PREMIER TECH

2023

AGTIV®

EFFICACY REPORT 2023

RELIABLE INOCULANTS

AGTIV FUEL

Single action rhizobium products FUEL legumes by fixing nitrogen for better growth.

AGTIV THRIVE

Dual action mycorrhizae and **rhizobium** products make plants THRIVE by increasing nutrient uptake.

AGTIV ENRICH

Dual action rhizobium and ***Bacillus*** collaborate to ENRICH the plant's nitrogen fixation with a healthy root system.

AGTIV STIMULATE

Single action *Bacillus* products STIMULATE the plant to grow more efficiently with a healthy root zone.

AGTIV IGNITE

Single action Serendipita products IGNITE plant growth and chlorophyll content for better yields.

AGTIV REACH

Single action mycorrhizae products REACH into the soil and help uptake more nutrients and water.

AGTIV®

DESIGNED BY NATURE. PERFECTED BY SCIENCE.

AGTIV® is an innovative technology brand made of high-quality and proven natural active ingredients that deliver superior performance for agricultural producers. We are introducing new product names reflecting the actions of our inoculants for plants.Ask your local AGTIV® rep or retailer to learn more about the 2023 season offer.

PREMIER TECH

info@ptagtiv.com 1 866 454-5867

PTAGTIV.COM

AGTIV® AVERAGE YIELD INCREASE BY CROP

10%
2.6 bu/ac
Average yield increase
65 sites over 12 years, Canada
LENTILS

7.5%
3.4 bu/ac
Average yield increase
93 sites over 8 years, Canada and Europe
SOYBEAN

6.7%
3.6 bu/ac
Average yield increase
24 sites over 10 years, Canada
PEAS

6.7%
2.5 bu/ac
Average yield increase
27 sites over 5 years, Canada
CANOLA

6.5%
3.8 bu/ac
Average yield increase
12 sites over 7 years, North America
DURUM WHEAT

9.8%
3.4 bu/ac
Average yield increase
4 sites over 4 year, Canada
CHICKPEA

9%
252 lb/ac
Average yield increase
12 sites over 5 years, Canada
DRY BEANS

10.5%
7.3 bu/ac
Average yield increase
28 sites over 6 years, Canada and Europe
BARLEY

9%
Average yield increase
17 sites over 9 years, Canada and Europe
ONIONS

10%
31.6 cwt/ac
Average yield increase
1184 sites over 11 years, North America and Europe
POTATO

AGTIV® RELIABLE INOCULANTS

	Product	Active Ingredient(s)	Organic	Application Mode: Granular In-Furrow	Application Mode: Mixing With Seeds	Application Mode: Liquid In-Furrow	Application Mode: Liquid On Seed	Formulation
PEA, LENTIL & FABA BEAN	**AGTIV® THRIVE™ P** PEA & LENTIL (previously named AGTIV® PULSES • Powder) **F:** Powder (peat) **S:** 4.7 kg (10.3 lb) pail – 2.4 kg (5.3 lb) pail **C: Peas & faba beans:** Pail 4.7 kg: **16 ha (40 acres)** – Pail 2.4 kg: **8 ha (20 acres)** **Lentils:** Pail 4.7 kg: **24 ha (60 acres)**	M R	✓		●			Powder
PEA, LENTIL & FABA BEAN	**AGTIV® THRIVE™ G** PEA & LENTIL (previously named AGTIV® PULSES • Granular) **F:** Granules (peat) **S:** 18.2 kg (40 lb) bag – 364 kg (800 lb) tote bag **C: Peas, lentils & faba beans:** Bag: **4 ha (10 acres)** – Tote bag: **80 ha (200 acres)**	M R	✓	●				Granules
PEA, LENTIL & FABA BEAN	**AGTIV® THRIVE™** PEA & LENTIL (previously named AGTIV® COMBO • Liquid for PULSES) **F:** Liquid **S:** Combo box: 8 L (8 kg) bag-in-box + 4 x 950 ml (4 x 32 fl. oz) bottles **C: Peas, lentils & faba beans: 32 ha (80 acres)**	M R	✓			●		Liquid
PEA, LENTIL & FABA BEAN	**AGTIV® FUEL™ P** PEA & LENTIL (previously named AGTIV® ON SEED™ RHIZO • Powder) **F:** Powder (peat) **S:** 4.7 kg (10.3 lb) pail **C: Peas & faba beans: 16 ha (40 acres)** – **Lentils: 24 ha (60 acres)**	R	✓		●			Powder
PEA, LENTIL & FABA BEAN	**AGTIV® FUEL™ G** PEA & LENTIL (previously named AGTIV® RHIZO • Granular for PULSES) **F:** Granules (peat) **S:** 18.2 kg (40 lb) bag – 364 kg (800 lb) tote bag **C: Peas, lentils & faba beans:** Bag: **4 ha (10 acres)** – Tote bag: **80 ha (200 acres)**	R	✓	●				Granules
PEA, LENTIL & FABA BEAN	**AGTIV® FUEL™ L** PEA & LENTIL ✱ (previously named AGTIV® RHIZO • Liquid for PULSES) **F:** Liquid **S:** 8 L (8 kg) bag-in-box **C: Peas, lentils & faba beans: 32 ha (80 acres)** or **6530 kg of seeds (240 bu)**	R	✓			●	●	Liquid
SOYBEAN	**AGTIV® THRIVE™ P** SOYBEAN (previously named AGTIV® SOYBEAN • Powder) **F:** Powder (peat) **S:** 4.7 kg (10.3 lb) pail **C: Soybean: 16 ha (40 acres)**	M R	✓		●			Powder
SOYBEAN	**AGTIV® THRIVE™ G** SOYBEAN (previously named AGTIV® SOYBEAN • Granular) **F:** Granules (peat) **S:** 18.2 kg (40 lb) bag – 364 kg (800 lb) tote bag **C: Soybean:** Bag: **4 ha (10 acres)** – Tote bag: **80 ha (200 acres)**	M R	*	●				Granules
SOYBEAN	**AGTIV® THRIVE™** SOYBEAN (previously named AGTIV® COMBO • Liquid for SOYBEAN) **F:** Liquid **S:** Combo box: 8 L (8 kg) bag-in-box + 2 x 950 ml (2 x 32 fl. oz) bottles **C: Soybean: 16 ha (40 acres)**	M R	✓			●		Liquid
SOYBEAN	**AGTIV® FUEL™ G** SOYBEAN (previously named AGTIV® BRADY • Granular for SOYBEAN) **F:** Granules (peat) **S:** 18.2 kg (40 lb) bag – 364 kg (800 lb) tote bag **C: Soybean:** Bag: **4 ha (10 acres)** – Tote bag: **80 ha (200 acres)**	R	*	●				Granules
SOYBEAN	**AGTIV® FUEL™ L** SOYBEAN ✱ (previously named AGTIV® BRADY • Liquid for SOYBEAN) **F:** Liquid **S:** 8 L (8 kg) bag-in-box **C: Soybean: 16 ha (40 acres)** or **5680 kg of seeds (250 units)**	R	✓			●	●	Liquid
SOYBEAN	**AGTIV® ENRICH™** SOYBEAN ✱ (previously named AGTIV® BB COMBO • Liquid for SOYBEAN) **F:** Liquid **S:** Combo box: 8 L (8 kg) (*Bradyrhizobium*) bag-in-box + 300 ml (*Bacillus*) bottle **C: Soybean: 16 ha (40 acres)** or **5680 kg of seeds (250 units)**	R B	✓			●	●	Liquid

The newly named products will be on the market in 2023.

		Active Ingredient(s)	Organic	Application Mode: Granular In-Furrow	Application Mode: Mixing With Seeds	Application Mode: Liquid In-Furrow	Application Mode: Liquid On Seed	Formulation
CANOLA & CEREAL	**AGTIV® IGNITE™ L** (previously named AGTIV® IGNITE • L for Brassicaceae) **F:** Liquid **S:** 11 L (11 kg) bag-in-box **C:** Canola: **454 kg (1000 lb) or 81 ha (200 acres) of seeds** Cereals: **9165 kg (20 205 lb) or 81 ha (200 acres) of seeds**	S	*				●	Liquid
CHICKPEA	**AGTIV® THRIVE™ P CHICKPEA** (previously named AGTIV® CHICKPEA • Powder) **F:** Powder (peat) **S:** 4.7 kg (10.3 lb) pail **C:** Chickpea: **16 ha (40 acres)**	M R	✓		●			Powder
CHICKPEA	**AGTIV® THRIVE™ G CHICKPEA** (previously named AGTIV® CHICKPEA • Granular) **F:** Granules (peat) **S:** 18.2 kg (40 lb) bag – 364 kg (800 lb) tote bag **C:** Chickpea: Bag: **4 ha (10 acres)** – Tote bag: **80 ha (200 acres)**	M R	✓	●				Granular
FIELD & SPECIALTY CROPS	**AGTIV® REACH™ P** (previously named AGTIV® FIELD CROPS – O • Powder, AGTIV® FIELD CROPS• Powder, AGTIV® FORAGES • Powder & AGTIV® SPECIALTY CROPS • Powder) **F:** Powder (peat) **S:** Case of 4 x 800 g (4 x 1.75 lb) pails **C:** Cereals, flax & dry beans: **32 ha (80 acres)** per case Alfalfa, mix forages & grass: **16 ha (40 acres)** per case Vegetables, berries & garlic: see page "Specialty Crops" for details.	M	✓		●			Powder
FIELD & SPECIALTY CROPS	**AGTIV® REACH™ G** (previously named AGTIV® FIELD CROPS • Granular & AGTIV® SPECIALTY CROPS • Granular) **F:** Granules (peat) **S:** 6 kg (13.2 lb) pail – 18.2 kg (40 lb) bag – 364 kg (800 lb) tote bag **C:** Cereals, flax & dry beans: Bag: **4 ha (10 acres)** – Tote bag: **80 ha (200 acres)** Alfalfa, mix forages & grass: Bag: **45 kg of seeds (99 lb)** – Tote bag: **720 kg of seeds (1584 lb)** Vegetables, herbs, berries & fruit trees: see page "Specialty Crops" for details.	M	*	●				Granular
FIELD & SPECIALTY CROPS	**AGTIV® REACH™ L** (previously named AGTIV® FIELD CROPS • Liquid) **F:** Liquid (spores in suspension) **S:** Case of 2 x 950 ml (2 x 32 fl. oz) bottles **C:** Cereals, flax & beans: **16 ha (40 acres)** per case	M	✓			●		Liquid
POTATO	**AGTIV® REACH™ L POTATO** (previously named AGTIV® POTATO • Liquid) **F:** Liquid (spores in suspension) **S:** Case of 2 x 950 ml (2 x 32 fl. oz) bottles **C:** Potato: **8 ha (20 acres)** per case	M	✓			●	●	Liquid

See last page for complete product recommendations.

