BrettYoung™
DISTINCT BY DESIGN

2027

Product Guide

CANOLA | INOCULANTS

This is your farm, your livelihood, and your legacy. Decisions matter.

At BrettYoung, we focus on delivering the kind of performance serious growers expect - built on proven genetics, disciplined agronomy, and a deep understanding of the conditions canola growers face.

As Canada's largest independent seed company, we bring you a level of choice and objectivity that sets us apart. We're not bound to a single system or approach - only to what delivers results.

That means carefully selected genetics, practical expertise, and solutions designed to perform where it counts: in your fields.

Because at the end of the day, it's all about us helping you get more from every acre.

BrettYoung™ DISTINCT BY DESIGN

CANADA BEST MANAGED COMPANIES Platinum member

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US Regional Account Managers (RAMs)

Clayton Hove
(701) 313-0250
Regional Account Manager
West of Hwy 83 in North Dakota and Montana

Rich Gross
(701) 330-2433
Regional Account Manager
East of Hwy 83 in North Dakota, Minnesota, Idaho, and Washington

Canola

Our newest LibertyLink hybrid has arrived. Introducing BY 7203LL — a high-performing hybrid built for strong yield potential, harvest ease, and robust disease protection.

BY 7203LL features Pod DefendR for shatter tolerance, Clubroot DefendR for stacked, next-generation clubroot resistance, and Blackleg DefendR for enhanced blackleg protection. This mid-maturity hybrid is slightly earlier than BY 7204LL, and is a strong choice for growers targeting top-end performance.

For growers seeking a TruFlex® canola option, BY 6222TF is our newest addition. This earlier maturing Pod DefendR hybrid combined with Blackleg DefendR and Clubroot DefendR traits delivers reliable yield potential and adaptability across a wide range of environments.

With these new hybrids, BrettYoung continues to deliver the latest advancements in disease resistance, pod shatter protection, and high-performance genetics to help maximize your canola crop.

BrettYoung Canola: Built for Performance

BrettYoung, together with our canola breeding partner, DL Canada, supplies top-tier canola genetics, focused on maximizing farmer returns through innovation and field-proven performance.

- DL Canada delivers 30+ years of Western Canadian-focused canola breeding
- DL Canada and BrettYoung's DefendR-rated canola hybrids deliver:
  - Proven yield performance
  - Pod shatter protection and strong disease resistance
  - Exceptional standability

Focused Efforts Will Deliver New Key Benefits

- DL Canada has prioritized verticillium stripe research
- DL Canada collaborates with U of M, U of A, and AAFC to advance resistance screening on several key diseases
- Access to elite European canola germplasm via DL Canada's global partnerships rapidly boosts hybrid development

Every acre matters. BrettYoung, with DL Canada, delivers where it counts.

Keeping Clubroot Under Control

Clubroot has been ravaging fields in parts of Western Canada and North Dakota for almost two decades now. The soil-borne disease causes galls to form on the roots of canola plants, eventually killing them prematurely. Over 55 clubroot pathotypes have been identified in North America's canola growing regions, of which many are able to overcome some sources of clubroot resistance. Even though clubroot pathotypes are diverse, three predominant pathotypes (3A, 3D, & 3H) account for over 60% of the clubroot isolates detected, while the bulk of the pathotypes have only been detected a couple of times.

Type of Detection (Range of Reported Isolates)	Number of Pathotypes	Isolates Phenotyped	Isolate Frequency (%)	Pathotypes
Prevalent (113-217)	3	455	63	3A, 3D, 3H
Common (26-41)	4	136	19	8E, 8N, 8P, 9E
Frequent (8-15)	5	57	8	5C, 5G, 5L, 8A, 8D
Infrequent (2-5)	15	46	6	2C, 3C, 3J, 3O, 5I, 5X, 6F, 8B, 8C, 8I, 8J, 9A, 9B, 9D, 13A
Rare (0-2)	16	15	2	2A, 2B, 2F, 3B, 4A, 5A, 5K, 6C, 6D, 6M, 7A, 8tG, 9C, 9G, 11A, 13B
New* (1)	12	12	2	1D, 1E, 1G, 1H, 3F, 3G, 3I, 5D, 6A, 6B, 8K, 9G
Totals	**55**	**721**	**100**	

*New detections only identified once, based on publication by Storfie et al. (2025)
References: Storfie et al. (2025), Hollman et al. (2023), Hollman et al. (2021), Strelkov et al. (2021), Strelkov et al. (2018), and Askarian et al. (2021)

BrettYoung's Clubroot DefendR®: Now Labeled Against Specific Pathotypes

Selection of a Clubroot DefendR hybrid is a strong step in the fight against clubroot. Along with the identification of new pathotypes, plant breeders have been identifying and incorporating new sources of resistance into their newest canola hybrids. This includes the stacking of multiple sources of clubroot resistance in new hybrids like BY 7203LL and BY 6222TF, and in proven performers like BY 7204LL and many other key hybrids.

