



ON SEED PACKAGE

PULSES



ON SEED PACKAGE PULSES

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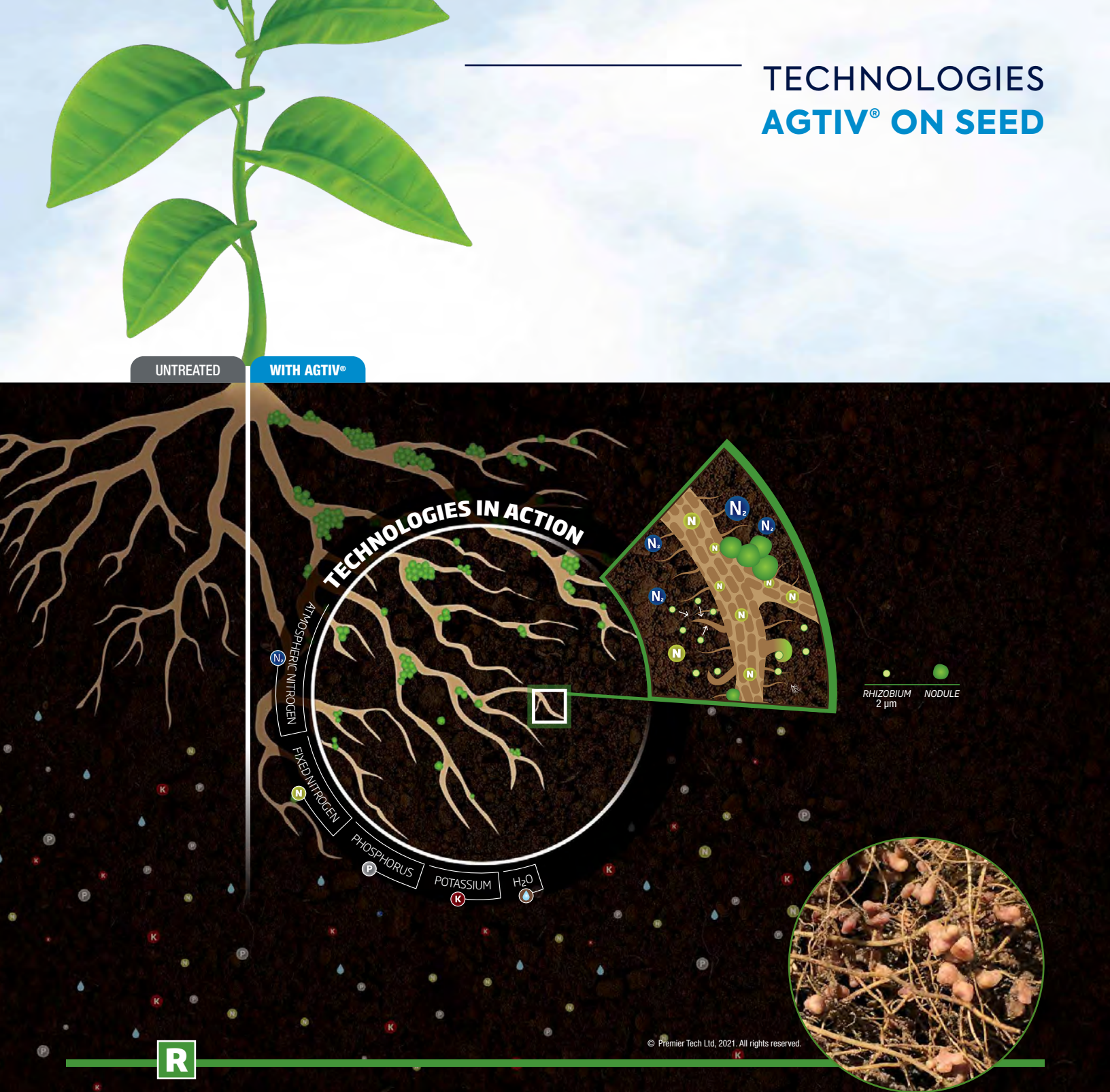
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TECHNOLOGIES AGTIV® ON SEED



R

RHIZOBIUM

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

PTB162 Technology (soybean),
Bradyrhizobium japonicum

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**



PRODUCT INFORMATION

AGTIV® ON SEED

ON-FARM MIXING WITH SEEDS

AGTIV® ON SEED™ — RHIZO • Powder for PULSES

ACTIVE INGREDIENT:

R RHIZOBIAL INOCULUM – PTB160 Technology
Rhizobium leguminosarum biovar viciae: 1.6×10^9 viable cells/g

INERT INGREDIENT: Peat

PARTICLE SIZE: < 1 mm (18 mesh)

BULK DENSITY: 400 g/L (1 lb/US dry qt)



SIZE	COVERS	CODE
4.7 kg (10.3 lb) – pail	Peas & faba beans: 16 ha (40 acres) Lentils: 24 ha (60 acres)	710403

DIRECTIONS FOR USE

DRY APPLICATION — Mix evenly with seeds at the bottom of the grain auger while filling drill, or directly in the drill box. Ensure uniform seed coverage is obtained. **Peas & faba beans**: apply at 300 g/ha (120 g or 4.2 oz/acre). **Lentils**: apply at 200 g/ha (80 g or 2.8 oz/acre).

SLURRY APPLICATION —

Pour one 4.7 kg pail in a clean container. Gradually add 8 - 10 litres of clean, non-chlorinated water and stir well. Add more water if the slurry is too thick. Pour onto the seeds and mix thoroughly to ensure even coating.



LIQUID FOR IN-FURROW OR ON SEED



AGTIV® RHIZO • Liquid for PULSES

ACTIVE INGREDIENT:

R RHIZOBIAL INOCULUM – PTB160 Technology
Rhizobium leguminosarum biovar viciae: 6×10^9 viable cells/g

PARTICLE SIZE: < 0.1 mm (150 mesh)

Contains non-soluble particles



SIZE	COVERS	CODE
8 L (8 kg) – bag-in-box	In-furrow: 32 ha (80 acres) On seed: 6530 kg of seeds (240 bu)	710204

DIRECTIONS FOR USE

LIQUID IN-FURROW — Apply directly in the seed row at a rate of 250 ml/ha (100 ml/acre). This product should be applied using the AGTIV® Liquid Injection Kit. To apply, prepare the product mixture and adjust the Dosatron® injection rate following the application chart and video at PTAGTIV.COM/en/liquid-injection-kit.