ACTIVE INGREDIENTS

M **MYCORRHIZAE**
PTB297 Technology

B **BACILLUS**
PTB180 Technology

R **RHIZOBIUM**
PTB160 Technology (pea & lentil)
PTB162 Technology (soybean)
Mesorhizobium ciceri (chickpea)

S **SERENDIPITA**
PTB299 Technology

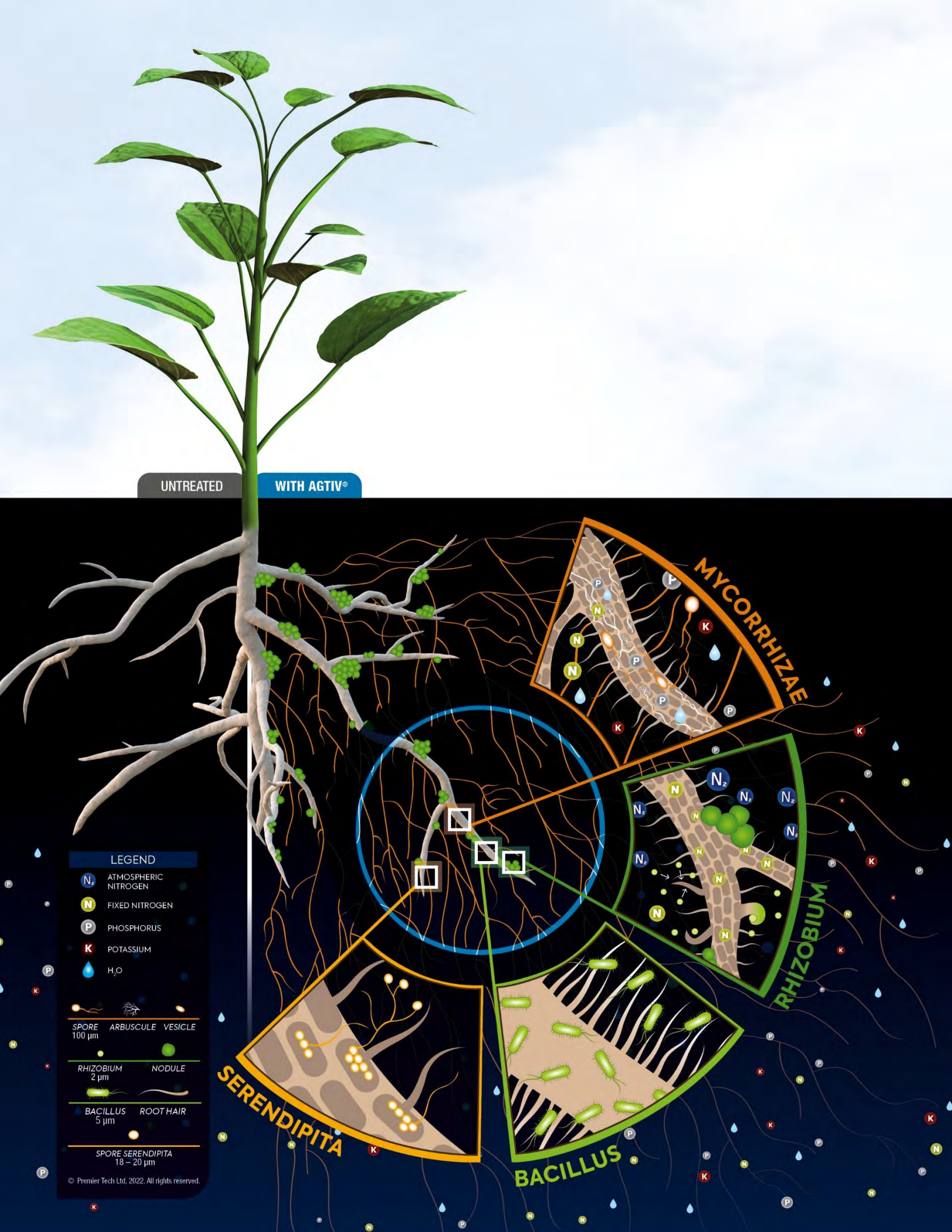
LEGEND

F: Formulation
S: Size
C: Crop/Coverage

★ Eligible with EXTENDER™ L for AGTIV® inoculants
✓ For organic use
* Non eligible for organic use. Contact us for more details.

FORMULATIONS

Liquid | Granular | Powder


UNTREATED
WITH AGTIV®
MYCORRHIZAE
RHIZOBIUM
SERENDIPITA
BACILLUS
LEGEND
ATMOSPHERIC NITROGEN
FIXED NITROGEN
PHOSPHORUS
POTASSIUM
H_2O
SPORE 100 µm
ARBUSCULE
VESICLE
RHIZOBIUM 2 µm
NODULE
BACILLUS 5 µm
ROOT HAIR
SPORE SERENDIPITA 18 – 20 µm
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AGTIV® BIOLOGICAL ACTIVE INGREDIENTS

For nearly 100 years, Premier Tech has been growing along with producers. Being a world leader in the industrial production of mycorrhizal inoculants has inspired us to go further in our search for natural technologies. Since then, we have introduced the benefits of B*acillus*, rhizobium, and Serendipita to the agricultural market. Furthermore, we have combined these powerful technologies to improve the quality and the yield of crops for the benefit of our clients.

Learn more at

PTAGTIV.COM/**en/technologies**

M — MYCORRHIZAE

PTB297 Technology, *Rhizophagus irregularis* (formerly known as *Glomus intraradices)*

Mycorrhizae are beneficial associations between a mycorrhizal fungus and roots. The mycorrhizal spores germinate in the soil and produce filaments (hyphae) which enter into root cells. This association allows the formation of an intra and extra-radical network of filaments that explore the soil and access more nutrients and water, and transfer them to the plant.

- EXPAND ROOT SYSTEM GROWTH
- ENHANCE NUTRIENT & WATER UPTAKE
- INCREASE TOLERANCE TO STRESSES
- IMPROVE SOIL STRUCTURE

R — RHIZOBIUM

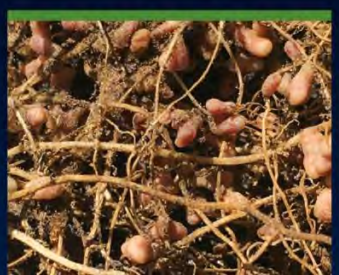
PTB160 Technology (pulses), *Rhizobium leguminosarum* biovar *viciae*

PTB162 Technology (soybean), *Bradyrhizobium japonicum*

Mesorhizobium ciceri (chickpea)

Rhizobium bacteria live and thrive in symbiosis in root nodules produced by the plant. They are responsible for fixing the atmospheric nitrogen and making it available for the plant.

- FIX NITROGEN & MAKE IT AVAILABLE TO THE PLANT



B — BACILLUS

PTB180 Technology, *Bacillus pumilus*

B*acillus* is a bacteria that provides a healthy root zone which leads to better yields. As a root colonizer, it stimulates the plant to grow more efficiently. Selected for its beneficial action of growth stimulation.

- IMPROVES ROOTING ENVIRONMENT & PLANT ESTABLISHMENT
- INCREASES PLANT VIGOR & PERFORMANCE

S — SERENDIPITA

PTB299 Technology, *Serendipita indica* (formerly known as *Piriformospora indica)*

The beneficial fungus *Serendipita indica*, a natural microorganism, forms an association with roots of many plants such as canola and cereals. It induces some of the plant gene expression and promotes phytohormone production.

- MITIGATES ABIOTIC STRESSES
- INCREASES CHLOROPHYLL CONTENT
- BETTER PLANT ESTABLISHMENT, GROWTH AND YIELD

EFFICACY REPORT
SUMMARY – MYCORRHIZAL & RHIZOBIAL INOCULANT

LENTIL

► PLOT & STRIP TRIALS

Research partners: GMAC's Ag Team, Wheatland Conservation Area, Prairie Ag Research Inc., and Small Plot Inc.

Research sites: Saskatchewan and Alberta

Treatments: a) AGTIV® THRIVE™* PEA & LENTIL;
b) Competitor inoculant A*;
c) Competitor inoculant B*;
d) Competitor inoculant C*;
e) Competitor inoculant D*.

Experimental design: 57 replicated plots per treatment (four trials with 6, one with 7, three with 8 and one strip trial with two replicated) in randomized complete block design

*Products applied according to manufacturers recommended rate.

Table 1. **Summary of Lentil yields (bu/ac) per trial.**

Location	Year	Seed variety	AGTIV® THRIVE™ PEA & LENTIL	Competitor inoculant			
				A	B	C	D
Brock (SK)	2015	N.A.	18.4	13.4	11.4		
Swift Current (SK)	2016	Small Red Lentils, Imax CL	50.1	43.3	41.1	37.7	
Coalhurst (AB)	2017	N.A.	19.5	19.1	19.2	18.5	
Vulcan (AB)	2019	Pedigree CDC Proclaim	32.6	28.8			28.4
Lethbridge (AB)	2021	Proclaim	46.8		46.4		
Vulcan (AB)	2021	Impulse	10.0		8.4		
Lethbridge (AB)	2022	Impulse	32.0		31.9		
Vulcan (AB)	2022	Impulse	38.7		38.3		
Swift Current (SK)	2022	Impulse	35.0		32.6		

Table 2. **Summary of Lentil yields (kg/ha) per trial.**

Location	Year	Seed variety	AGTIV® THRIVE™ PEA & LENTIL	Competitor inoculant			
				A	B	C	D
Brock (SK)	2015	N.A.	1237	901	766		
Swift Current (SK)	2016	Small Red Lentils, Imax CL	3367	2910	2762	2533	
Coalhurst (AB)	2017	N.A.	1310	1284	1290	1243	
Vulcan (AB)	2019	Pedigree CDC Proclaim	2192	1937			1910
Lethbridge (AB)	2021	Proclaim	3145		3118		
Vulcan (AB)	2021	Impulse	672		564		
Lethbridge (AB)	2022	Impulse	2150		2144		
Vulcan (AB)	2022	Impulse	2601		2574		
Swift Current (SK)	2022	Impulse	2352		2191		

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EFFICACY REPORT
2022 – MYCORRHIZAL & RHIZOBIAL INOCULANT

LENTIL

► PLOT TRIAL

Research partner: Prairie Ag Research Inc.

Research site: Lethbridge, AB

Treatments: a) Untreated Check
b) AGTIV® THRIVE™ PEA & LENTIL*
c) Competitor inoculant B*

* Granular inoculant applied according to manufacturer's recommended rate

Experimental design: Complete Randomized Block Design, 8 repetitions, 12 m^2 plots

Variety: Impulse

Previous crop: Fallow

Seeding details: Seeded on May 23, 2022, with a cone seeder at a rate of 50 kg/ha in a clay loam soil (pH: 7.4, OM: 4%). Emergence on May 30.

