



RESULTS FOCUSED

2021 Product Guide

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NexusBioAg

NexusBioAg is proud to provide an extensive portfolio of crop nutrition solutions, which includes industry leading inoculants, micronutrients, nitrogen stabilizers and foliar products.

NexusBioAg is committed to launching innovative, cutting-edge products, which provide value and benefit to the Canadian agricultural industry and growers. This year we are pleased to launch three new inoculants – BioniQ®, TagTeam® BioniQ®, and Optimize® LV. These inoculants are proven to increase yields and enhance crop performance for pulses including lentils and peas, cereals (small grains), canola and soybeans. The launch of these new products is a direct result of our collaboration with customers, Novozymes' research and development, and multiyear field trials conducted across Canada through the BioAdvantage Trials (BAT) program.

NexusBioAg is committed to helping Canadian growers and retailers, and when you choose to work with the innovation leader in the ag market, you'll be working with a dedicated team, who provides solutions designed to help you produce more with less—and in a sustainable way that benefits agriculture, the consumer, the environment, and society as a whole.

NexusBioAg strives to help meet the needs of increasingly unique agricultural businesses. Through best-in-class capabilities, a collaborative team-oriented approach, and our commitment to agricultural integrity, NexusBioAg is helping our customers innovate and grow.

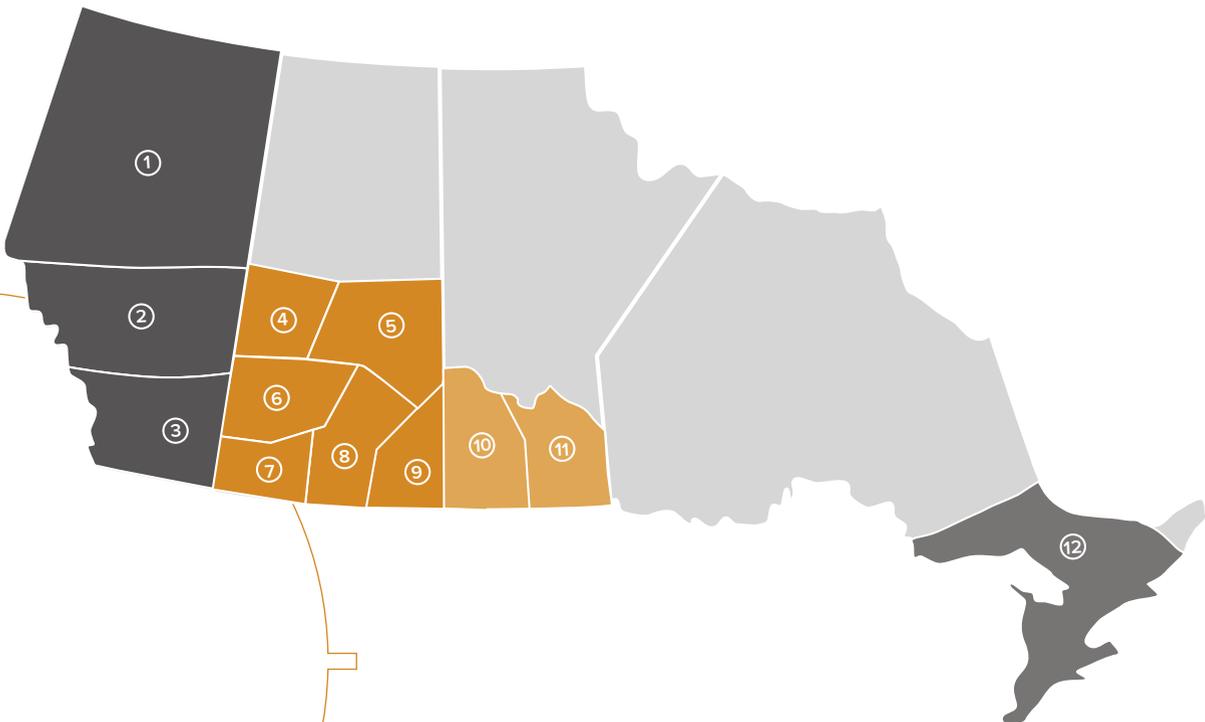
Your solution for crop nutrition



BioAdvantage Trials

Over the past 6 years, efforts from producers, retailers, and agronomists like you have contributed to making the BioAdvantage Trials program the leading inoculant field scale testing program in the industry. The successful development and testing of inoculant products has contributed to a deeper understanding of the agronomics, placement, and expectations of the portfolio. As a result of your commitment to the program, over 400 trials – across 6 provinces, with 6 different inoculants on 12 different crops have been completed.

Thank you for your continued support, and we look forward to collaborating on future BioAdvantage Trials to test the inoculant and micronutrient products from the expanded NexusBioAg portfolio. Visit BATResults.ca to view BioAdvantage Trial results in your area.





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NEW!

TagTeam® BioniQ®

Lentil · Pea

Product Overview

Five Biological Actives for... Stronger Roots... Faster Nodulation... Better Yields.

TagTeam® BioniQ® increases yield and performance over a wide range of geographic locations and field conditions. TagTeam BioniQ is the next generation granular inoculant that combines five biological actives to maximize your pulse crop performance. A specially selected *Rhizobium* strain and the proven performance of LCO (lipochitooligosaccharide) technology are utilized to provide improved nodule formation and increased nitrogen fixation. TagTeam BioniQ contains the phosphate-solubilizing benefits of the *Penicillium bilaiae* fungi as well as the addition of the biologicals, *Bacillus amyloliquefaciens* and *Trichoderma virens* for increased availability and uptake of nitrogen, phosphate and potassium. The ability to release nutrients from the soil helps maximize the effectiveness of inputs and improve yield potential.

Root and Shoot Development

Early-season phosphate availability is difficult when the plant does not have a root mass or the energy to develop a root mass. *Penicillium bilaiae* helps with both of these issues by making phosphate available to the plant to support root and shoot growth.