LIQUID ON SEED

Shake well before use and apply directly to the seed. Apply 33 ml per 27 kg seeds, ensure full coverage. Optimum on-seed viability for 30 days when treated seeds are stored below 12°C (54°F).



OPTIMUM ON SEED VIABILITY



AGTIV® EXTENDER • Liquid

ON-SEED:

Optimum on-seed viability for 90 days whit Extender treated seeds when stored below 18°C (64°F).



SIZE	COVERS	CODE
1.6 L (1.6 kg) bag-in-box	5 680 kg of seeds (250 units of soybean) 6 530 kg of seeds (240 bu of pulses)	710401





COMPATIBILITY PESTICIDES

COMPATIBILITY REPORT

2019 – RHIZOBIUM ON SEED

► LAB TEST

Test description: Nodulation tests on plants inoculated with PTB160 Technology - *Rhizobium leguminosarum* biovar *vicea* (peas) and fungicides applied on seeds for different periods of time prior to seeding. Treated seeds were stored in a cold room (temperature between 4°C to 8°C).

Research site: Premier Tech Campus (QC), Canada

Treatments: a) PTB160 applied at seeding;
b) PTB160 & fungicide (Cruiser Maxx Vibrance Pulses) applied at seeding;
c) Seeds treated with PTB160, Cruiser Maxx Vibrance Pulses & water;
d) Seeds treated with PTB160, Cruiser 5FS & water;
e) Seeds treated with PTB160, Apron Maxx RTA & water;
f) Seeds treated with PTB160, Vibrance 500 FS & water;
g) Seeds treated with PTB160, Intego Solo & water.

Experimental design: 4 plants per treatment in randomized block design. Nodule count was done after 25 days.

Table 1. Summary of weighted nodule numbers

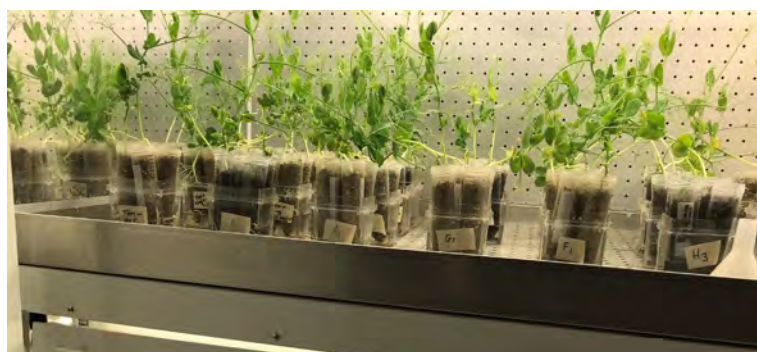
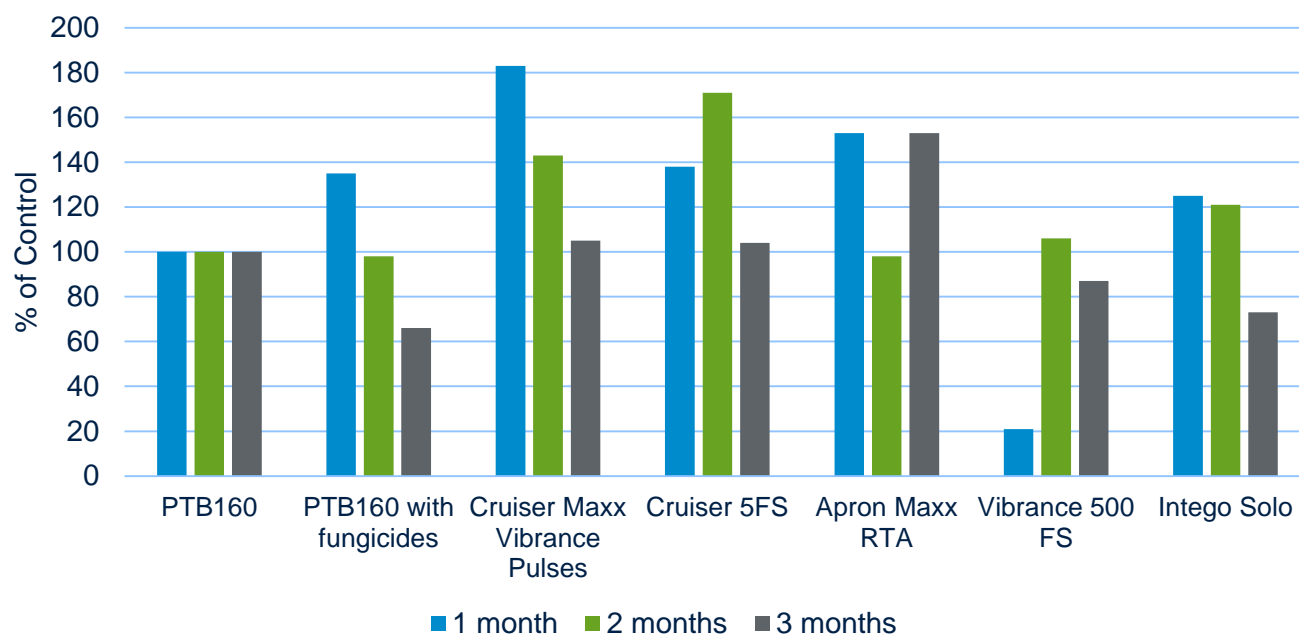


Figure 1. Plants during the test

COMPATIBILITY REPORT

2020 – RHIZOBIUM WITH PESTICIDES

► LAB TEST

Test description: Nodulation tests on pea plants treated with ON SEED PTB160 Technology - *Rhizobium leguminosarum* biovar *viciae* in combination with various pesticides.