Table 1. **Summary of yields per treatment.**

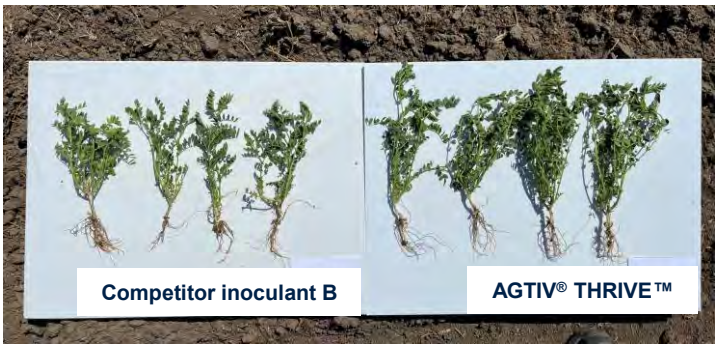
Treatment	Yield (bu/ac)	Yield increase (bu/ac)
Untreated Check	30.1	-
AGTIV® THRIVE™ PEA & LENTIL	32.0	1.9
Competitor inoculant B	31.9	1.8

Plot operational notes and rain fall.

- No fertilization
- Pesticides:
  - May 20, Glyphosate (pre seeding burn off)
  - June 30, Odyssey and Merge (broadleaf weeds)
- Harvested on September 7, 2022

Month	Precipitation (mm)
May	35.8
June	114.5 *
July	57.4
August	31.7 *
TOTAL	**239.4**

* Plots were irrigated during those months



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EFFICACY REPORT
2022 – MYCORRHIZAL & RHIZOBIAL INOCULANT

LENTIL

► PLOT TRIAL

Research partner: Small Plot Inc.

Research site: Vulcan, AB

Treatments: a) Untreated Check
b) AGTIV® THRIVE™ PEA & LENTIL*
c) Competitor inoculant B*

* Granular inoculant applied according to manufacturer's recommended rate

Experimental design: Complete Randomized Block Design, 6 repetitions, 16 m^2 plots

Variety: Impulse

Previous crop: Fallow

Seeding details: Seeded on May 12, 2022, with a plot drill machine at a rate of 89 kg/ha in a loam soil (pH: 7, OM: 3.5%). Emergence on May 30.

Table 1. **Summary of yields per treatment.**

Treatment	Yield (bu/ac)	Yield increase (bu/ac)
Untreated Check	37.1	-
AGTIV® THRIVE™ PEA & LENTIL	38.7	1.6
Competitor inoculant B	38.3	1.2

Plot operational notes and rain fall.

- Fertilization of 11-51-0-0 sidebanded at seeding on May 12
- Pesticides:
  - July 3: Applied Odyssey NXT for post herbicide weed control
  - Applied ZIVATA for grasshopper control twice
- Harvested on August 30, 2022

Month	Precipitation (mm)
May	9.8
June	136.8
July	86.0
August	18.1
TOTAL	**250.7**

PREMIER TECH

EFFICACY REPORT
2022 – MYCORRHIZAL & RHIZOBIAL INOCULANT

LENTIL

► PLOT TRIAL

Research partner: Wheatland Conservation Area

Research site: Swift Current, SK

Treatments: a) Untreated Check
b) AGTIV® THRIVE™ PEA & LENTIL*
c) Competitor inoculant B*

* Granular inoculant applied according to manufacturer's recommended rate

Experimental design: Complete Randomized Block Design, 8 repetitions, 17 m^2 plots

Variety: Impulse

Previous crop: Wheat

Seeding details: Seeded on May 6, 2022, with a cone seeder at a rate of 67 kg/ha in a sandy loam soil (pH: 6.1, OM: 2.7%) Emergence on May 27.

Table 1. **Summary of yields per treatment.**

Treatment	Yield (bu/ac)	Yield increase (bu/ac)
Untreated Check	32.9	-
AGTIV® THRIVE™ PEA & LENTIL	35.0	2.1
Competitor inoculant B	32.6	-

Plot operational notes and rain fall.

- Fertilization of 11-52-0 sidebanded at seeding (100 kg/ha) on May 6.
- Pesticides:
  - May 2, RT540 (pre seeding burn off)
  - June 7, Centurion + AMIGO (post emergence weed control)
  - June 16, Solo ADV herbicide (broadleaf weed control)
  - July 27, Proline GOLD (sclerotinia control)
  - August 8, Reglone (desiccant)
- Harvested on August 8, 2022

Month	Precipitation (mm)
May	51.2
June	37.7
July	90.4
August	7.5
TOTAL	**186.8**

PREMIER TECH

EFFICACY REPORT
SUMMARY – MYCORRHIZAL & RHIZOBIAL INOCULANT

PEA

► PLOT TRIALS

Research partners: ICMS, Wheatland Conservation Area and Ag-Quest inc.

Research sites: Alberta, Saskatchewan and Manitoba

Treatments: a) AGTIV® THRIVE™ PEA & LENTIL*;
b) Competitor inoculant A*;
c) Competitor inoculant B*;
d) Competitor inoculant D*.

Experimental design: 51 replicated plots per treatment (five trials with 6, two with 8 and one with 5) in randomized complete block design

*Products applied according to manufacturers recommended rate.

Table 1. **Summary of Pea yields (bu/ac) per trial.**

Location	Year	Seed variety	AGTIV® THRIVE™ PEA & LENTIL	Competitor inoculant		
				A	B	D
Fort Saskatchewan (AB)	2015	Meadow	88.6	86.2	79.5	
Swift Current (SK)	2017	Amarillo	14.0	12.7	12.4	
Saskatoon (SK)	2019	AAC Ardill	65.0	52		63.2
Portage la Prairie (MB)	2021	Carver	45.2		41.3	
Josephburg (AB)	2022	Striker	45.4		46.6	
Saskatoon (SK)	2022	ACC Ardill	36.4		35.8	
Saskatoon (SK)	2022	CDC Spectrum	30.7		28.8	
Swan River (MB)	2022	Inca	91.5		87.1	

Table 2. **Summary of Pea yields (kg/ha) per trial.**

Location	Year	Seed variety	AGTIV® THRIVE™ PEA & LENTIL	Competitor inoculant		
				A	B	D
Fort Saskatchewan (AB)	2015	Meadow	5958	5793	5342	
Swift Current (SK)	2017	Amarillo	941	853	833	
Saskatoon (SK)	2019	AAC Ardill	4371	3497		4250
Portage la Prairie (MB)	2021	Carver	3037		2775	
Josephburg (AB)	2022	Striker	3051		3132	
Saskatoon (SK)	2022	ACC Ardill	2446		2406	
Saskatoon (SK)	2022	CDC Spectrum	2063		1935	
Swan River (MB)	2022	Inca	6149		5853	

EFFICACY REPORT
2022 – MYCORRHIZAL & RHIZOBIAL INOCULANT

PEA

► PLOT TRIAL

Research partner: Integrated Crop Management Services (ICMS)

Research site: Josephburg, AB

Treatments: a) Untreated Check
b) AGTIV® THRIVE™ PEA & LENTIL
c) Competitor inoculant B*

* Granular inoculant applied according to manufacturer's recommended rate

Experimental design: Complete Randomized Block Design, 8 repetitions, 15 m^2 plots

Variety: Striker

Previous crop: Fallow

Seeding details: Seeded on June 20, 2022, with a cone seeder at a rate of 160 kg/ha in a loam soil (pH: 5.7, OM: 8%). Emergence on July 3.

Table 1. **Summary of yields and protein content per treatment.**

Treatment	Yield (bu/ac)	Yield increase (bu/ac)	Protein content (%)
Untreated Check	44.1	-	21.3
AGTIV® THRIVE™ PEA & LENTIL	45.4	1.3	22.2
Competitor inoculant B	46.6	2.5	20.9

Plot operational notes and rain fall.

- Fertilization of 80-30-20-20 kg/ha NPKS pre seeding
- Pesticides:
  - June 1, Roundup WeatherMAX (Pre seed burn off)
  - Odyssey + Merge (broadleaf weeds)
- Harvested on September 20, 2022

Month	Precipitation (mm)
June	109.3
July	35.0
August	34.4
September	10.6
TOTAL	**189.3**

PREMIER TECH

EFFICACY REPORT
2022 – MYCORRHIZAL & RHIZOBIAL INOCULANT

PEA

► PLOT TRIAL

Research partner: Integrated Crop Management Services (ICMS)

Research site: Saskatoon, SK

Treatments: a) Untreated Check
b) AGTIV® THRIVE™ PEA & LENTIL
c) Competitor inoculant B*

* Granular inoculant applied according to manufacturer's recommended rate

Experimental design: Complete Randomized Block Design, 8 repetitions, 15 m^2 plots

Variety: ACC Ardill

Previous crop: Wheat

Seeding details: Seeded on May 26, 2022, with a cone seeder at a rate of 225 kg/ha in a clay soil (pH: 8, OM: 8.8%). Emergence on June 15.

Table 1. **Summary of yields and protein content per treatment.**

Treatment	Yield (bu/ac)	Yield increase (bu/ac)	Protein content (%)
Untreated Check	34.8	-	17.5
AGTIV® THRIVE™ PEA & LENTIL	36.4	1.6	18.0
Competitor inoculant B	35.8	1.0	17.1

Plot operational notes and rain fall.

- Fertilization of 80-20-10-20 kg/ha NPKS pre seeding + 28% Urea Ammonium Nitrate on July 4
- Pesticides:
  - July 4, Viper ADV (to control emerged weeds)
  - August 31, Reglone Ion (Desiccant)
- Harvested on September 6, 2022

Month	Precipitation (mm)
May	25.8
June	38.0
July	46.5
August	25.6
TOTAL	**135.9**

PREMIER TECH

EFFICACY REPORT
2022 – MYCORRHIZAL & RHIZOBIAL INOCULANT

PEA

► PLOT TRIAL

Research partner: Ag-Quest inc.

Research site: Saskatoon, SK

Treatments: a) Untreated Check
b) AGTIV® THRIVE™ PEA & LENTIL
c) Competitor inoculant B*

* Granular inoculant applied according to manufacturer's recommended rate

Experimental design: Complete Randomized Block Design, 6 repetitions, 8.2 m^2 plots

Variety: CDC Spectrum

Previous crop: Oats

Seeding details: Seeded on May 27, 2022, with a cone seeder and a techno till drill opener at a rate of 160 kg/ha in a loam soil (pH: 5.8, OM: 3.5%). Emergence on June 3.