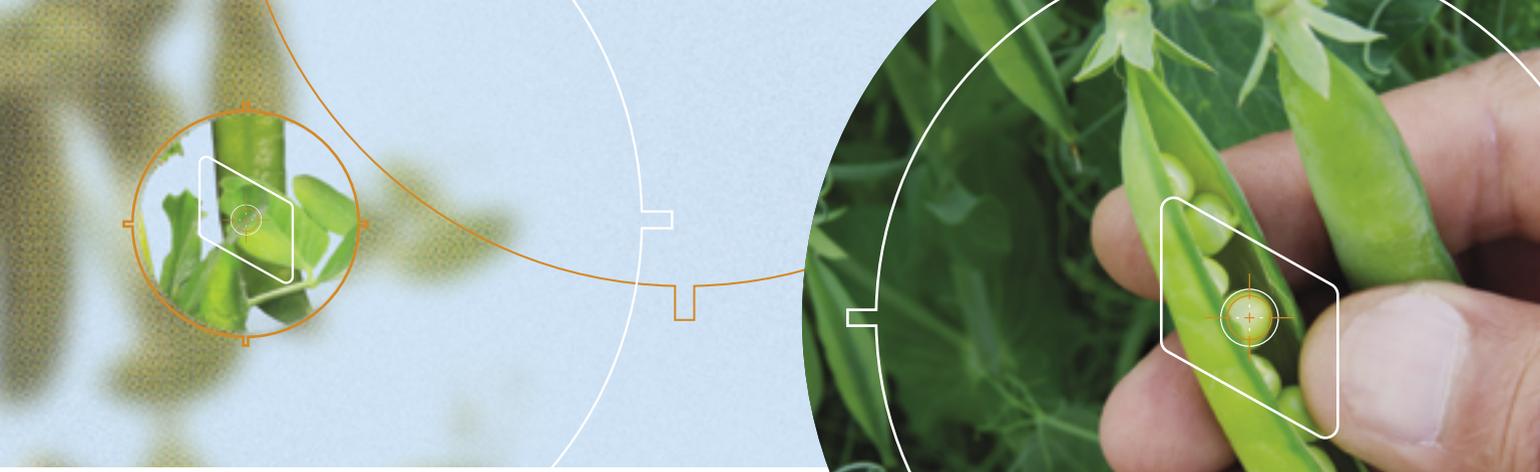
Phosphate Is Crucial To Nitrogen Fixation

Research shows that phosphate nutrition has a significant, positive impact on nitrogen fixation.¹ Good phosphate nutrition results in more nodules being formed and more active nitrogen fixation.

- Phosphate helps move the energy from photosynthesis to the roots, where it is needed to fuel nitrogen fixation.
- More extensive root growth provides greater opportunity for the development of nitrogen-fixing nodules.
- Faster development of active nodules results in greater nitrogen fixation.
- Phosphate nutrition increases the number and size of nodules, and the amount of nitrogen fixed by the plant.

Most phosphate fertilizer is also banded away from the seed in pea and lentil crops, resulting in limited early-season availability to the crop. *Penicillium bilaiae* helps overcome this limitation by providing early-season access to soil and starter fertilizer phosphate.

¹ Source: Phosphorus for Agriculture. Potash and Phosphate Institute. 1988. Reprinted from Fall 1988 issue of Better Crops with Plant Food magazine.



TagTeam BioniQ's 5 Biological Actives:



Rhizobium leguminosarum



LCO (lipochitooligosaccharide) technology



Bacillus amyloliquefaciens



Penicillium bilaiae



Trichoderma virens

Earlier Nodulation Development

LCO is a molecule involved in the rhizobia–legume nodulation system. LCO is an important component in nodulation as a key driver in the communication between plants and rhizobia.

When the LCO molecule is present at the time of planting, it allows for the nodulation process to begin, independent of variety, soil and environmental conditions. The benefit of earlier nodulation initiation is nitrogen availability to the plant, which supports plant growth such as root and shoot development. The result of this early-season activity is improved plant performance.

Features & Benefits



Increased yield and return on investment - see more at BATResults.ca



Performance in a variety of soil conditions and types



Improved nodule formation and nitrogen fixation



Greater opportunity for earlier nodulation with LCO



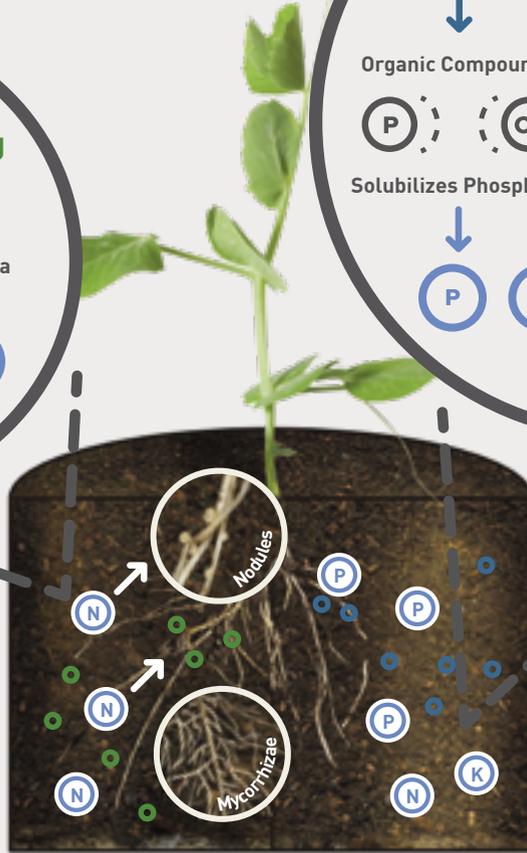
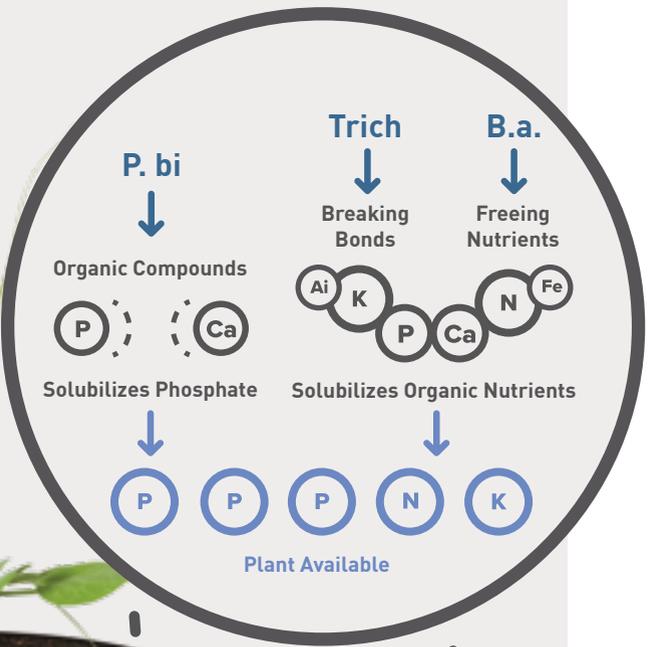
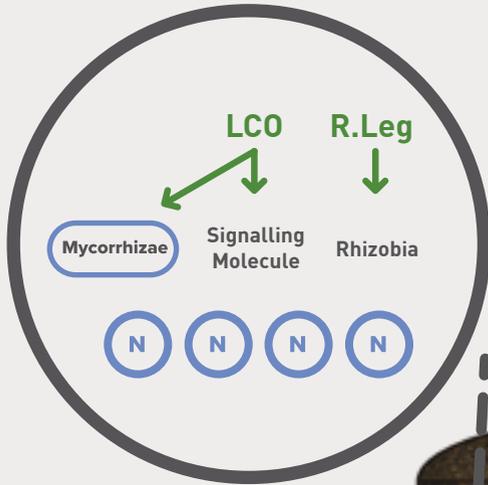
Improved availability of nitrogen, phosphate and potassium



