicated) trials and Grower Demo strip trials (2010-2015).

** Source: Canola yield averaged across 137 Grower demonstration strips in Western Canada from 2013-2015.

Any Questions?
Thank You!

If Interested the best discounts on seed are available until this Friday, Dec. 10th.

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