Table 1. **Summary of yields per treatment.**

Treatment	Yield (bu/ac)	Yield increase (bu/ac)
Untreated Check	27.2	-
AGTIV® THRIVE™ PEA & LENTIL	30.7	3.5
Competitor inoculant B	28.8	1.6

Plot operational notes and rain fall.

- Fertilization of 11-52-0 side banded (72 kg/ha)
- Pesticides:
  - May 11, Roundup WeatherMAX + Aim EC (Pre seed burn off)
  - June 8 , Centurion (post emergence herbicide)
  - June 21, July 4 & 12, Basagran Forté + Assure II (post emergence herbicide)
  - August 6, Matador herbicide (flea beetle control)
  - August 16, Reglone Ion (Desiccant)
- Harvested on August 24, 2022

Month	Precipitation (mm)
May	27.3
June	37.1
July	41.3
August	15.8
TOTAL	**121.5**

PREMIER TECH

EFFICACY REPORT
2022 – MYCORRHIZAL & RHIZOBIAL INOCULANT

PEA

► PLOT TRIAL

Research partner: New Era Ag Research and Technologies

Research site: Swan River, MB

Treatments: a) Untreated Check
b) AGTIV® THRIVE™ PEA & LENTIL*
c) Competitor inoculant B*

* Granular inoculant applied according to manufacturer's recommended rate

Experimental design: Complete Randomized Block Design, 6 repetitions, 15 m^2 plots

Variety: Inca

Previous crop: Canola

Seeding details: Seeded on May 24, 2022, with a cone seeder at a rate of 286 kg/ha in a clay loam soil (pH: 6.5, OM: 5.3%). Emergence on June 3.

Table 1. **Summary of yields per treatment.**

Treatment	Yield (bu/ac)	Yield increase (bu/ac)
Untreated Check	85.3 [b]	-
AGTIV® THRIVE™ PEA & LENTIL	91.5 [a]	6.2
Competitor inoculant B	87.1 [b]	1.8

[1] Yields with same letter are not statistically different according to a Tukey HSD test ($p \leq 0.1$).

Plot operational notes and rain fall.

- Fertilization of MAP 11-52-0 on May 25 (47 kg/ha)
- Pesticides:
  - June 9, Coragen & Pounce (for cutworm & flea beetle control)
  - June 22, Viper ADV (post emergence weed control)
  - July 18, Priaxor (white mold control)
  - August 25, Guardsman (Desiccant)
- Harvested on August 31, 2022

Month	Precipitation (mm)
May	14.5
June	80.0
July	32.3
August	48.8
September	58.9
TOTAL	**234.5**

PREMIER TECH

EFFICACY REPORT

SUMMARY – MYCORRHIZAL & RHIZOBIAL INOCULANT

SOYBEAN

► PLOT & STRIP TRIALS

Research partners: ICMS, AgQuest, New Era Ag research, Stoney Ridge Ag Services and South East Research Farm (SERF).

Research sites: Manitoba and Saskatchewan

Treatments: a) AGTIV® THRIVE™ SOYBEAN*;
b) Competitor inoculant A*;
c) Competitor inoculant B*;
d) Competitor inoculant C*;
e) Competitor inoculant D*;
f) Competitor inoculant E*.

Experimental design: Total of 86 replicated plots per treatment in randomized complete block design, and one strip trial with 2 replicated strips.

*Products applied according to manufacturers recommended rate.

Table 1. **Summary of Soybean yields (bu/ac)[1] per trial[2].**

Location	Year	Seed variety	AGTIV® THRIVE™ SOYBEAN	Competitor inoculant				
				A	B	C	D	E
Morden (MB)	2015	Northstar, Anola	31.8 [a]	27.8 [b]	30.5 [a,b]			
Portage La Prairie (MB)	2015	Pride Seeds, PS0035	57.3	55.4	58.2			
Oakville (MB)	2016	Legend Seeds, Eclipse	79.7	77.8	77.7			
Swan River (MB)	2017	Prograin, Dario	40.7 [a]	35.0 [b,c]		32.5 [c]		
Portage La Prairie (MB)	2017	Northstar, Richer	58.3	54.5	54.5	54.7		
Binscarth (MB)	2017	Pioneer Ultra Early	30.1 [a]	27.7 [b]	29.0 [a,b]	28.5 [b]		
Redvers (SK)	2018	Prograin, Dario	31.1	28.2	25.8			
Swan River (MB)	2018	Prograin, Dario	57.7	47.2	54.3	55.5		
Portage La Prairie (MB)	2018	Secan, Barker	49.4	47.2	47.8			
Elm Creek (MB)	2019	Gray R2	37.1	36.9			35.9	
Redvers (SK)	2019	NSC Watson RR2Y	16.3	14.9		15.8		
Swan River (MB)	2019	Syngenta M2	35.7 [a]	29.9 [b]		35.7 [a]		
Redvers (SK)	2022	NSC Redvers	54.9	53.7				
Portage La Prairie (MB)	2022	NSC Redvers RR2X	64.9	63.4				

[1] Average yields followed by different letters are significantly different at $p \leq 0.05$.
[2] To obtain kg/ha results, multiply bushels by 60 and then by 1.12085 (n*60*1.12085).

PREMIER TECH

EFFICACY REPORT
2022 – MYCORRHIZAL & RHIZOBIAL INOCULANT

SOYBEAN

► PLOT TRIAL

Research partner: South East Research Farm (SERF)

Research site: Redvers, SK

Treatments: a) Untreated Check (No granular product)
b) AGTIV® THRIVE™ SOYBEAN*
c) Competitor inoculant A*

* Granular inoculant applied according to manufacturer's recommended rate

Experimental design: Complete Randomized Block Design, 6 repetitions, 12 m^2 plots

Variety: NSC Redvers (seeds pretreated with a commercial rhizobium)

Previous crop: Pea

Seeding details: Seeded on June 8, 2022, with a cone seeder at a rate of 80 kg/ha in a loam soil (pH: 7.6, OM: 4.2%).

Table 1. **Summary of soybean yields per treatment.**

Treatment	Yield (bu/ac)	Yield increase (bu/ac)
Untreated Check	52.9	-
AGTIV® THRIVE™ SOYBEAN	54.9	2.0
Competitor inoculant A	53.7	0.8

Plot operational notes and rain fall.

- Fertilization of 5-22-0 kg/ha at seeding
- Pesticides:
  - June 9, Roundup pre burn
  - July 6, Roundup
- Harvested on October 5, 2022

Month	Precipitation (mm)
May	121.0
June	75.0
July	259.0
August	25.2
September	15.0
TOTAL	**465.2**

PREMIER TECH

EFFICACY REPORT
2022 – MYCORRHIZAL & RHIZOBIAL INOCULANT

SOYBEAN

► PLOT TRIAL

Research partner: Integrated Crop Management Services (ICMS)

Research site: Portage la Prairie, MB

Treatments: a) Untreated Check (no granular product)
b) AGTIV® THRIVE™ SOYBEAN*
c) Competitor inoculant A*

* Granular inoculant applied according to manufacturer's recommended rate

Experimental design: Complete Randomized Block Design, 6 repetitions, 21 m^2 plots

Variety: NSC Redvers RR2X (seeds pretreated with a commercial rhizobium)

Previous crop: Wheat

Seeding details: Seeded on June 17, 2022, with a cone seeder at a rate of 140 kg/ha in a clay loam soil (pH: 8.2, OM: 6.7%). Emergence on June 22.

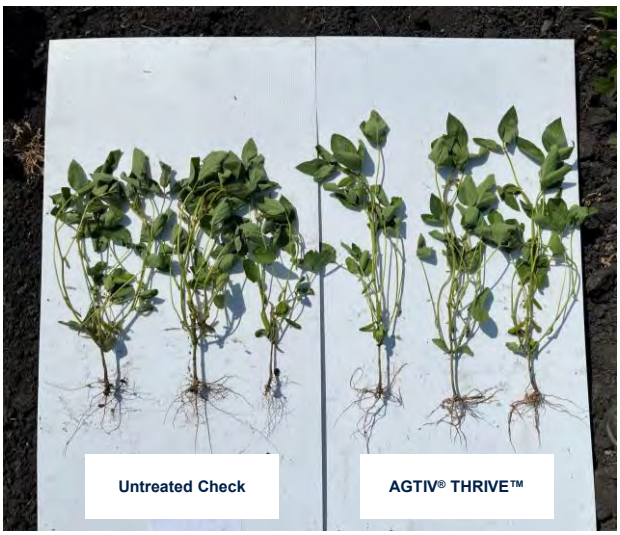
Table 1. **Summary of soybean yields per treatment.**

Treatment	Yield (bu/ac)	Yield increase (bu/ac)
Untreated Check	63.0	-
AGTIV® THRIVE™ SOYBEAN	64.9	1.9
Competitor inoculant A	63.4	0.4

Plot operational notes and rain fall.

- No Fertilization
- Pesticides:
  - June 24 & July 14, Roundup WeatherMAX (post emergence weed control)
- Harvested on October 11, 2022

Month	Precipitation (mm)
May	140.7
June	70.3
July	96.3
August	89.0
September	50.3
TOTAL	**446.6**



PREMIER TECH

EFFICACY REPORT
SUMMARY – MYCORRHIZAL INOCULANT

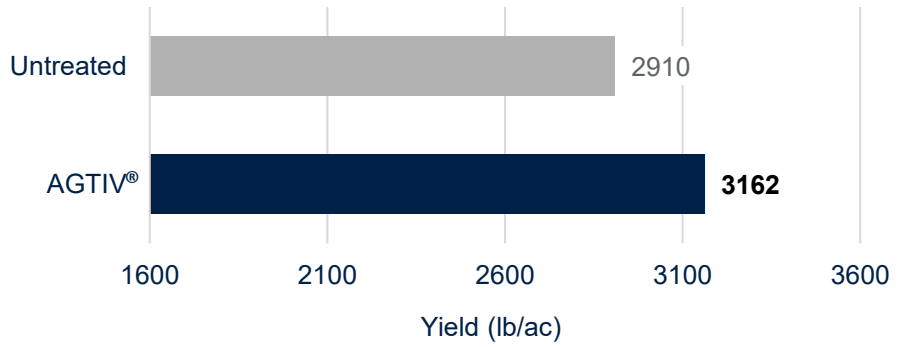
DRY BEAN

► GROWER SPLIT FIELDS

Table 1. **Average yield increase with AGTIV® REACH™ for different years (2014 to 2020) in Canada.**

Year	Number of sites	Average increase (lb/ac)	Average increase (kg/ha)	Average increase (%)
2014	2	337	378	13
2015	2	482	542	17.3
2016	5	130	146	5.5
2017	2	146	164	5.1
2020	1	462	518	10.7
Total	**12 sites**	**252 lb/ac**	**283 kg/ha**	**9.0%**

Figure 1. **Average yield with AGTIV® REACH™ in Canada (2014 to 2020).**



Faster plant development, larger plants and quicker row closure with AGTIV®.