Earlier, more uniform maturity

How It Works

Five biological actives for improved nutrient availability, nodule formation, and nitrogen fixation in a variety of soil conditions.



LCO = Lipochitooligosaccharide

- Stress Mitigation
- Enhances Nodulation
- Increases Association with Mycorrhizae

R.Leg = Rhizobium leguminosarum

- Fixes Nitrogen

Trich = *Trichoderma virens*
 P. bi = *Penicillium bilaiae*
 B. a. = *Bacillus amyloliquefaciens*

BioAdvantage Trials

Pea



Win Rate



Yield Advantage

Source: Results were collected from 26 farmer-conducted, large-scale, side-by-side BioAdvantage Trials conducted in Western Canada from 2017-2020.

Lentil



Win Rate



Yield Advantage

Source: Results were collected from 10 farmer-conducted, large-scale, side-by-side BioAdvantage Trials conducted in Western Canada from 2017-2020.

TagTeam BioniQ Is Available In The Following Formulation

CROP	INOCULANT SPECIES	TAGTEAM BIONIQ FORMULATIONS AVAILABLE
Pea, Lentil	<i>Penicillium bilaiae</i> + <i>Rhizobium leguminosarum</i> + <i>Bacillus amyloliquefaciens</i> + <i>Trichoderma virens</i> + lipochitoooligosaccharide	Granular

Application

TagTeam BioniQ granular should be applied directly with the seed in the seed row using a granular tank for application. Application rates vary according to row spacing (refer to table). Please read the label before application for complete use instructions.

- Pour into tank through a screen.
- Fill the tank to match or slightly exceed seed requirements. Do not overfill the tank to avoid compaction.
- If augering TagTeam BioniQ granular, do so at low speeds to avoid damage to the granules.
- Do not mix TagTeam BioniQ granular in the same tank with seed or fertilizer.
- Do not leave TagTeam BioniQ granular in the tank overnight as condensation can cause lumps to form.

TagTeam BioniQ Application Rates

PACKAGE SIZE	18 KG (39.68 LB) BAG		454 KG (1,001 LB) BAG	
	Row spacing	lb/ac	ac/bag	lb/ac
6 in	5.5	7.2	5.5	182.0
7 in	4.7	8.4	4.7	213.0
8 in	4.1	9.7	4.1	244.1
9 in	3.6	11.0	3.6	278.0
10 in	3.3	12.0	3.3	303.3
12 in	2.7	14.7	2.7	370.7
15 in	2.2	18.0	2.2	455.0

Note: The bulk density of TagTeam BioniQ granular is approximately 0.6 g/cm³ (37 lb/ft³).

Product Packaging

Pea/Lentil

	Granular	1	x	18 kg	=	
	Granular	1	x	454 kg	=	

TagTeam® LCO

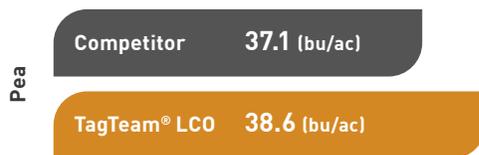
Lentil · Pea

Product Overview

Three Powerful Technologies Combine To Build A Better Crop

TagTeam LCO inoculant is a triple-action granular product that combines a specially selected *Rhizobium* strain with the phosphate-solubilizing *Penicillium bilaiae* fungi and the proven performance of LCO (lipochitooligosaccharide) technology for increased nitrogen fixation.

Higher yield potential



Results were collected from 7 farmer-conducted, large-scale, side-by-side BioAdvantage Trials conducted in Alberta and Saskatchewan in 2018.



Results were collected from 5 farmer-conducted, large-scale, side-by-side BioAdvantage Trials conducted in Saskatchewan in 2018.

Root and Shoot Development

Early-season phosphate availability is difficult when the plant does not have a root mass or the energy to develop a root mass. *Penicillium bilaiae* helps with both of these issues by making phosphate available to the plant to support root and shoot growth.

Phosphate Is Crucial To Nitrogen Fixation

Research shows that phosphate nutrition has a significant, positive impact on nitrogen fixation.¹ Good phosphate nutrition results in more nodules being formed and more active nitrogen fixation.

- Phosphate helps move the energy from photosynthesis to the roots, where it is needed to fuel nitrogen fixation.
- More extensive root growth provides greater opportunity for the development of nitrogen-fixing nodules.
- Faster development of active nodules results in greater nitrogen fixation.
- Phosphate nutrition increases the number and size of nodules, and the amount of nitrogen fixed by the plant.

Most phosphate fertilizer is also banded away from the seed in pea and lentil crops, resulting in limited early-season availability to the crop. *Penicillium bilaiae* helps overcome this limitation by providing early-season access to soil and starter fertilizer phosphate.

¹ Source: Phosphorus for Agriculture. Potash and Phosphate Institute. 1988. Reprinted from Fall 1988 issue of Better Crops with Plant Food magazine.



Earlier Nodulation Development

LCO is a molecule involved in the rhizobia–legume nodulation system. LCO is an important component in nodulation as a key driver in the communication between plants and rhizobia.

When the LCO molecule is present at the time of planting, it allows for the nodulation process to begin, independent of variety, soil and environmental conditions. The benefit of earlier nodulation initiation is nitrogen availability to the plant, which supports plant growth such as root and shoot development. The result of this early-season activity is improved plant performance.