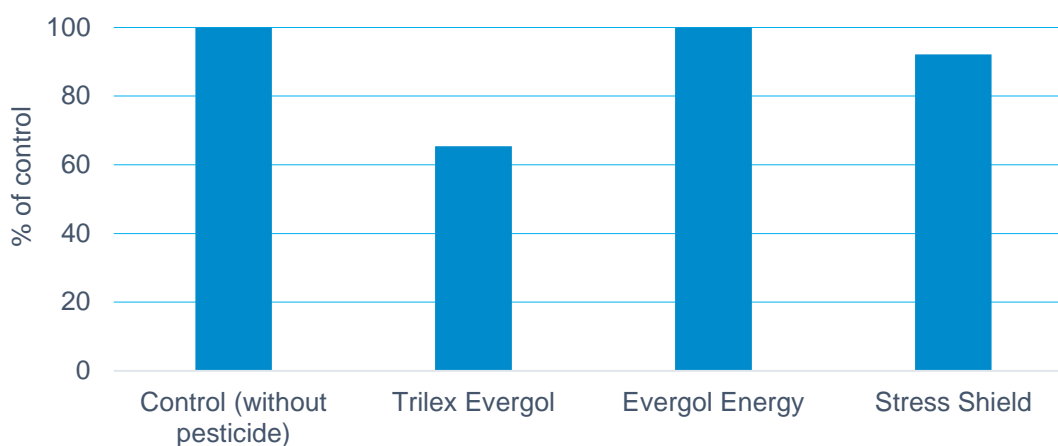
Research site: Premier Tech Campus (QC), Canada

Pea Variety: Peas CDC Meadow

Treatments: a) Control (PTB160 without any pesticide application);
b) PTB160 with Trilex Evergol®;
c) PTB160 with Evergol® Energy Seed Treatment Fungicide;
d) PTB160 with Stress Shield®;

Experimental design: 12 plants per treatment. All plants were inoculated with AGTIV® ON SEED RHIZO • LIQUID for Pulses

Table 1. Summary for the weighted nodule numbers



COMPATIBILITY REPORT

2021 – RHIZOBIUM WITH PESTICIDES

► LAB TEST

Test description: Nodulation tests on pea plants treated with ON SEED PTB160 Technology - *Rhizobium leguminosarum* biovar *viciae* in combination with or without the Rancona pesticide

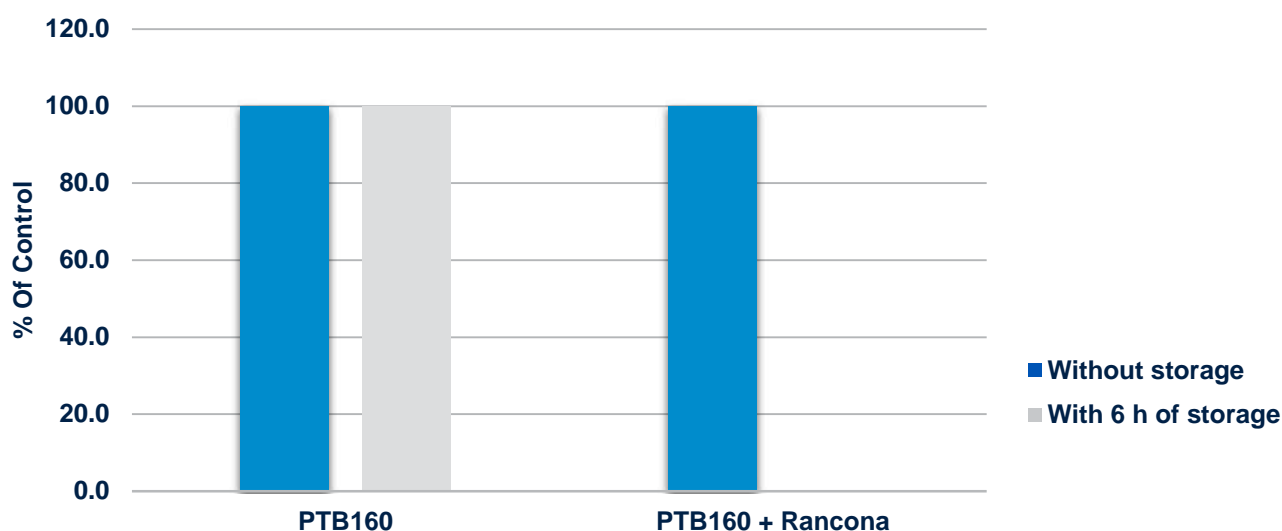
Research site: Premier Tech Campus (QC), Canada

Pea Variety: Peas CDC Meadow

Experimental design: 12 plants per treatment.

Treatments: a) Pea seeds sowed immediately after the PTB160 application (Control)
b) Pea seeds sowed immediately after the PTB160 and Rancona application
c) Pea seeds sowed after 6-hour storage at room temperature following PTB160 application
d) Pea seeds sowed after 6-hour storage at room temperature following PTB160 and Rancona application