Hybrid	Prevalent Pathotypes*			Common and Frequent Pathotypes*								
	3A	3D	3H	8E	8N	8P	9E	8A	5L	5G	8D	5C
BY 7206LL	R	R	R	R	R	R	R	R	R	R	R	R
BY 7204LL	R	R	R	R	R	R	R	R	R	R	R	R
BY 7203LL	R	R	R	R	R	R	R	R	R	R	R	R
BY 7202LL	R	R	R	R	R	R	R	R	R	R	R	R
BY 6223TF	R	R	R	R	R	R	R	R	R	R	R	R
BY 6222TF	R	R	R	R	R	R	R	R	R	R	R	R
BY 6217TF	R	R	R	R	R	R	TBD	R	R	R	R	R
BY 6216TF	R	R	R	R	R	R	TBD	R	R	R	R	R

*Pathotypes listed in order of frequency detected from 2014-2023 through published clubroot surveys.
BrettYoung hybrids are also resistant to many infrequent, rare, and new pathotypes identified but not listed in the table.
R: Resistant, S: Susceptible, TBD: To be determined, currently being screened.

DEFENDR Genetic Traits

DefendR is an easy-to-understand approach that highlights the superior harvest management and disease resistance genetics developed by our primary canola breeding partner, DL Canada. The DefendR trait platform is gene-driven and can be an important piece of your overall canola management and production strategy. BrettYoung uses the DefendR designation to signal genetic tolerance to pod shatter and durable resistance to two prominent disease complexes affecting canola: clubroot and blackleg.

DefendR Traits

Trait	Minimum Resistance Level	Hybrids	
POD DEFENDR	A dependable level of shatter tolerance, well suited to straight-cut or delayed swathing harvest systems. Pod DefendR-rated hybrids score a minimum of 7.0 on the Canola Council of Canada's canola shatter rating scale.	BY 7206LL BY 7204LL BY 7203LL BY 7202LL	BY 6223TF BY 6222TF BY 6217TF
BLACKLEG DEFENDR	Contains one or more major blackleg resistance genes that align with predominant blackleg race(s), combined with a strong R-rating for adult plant (quantitative) blackleg resistance.	BY 7206LL BY 7203LL BY 6222TF	BY 6217TF
CLUBROOT DEFENDR	Stacked 1st and next-generation clubroot resistance genes that protect against the prevalent pathotypes (3A, 3D, and 3H). Clubroot DefendR also protects against common (8E, 8N, 8P, and 9E), and frequent (5C, 5G, 5L, 8A, and 8D) pathotypes, and against many other infrequent, rare, and new pathotypes.	BY 7206LL BY 7204LL BY 7203LL BY 7202LL	BY 6223TF BY 6222TF BY 6217TF

POD DEFENDR

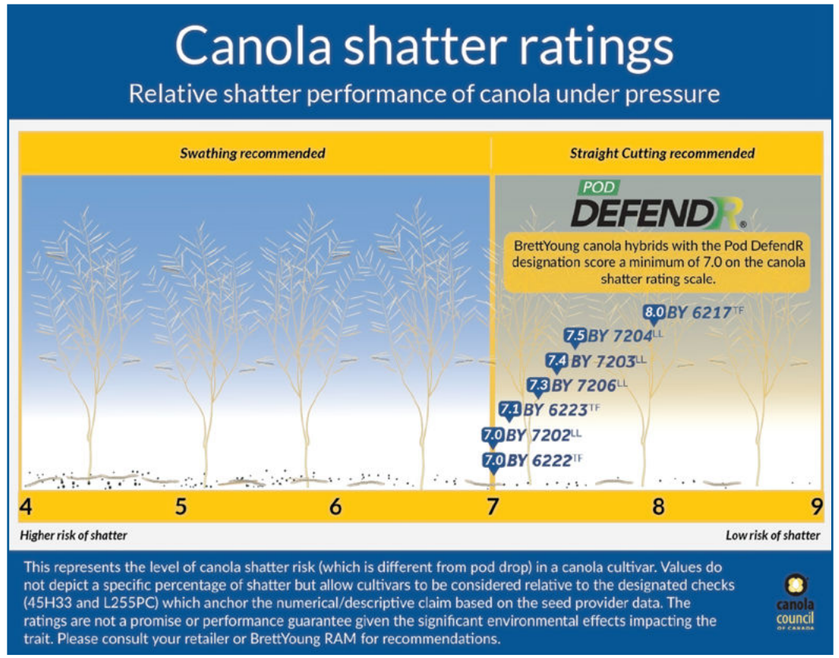
The introduction of pod shatter-tolerant hybrids to canola growers several years ago led to a significant increase in adoption of both direct harvesting and delayed swathing of canola crops. BrettYoung canola growers are enjoying this same flexibility because of our pod shatter-tolerance trait, which delivers the dependable levels of shatter tolerance expected by growers.