Features & Benefits



Improved
nodule
formation



Improved
phosphate
availability



Enhanced nutrient
availability, which
supports root and
shoot growth



Increased
nitrogen
fixation



Greater opportunity
for the development
of nitrogen-fixing
nodules with LCO

How It Works

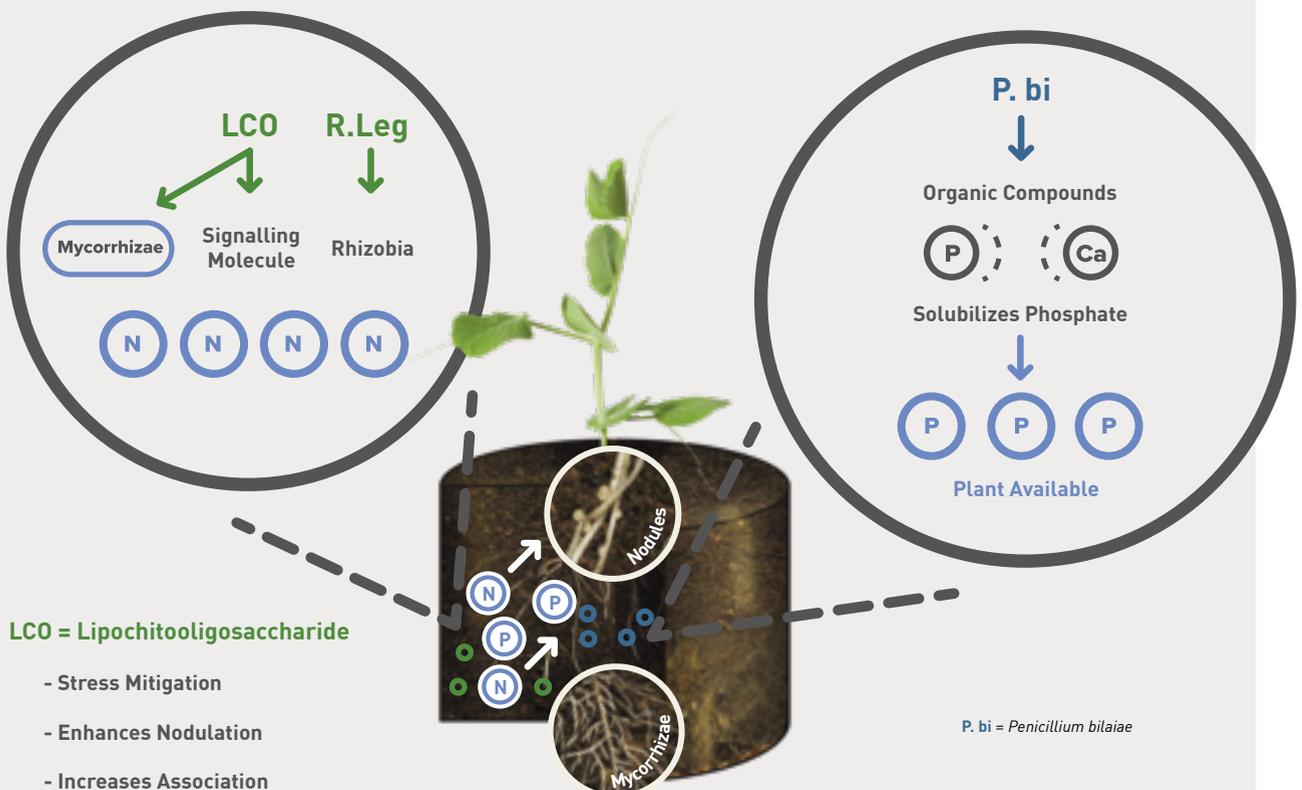
Three biological actives for enhanced phosphate availability, nitrogen fixation and earlier nodulation development.

Freeing Phosphate

Penicillium bilaiae releases bound mineral forms of soil and fertilizer phosphate, making it more available to the plant.

More Nitrogen

- 1 Needing nitrogen, the plant releases flavonoids to signal rhizobia.
- 2 Sensing the flavonoids, the rhizobia signal LCO back to the plant.
- 3 The plant can respond to the LCO, allowing the rhizobia to infect its roots.
- 4 This infection can create nodules, which help fix atmospheric nitrogen.



LCO = Lipochitooligosaccharide

- Stress Mitigation
- Enhances Nodulation
- Increases Association with Mycorrhizae

R. Leg = *Rhizobium leguminosarum*

- Fixes Nitrogen

P. bi = *Penicillium bilaiae*

TagTeam LCO Is Available In The Following Formulation

CROP	INOCULANT SPECIES	TAGTEAM FORMULATIONS AVAILABLE
Pea, Lentil	<i>Penicillium bilaiae</i> + <i>Rhizobium leguminosarum</i> + lipochitooligosaccharide	Granular

Application

TagTeam LCO granular should be applied directly with the seed in the seed row using a granular tank for application. Application rates vary according to row spacing (refer to table). Please read the label before application for complete use instructions.

- Pour into tank through a screen.
- Fill the tank to match or slightly exceed seed requirements. Do not overfill the tank to avoid compaction.
- If augering TagTeam LCO granular, do so at low speeds to avoid damage to the granules.
- Do not mix TagTeam LCO granular in the same tank with seed or fertilizer.
- Do not leave TagTeam LCO granular in the tank overnight as condensation can cause lumps to form.

TagTeam LCO Granular Application Rates

PACKAGE SIZE	18 KG (39.68 LB) BAG		454 KG (1,001 LB) BAG		NEW SIZE
	Row spacing	lb/ac	ac/bag	lb/ac	
6 in	5.5	7.2	5.5	182.0	
7 in	4.7	8.4	4.7	213.0	
8 in	4.1	9.7	4.1	244.1	
9 in	3.6	11.0	3.6	278.0	
10 in	3.3	12.0	3.3	303.3	
12 in	2.7	14.7	2.7	370.7	
15 in	2.2	18.0	2.2	455.0	

Note: The bulk density of TagTeam LCO granular is approximately 0.6 g/cm³ (37 lb/ft³).

Product Packaging



TagTeam®

Chickpea · Faba bean · Lentil · Pea · Soybean

Product Overview

Balanced Nutrition

Balanced nutrition of phosphate and nitrogen is necessary to maximize your crop's yield potential. TagTeam inoculant provides this balanced nutrition by combining the active ingredient from JumpStart inoculant with a nitrogen-fixing bacteria to produce a dual-action inoculant.