Table 1. Effect of Rancona and storage time on pea weighted nodule numbers



COMPATIBILITY REPORT

2021 – RHIZOBIUM WITH PESTICIDES

► LAB TEST - TANK MIXING

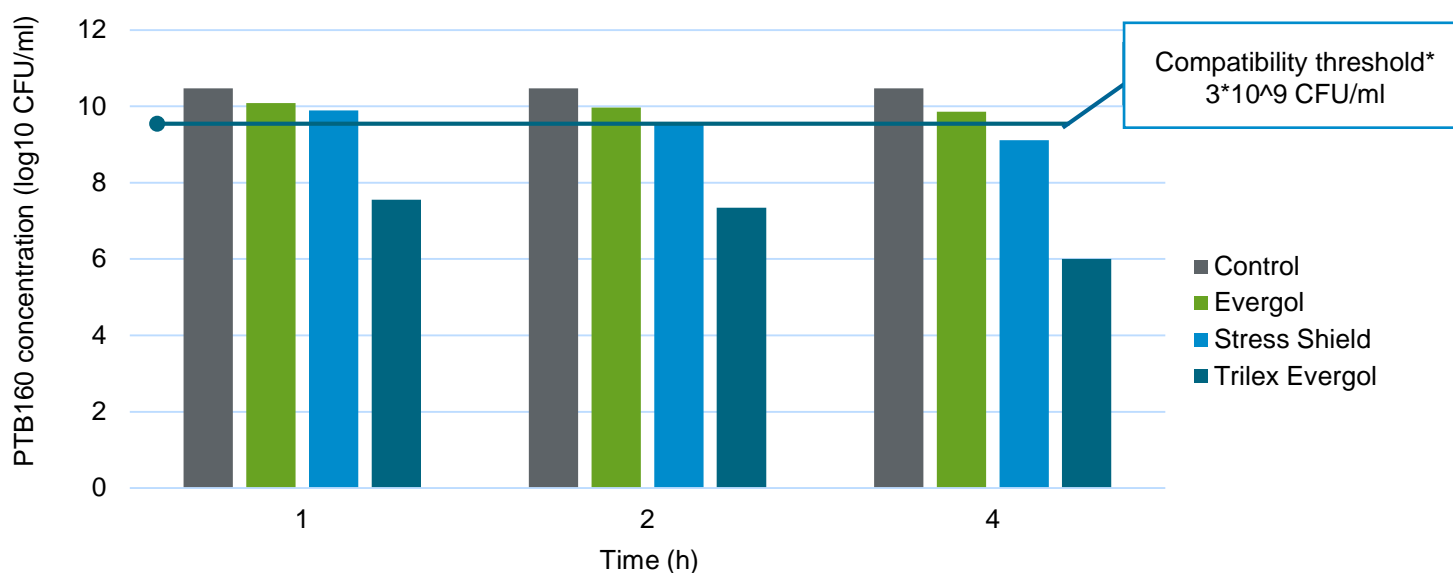
Test description: Over time survival test of PTB160 Technology - Rhizobium leguminosarum biovar viciae under pesticides tank mix condition

Research site: Premier Tech Campus (QC), Canada

Treatments: a) Control (PTB160 without any pesticide);
b) PTB160 with Evergol® Energy;
c) PTB160 with Stress Shield®;
d) Trilex Evergol®

Experimental design: 3 sampling times per treatment and 3 replicates per each bacterial enumeration

Table 1. **Survival over time of PTB160 on combination with pesticides**



* To achieve the best performance, concentration must remain above to the compatibility threshold

COMPATIBILITY

PESTICIDES



► PESTICIDES PRODUCTS COMPATIBILITY

Rhizobium leguminosarum biovar *viciae* PTB160 Technology

Recommended application methods: in the furrow in separate tanks or sequential on seed application.

Last modification: October 2021

COMMERCIAL NAME NOM COMMERCIAL	COMPANY COMPAGNIE	ACTIVE INGREDIENT INGRÉDIENT ACTIF	CATEGORY CATÉGORIE	COMPATIBILITY COMPATIBILITÉ RHIZOBIUM (PTB160)
APRON MAXX® RTA®	Syngenta	Metalaxyl 1.10% Fludioxonil 0.73%	Fungicide / Fongicide	YES / OUI
CRUISER® 5FS	Syngenta	Thiamethoxam 47.6%	Insecticide	YES / OUI
CRUISER MAXX® VIBRANCE® Pulses	Syngenta	Thiamethoxam 47.6%	Fungicide-Insecticide Fongicide-Insecticide	YES / OUI
		Metalaxyl 1.10%		
		Fludioxonil 0.73%		
		Sedaxane 500 g/L		
INTEGO™	Syngenta	Ethaboxam 383 g/L	Fungicide / Fongicide	YES / OUI
VIBRANCE® 500FS	Syngenta	Sedaxane 500 g/L	Fungicide / Fongicide	YES / OUI
EverGol-Energy	Bayer	Penflufen 38.4 g/L	Fungicide / Fongicide	YES / OUI
		Prothioconazole 76.8 g/L		
		Metalaxyl 61.4 g/L		
STRESS SHIELD® 600	Bayer	Imidacloprid 600 g/L	Insecticide / Insecticide	YES / OUI
TRILEX EverGol®	Bayer	Penflufen 154 g/L	Fungicide / Fongicide	YES / OUI
		Trifloxystrobin 154 g/L		
		Metalaxyl 317 g/L		
RACONA® TRIO	Arysta LifeScience Canada Inc.	Ipconazole 5.0 g/L	Fungicide / Fongicide	NO / NON
		Carbathiin 133.33 g/L		
		Metalaxyl 13.33 g/L		

For most up-to-date information, visit ptAGTIV.com/toolbox



SEED STORAGE

EFFICACY REPORT

2020 – ON SEED RHIZOBIUM WITH INOCULANT EXTENDER

► LAB TEST

Test description: Nodulation tests on pea plants inoculated with ON SEED PTB160 Technology - *Rhizobium leguminosarum* biovar *vicea* with the AGTIV® Inoculant Extender for Pulses after different storage lengths & temperatures.

Research site: Premier Tech Campus (QC), Canada

Pea variety: CDC Meadowland treated with Cruiser Maxx

Experimental design: 12 plants per treatment.

Treatments:

AGTIV® ON SEED™ RHIZO • Powder for Pulses
with AGTIV® Inoculant Extender for Pulses:

- b) stored for 7 days at 8-12°C;
- c) stored for 20 days at 8-12°C;
- d) stored for 30 days at 8-12°C;
- e) stored for 60 days at 8-12°C;
- f) stored for 7 days at 20-24°C;
- g) stored for 20 days at 20-24 °C;
- h) stored for 30 days at 20-24 °C;
- i) stored for 60 days at 20-24 °C;

AGTIV® ON SEED™ RHIZO • Powder for Pulses
without AGTIV® Inoculant Extender for Pulses:

- j) stored for 7 days at 8-12°C;
- k) stored for 20 days at 8-12°C;
- l) stored for 30 days at 8-12°C;
- m) stored for 60 days at 8-12°C;
- n) stored for 7 days at 20-24°C;
- o) stored for 20 days at 20-24 °C;
- p) stored for 30 days at 20-24 °C;
- q) stored for 60 days at 20-24 °C;