Pod shattering, and the seed dispersion associated with it, is a survival mechanism found in nature and, despite decades of breeding and domestication, canola pods still have a natural tendency to split and open at maturity, with the goal of scattering seeds. Plant breeders and trait developers have been working to understand the physiology of canola pod ripening and pod shatter mechanisms.

DL Canada, and its parent companies, have researched their own solutions, and what has emerged is an understanding of a complex pathway of gene interaction that controls pod valve function.

Much of this work has meant isolating specific genes from other brassica species and breeding them into canola to interrupt these shatter-inducing pathways. If you've ever grown mustard, you're aware of the substantial pod shatter resistance in that crop.

The result is Pod DefendR, a specific genetic trait that reduces pod tension built up at maturity and ultimately, the tendency for canola pods to split at the pod dehiscence zone (pod seam) that holds both sides (valves) of the pod together.



BrettYoung canola hybrid pod shatter tolerance scores are developed through internal and breeder trial data.

BLACKLEG DEFENDR

Blackleg has re-emerged as a major challenge in intensive canola production, requiring an integrated management approach that includes crop rotation, field scouting, and selecting the right hybrid. BrettYoung hybrids with the Blackleg DefendR trait are rated strongly resistant (R) to blackleg and include major resistance genes aligned with predominant blackleg races for enhanced protection in higher-risk environments. BrettYoung canola hybrids are also treated with Helix Saltro®, which helps control airborne blackleg and complements the built-in DefendR resistance package to help protect yield potential.

CLUBROOT DEFENDR

Clubroot is established in parts of North Dakota and continues to evolve as new, more virulent pathotypes emerge that can overcome earlier resistance sources. BrettYoung hybrids with the Clubroot DefendR trait feature stacked, next-generation resistance genes that protect against both original pathotypes, such as 3H, and newer predominant pathotypes like 3A and 3D. Supported by DL Canada's strong breeding pipeline and high-performing genetics, BrettYoung continues to deliver hybrids designed to help growers stay ahead of this challenging disease.

For the latest insights on clubroot, see the article on page 03 of this guide.

Disease Differentiation

Background

Blackleg in canola is no new disease for farmers to try and manage. It's been around since shortly after the introduction of canola to the Prairies, and thankfully, a disease with many management tools to deploy against it. Using resistant hybrids, crop rotation, active scouting, and fungicide use, blackleg can be managed to cause minimal plant and yield damage.

However, blackleg in canola crops remains prevalent, with over 80% of fields surveyed annually across the Prairies, showing some signs of the disease. Low incidence and severity of the disease are usually indicated, but some more elevated disease situations have become a challenge for farmers on tight canola growing rotations.

One newer complication when trying to manage blackleg is now the inclusion of the canola disease, verticillium stripe.

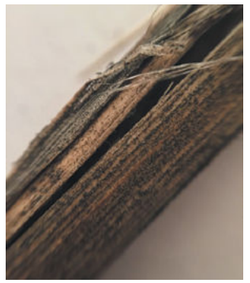
First identified in Manitoba in 2014, *Verticillium longisporum* is spreading across the Prairies and parts of North Dakota like wildfire. This soil-borne fungal pathogen causes verticillium stripe in canola, which is a stem striping disease that causes canola plants to ripen early, leading to lodging and eventual yield losses.

Many fields across parts of North Dakota now show signs for both blackleg and verticillium stripe. Do these two diseases work together? Is there a compounding effect causing further damage to canola plants?

Disease Identification

Proper disease identification has been a priority, especially with trying to identify verticillium stripe against other common canola diseases.

The key distinguishing sign that *Verticillium longisporum* is present is the development of microsclerotia within the vascular tissue of the plant. Microsclerotia are best seen post-harvest when you remove the plant's outer stem wall. They leave the inside of the plant tissue with a greyish hue, and if using a magnifying lens, you will see the individual tiny black microsclerotia.



Microsclerotia of verticillium

Pycnidia of blackleg

The presence of pycnidia or pseudothecia indicates that a blackleg-causing pathogen (*Leptosphaeria maculans* or *L. biglobosa*) has attacked. These fruiting bodies develop on the outside of the plant tissue and can be felt as raised bumps. If moisture is present, the pycnidia will ooze pink as they release ascospores into the environment.