PREMIER TECH

EFFICACY REPORT
SUMMARY – MYCORRHIZAL & RHIZOBIAL INOCULANT

CHICKPEA

► PLOT TRIALS

Research partners: Prairie Ag Research, Wheatland Conservation Area and Ag Quest inc.

Research sites: Alberta and Saskatchewan

Treatments: a) AGTIV® THRIVE™ CHICKPEA*;
b) Competitor inoculant A*;
c) Competitor inoculant B*;

*Products applied according to manufacturers recommended rate.

Experimental design: Total of 24 replicated plots per treatment in randomized complete block design.

Table 1. **Summary of Chickpea yields (bu/ac) per trial[1].**

Location	Year	Seed variety	AGTIV® THRIVE™ CHICKPEA	Competitor inoculant	
				A	B
Swift Current (SK)	2018	Leader	28.0	28.8	26.1
Lethbridge (AB)	2018	Alma	73.0	71.3	71.0
Lethbridge (AB)	2022	Clearfield Kabuli	43.1		41.2
Taber (AB)	2022	CDC Pearl	41.7[b]		39.4[ab]

[1] Yields with the same letter are not statistically different according to a LSD test ($p \leq 0.05$).

PREMIER TECH

EFFICACY REPORT
2022 – MYCORRHIZAL & RHIZOBIAL INOCULANT

CHICKPEA

► PLOT TRIAL

Research partner: Prairie Ag Research

Research site: Lethbridge, AB

Treatments: a) Untreated Check
b) AGTIV® THRIVE™ CHICKPEA*
c) Competitor inoculant B*

* Granular inoculant applied according to manufacturer's recommended rate

Experimental design: Complete Randomized Block Design, 6 repetitions, 12 m^2 plots

Variety: Alma Clearfield Kabuli

Previous crop: Fallow

Seeding details: Seeded on May 23, 2022, with a cone seeder at a rate of 150 kg/ha in a clay loam soil (pH: 7.4, OM: 4%). Emergence on June 3.

Table 1. **Summary of yields per treatment.**

Treatment	Yield (bu/ac)	Yield increase (bu/ac)
Untreated Check	36.1	-
AGTIV® THRIVE™ CHICKPEA	43.2	7.1
Competitor inoculant B	41.2	5.1

Plot operational notes and rain fall.

- No fertilization
- Pesticides:
  - May 20, Glyphosate (pre seeding burn off)
  - June 30, Odyssey and Merge (broadleaf weeds)
- Harvested on September 14, 2022

Month	Precipitation (mm)
May	35.8
June	114.5*
July	57.4
August	31.7*
TOTAL	**239.4**

* Plots were irrigated during those months

PREMIER TECH

EFFICACY REPORT
2022 – MYCORRHIZAL & RHIZOBIAL INOCULANT

CHICKPEA

► PLOT TRIAL

Research partner: Ag-Quest inc.

Research site: Taber, AB

Treatments: a) Untreated Check
b) AGTIV® THRIVE™ CHICKPEA*
c) Competitor inoculant B*

* Granular inoculant applied according to manufacturer's recommended rate

Experimental design: Complete Randomized Block Design, 6 repetitions, 10 m^2 plots

Variety: CDC Pearl

Previous crop: Rye

Seeding details: Seeded on May 27, 2022, with a cone seeder at a rate of 150 kg/ha in a sandy loam soil (pH: 7.9, OM: 2.1%). Emergence on June 13.

Table 1. **Summary of yields per treatment.**

Treatment	Yield (bu/ac) [1]	Yield increase (bu/ac)
Untreated Check	37.2 [a]	-
AGTIV® THRIVE™ CHICKPEA	41.7 [b]	4.5
Competitor inoculant B	39.4 [ab]	2.2

[1] Yields with the same letter are not statistically different according to a LSD test ($p \leq 0.05$).

Plot operational notes and rain fall.

- Fertilization of P_2O_5 pre seeding (36 kg/ha)
- Pesticides:
  - May 28, Authority + Roundup Transorb (pre-emergence burn off)
  - June 27, Select + AMIGO (post emergence weed control)
  - June 28, Solo + Merge post emergence weed control)
  - July 2, TOUGH (broadleaf weeds control)
- Harvested on September 23, 2022

Month	Precipitation (mm)
May	17.5
June	140.5 *
July	204.3 *
August	84.9 *
September	9.7
TOTAL	**456.9**

* Plots were irrigated during those months

PREMIER TECH

SUMMARY – SERENDIPITA ON SEED INOCULANT

► GROWER SPLIT FIELDS AND PLOT TRIALS

Table 1. **Average increase of canola yield with AGTIV® IGNITE™ L for different years (2018-2022).**

Year	Number of sites	Untreated check (bu/ac)	AGTIV® IGNITE • L yield (bu/ac)	Yield increase (bu/ac)
2018	1	63.5	68.0	4.5
2019	6	44.6	47.1	2.5
2020	5	37.2	39.6	2.4
2021	8	32.5	35.0	2.5
2022	7	33.6	36.2	2.6
Total	**27 sites**	**37.2[a]**	**39.7[b]**	**2.5 bu/ac ***

*Summary of means for **AGTIV® IGNITE™** are significantly different following a combined site ANOVA and a Tukey test ($p<0.05$) $p < 0.001$

Table 2. **Average increase of canola oil content with AGTIV® IGNITE™ L for different years (2019-2022).**

Year	Number of sites	Untreated check (oil%)	AGTIV® IGNITE • L (oil%)	Oil increase (%)
2019	3	41.2	42.1	0.9
2020	4	39.2	40.6	1.4
2021	5	38.1	38.5	0.4
2022	7	35.3	36.1	0.8
Total	**19 sites**	**37.8[a]**	**38.7[b]**	**0.9%***

*Summary of means for **AGTIV® IGNITE™** are significantly different following a combined site ANOVA and a Tukey test ($p<0.1$) $p=0.05$

SUMMARY – SERENDIPITA ON SEED INOCULANT

► GROWER SPLIT FIELDS AND PLOT TRIALS

Table 1. **Summary of canola yield trials for different sites (2018-2022).**

Year	site	Untreated check yield (bu/ac)	AGTIV® IGNITE™ L yield (bu/ac)	Yield increase (bu/ac)
2018	**Swan River**	63.5	68	4.5
2019	**Josephburg**	46.8	53.2	6.4
2019	**Portage la Prairie**	78	78	0
2019	**Saskatoon**	38.8	41.8	3
2019	**Swan River**	53.7	55.4	1.7
2019	**Taber**	25.4	27	1.6
2019	**Swift Current**	25	27.1	2.1
2020	**Josephburg**	47.2	49.5	2.3
2020	**Moon Lake**	16.3	18.2	1.9
2020	**Farm Beechy**	24.2	27.8	3.6
2020	**Swan River**	61.2	64	2.8
2020	**Taber**	37.3	38.5	1.2
2021	**Josephburg**	23.9	25.0	1.1
2021	**Saskatoon**	10.3	12.5	2.2
2021	**Elm Creek**	36.2	37.2	1
2021	**Swan River**	46.9	48.2	1.3
2021	**Portage la Prairie**	36.3	38.9	2.6
2021	**Westline Farms**	29.7	32.5	2.8
2021	**Lillico Farms**	26.4	31.5	5.1
2021	**Sandy Ridge Farms**	41.8	44.1	2.3
2022	**Saskatoon**	19.6	21.0	1.4
2022	**Portage la Prairie**	29.3	32.8	3.5
2022	**Taber**	28.2	32.7	4.5
2022	**Elm Creek**	46.1	48	1.9
2022	**Alma**	20.0	21.4	1.4
2022	**Redvers**	32.2	34.1	1.9
2022	**Swan River**	60.0	62.2	2.2
Total	**27 sites**	37.2[a]	39.7[b]	**2.5 bu/ac ***

*Summary of means for **AGTIV® IGNITE™** are significantly different following a combined site ANOVA and a Tukey test ($p<0.05$) $p=0.001$

SUMMARY – SERENDIPITA ON SEED INOCULANT

► PLOT TRIALS

Table 1. **Summary of canola oil content trials for different sites (2019-2022).**

Year	Site	Untreated check oil (%)	AGTIV® IGNITE™ L oil (%)	oil increase (%)
2019	Josephburg	28.1	28.6	0.5
2019	Portage la Prairie	45.5	45.7	0.2
2019	Swan River	49.9	52.1	2.2
2020	Moon Lake	41.6	43.1	1.5
2020	Taber	41.7	42.1	0.4
2020	Josephburg	34.7	36.6	1.9
2020	Swan River	38.7	40.5	1.8
2021	Josephburg	39.1	39.7	0.6
2021	Saskatoon	41.8	42.1	0.3
2021	Elm Creek	35.1	37.1	2
2021	Swan River	37.8	37.8	0
2021	Portage la Prairie	36.6	36	-0.6
2022	Saskatoon	36.6	36.3	-0.3
2022	Taber	32.1	32.9	0.8
2022	Redvers	36.6	36.5	-0.1
2022	Swan River	37.3	37.7	0.4
2022	Portage la Prairie	30.6	35.2	4.6
2022	Elm Creek	37.7	37.3	-0.4
2022	Alma	36.3	36.9	0.6
Total	**19 sites**	37.8 [a]	38.7 [b]	**0.9%***

*Summary of means for **AGTIV® IGNITE™** are significantly different following a combined site ANOVA and a Tukey test ($p<0.1$) $p=0.05$

EFFICACY REPORT
2022 – SERENDIPITA ON SEED INOCULANT

CANOLA

► PLOT TRIAL

Research partner: Integrated Crop Management Services (ICMS)

Research site: Saskatoon, SK

Treatments: a) Untreated Check
b) AGTIV® IGNITE™ L*

* Liquid inoculant applied according to manufacturer's recommended rate

Experimental design: Complete Randomized Block Design, 6 repetitions, 30 m^2 plots

Variety: PIONEER P509-L Treated with Lumiderm, LumiGen and Helix vibrance

Previous crop: Wheat

Seeding details: Seeded on May 26, 2022, with a cone seeder at a rate of 7 kg/ha in a clay soil (pH: 8.0, OM: 8.8%). Emergence on June 21.

Table 1. **Summary of yields per treatment.**

Treatment	Yield (bu/ac)	Yield increase (bu/ac)	Oil content (%)
Untreated Check	19.6	-	36.6
AGTIV® IGNITE™ L	21.0	1.4	36.3

Plot operational notes and rain fall.