Table 1. Weighted nodule numbers with 8 to 12°C seed storage

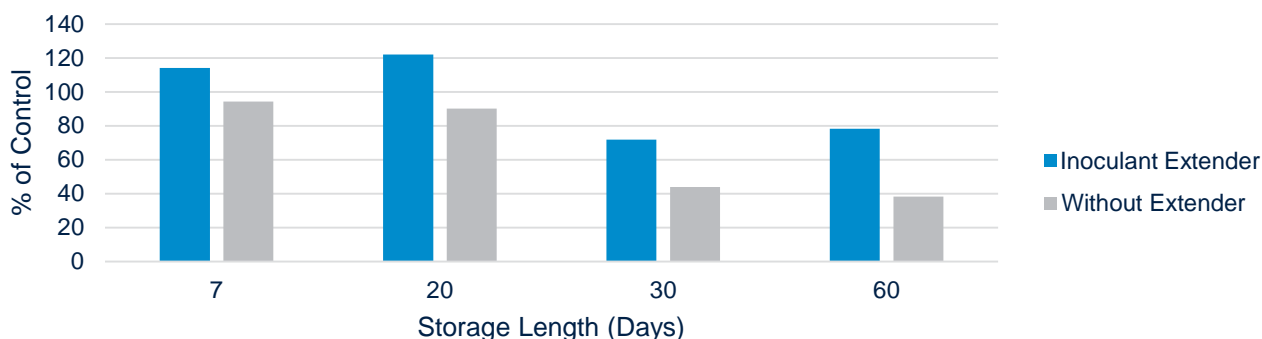
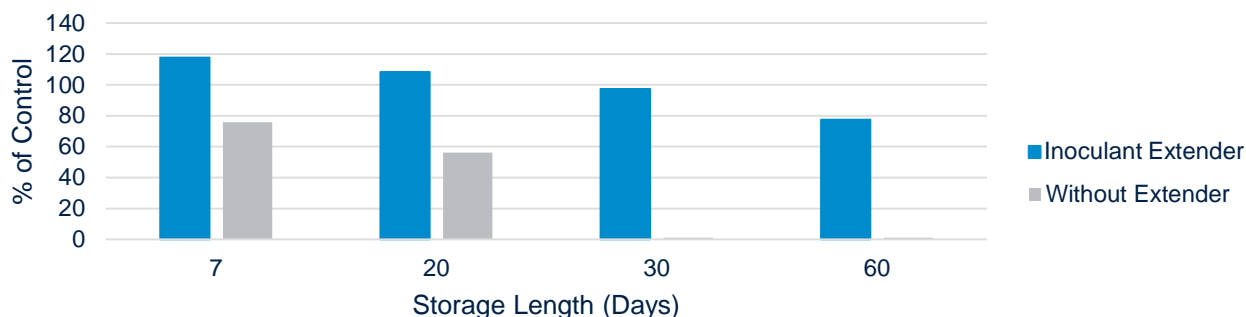


Table 2. Weighted nodule numbers with 20 to 24°C seed storage



EFFICACY REPORT

2021 – ON SEED AGTIV® COMBO • Liquid for PULSES

► LAB TEST

Test description: Nodulation tests on pea plants inoculated with AGTIV® COMBO • Liquid for PULSES (*Rhizobium leguminosarum* biovar *vicea* PTB160 and *Bacillus pumilus* PTB180 Technologies) with the extender after different storage lengths and temperatures

Research site: Premier Tech Campus (QC), Canada

Pea variety: CDC Meadowland

Experimental design: 12 plants per treatment.

Treatments:

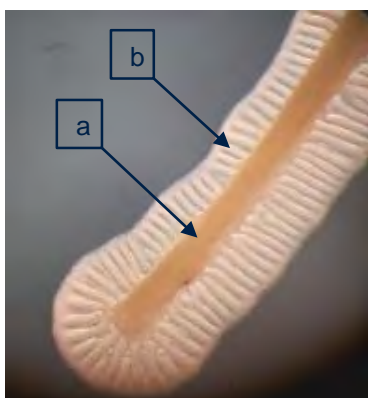
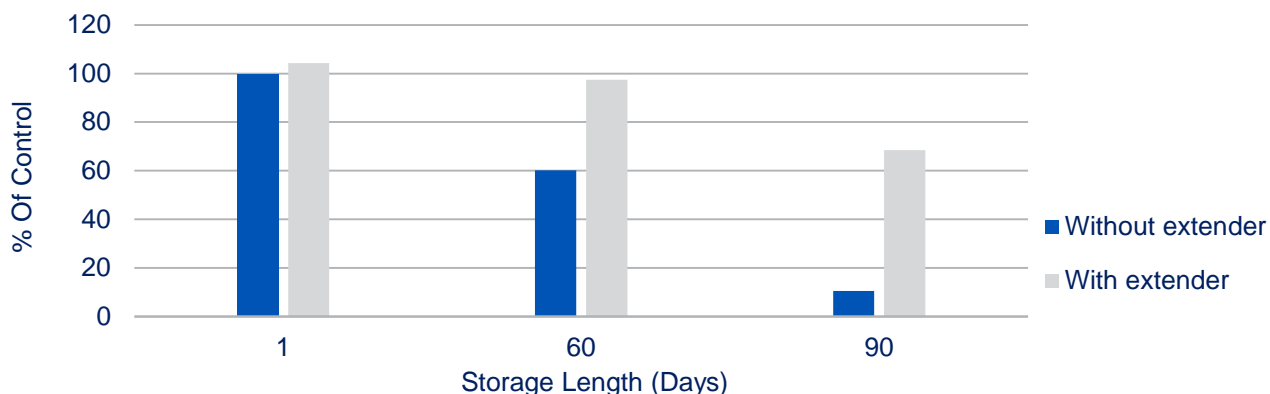
AGTIV® COMBO • Liquid for PULSES
without extender:

- a) stored for 1 days at 13-16°C
- b) stored for 60 days at 16-23°C
- c) stored for 90 days at 18-23°C

AGTIV® COMBO • Liquid for PULSES
with extender:

- d) stored for 1 days at 13-16°C
- e) stored for 60 days at 16-23°C
- f) stored for 90 days at 18-23°C

Table 1. **Weighted nodule numbers with or without extender**



Section of pea root sampled from growing plant (90 days seed storage) and transplanted on laboratory sterile in-vitro growing medium. a) Pea root, b) Biofilm formed by the *Bacillus pumilus* PTB180 around the root confirming his establishment.