Fruiting bodies for pathogens develop under specific conditions and may not be visible at the time of disease surveying canola crops. An early indicator symptom would be assessing the colour of root tissue; early signs of verticillium stripe give root tissue a greyish starburst hue, whereas blackleg will produce predominant black wedges, and healthy plants will be vibrant, moisture-filled, and beige in colour.

Left to right: verticillium stripe – blackleg – healthy plant stem

Plant lodging and stem striping can be caused by a whole range of biotic and abiotic stressors. Determining the reason for the plant damage will help to deploy better management practices in future canola crops.

Additional Diseases

Top: Sclerotinia
Bottom: Verticillium stripe

Both stems are extremely fragile and shred; Sclerotinia will reveal a sclerotia body in the inside of the plant stem; Verticillium will reveal microsclerotia underneath the stem wall.

Top: Grey stem
Bottom: Verticillium stripe

Both diseases are easily found post-harvest. Grey stem infected residue will be grey in colour but firm stems; verticillium stripe-infected residue will be fragile and shred.

Top: Sooty Mold
Bottom: Verticillium stripe

Sooty mold flares up with late-season moisture, will appear as a black powder on the outside of the stem wall. Verticillium stripe will have microsclerotia underneath the stem wall.

The Unknowns

With not much known about verticillium stripe, researchers are now focusing their efforts on trying to find solutions. Plant breeders have been finding ways to work with the disease within plant breeding programs to screen hybrids for tolerance towards verticillium stripe. The mechanism for resistance within hybrids is still not known, and the breeders struggle to find a resistant and susceptible check to use as an industry standard when screening for verticillium stripe tolerance. However, many plant breeders note susceptibility differences among hybrids infected by verticillium stripe, which can be used to help promote hybrids that should handle the stress from the disease better than others.

Vast ranges of plant yield loss from verticillium stripe have been reported in the literature and from farmer experiences, but a standardized yield loss scale does not exist for our currently deployed hybrids in North America. Understanding verticillium stripe's impact on canola needs to be established first before taking a closer look at what the compounding effect of what verticillium stripe and blackleg may have on a plant. There are a growing number of fields that have both disease-causing pathogens present, but is this just coincidence due to the nature of how easily these two diseases spread, or is it because there is a mutualistic relationship between pathogens? These are questions the research community has been tasked with.

Verticillium stripe is widespread and here to stay, so learn how to properly identify it in the field against other canola diseases. Industry collaboration will be key to better understand and develop management practices against this disease. With blackleg in canola, many well-established management practices exist and need to be deployed. Managing blackleg in fields may just help provide the extra boost the plants need to withstand verticillium stripe pressure.

Canola Portfolio

Realize your yield potential with BrettYoung canola. BrettYoung has industry-leading hybrids in LibertyLink®, TruFlex® canola, and Clearfield® systems, sourcing the best technology and genetics to keep your operation profitable.

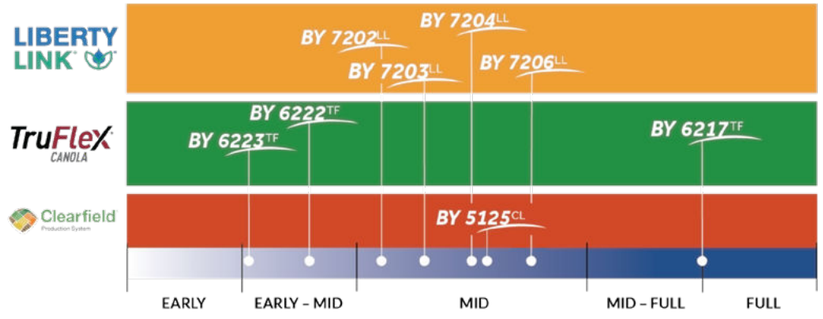
BrettYoung's premium canola genetics also carry the DefendR trait platform as part of an active disease and harvest management strategy. A variety of maturity and DefendR trait combinations will help you find the best canola hybrid fit for your farm.