The active ingredient in JumpStart is the soil fungus, *Penicillium bilaiae* (*P. bilaiae*). This fungus and the rhizobia in TagTeam inoculant work together to create a unique value equation.

The soil fungus is the key to the equation. It grows along the plant roots and makes less-available forms of phosphate available to the plant. Phosphate is an important component that drives the needed energy for the nitrogen fixation process.

Early-season phosphate availability is difficult when the plant does not have a root mass or the energy to develop a root mass. *Penicillium bilaiae* helps with both of these issues by making phosphate available to the plant to support root and shoot growth.

Phosphate Is Crucial To Nitrogen Fixation

Research shows that phosphate nutrition has a significant, positive impact on nitrogen fixation.¹ Good phosphate nutrition results in more nodules being formed and more active nitrogen fixation.

- Phosphate helps move the energy from photosynthesis to the roots, where it is needed to fuel nitrogen fixation.
- More extensive root growth provides greater opportunity for the development of nitrogen-fixing nodules.
- Faster development of active nodules results in greater nitrogen fixation.
- Phosphate nutrition increases the number and size of nodules, and the amount of nitrogen fixed by the plant.

Most phosphate fertilizer is also banded away from the seed in pea and lentil crops, resulting in limited early-season availability to the crop. *Penicillium bilaiae* helps overcome this limitation by providing early-season access to soil and starter fertilizer phosphate.

¹ Source: Phosphorus for Agriculture. Potash and Phosphate Institute. 1988. Reprinted from Fall 1988 issue of Better Crops with Plant Food magazine.



TagTeam Inoculant Solves Starter Fertilizer Problems

TagTeam improves phosphate availability, even if starter phosphate fertilizer is used. TagTeam helps the developing primary roots access phosphate early in the growth stages, even before the root reaches the starter fertilizer band. As the primary root develops, TagTeam provides greater availability of soil and fertilizer phosphate, allowing the root to better access phosphate nutrition throughout the rooting zone.

Features & Benefits



Improved
nodule
formation



Improved
phosphate
availability



Enhanced nutrient
availability, which
supports root and
shoot growth



Increased
nitrogen
fixation

How It Works

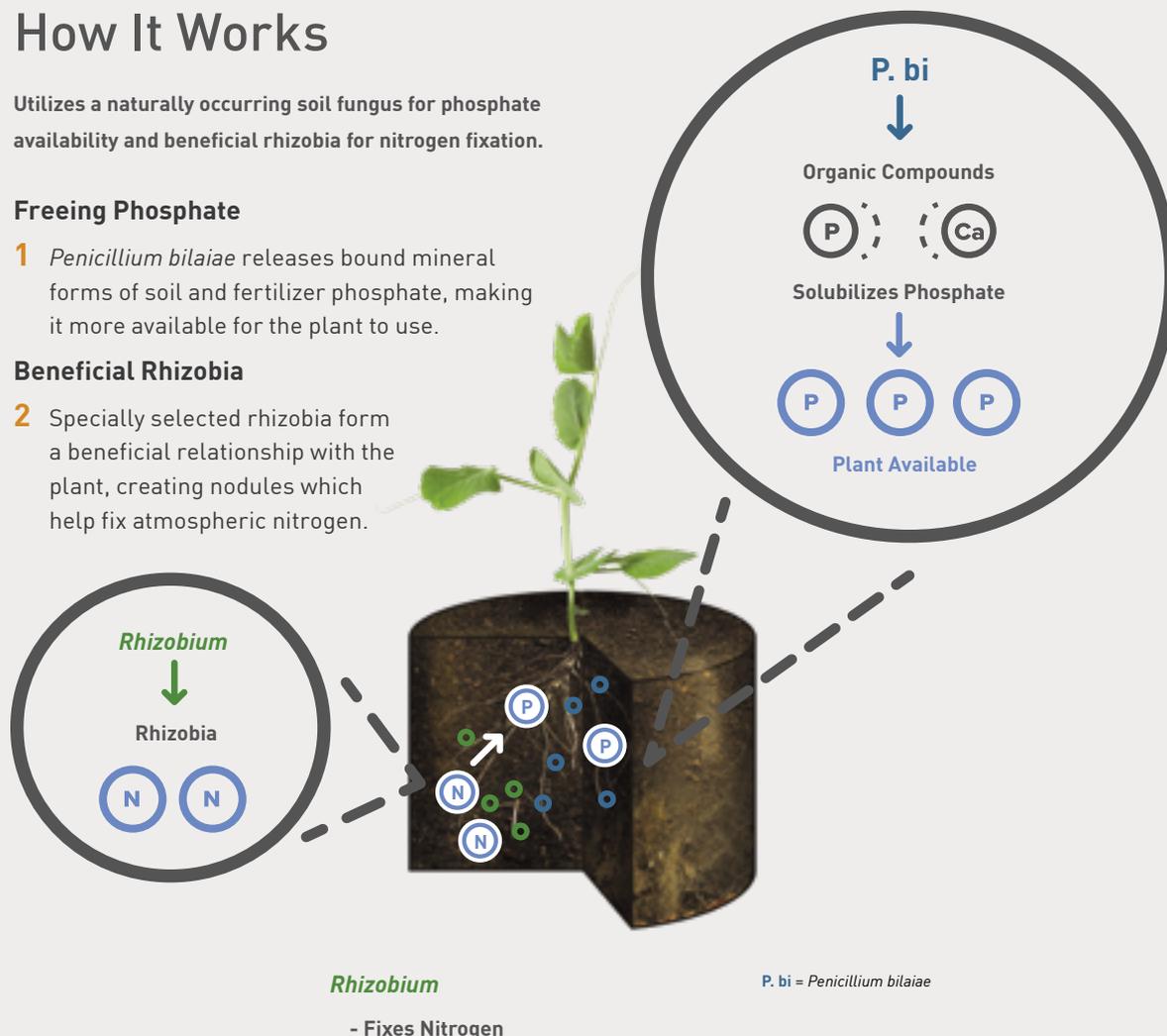
Utilizes a naturally occurring soil fungus for phosphate availability and beneficial rhizobia for nitrogen fixation.

Freeing Phosphate

- 1 *Penicillium bilaiae* releases bound mineral forms of soil and fertilizer phosphate, making it more available for the plant to use.

Beneficial Rhizobia

- 2 Specially selected rhizobia form a beneficial relationship with the plant, creating nodules which help fix atmospheric nitrogen.