STORAGE

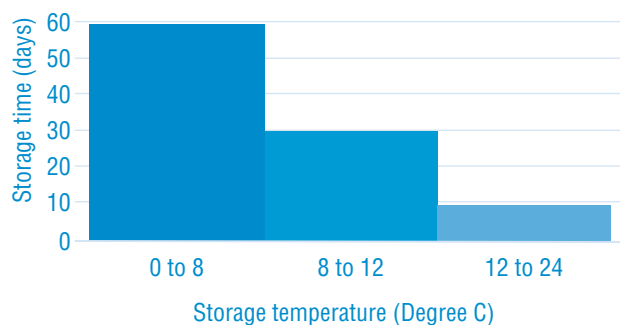
TEMPERATURE



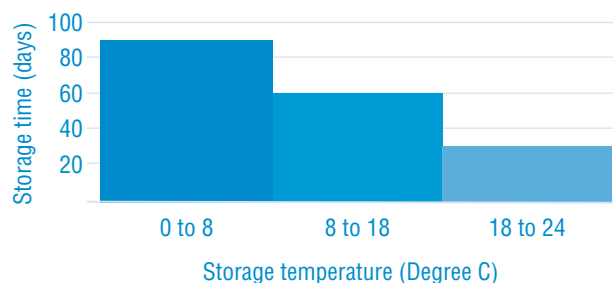
► STORAGE TIME vs TEMPERATURE FOR OPTIMUM NODULATION

In testing conditions, we established optimum nodulation when treated seeds are stored at a specified temperature according to storage length.

STORAGE TIME vs TEMPERATURE
without Extender



STORAGE TIME vs TEMPERATURE
with Extender



Follow the manufacturer's recommendations for handling, application and storage before seeding.





COMPATIBILITY LIQUID FERTILIZERS

COMPATIBILITY REPORT

2020 – RHIZOBIUM & BRADYRHIZOBIUM WITH ALPINE G22®

► LAB TEST

Test description: Nodulation tests on plants inoculated with PTB160 Technology - *Rhizobium leguminosarum* biovar *vicea* (peas) or PTB162 Technology - *Bradyrhizobium japonicum* (soybean) at different contact times with Alpine G22® Liquid Fertilizer prior to seeding.

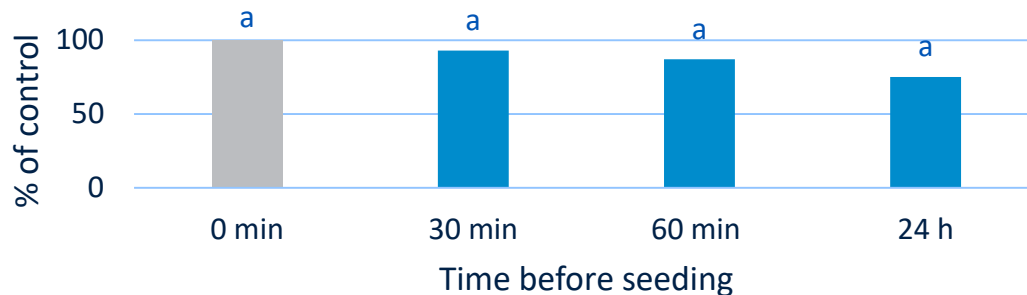
Research site: Premier Tech Campus (QC), Canada

Treatments for PTB160 and PTB162:

- a) PTB160 / PTB162 in contact with Alpine G22® directly at seeding;
- b) PTB160 / PTB162 in contact with Alpine G22® 30 minutes before seeding;
- c) PTB160 / PTB162 in contact with Alpine G22® 60 minutes before seeding;
- d) PTB160 / PTB162 in contact with Alpine G22® 24 hours before seeding.

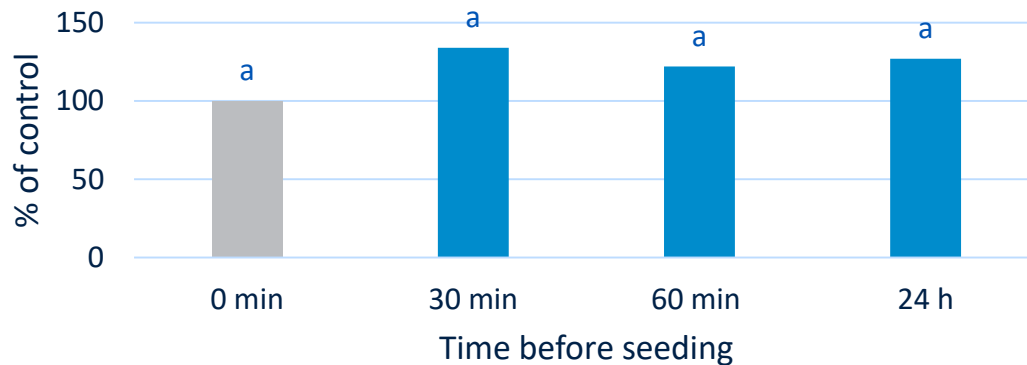
Experimental design: 6 plants per treatment. Nodulation was observed after 25 days. Fertilizer was applied at 37 l/ha (4 gal/ac).

Table 1. Summary for the weighted nodule numbers for PTB160.



Lowercase letters indicate Duncan ranking of averages at 5% confidence interval.

Table 2. Summary for the weighted nodule numbers for PTB162.



Lowercase letters indicate Duncan ranking of averages at 5% confidence interval.

COMPATIBILITY REPORT

2020 – RHIZOBIUM & BRADYRHIZOBIUM WITH AMMONIUM THIOSULFATE

► LAB TEST

Test description: Nodulation tests on plants inoculated with PTB160 Technology - *Rhizobium leguminosarum* biovar *vicea* (peas) or PTB162 Technology - *Bradyrhizobium japonicum* (soybean) at different contact times with Ammonium Thiosulfate Liquid Fertilizer prior to seeding.