Hybrid	Herbicide System	Blackleg Rating	Blackleg Major Gene	Clubroot Rating	DefendR Disease Designation	Standability	Pod Shatter Tolerance Rating[2]	Maturity[1]
BY 7206LL	LIBERTY LINK	R – AE_2G	LepR2 Rlm1 Rlm7	R (Next-generation* resistance)	DEFENDR BLACKLEG • CLUBROOT	Excellent	7.3	Mid
BY 7204LL	LIBERTY LINK	R – E_2	Rlm7	R (Next-generation* resistance)	CLUBROOT DEFENDR	Excellent	7.5	Mid
NEW BY 7203LL	LIBERTY LINK	R – E_2	Rlm7	R (Next-generation* resistance)	DEFENDR BLACKLEG • CLUBROOT	Very Good	7.4	Mid
BY 7202LL	LIBERTY LINK	R – C	Rlm3	R (Next-generation* resistance)	CLUBROOT DEFENDR	Excellent	7.0	Mid
BY 6223TF	TruFlex CANOLA	R – E_2G	Rlm7 RlmS	R (Next-generation* resistance)	CLUBROOT DEFENDR	Excellent	7.1	Early – Mid
NEW BY 6222TF	TruFlex CANOLA	R – CG	Rlm3 LepR2	R (Next-generation* resistance)	DEFENDR BLACKLEG • CLUBROOT	Excellent	7.0	Early – Mid
BY 6217TF	TruFlex CANOLA	R – CE_2	Rlm3 Rlm7	R (Next-generation* resistance)	DEFENDR BLACKLEG • CLUBROOT	Excellent	8.0	Mid – Full
BY 5125CL	Clearfield Production System for Canola	R – C	Rlm3	R (1st-generation resistance)	—	Excellent	—	Mid

Disease Management Rating: R = Resistant
[1]Maturity ratings based on relative to check performance in co-op registration trials.
[2]Pod shatter tolerance rating. This is based on the Canola Council of Canada's shatter tolerance scale of 1 – 9. 1 = poor, 9 = excellent. Results may vary slightly on your farm due to environmental factors and management practices.
*Next-generation resistance includes pathotypes covered by 1st-generation resistance plus resistance to newer pathotypes such as 3A, 3D, 3H, and other prevalent pathotypes.
**1st-generation resistance means resistant to pathotypes 2F, 3H, 5I, 6M, and 8N (these are equivalent to pathotypes 2, 3, 5, 6, 8 on the Williams' Differential set).

For product performance information scan this QR code or visit brettyoung.com/product-performance.

Canola Hybrid Maturities



Canola Seed Treatments

BrettYoung canola hybrids have a base treatment of Helix® Saltro® with the add-on seed treatment BUTEO® start.

Pests Controlled by Seed Treatments	Base Treatment	Additional Pests Controlled with Add-on Seed Treatment
	Helix Vibrance & Saltro	BUTEO start
Pythium spp.	✓	
Fusarium spp.	✓	
Rhizoctonia spp.	✓	
Seed-borne Blackleg	✓	
Airborne Blackleg	✓	
Flea Beetles	✓	
Enhanced Flea Beetle Control		✓

Canola Hybrids

BY 7206LL

Unlock the Full Potential of Your Canola Crop with This Hybrid — Engineered for Pod Shatter Control, Advanced Clubroot Defense, and Unbeatable Blackleg Resistance

- Pod DefendR — durable shatter-tolerance technology
- DefendR-rated blackleg resistance and next-generation clubroot protection
- Strong early-season vigor and excellent standability

Blackleg	Blackleg Major Gene	Clubroot	Standability	Maturity	Pod Shatter Tolerance Rating
R – AE_2G	LepR2, Rlm1, Rlm7	R (Next-generation* resistance)	Excellent	Mid	7.3

BY 7204LL

The Future of Canola Hybrid Technology Is Here: Consistent, High-Yield Performance in a Mid-Maturity Hybrid with Pod and Clubroot DefendR Genetic Traits

- Pod DefendR — durable shatter-tolerance technology
- DefendR-rated next-generation clubroot protection
- Strong early-season vigor and excellent standability

Blackleg	Blackleg Major Gene	Clubroot	Standability	Maturity	Pod Shatter Tolerance Rating
R – E_2	Rlm7	R (Next-generation* resistance)	Excellent	Mid	7.5

NEW BY 7203LL

Field Tested, Farmer Approved — Featuring Pod Shatter Control, Unbeatable Clubroot Defense, and Advanced Blackleg Resistance

- A high-yielding earlier mid-maturity hybrid
- Pod DefendR shatter-tolerance technology
- Double-layered Clubroot and Blackleg DefendR® traits

Blackleg	Blackleg Major Gene	Clubroot	Standability	Maturity	Pod Shatter Tolerance Rating
R – E_2	Rlm7	R (Next-generation* resistance)	Very Good	Mid	7.4

BY 7202LL

Boost Your Canola Harvest — This Hybrid Features Pod DefendR Shatter Tolerance and Cutting-Edge Clubroot Protection

- Pod DefendR — durable shatter-tolerance technology
- DefendR-rated next-generation clubroot protection
- Strong early-season vigor and excellent standability