TagTeam Is Available In The Following Formulations

CROP	INOCULANT SPECIES	TAGTEAM FORMULATIONS AVAILABLE
Chickpea	<i>Penicillium bilaiae</i> + <i>Mesorhizobium ciceri</i>	Granular, peat
Faba bean	<i>Penicillium bilaiae</i> + <i>Rhizobium leguminosarum</i>	Granular
Pea, Lentil	<i>Penicillium bilaiae</i> + <i>Rhizobium leguminosarum</i>	Liquid, peat
Soybean	<i>Penicillium bilaiae</i> + <i>Bradyrhizobium japonicum</i>	Granular, peat

TagTeam for Soybean

TagTeam for soybean combines the phosphate-solubilizing organism *P. bilaiae* and *Bradyrhizobium japonicum* in one inoculant to help address your soybean crop's phosphate and nitrogen fertility needs.

Soybean Fertility

Phosphate fertility programs in soybeans must deal with several challenges that may limit phosphate availability and uptake.

- Soybean seed is very sensitive to fertilizer injury from applied phosphate fertilizer. If you are unable to seed-place phosphate effectively, or if you broadcast phosphate before seeding, TagTeam will help make phosphate available to your soybean crop at the critical early-season stage.
- Calcareous soils readily tie up phosphate. The phosphate-solubilizing component of TagTeam will help increase phosphate availability of both residual soil phosphate and incorporated phosphate in these types of soils.

Application

TagTeam is available in granular, peat and liquid formulations to meet your different crop and equipment needs. Please read the label before application for complete use instructions.

TagTeam Granular

TagTeam granular should be applied directly with the seed in the seed row using a granular tank for application. Application rates vary according to row spacing (refer to Table 1 below for details).

- Pour into tank through a screen.
- Fill tank to match or slightly exceed seed requirements. Do not overfill tank to avoid compaction.
- If auguring TagTeam granular, do so at low speeds to avoid damage to the granules.
- Do not mix TagTeam in the same tank with seed or fertilizer.
- Do not leave TagTeam granular in the tank overnight as condensation can cause lumps to form.

Table 1. TagTeam Granular Application Rates

CROP	CHICKPEA				FABA BEAN		SOYBEAN			
	Package size	18 kg (39.68 lb) bag	454 kg (1,001 lb) bag	NEW SIZE	18 kg (39.68 lb) bag	18 kg (39.68 lb) bag	18 kg (39.68 lb) bag	454 kg (1,001 lb) bag	NEW SIZE	
Row spacing	lb/ac	ac/bag	lb/ac	ac/bag	lb/ac	ac/bag	lb/ac	ac/bag	lb/ac	ac/bag
7 in	4.7	8.4	4.7	213.0	4.7	8.4	6.2	6.4	6.2	161.4
8 in	4.1	9.7	4.1	244.1	4.1	9.7	5.4	7.3	5.4	185.4
9 in	3.6	11.0	3.6	278.0	3.6	11.0	4.7	8.4	4.7	213.0
10 in	3.3	12.0	3.3	303.3	3.3	12.0	4.3	9.2	4.3	232.8
12 in	2.7	14.7	2.7	370.7	2.7	14.7	3.6	11.0	3.6	278.0
15 in	2.2	18.0	2.2	455.0	2.2	18.0	2.9	13.7	2.9	345.1
24 in	-	-	-	-	-	-	1.8	22.0	1.8	556.1
30 in	-	-	-	-	-	-	1.4	28.3	1.4	714.9

Note: The bulk density of TagTeam granular is approximately 0.6 g/cm³ (37 lb/ft³).

TagTeam Liquid

TagTeam liquid should be applied directly to the seed at a rate of 2.5 fluid ounces per bushel (75 ml/27 kg) of seed. Once applied to bare seed, plant within 48 hours.

Table 2. TagTeam Liquid Application

TAGTEAM LIQUID			
Crop	Size	bu	lb
Pea, Lentil	3.0 litre + 57 g WP	40	2,400

TagTeam Peat

TagTeam peat has its own sticker in the formulation. A separate sticker is not needed.

Apply TagTeam to pre-moistened seed, or add water while applying TagTeam, or mix TagTeam with cool, clean water and apply to seed as a slurry. Please refer to Table 3 for approximate water rates. Once TagTeam is mixed into water, apply to seed within six hours.

Table 3. TagTeam Peat Application

TAGTEAM PEAT		AMOUNT OF SEED TREATED/BAG			WATER RATE ¹
Crop	Bag size	Units	bu	lb	Litres
Chickpea	2.20 kg	-	50	3,000	4.0
Lentil	2.20 kg	-	30	1,800	2.5
Pea	2.20 kg	-	50	3,000	4.0
Soybean	2.45 kg	40	33	2,000	3.0

¹Approximate water volume for peat slurry application.

TagTeam can be applied up to 48 hours before seeding, depending on crop, and can be used with many different seed treatments. Visit nexusbioag.com for the most up-to-date seed treatment compatibility information.



Product Packaging

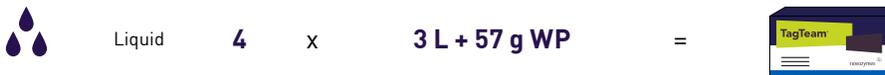
Chickpea



Faba bean



Pea/Lentil



Soybean



NEW!

BioniQ®

Barley · Canola · Wheat

Product Overview

Three Biological Actives for... Stronger Roots... Greater Nutrient Availability... Better Yields.

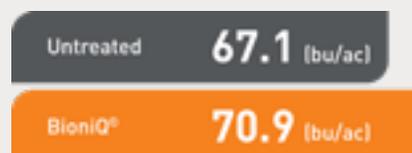
BioniQ is the inoculant for every cereal and canola grower that helps improve nutrient and moisture uptake, phosphate availability, and ultimately helps to increase yield potential. The *Penicillium bilaiae* fungus helps release bound mineral forms of soil and fertilizer phosphate, making it more readily available for the plant to use. The biologicals *Bacillus amyloliquefaciens* and *Trichoderma virens* help increase availability and uptake of nitrogen, phosphate, and potassium, which supports root and shoot growth in cereal and canola crops.