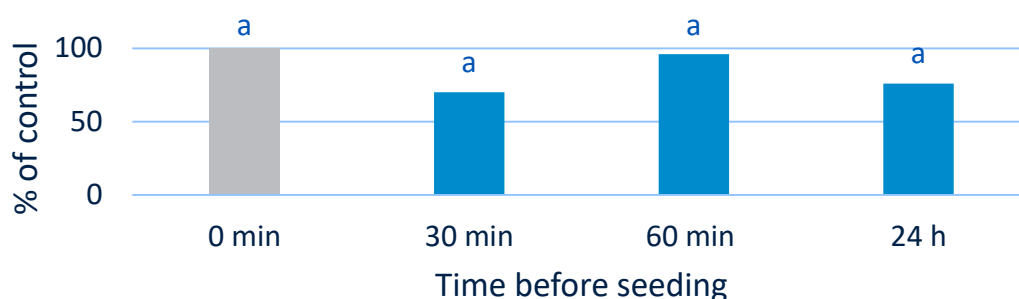
Research site: Premier Tech Campus (QC), Canada

Treatments for PTB160 and PTB162:

- a) PTB160 / PTB162 in contact with Ammonium Thiosulfate directly at seeding;
- b) PTB160 / PTB162 in contact with Ammonium Thiosulfate 30 minutes before seeding;
- c) PTB160 / PTB162 in contact with Ammonium Thiosulfate 60 minutes before seeding;
- d) PTB160 / PTB162 in contact with Ammonium Thiosulfate 24 hours before seeding.

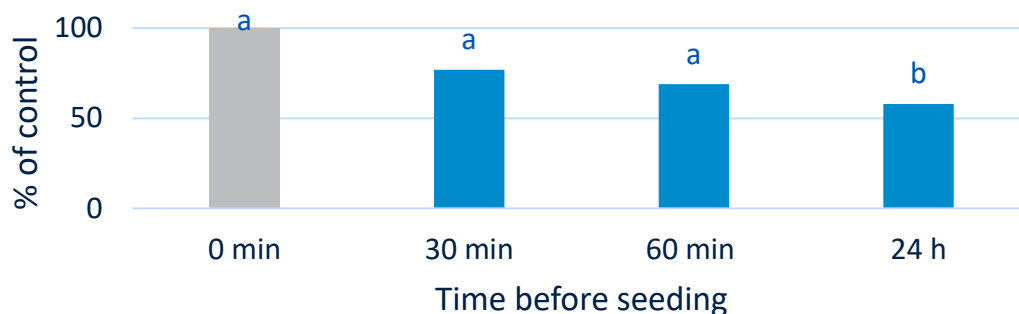
Experimental design: 8 plants per treatment. Nodulation was observed after 25 days. Fertilizer was applied at 37 l/ha (4 gal/ac).

Table 1. Summary for the weighted nodule numbers for PTB160.



Lowercase letters indicate Duncan ranking of averages at 5% confidence interval.

Table 2. Summary for the weighted nodule numbers for PTB162.



Lowercase letters indicate Duncan ranking of averages at 5% confidence interval.

COMPATIBILITY REPORT

2020 – RHIZOBIUM & BRADYRHIZOBIUM WITH AMMONIUM POLYPHOSPHATE

► LAB TEST

Test description: Nodulation tests on plants inoculated with PTB160 Technology - *Rhizobium leguminosarum* biovar *vicea* (peas) or PTB162 Technology - *Bradyrhizobium japonicum* (soybean) at different contact times with Ammonium Polyphosphate Liquid Fertilizer prior to seeding.

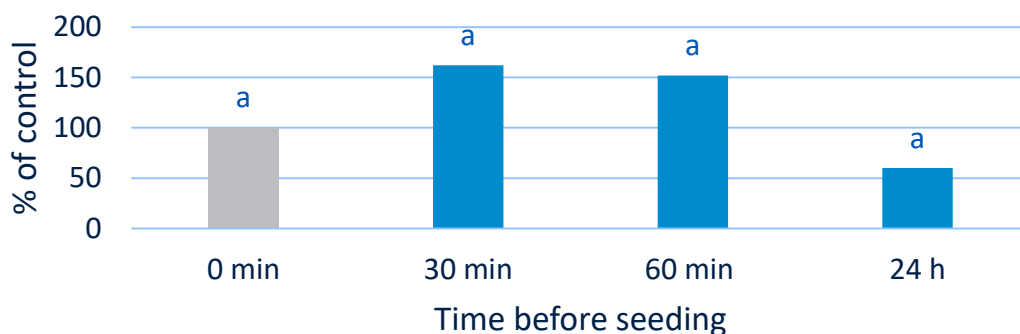
Research site: Premier Tech Campus (QC), Canada

Treatments for PTB160 and PTB162:

- a) PTB160 / PTB162 in contact with Ammonium Polyphosphate directly at seeding;
- b) PTB160 / PTB162 in contact with Ammonium Polyphosphate 30 minutes before seeding;
- c) PTB160 / PTB162 in contact with Ammonium Polyphosphate 60 minutes before seeding;
- d) PTB160 / PTB162 in contact with Ammonium Polyphosphate 24 hours before seeding.

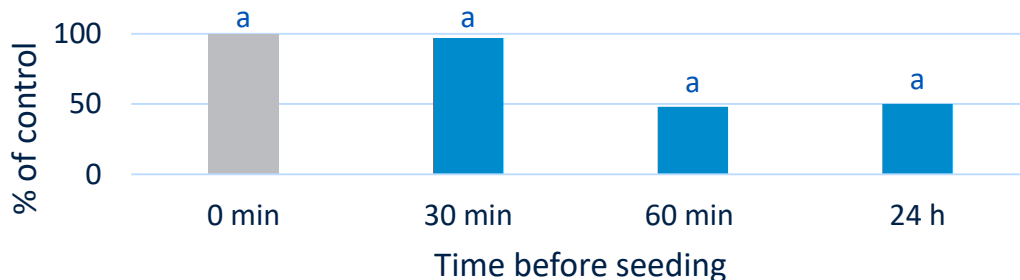
Experimental design: 8 plants per treatment. Nodulation was observed after 25 days. Fertilizer was applied at 37 l/ha (4 gal/ac).

Table 1. Summary for the weighted nodule numbers for PTB160.



Lowercase letters indicate Duncan ranking of averages at 5% confidence interval.

Table 2. Summary for the weighted nodule numbers for PTB162.



Lowercase letters indicate Duncan ranking of averages at 5% confidence interval.