Blackleg	Blackleg Major Gene	Clubroot	Standability	Maturity	Pod Shatter Tolerance Rating
R – C	Rlm3	R (Next-generation* resistance)	Excellent	Mid	7.0

BY 6223TF

A TruFlex® Canola Hybrid Featuring Pod Shatter Tolerance and Next-Generation Clubroot Resistance That Delivers Stronger Yields and Superior Harvest Security in an Early-Mid Maturity Package

- Another BrettYoung canola hybrid with Pod DefendR — a shatter-tolerance trait
- DefendR-rated clubroot resistance
- Early-mid maturity suitable for mid- and full-season zones
- TruFlex canola hybrid equipped with the latest in herbicide trait technology

Blackleg	Blackleg Major Gene	Clubroot	Standability	Maturity	Pod Shatter Tolerance Rating
R – E_2G	Rlm7, RlmS	R (Next-generation* resistance)	Excellent	Early – Mid	7.1

NEW BY 6222TF

Unleash the Full Potential of TruFlex Canola — Designed with Pod DefendR Shatter Tolerance Technology Ideal for Delayed Swathing and Straight Cut Harvesting, Cutting-Edge Clubroot Control, and Advanced Blackleg Defense

- A high-yielding earlier mid-maturity hybrid
- Pod DefendR shatter-tolerance technology
- Double-layered Clubroot and Blackleg DefendR® traits

Blackleg	Blackleg Major Gene	Clubroot	Standability	Maturity	Pod Shatter Tolerance Rating
R – CG	Rlm3, LepR2	R (Next-generation* resistance)	Excellent	Early – Mid	7.0

Disease Management Rating: R = Resistant
[1]Maturity ratings based on relative to check performance in co-op registration trials.
*Next-generation resistance includes pathotypes covered by 1st-generation resistance plus resistance to newer pathotypes such as 3A, 3D, 3H, and other prevalent pathotypes.
**1st-generation resistance means resistant to pathotypes 2F, 3H, 5I, 6M, and 8N (these are equivalent to pathotypes 2, 3, 5, 6, 8 on the Williams' Differential set).

BY 6217TF

Pod, Clubroot, and Blackleg DefendR Protection and Flexibility of the TruFlex® Canola System

- Another BrettYoung canola hybrid with Pod DefendR — a shatter-tolerance trait
- DefendR-rated clubroot and blackleg resistance
- Mid to full maturity suitable for mid- and full-season zones
- TruFlex canola hybrid equipped with the latest in herbicide trait technology

Blackleg	Blackleg Major Gene	Clubroot	Standability	Maturity	Pod Shatter Tolerance Rating
R – CE_2	Rlm3, Rlm7	R (Next-generation* resistance)	Excellent	Mid – Full	8.0

BY 5125CL

An Outstanding Yield Performer in the Clearfield® Segment

- 1st-generation** clubroot protection
- Blackleg resistant
- Can be marketed under the Clearfield (non-GMO) canola premium programs

Blackleg	Blackleg Major Gene	Clubroot	Standability	Maturity	Pod Shatter Tolerance Rating
R – C	Rlm3	R (1st-generation** resistance)	Excellent	Mid	—

Disease Management Rating: R = Resistant
[1]Maturity ratings based on relative to check performance in co-op registration trials.
*Next-generation resistance includes pathotypes covered by 1st-generation resistance plus resistance to newer pathotypes such as 3A, 3D, 3H, and other prevalent pathotypes.
**1st-generation resistance means resistant to pathotypes 2F, 3H, 5I, 6M, and 8N (these are equivalent to pathotypes 2, 3, 5, 6, 8 on the Williams' Differential set).

BY PLUS™

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- Access to the best offers through BrettYoung Retailers, including product discounts and re-seed benefits
- First look and preferred access to new BrettYoung products
- Opportunities to tell us how BrettYoung products performed on your farm

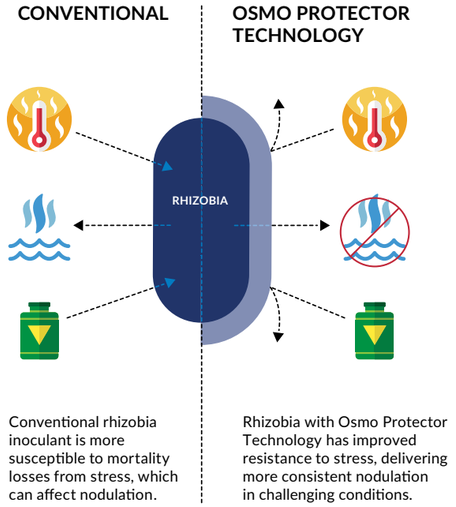
Inoculants

Our biologicals lineup sets the industry standard. With one-of-a-kind technology engineered to enhance performance in even the toughest conditions, our biologicals offer faster nodulation and optimal nitrogen fixation with lower application rates. When you choose BrettYoung biologicals, you choose the best.