- Fertilizer blend of 80-30-10-20 of actual kg/ha incorporated in tillage prior to seeding
- Pesticides:
  - July 4, Liberty 150 herbicide (post emergence weeds)
  - August 18, Decis 5EC (flea beetle and grasshopper control)
  - September 6, Reglone Ion (desiccant)
- Harvested on September 16, 2022

Month	Precipitation (mm)
May	25.8
June	38.0
July	46.5
August	25.6
September	6.8
TOTAL	**142.7**

PREMIER TECH

EFFICACY REPORT
2022 – SERENDIPITA ON SEED INOCULANT

CANOLA

► PLOT TRIAL

Research partner: Integrated Crop Management Services (ICMS)

Research site: Portage la Prairie, MB

Treatments: a) Untreated Check
b) AGTIV® IGNITE™ L*

* Liquid inoculant applied according to manufacturer's recommended rate

Experimental design: Complete Randomized Block Design, 6 repetitions, 30 m^2 plots

Variety: DEKALB 75-65 RR Treated with Prosper Evergol

Previous crop: Carrots

Seeding details: Seeded on June 17, 2022, with a cone planter at a rate of 8.2 kg/ha in a clay soil (pH: 7.7, OM: 6.9%). Emergence on June 23.

Table 1. **Summary of yields per treatment.**

Treatment	Yield (bu/ac)	Yield increase (bu/ac)	Oil content (%)
Untreated Check	29.3	-	30.6
AGTIV® IGNITE™ L	32.8	3.5	35.2

Plot operational notes and rain fall.

- No fertilization
- Pesticides:
  - June 24, Roundup WeatherMAX (volunteer canola control) & Sevin XLR (flea beetle control)con
  - July 14, Roundup WeatherMAX (post emergence weeds control)
  - Harvested on September 26, 2022

Month	Precipitation (mm)
May	140.7
June	70.3
July	96.3
August	89.0
September	50.3
TOTAL	**446.6**

PREMIER TECH

EFFICACY REPORT
2022 – SERENDIPITA ON SEED INOCULANT

CANOLA

► PLOT TRIAL

Research partner: Ag-Quest Inc.

Research site: Taber, AB

Treatments: a) Untreated Check
b) AGTIV® IGNITE™ L*

* Liquid inoculant applied according to manufacturer's recommended rate

Experimental design: Complete Randomized Block Design, 6 repetitions, 30 m^2 plots

Variety: DEKALB DKTF96 SC Treated with Buteo, Prosper EverGol and Fortenza

Previous crop: Rye

Seeding details: Seeded on May 24, 2022, with a cone seeder at a rate of 8 kg/ha in a loam soil (pH: 7.8, OM: 2.6%). Emergence on June 6.

Table 1. **Summary of yields per treatment.**

Treatment	Yield (bu/ac)	Yield increase (bu/ac)	Oil content (%)
Untreated Check	28.8	-	32.1
AGTIV® IGNITE™ L	32.7	3.9	32.9

Plot operational notes and rain fall.

- Fertilizer blend of 0-58-0-17 of actual kg/ha harrowed on May 16, prior to seeding
- Pesticides:
  - May 18, June 9, 17 & 29, Roundup Transorb (Pre and post seeding herbicide)
  - June 22, July 6 & 15, Sevin XLR Plus & Decis (flea beetle control)
- Harvested on August 31, 2022

Month	Precipitation (mm)
May	55.1
June	78.2
July	204.3*
August	89.3*
TOTAL	**426.9**

* Plots were irrigated during those months

PREMIER TECH

EFFICACY REPORT
2022 – SERENDIPITA ON SEED INOCULANT

CANOLA

► PLOT TRIAL

Research partner: Ag-Quest Inc.

Research site: Elm Creek, MB

Treatments: a) Untreated Check
b) AGTIV® IGNITE™ L*

* Liquid inoculant applied according to manufacturer's recommended rate

Experimental design: Complete Randomized Block Design, 6 repetitions, 34 m^2 plots

Variety: In Vigor L233P Treated with Lumiderm

Previous crop: Rye

Seeding details: Seeded on June 5, 2022, with a cone seeder at a rate of 5.5 kg/ha in a sandy loam soil (pH: 8.3, OM: 2.2%). Emergence on June 10.

Table 1. **Summary of yields per treatment.**

Treatment	Yield (bu/ac)	Yield increase (bu/ac)	Oil content (%)
Untreated Check	46.1	-	37.7
AGTIV® IGNITE™ L	48.0	1.9	37.3

Plot operational notes and rain fall.

- Broadcast fertilizer blend of actual 137-36-22-28 kg/ha prior to seeding
- Pesticides:
  - June 17, Liberty (emerged weeds control)
  - July 1, Centurion + AMIGO (grassy weeds control)
  - July 1, Coragen (grasshopper control)
  - September 8, Reglone Ion (Desiccant)
- Harvested on September 13, 2022

Month	Precipitation (mm)
May	131.0
June	65.6
July	92.6
August	57.6
September	30.8
TOTAL	**377.6**

PREMIER TECH

EFFICACY REPORT
2022 – SERENDIPITA ON SEED INOCULANT

CANOLA

► PLOT TRIAL

Research partner: Wellington Agricultural Research

Research site: Alma, ON

Treatments: a) Untreated Check
b) AGTIV® IGNITE™ L*

* Liquid inoculant applied according to manufacturer's recommended rate

Experimental design: Complete Randomized Block Design, 6 repetitions, 10 m^2 plots

Variety: In Vigor L233P treated with Prosper Evergol

Previous crop: Soybean

Seeding details: Seeded on May 30, 2022, with a cone seeder at a rate of 5.5 kg/ha in a loam soil (pH: 7.5, OM: 3.7%). Emergence on June 6.

Table 1. **Summary of yields per treatment.**

Treatment	Yield (bu/ac)	Yield increase (bu/ac)	Oil content (%)
Untreated Check	20.0	-	36.3
AGTIV® IGNITE™ L	21.4	1.4	36.9

Plot operational notes and rain fall.

- Fertilization blend 160-20-0 of actual kg/ha prior to seeding on May 10
- Pesticides:
  - June 21, Liberty (emerged weeds control) + Matador (flea beetle control)
- Harvested on September 17, 2022

Month	Precipitation (mm)
May	76.4
June	46.2
July	29.8
August	69.6
TOTAL	**222.0**

PREMIER TECH

EFFICACY REPORT
2022 – SERENDIPITA ON SEED INOCULANT

CANOLA

► PLOT TRIAL

Research partner: South East Research Farm (SERF)

Research site: Redvers, SK

Treatments: a) Untreated Check
b) AGTIV® IGNITE™ L*

* Liquid inoculant applied according to manufacturer's recommended rate

Experimental design: Complete Randomized Block Design, 6 repetitions, 12 m^2 plots

Variety: InVigor L340 PC treated with Vercoras & Poncho

Previous crop: Peas

Seeding details: Seeded on June 1, 2022, with a cone seeder at a rate of 9 kg/ha in a loam soil (pH: 7.6, OM: 4.2%).

Table 1. **Summary of yields per treatment.**

Treatment	Yield (bu/ac)	Yield increase (bu/ac)	Oil content (%)
Untreated Check	32.2	-	36.6
AGTIV® IGNITE™ L	34.1	1.9	36.5

Plot operational notes and rain fall.

- Fertilization of actual 100-25-0-6 of actual kg/ha at seeding
- Pesticides:
  - June 6, Roundup (pre burn off herbicide)
  - June 23, Voliam (flea beetle control)
  - June 23, Liberty (post emerged weeds control)
- Harvested on September 16, 2022

Month	Precipitation (mm)
May	121.0
June	75.0
July	259.0
August	25.2
September	15.0
TOTAL	**495.2**

PREMIER TECH

EFFICACY REPORT
2022 – SERENDIPITA ON SEED INOCULANT

CANOLA

► PLOT TRIAL

Research partner: New Era Ag Research and Technologies

Research site: Swan River, MB

Treatments: a) Untreated Check
b) AGTIV® IGNITE™ L*

* Liquid inoculant applied according to manufacturer's recommended rate

Experimental design: Complete Randomized Block Design, 6 repetitions, 30 m^2 plots

Variety: InVigor LL 234 PC treated with Lumiderm & Helix Vibrance

Previous crop: Carrots

Seeding details: Seeded on June 5, 2022, with a cone seeder at a rate of 6 kg/ha in a clay loam soil (pH: 7.1, OM: 6.2%).

Table 1. **Summary of yields and oil content per treatment.**

Treatment	Yield (bu/ac)	Yield increase (bu/ac)	Oil content (%)
Untreated Check	60.0	-	30.6
AGTIV® IGNITE™ L	62.2	2.2	35.2

Plot operational notes and rain fall.

- Fertilization of actual 147-115-66 of actual kg/ha in the fall of 2021
- Pesticides:
  - June 19 & 28, ARROW ALL IN (grassy weeds control post herbicide)
  - June 23 & 28, Pounce (flea beetle control)
  - July 22, Cotegra (sclerotinia stem rot control)
- Harvested on September 28, 2022

Month	Precipitation (mm)
May	114.0
June	59.4
July	40.6
August	41.8
September	34.7
TOTAL	**290.5**

PREMIER TECH

SUMMARY – SERENDIPITA ON SEED INOCULANT

► PLOT TRIALS

Table 1. **Summary of durum wheat yield trials for different sites (2021-2022).**

Year	Sites	Untreated check yield (bu/ac)	AGTIV® IGNITE™ L yield (bu/ac)	Yield increase (bu/ac)
2021	**Lethbridge**	66.7	73.3	6.6
2021	**Vulcan**	25.8	28.8	3
2021	**Taber**	39.0	40.6	1.6
2021	**Swift Current**	11.8	14.4	2.6
2022	**Lethbridge**	50.2	59.0	8.8
2022	**Swift Current**	54	55.8	1.8
2022	**Vulcan**	29.2	31.0	1.8
2022	**Taber**	27.3	31.8	4.5
Total	**8 sites**	**38.0[a]**	**41.8[b]**	**3.8 bu/ac ***

* Yields with same letter are not statistically different according to a Tukey HSD test ($p \leq 0.05$).

EFFICACY REPORT
2022 – SERENDIPITA ON SEED INOCULANT

DURUM WHEAT

► PLOT TRIAL

Research partner: Prairie Ag Research

Research site: Lethbridge, AB

Treatments: a) Untreated Check
b) AGTIV® IGNITE™ L*

* Liquid inoculant applied according to manufacturer's recommended rate

Experimental design: Complete Randomized Block Design, 6 repetitions, 12 m^2 plots

Variety: Grainland

Previous crop: Fallow

Seeding details: Seeded on May 23, 2022, with a cone seeder at a rate of 100 kg/ha in a clay loam soil (pH: 7.4, OM: 4%). Emergence on May 30.