COMPATIBILITY REPORT

2020 – RHIZOBIUM & BRADYRHIZOBIUM WITH UREA AMMONIUM NITRATE

► LAB TEST

Test description: Nodulation tests on plants inoculated with PTB160 Technology - *Rhizobium leguminosarum* biovar *vicea* (peas) or PTB162 Technology - *Bradyrhizobium japonicum* (soybean) at different contact times with Urea Ammonium Nitrate Liquid Fertilizer prior to seeding.

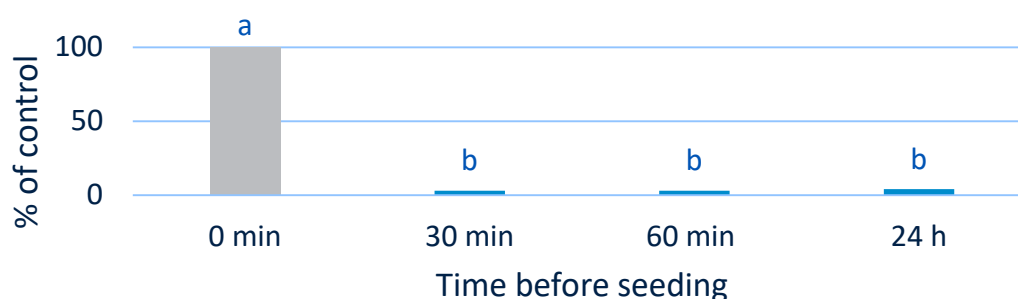
Research site: Premier Tech Campus (QC), Canada

Treatments for PTB160 and PTB162:

- a) PTB160 / PTB162 in contact with Urea Ammonium Nitrate directly at seeding;
- b) PTB160 / PTB162 in contact with Urea Ammonium Nitrate 30 minutes before seeding;
- c) PTB160 / PTB162 in contact with Urea Ammonium Nitrate 60 minutes before seeding;
- d) PTB160 / PTB162 in contact with Urea Ammonium Nitrate 24 hours before seeding.

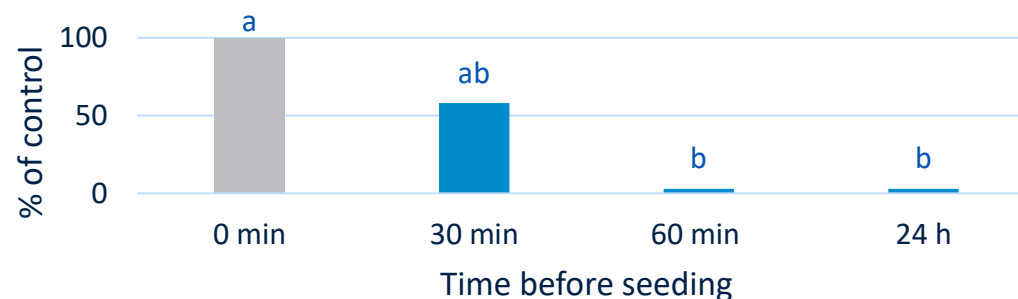
Experimental design: 8 plants per treatment. Nodulation was observed after 25 days. Fertilizer was applied at 37 l/ha (4 gal/ac).

Table 1. Summary for the weighted nodule numbers for PTB160.



Lowercase letters indicate Duncan ranking of averages at 5% confidence interval.

Table 2. Summary for the weighted nodule numbers for PTB162.



Lowercase letters indicate Duncan ranking of averages at 5% confidence interval.

COMPATIBILITY REPORT

2021 – FERTILIZERS COMPATIBILITY

► LAB TEST

List of fertilizers compatible with *Rhizobium leguminosarum* biovar *viciae* – PTB160

Technology

Recommended application methods: in the furrow in separate tanks or seed treatment

Last update: October 2021

COMMERCIAL NAME NOM COMMERCIAL	COMPANY COMPAGNIE	ACTIVE INGREDIENT INGRÉDIENT ACTIF	COMPATIBILITY / COMPATIBILITÉ RHIZOBIUM (PTB160)	
			SEPARATE TANKS / RÉSERVOIRS SÉPARÉS	TANK MIX / RÉSERVOIR UNIQUE
ALPINE G22®	Alpine® Liquid Fertilizer	6-22-2	YES / OUI	YES / OUI (12 h)
Ammonium Polyphosphate	Nutrien Ltd	10-34-0	YES / OUI	YES / OUI (1 h)
Urea Ammonium Nitrate	Nutrien Ltd	28-0-0	YES / OUI	NO / NON
Ammonium Thiosulfate	Koch Nitrogen Company, LLC	15-0-0-20	YES / OUI	YES / OUI (12 h)

For most up-to-date information, visit ptAGTIV.com/toolbox



ON SEED TOOLS



ON SEED BAG TAGS

Find printable versions on our website
or ask us to send you printed tags
directly to you

PTAGTIV.COM/toolbox/#_onseed

Any questions contact us
1 866 454-5867



BAG TAG for
AGTIV® ON SEED
RHIZOBIUM – Liquid

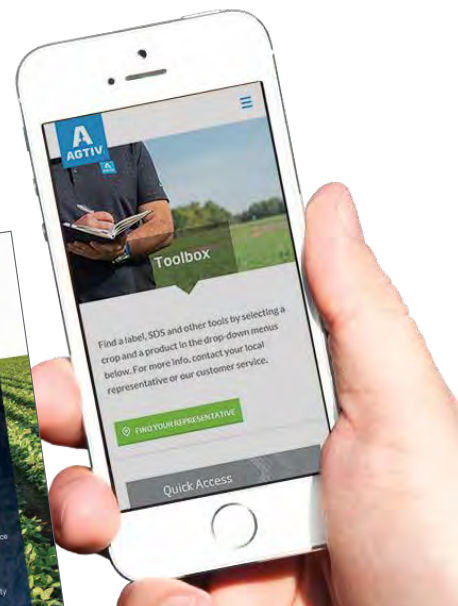


BAG TAG for
AGTIV® ON SEED
RHIZOBIUM – Powder



PROMO SHEET

Find PDF versions on our website
or ask us to send you printed
promo sheets directly to you
PTAGTIV.COM/toolbox/#_onseed





2022 ON SEED PACKAGE



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