Osmo Protector Technology

Many of BrettYoung's inoculants come equipped with Osmo Protector Technology, which features high-performance bacteria with longer on-seed survival. Rhizobia with Osmo Protector Technology are better equipped to withstand tough conditions and deliver excellent compatibility with many seed treatments.

Osmo Protector Technology strengthens the cell walls of rhizobial bacteria through a longer, stress-inducing manufacturing process. This enhances on-seed survival and performance in challenging environments including exposure to higher temperatures, low moisture soils, and chemical (seed treatment) stresses.



Making the Switch to a Liquid Inoculant: It's Time

A lot of growers have gotten comfortable with traditional inoculant formats over the years, but that doesn't mean there isn't a better way. Liquid inoculants are an option — and they're a better one in every way.

BrettYoung Regional Account Manager Clayton Hove has had various growers make the switch, and each of them has been thrilled with the results.

"As a rule, using a liquid inoculant is easier," said Hove. "You're applying it through an applicator kit, so you're drizzling it on or applying it through a seed treater when treating seed. Other formats can be bulky, so you have to auger it or lift it into the air seeder."

Liquid inoculants also cost less per acre, making them the more economical option. And because liquid inoculants are applied directly to the seed, they're more convenient to use with seed-applied products like seed treatments.

The on-seed life of our liquid inoculants is perhaps the biggest reason to make the switch. BrettYoung's Osmium® liquid inoculant (available in pea & lentil or chickpea formulations), depending on what fungicidal seed treatment you are applying with it, can last anywhere from five to 15 days on seed, giving you maximum flexibility.

"When you put Osmium inoculant on seed, it should be able to deliver more consistent nodulation because of Osmo Protector Technology," said Hove. "It won't be as affected by challenging conditions."

Bio-Inducer Technology

To accomplish nodulation, plant roots and rhizobia bacteria communicate using chemical signals. In turn, rhizobia respond with additional chemical signals (called nodulation determinants), initiating the nodulation process.

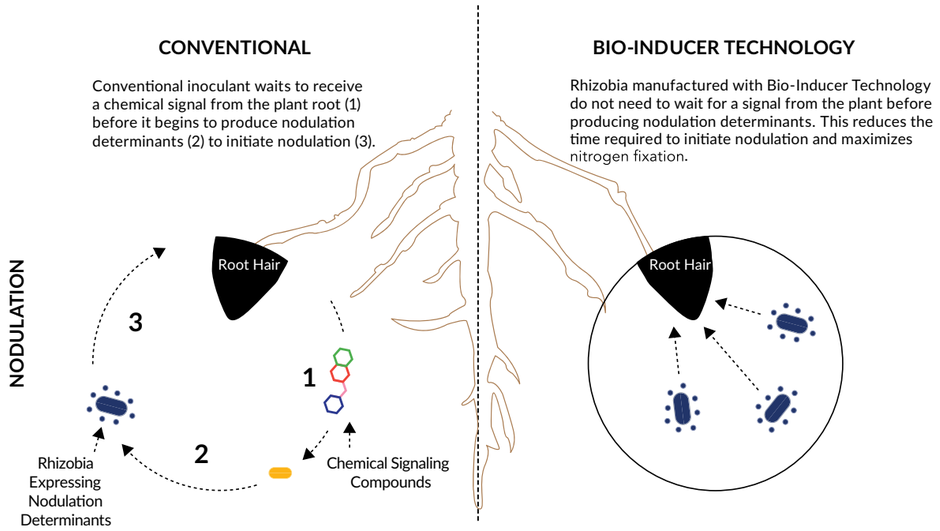
These nodulation determinants include:

- **Nod Factors** — Chemical compounds released by the rhizobia bacteria, signaling the plant to initiate nodulation
- **Lipopolysaccharides (LPS)** — Long-chain fatty acid molecules responsible for the development of the infection tube
- **Type Three Secretion System (T3SS)** — A protein structure used to transport substances between the cells of the rhizobia and the plant

Bio-Inducer Technology assists in the process by stimulating earlier production of specific nodulation determinants through introducing rhizobia to plant-based signaling compounds, called Bio-Inducer components, during the manufacturing process. These compounds mimic what plant roots release naturally in the soil, inducing the rhizobia to respond by releasing nodulation determinants, as if they were already in the presence of a receptive host.

The early presence of these nodulation determinants accelerates the nodulation process in the soil and improves nodulation on a plant's crown and primary roots, where nodules are most effective. This maximizes nitrogen fixation and yield potential, delivering more consistent performance under all conditions.