Table 1. **Summary of yields per treatment.**

Treatment	Yield [1] (bu/ac)	Yield increase (bu/ac)
Untreated Check	50.2 [b]	-
AGTIV® IGNITE™ L	59.0 [a]	8.8

[1] Yields with same letter are not statistically different according to a Tukey HSD test ($p \leq 0.05$).

Plot operational notes and rain fall.

- No fertilization
- Pesticides:
  - May 20, Glyphosate (pre seeding burn off)
  - June 30, Infinity (broadleaf weeds control)
- Harvested on September 14, 2022

Month	Precipitation (mm)
May	17.5
June	140.5 *
July	204.3 *
August	84.9 *
September	9.7
TOTAL	**456.9**

* Plots were irrigated during those months

PREMIER TECH

EFFICACY REPORT
2022 – SERENDIPITA ON SEED INOCULANT

DURUM WHEAT

► PLOT TRIAL

Research partner: Wheatland Conservation Area

Research site: Swift Current, SK

Treatments: a) Untreated Check
b) AGTIV® IGNITE™ L*

* Liquid inoculant applied according to manufacturer's recommended rate

Experimental design: Complete Randomized Block Design, 8 repetitions, 17 m^2 plots

Variety: Alloy

Previous crop: Wheat

Seeding details: Seeded on May 18, 2022, with a cone seeder at a rate of 123 kg/ha in a sandy loam soil (pH: 6.1, OM: 2.7%).

Table 1. **Summary of yields per treatment.**

Treatment	Yield (bu/ac)	Yield increase (bu/ac)
Untreated Check	54.0	-
AGTIV® IGNITE™ L	55.8	1.8

Plot operational notes and rain fall.

- Fertilization of 30-15-0-6 (374 kg/ha) sidebanded on June 8
- Pesticides:
  - May 2, RT540 (pre burn off herbicide)
  - June 8 Achieve (post emergence weeds control)
- Harvested on August 16, 2022

Month	Precipitation (mm)
May	51.2
June	37.7
July	90.4
August	7.5
TOTAL	**186.8**

PREMIER TECH

EFFICACY REPORT
2022 – SERENDIPITA ON SEED INOCULANT

DURUM WHEAT

► PLOT TRIAL

Research partner: Small Plot

Research site: Vulcan, AB

Treatments: a) Untreated Check
b) AGTIV® IGNITE™ L*

* Liquid inoculant applied according to manufacturer's recommended rate

Experimental design: Complete Randomized Block Design, 8 repetitions, 16 m^2 plots

Variety: Spitfire

Previous crop: Rye

Seeding details: Seeded on May 16, 2022, with a plot drill machine at a rate of 130 kg/ha in a clay loam soil (pH: 7.6, OM: 3%). Emergence on May 28.

Table 1. **Summary of yields per treatment.**

Treatment	Yield (bu/ac)	Yield increase (bu/ac)
Untreated Check	29.2	-
AGTIV® IGNITE™ L	31.0	1.8

Plot operational notes and rain fall.

- Fertilization of 60-15-15-6 kg/ha sidebanded at seeding on May 16
- Pesticides:
  - June 25: Herbicide Epic and Stellar XL
  - ZIVATA for grasshoppers control
- Harvested on August 30, 2022

Month	Precipitation (mm)
May	9.8
June	136.8
July	86.0
August	18.1
TOTAL	**250.7**

PREMIER TECH

EFFICACY REPORT
2022 – SERENDIPITA ON SEED INOCULANT

DURUM WHEAT

► PLOT TRIAL

Research partner: Ag-Quest

Research site: Taber, AB

Treatments: a) Untreated Check
b) AGTIV® IGNITE™ L*

* Liquid inoculant applied according to manufacturer's recommended rate

Experimental design: Complete Randomized Block Design, 6 repetitions, 22.5 m^2 plots

Variety: Strongfield

Previous crop: Rye

Seeding details: Seeded on May 17, 2022, with a cone seeder at a rate of 117 kg/ha in a sandy loam soil (pH: 7.8, OM: 2.6%). Emergence on May 20.

Table 1. **Summary of yields per treatment.**

Treatment	Yield (bu/ac)	Yield increase (bu/ac)
Untreated Check	27.3	-
AGTIV® IGNITE™ L	31.8	4.5

Plot operational notes and rain fall.

- Fertilization of 5-20-5 kg/ha prior to seeding
- Pesticides:
  - May 18, Roundup Transorb (pre emergence herbicide
  - June 19, Achieve liquid (emerged weeds)
  - July 6, Infinity and Achieve Liquid (annual grass control)
- Harvested on August 30, 2022

Month	Precipitation (mm)
May	16.1
June	78.2
July	204.3*
August	89.3*
TOTAL	**387.9**

* Plots were irrigated during those months

PREMIER TECH

EFFICACY REPORT
2021 – SERENDIPITA ON SEED INOCULANT

DURUM WHEAT

► PLOT TRIAL

Research partner: Prairie Ag Research

Research site: Lethbridge, AB

Treatments: a) Untreated Check
b) AGTIV® IGNITE™ L*

* Liquid inoculant applied according to manufacturer's recommended rate

Experimental design: Complete Randomized Block Design, 8 repetitions, 12 m^2 plots

Variety: Grainland

Previous crop: Barley

Seeding details: Seeded on May 31, 2021, with a cone seeder at a rate of 100 kg/ha in a clay loam soil (pH: 7.4, OM: 2.9%). Emergence on June 7.

Table 1. **Summary of yields and protein content per treatment.**

Treatment	Yield [1] (bu/ac)	Yield increase (bu/ac)	Protein (%)
Untreated Check	66.7 [b]	-	19.2
AGTIV® IGNITE™ L	73.3 [a]	6.6	20.3

[1] Yields with same letter are not statistically different according to a Tukey HSD test ($p \leq 0.05$).

Plot operational notes and rain fall.

- No fertilization
- Pesticides:
  - May 31, Glyphosate (emerged weeds)
  - June 28, Achieve, Infinity and Turbocharge (broadleaf weeds)
- Harvested on September 14, 2021

Month	Precipitation (mm)
May	33.1
June	76.5
July	70.3
August	35.6
TOTAL	**215.5**

PREMIER TECH

EFFICACY REPORT
2021 – SERENDIPITA ON SEED INOCULANT

DURUM WHEAT

► PLOT TRIAL

Research partner: Small Plot

Research site: Vulcan, AB

Treatments: a) Untreated Check
b) AGTIV® IGNITE™ L*

* Liquid inoculant applied according to manufacturer's recommended rate

Experimental design: Complete Randomized Block Design, 8 repetitions, 32 m^2 plots

Variety: Spitfire

Previous crop: Oats

Seeding details: Seeded on May 16, 2021, with a plot drill machine at a rate of 115 kg/ha in a loam soil (pH: 7.5, OM: 3%). Emergence on May 20.

Table 1. **Summary of yields per treatment.**

Treatment	Yield (bu/ac)	Yield increase (bu/ac)
Untreated Check	25.8	-
AGTIV® IGNITE™ L	28.8	3.0

Plot operational notes and rain fall.

- 70-20-20-20 kg/ha sidebanded at seeding
- Pesticides:
  - July 25, ZIVATA sprayed for grasshoppers
- Harvested on August 30, 2021

Month	Precipitation (mm)
May	167
June	109
July	152
August	163
TOTAL	**591**

PREMIER TECH

EFFICACY REPORT
2021 – SERENDIPITA ON SEED INOCULANT

DURUM WHEAT

► PLOT TRIAL

Research partner: Ag-Quest

Research site: Taber, AB

Treatments: a) Untreated Check
b) AGTIV® IGNITE™ L*

* Liquid inoculant applied according to manufacturer's recommended rate

Experimental design: Complete Randomized Block Design, 8 repetitions, 22.5 m^2 plots

Variety: Strongfield

Previous crop: Rye

Seeding details: Seeded on June 6, 2021, with a cone seeder at a rate of 130 kg/ha in a loam soil (pH: 7.8, OM: 2.2%). Emergence on June 20.

Table 1. **Summary of yields per treatment.**

Treatment	Yield (bu/ac)	Yield increase (bu/ac)
Untreated Check	39	-
AGTIV® IGNITE™ L	40.6	1.6

Plot operational notes and rain fall.

- No fertilization
- Pesticides:
  - July 2, Infinity and Achieve Herbicide (broadleaf control)
  - July 16, Axial Herbicide (annual grass control)
- Harvested on September 3, 2021

Month	Precipitation (mm)
May	24.8
June	89.9
July	78.5
August	53.7
TOTAL	**246.9**

PREMIER TECH

EFFICACY REPORT
2021 – SERENDIPITA ON SEED INOCULANT

DURUM WHEAT

► PLOT TRIAL

Research partner: Wheatland Conservation Area

Research site: Swift Current, SK

Treatments: a) Untreated Check
b) AGTIV® IGNITE™ L*

* Liquid inoculant applied according to manufacturer's recommended rate

Experimental design: Complete Randomized Block Design, 8 repetitions, 18 m^2 plots

Variety: Transcend

Previous crop: Barley

Seeding details: Seeded on May 28, 2021, with a cone seeder at a rate of 130 kg/ha in a sandy loam soil (pH: 6.5, OM: 2.7%). Emergence on June 11.

Table 1. **Summary of yields per treatment.**

Treatment	Yield (bu/ac)	Yield increase (bu/ac)
Untreated Check	11.8	-
AGTIV® IGNITE™ L	14.4	2.6

Plot operational notes and rain fall.