BioniQ's 3 Biological Actives:

-  *Penicillium bilaiae*
-  *Bacillus amyloliquefaciens*
-  *Trichoderma virens*

BioAdvantage Trials

Wheat



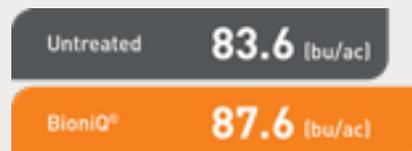
Win Rate



Yield Advantage

Source: Results were collected from 36 farmer-conducted, large-scale, side-by-side BioAdvantage Trials conducted in Western Canada from 2017-2020.

Barley



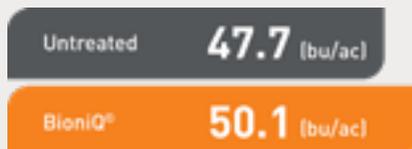
Win Rate



Yield Advantage

Source: Results were collected from 12 farmer-conducted, large-scale, side-by-side BioAdvantage Trials conducted in Western Canada from 2017-2020.

Canola



Win Rate



Yield Advantage

Source: Results were collected from 69 farmer-conducted, large-scale, side-by-side BioAdvantage Trials conducted in Western Canada from 2017-2020.



Features & Benefits

The *Bacillus amyloliquefaciens* and *Trichoderma virens* based treatment helps increase availability and uptake of nitrogen, phosphate and potassium. Its ability to release nutrients from the soil helps maximize the effectiveness of your inputs and improve your yield potential.

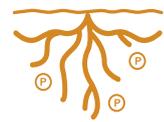
BioniQ increases yield and performance over a wide range of geographic locations and field conditions.



Increased yield and return on investment - see more at BATResults.ca



Performance in a variety of soil conditions and types; active in cool soils for enhanced early-season vigour



Improved availability of phosphate for enhanced root growth



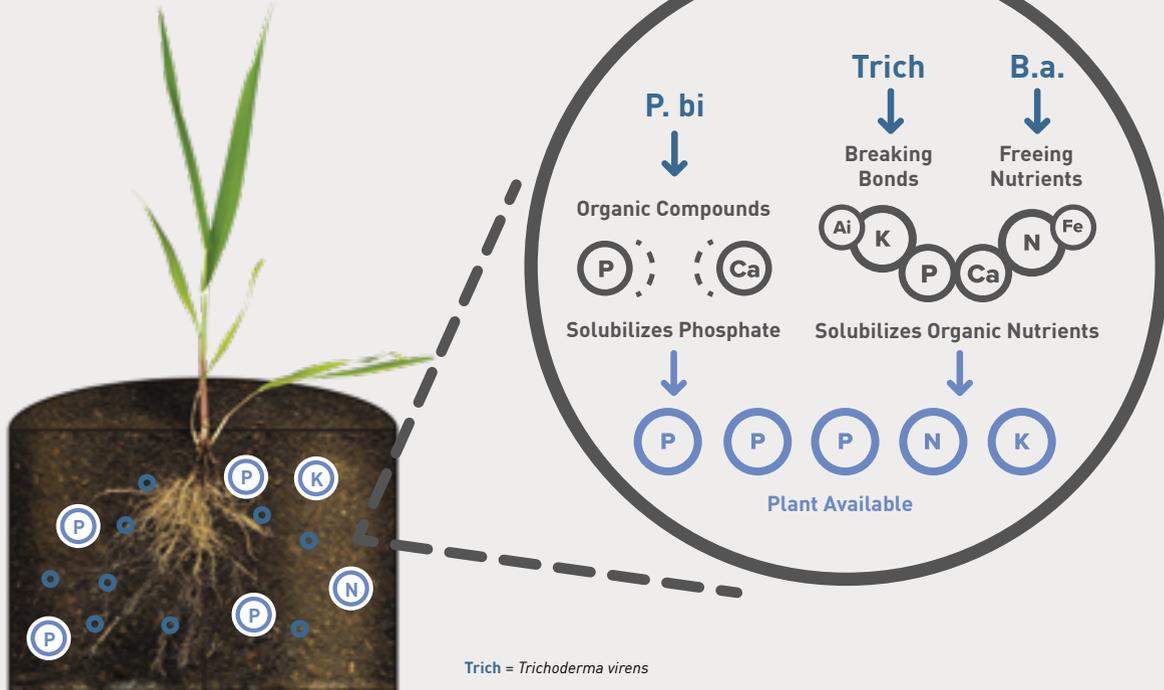
Earlier, more uniform maturity



Enhanced nutrient availability, which supports root and shoot growth

How It Works

Three biological actives for improved availability and uptake of nutrients in a variety of soil conditions.



Trich = *Trichoderma virens*
P. bi = *Penicillium bilaiae*
B. a. = *Bacillus amyloliquefaciens*

BioniQ On Winter Wheat

When it comes to a successful winter cereal crop, the beginning determines the end. Without good stand establishment in the fall, winter survival suffers and yields decline. Phosphate fertility and other key factors, including seeding date and planting depth, require careful attention to ensure a good start.

For the best winter survival, cereals must germinate uniformly in the fall and develop at least two to three leaves and crown tissue. Then, in the spring, the winter cereal plant re-grows from the crown tissue.

Development Of Root And Shoot Growth

Proper phosphate fertility helps winter cereals establish quickly and uniformly. Phosphate, which is an essential component of the energy-building process, enhances early plant development and vigorous root and shoot growth.

Better Stand Establishment

Achieving high winter wheat yields requires two critical factors: winter hardiness and rapid spring re-growth. Both factors are directly influenced by the phosphate status in the plant. Adequate phosphate nutrition promotes rapid emergence and establishment in the fall, allowing the plants to achieve optimal root and shoot growth and nutrient uptake prior to dormancy. This promotes winter hardiness and a greater probability of the crop withstanding adverse environmental conditions. A healthy, well-established stand is better able to survive over winter and is better able to exhibit rapid re-growth in the spring to set up yield potential.

Application

BioniQ comes in a wettable powder co-pack that is optimally formulated for canola and cereal crops. The product is conveniently packaged for ease of use and can be applied similar to other wettable powder inoculants in the NexusBioAg portfolio. Please read the label before application for complete use instructions.

Open package only when ready to use. Use before expiration date. Apply this product only as specified on this label. Reference the specified application rate to determine the proper amount needed for seed.

Inoculate seed on-farm by adding and thoroughly mixing the entire contents of both Active Powder A (333 g) and Active Powder B (450 g) in the appropriate amount of water (refer to Table 1) prior to or during seeding.