Signum Soybean inoculants come equipped with Bio-Inducer Technology, which accelerates and improves nodulation. This not only maximizes nitrogen fixation but also improves yield potential for your crop.



Pea/Lentil Osmium® Osmo Protector

Osmium Pea/Lentil is a convenient liquid inoculant featuring Osmo Protector Technology to provide pea and lentil growers with longer on-seed survival and enhanced performance in challenging environments.

- Enhanced performance in challenging environments
- Longer survival on-seed
- Convenient all-in-one liquid formulation

Formulation:	Liquid Suspension
Guaranteed Analysis:	*Rhizobium leguminosarum* bv. *viciae* 1 x 10^9 CFU/ml
Technology:	Osmo Protector Technology
Crops:	Peas, lentils and faba beans
Application:	On-Seed
Application Rate:	3 fl. oz./100 lb, 200 ml/100 kg
On-Seed Life:	Up to 15 days[1]
Package Size:	2 x 184 fl. oz. (2 x 5.45 L) – treats 12,000 lb (200 bu)

Chickpea Osmium® Osmo Protector

Osmium Chickpea is an inoculant featuring Osmo Protector Technology that provides chickpea growers with a liquid formulation that has on-seed survival that outperforms all other peat and liquid inoculants and enhance performance in challenging environments.

- Enhanced performance in challenging environments
- Longer survival on-seed
- Convenient all-in-one liquid formulation

Formulation:	Liquid Suspension
Guaranteed Analysis:	*Mesorhizobium ciceri* 1 x 10^9 CFU/ml
Technology:	Osmo Protector Technology
Crops:	Chickpeas
Application:	On-Seed
Application Rate:	3 fl. oz./100 lb, 200 ml/100 kg
On-Seed Life:	Up to 15 days[1]
Package Size:	2 x 184 fl. oz. (2 x 5.45 L) – treats 12,000 lb (200 bu)

[1]Visit brettyoung.com/compatibility for seed treatment compatibility information.

Signum® Bio-Inducer

Signum Soybean is an effective and convenient inoculant equipped with both Osmo Protector and Bio-Inducer Technology to promote quicker biological fixation of nitrogen, allowing soybean growers to maximize yields even in stressful growing conditions.

- High concentration
- Bio-inducers
- Enhanced performance in challenging environments
- Longer survival on-seed
- Convenient all-in-one liquid formulation

Formulation:	Liquid Suspension
Guaranteed Analysis:	*Bradyrhizobium japonicum* 1 x 10^{10} CFU/ml
Technology:	Bio-Inducer Technology, Osmo Protector Technology
Crops:	Soybean
Application:	On-Seed
Application Rate:	2 fl. oz./100 lb, 130 ml/100 kg
On-Seed Life:	Up to 120 days[1]
Package Size:	400 fl. oz. (11.84 L) – treats 400 units (20,000 lb); 40 fl. oz. (1.18 L) – treats 40 units (2,000 lb)

Launcher™ Liquid Soybean Inoculant

Formulation:	Liquid Suspension
Guaranteed Analysis:	*Bradyrhizobium japonicum* 4 x 10^9 CFU/ml
Crop:	Soybean
Application:	On-Seed or In-Furrow
On-Seed Application Rate:	2 fl. oz./100 lb, 130ml/100kg
In-Furrow Application Rate:	0.5 fl. oz./1,000 ft, 5ml/100m
On-Seed Life:	Up to 4 days[1]
Package Size:	400 fl. oz. (11.84 L) – treats 400 units (20,000 lb); 40 fl. oz. (1.18 L) – treats 40 units (2,000 lb)

Bio-Inducer Technology	*Included In Signum® Bio-Inducer	**Bio-Inducers** Accelerates initial, early communication between rhizobia and plant roots and triggers earlier nodulation for maximum nitrogen fixation.
Osmo Protector Technology	*Included In Signum® Bio-Inducer, Chickpea Osmium® Osmo Protector	**Enhanced Performance in Challenging Environments** Osmo Protector Technology results in tougher bacteria that enhances performance in the field under adverse conditions. This includes high temperatures, low water availability, and chemical (seed treatment) stresses. **Longer Survival On-Seed** Osmo Protector Technology provides added protection for longer on-seed survival without requiring an extender. This allows growers much greater planting window flexibility compared to other seed-applied liquid and peat inoculants.

BrettYoung Head Office
Box 99 St. Norbert Postal Stn
Winnipeg, MB
Canada R3V 1L5
Toll-Free: 800-665-5015

BrettYoung™
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BrettYoung.com
@BrettYoungSeeds