- 30-15-06-6 sidebanded at seeding (374 kg/ha)
- Pesticides:
  - May 4, RT540 + Aim EC (pre emergence herbicide)
  - June 17 Achieve + Buctril (Emerged weeds)
- Harvested on August 27, 2021

Month	Precipitation (mm)
May	44.1
June	74.5
July	51.9
August	43.2
TOTAL	**213.7**

PREMIER TECH

SUMMARY – MYCORRHIZAL INOCULANT

► GROWER SPLIT FIELDS

Table 1. **Average yield increase with AGTIV® REACH™ in Canada and Europe (43 sites, 2012 to 2021).**

Number of sites	Average increase (%)
43	7,7%

Table 2. **Average yield increase with AGTIV® REACH™ in Western Canada (2012 to 2018).**

Number of sites	Average increase (bu/ac)	Average increase (%)
12	3.8	6.5%

Table 3. **Average yield increase with AGTIV® mycorrhizal inoculant in FRANCE, Europe (2012 to 2021).**

Number of sites	Average increase (bu/ac)	Average increase (%)
31	8.3	8.2%

EFFICACY REPORT
SUMMARY – MYCORRHIZAL INOCULANT

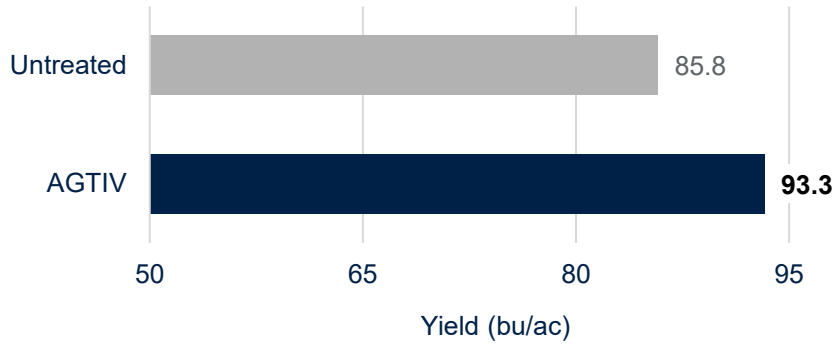
BARLEY

► GROWER SPLIT FIELDS

Table 1. **Average yield increase with AGTIV® REACH™ in Canada (2012 to 2016).**

Number of sites	Average increase (bu/ac)	Average increase (kg/ha)	Average increase (%)
26	7.0	377	10.6%

Figure 1. **Average yield increase with AGTIV® mycorrhizal inoculant in Canada and Europe (28 sites, 2012 to 2017).**



Barley plants have an increased root mass on the right with AGTIV®, which leads to enhanced plant health and growth.

PREMIER TECH

POTATO

► GROWER SPLIT FIELDS AND TRIALS

Table 1. **Average increase of marketable yield* with AGTIV® REACH™ L POTATO for different territories (2011 to 2021).**

Territory	Number of sites	Yield increase (t/ha)	Yield increase (cwt/ac)	Yield increase (%)
Canada	585	3.1	27.6	9.9
United States	67	3.3	29.8	10.8
Mexico	4	2.3	20.0	8.6
France & Switzerland	496	4.1	36.3	9.9
Germany	32	4.2	37.4	10.0
Total	**1184 sites**	**3.6 t/ha***	**31.6 cwt/ac****	**10.0%**

Table 2. **Average increase of marketable yield* with AGTIV® REACH™ L POTATO for different years (2011-2022).**

Year	Number of sites	Yield increase (t/ha)	Yield increase (cwt/ac)	Yield increase (%)
2011	32	2.6	23.3	6.6
2012	33	3.2	28.5	9.0
2013	70	3.6	31.9	11.2
2014	116	4.5	40.3	12.8
2015	145	4.0	35.3	10.7
2016	243	3.9	34.8	10.5
2017	213	2.7	24.0	7.7
2018	113	3.4	30.2	11.2
2019	117	3.5	31.1	8.6
2020	49	2.9	25.6	9.8
2021	41	4.1	36.4	10.2
2022	12	3.4	29.2	7.8
Total	**1184 sites**	**3.6 t/ha***	**31.6 cwt/ac****	**10.0%**

* Statistically significant at $p<0.001$ following a T test.

**cwt/ac = 100 lb/ac

ONION

► GROWER SPLIT FIELDS AND PLOT TRIALS[1]

Table 1. **Average increase of marketable yields[2] (t/ha) with AGTIV® REACH™ for different years (2014-2019)**

Year	Number of sites	Yield Untreated	Yield AGTIV®	Yield increase	Yield increase (%)
2014	2	67.7	73.2	5.4	8.0
2015	4	44.3	47.6	3.3	8.7
2016	1	60.7	64.1	3.4	5.6
2017	1	18.2	20.4	2.2	12.2
2018	2	40.0	46.1	6.2	20.3
2019	6	50.3	52,6	2.2	3.3
Total	**16 sites**	**48.3[a]**	**51.8[b]**	**3.5 t/ha**	**8.1%**

[1] Split fields and trials conducted in North America and Europe

[2] Yields without the same letter are statisticly different based on a Tukey HSD test ($p \leq 0.05$).

Table 2. **Average increase of marketable yields[2] (lb/ac) with AGTIV® REACH™ for different years (2014-2019)**

Year	Number of sites	Yield Untreated	Yield AGTIV®	Yield increase	Yield increase (%)
2014	2	60 400	65 307	4 817	8.0
2015	4	39 523	42 467	2 944	8.7
2016	1	54 155	57 188	3 033	5.6
2017	1	16 237	18 200	1 962	12.2
2018	2	35 687	41 129	5 531	20.3
2019	6	44 876	46 928	1 962	3.3
Total	**16 sites**	**41 813[a]**	**45 203[b]**	**3 375 lb/ac**	**8.1%**

[1] Split fields and trials conducted in North America and Europe

[2] Yields without the same letter are statisticly different based on a Tukey HSD test ($p \leq 0.05$).

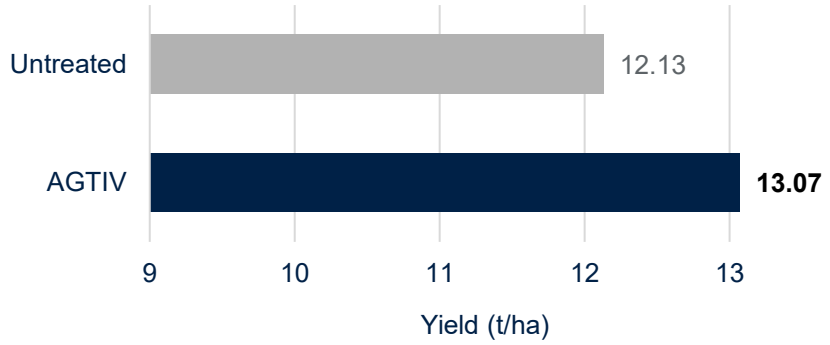
SUMMARY – MYCORRHIZAL INOCULANT

► GROWER SPLIT FIELDS

Table 1. **Average yield increase with AGTIV® mycorrhizal inoculant for different years (2017 and 2018) in France, Europe.**

Variety	Untreated		AGTIV® mycorrhizal inoculant		Difference (%) AGTIV® vs untreated
	(lb/ac)	(t/ha)	(lb/ac)	(t/ha)	
Stanley	13 561	15.16	14 810	16.56	+9.2
Costal	11 865	13.31	12 668	14.24	+6.9
Bamaco	15 167	16.98	16 594	18.57	+9.4
Compass	8 297	9.27	9 635	10.8	+16.5
Paloma	9 546	10.73	9 367	10.47	-2.5
Linex	6 512	7.33	6 959	7.83	+6.8
Average	**10 795 lb/ac**	**12.13 t/ha**	**11 687 lb/ac**	**13.07 t/ha**	**+7.7%**

Figure 1. **Yield increase with AGTIV® mycorrhizal inoculant.**



EFFICACY REPORT
SUMMARY – MYCORRHIZAL INOCULANT

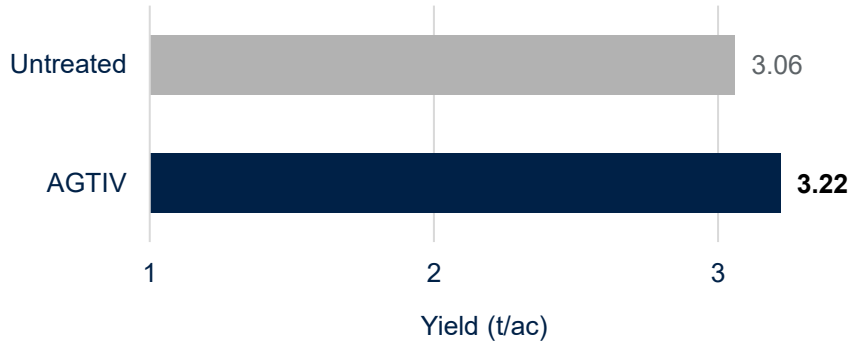
GREEN PEA

► GROWER SPLIT FIELDS

Table 1. **Average yield increase with AGTIV® THRIVE™ P PEA & LENTIL for different years (2015 to 2017) in Ontario and Quebec, Canada.**

Year	Number of sites	Average increase (t/ac)	Average increase (t/ha)	Average increase (%)
2015	4	0.31	0.77	23.3
2016	7	0.08	0.20	3.5
2017	1	0.12	0.30	3.7
Total	**12 sites**	**0.16 t/ac**	**0.40 t/ha**	**10.1%**

Figure 1. **Average yield increase with AGTIV® THRIVE™ P PEA & LENTIL in Ontario and Quebec, Canada (2015 to 2017).**



Plant growth and health is enhanced on the right, and the leaf area is increased with AGTIV®.

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EFFICACY REPORT
SUMMARY – MYCORRHIZAL INOCULANT

PEPPER

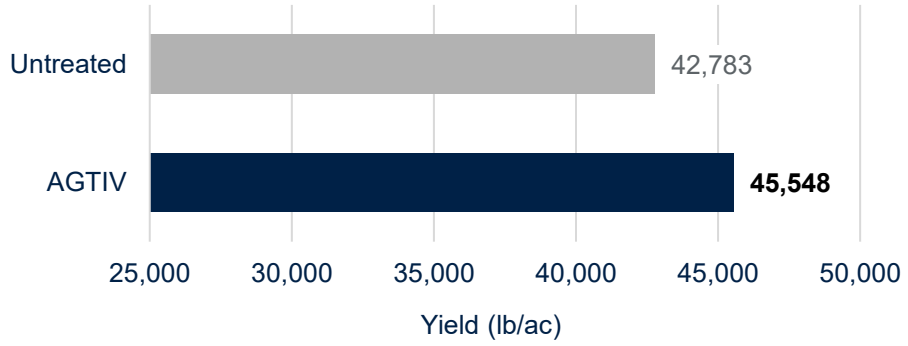
► GROWER SPLIT FIELDS

Table 1. **Average yield increase with AGTIV® REACH™ for different years (2002 to 2016) in ONTARIO & QUEBEC, Canada.**

Year	Number of sites	Average increase (lb/ac)	Average increase (t/ha)	Average increase (%)
2002	2	*	*	5.1
2015	2	2840	3.18	10.0
2016	1	2617	2.93	3.7
Total	**5 sites**	**2766 lb/ac ****	**3.10 t/ha ****	**6.8%**

* Plot trial data for 2002: average increase of 95 g/plant.
** The 2766 lb/ac average refers only to 2015-2016 data.

Figure 1. **Average yield increase with AGTIV® REACH™ in Ontario, Canada (2015-2016).**



More developed root system, more leaves and bigger fruits with AGTIV®.

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EFFICACY REPORT 2023

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PT Growers and Consumers
1, avenue Premier
Campus Premier Tech
Rivière-du-Loup (Québec)
G5R 6C1 CANADA

PTAGTIV.COM
1 866 454-5867
info@ptagtiv.com

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