- BioniQ can be applied utilizing commercial on seed application equipment.
- Applicators used previously for pesticides should be triple rinsed before being used for BioniQ application.
- BioniQ can be applied up to 60 days prior to seeding (depending on seed type) and can be used with many different seed treatments. Visit nexusbioag.com for the most up-to-date information on seed treatment compatibility.

Table 1: BioniQ Wettable Powder Application

Crop	783 g co-pack		Water (litres)
	Seed treated/one 783 g co-pack		
Barley	250 bu	12,000 lb	42
Canola/mustard	10 bu	500 lb	5
Oats	250 bu	8,500 lb	42
Rye	250 bu	14,000 lb	42
Wheat	250 bu	15,000 lb	42

Product Packaging



JumpStart[®]

All Crops

Product Overview

Phosphate Fertilizer Use Efficiency

Up to 90% of applied phosphate fertilizer goes unused in the year of application as it gets tied (bound) to soil particles and other elements, making it unavailable to the crop. Some of this is used over subsequent years, but at least 25% never becomes available.¹ It is crucial to make the most efficient use of fertilizer phosphate to maximize yield potential.

JumpStart inoculant contains the naturally occurring soil fungus *Penicillium bilaiae* (*P. bilaiae*), discovered by Agriculture and Agri-Food Canada, which grows along plant roots, releasing phosphate bound in the soil, making it more readily available for the crop to use.

Penicillium bilaiae, the active ingredient in JumpStart, does not eliminate the need for phosphate fertilizer, but provides crops access to more phosphate for higher yield potential.

- JumpStart results are greatest in soils with lower levels of available phosphate and high to medium levels of bound/unavailable phosphate.
- JumpStart works at low soil temperatures when phosphate availability is normally limited.
- In independent research, JumpStart resulted in a 22% increase in the proportion of root that contained root hairs and a 33% increase in the mean root-hair length in field pea.²
- JumpStart can work in soils within a wide pH range. It is the level of available phosphate, not the pH, that determines the benefit of JumpStart.

¹ Source: Better Crops Vol. 86 (2002, No. 4), International Plant Nutrition Institute (formerly: Potash and Phosphate Institute).

² Source: *Penicillium bilaiae* inoculation increases root-hair production in field pea. Robert H. Gulden and J. Kevin Vessey. May 17, 2000.

³ Source: Phosphorous for Agriculture, International Plant Nutrition Institute (formerly: Potash and Phosphate Institute).

Factors Affecting Phosphate Availability³

Phosphate Is Less Available

- In soils containing high levels of cations, such as calcium, magnesium, iron or aluminum.
- In soils with high clay content.
- At colder soil temperatures.
- To crops with a tap root system.
- In dry soils.



Features & Benefits

Benefits To Better Phosphate Uptake With JumpStart

JumpStart inoculant promotes greater phosphate availability, which results in early vigour, greater stress tolerance and earlier, more even maturity. JumpStart improves phosphate availability to plants at the most vulnerable stages and reduces the need to seed-place high rates of phosphate fertilizer with sensitive seed like canola, pea, lentil and soybean.

Early Vigour

Cool soils, common under direct seeding or early seeding conditions, mean phosphate is less available to plants.

If early-season phosphate availability is limited, it can reduce early-season growth and, ultimately, crop yield.

Early spring conditions, including cool soils, are difficult on plants, especially when phosphate is not available. Because JumpStart is active under these conditions, phosphate availability is improved when the plant needs it.

Greater Stress Tolerance

Plants with larger healthy root systems have the ability to better withstand a variety of stresses such as drought and weed pressure. Healthy root systems help plants access moisture and nutrients more efficiently.

JumpStart increases phosphate availability in all areas of the soil that the root explores, not just around the fertilizer band, which helps promote more root growth.



Improved phosphate availability



Active in cool soil temps helping to enhance early-season vigour



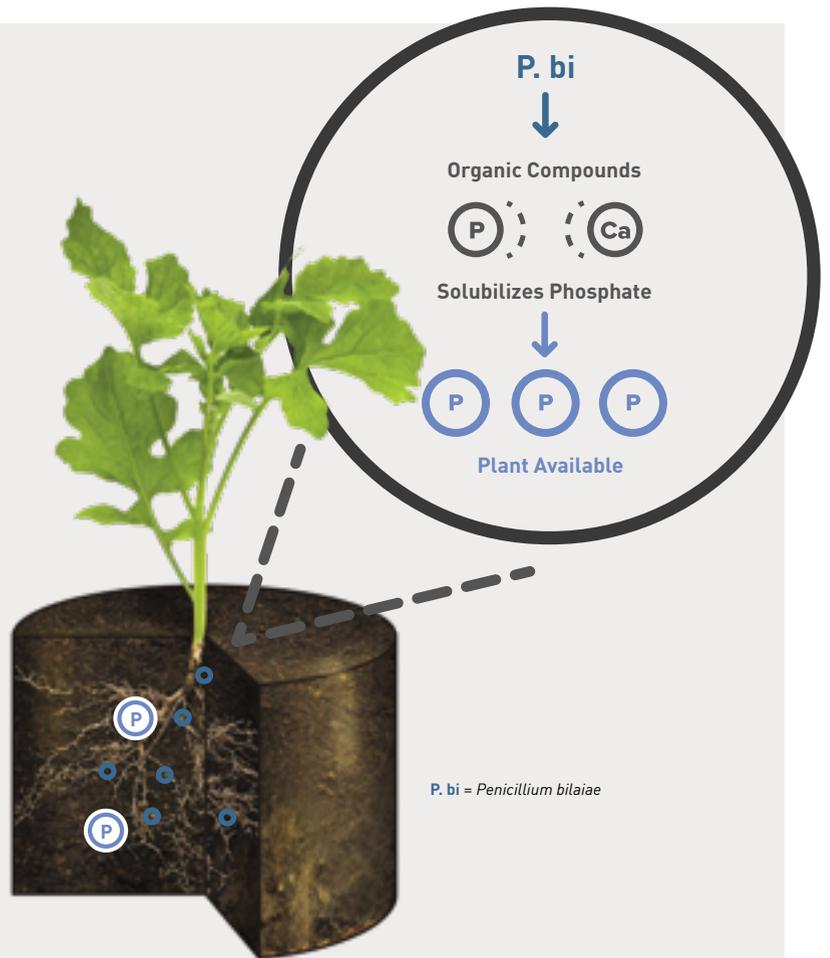
Earlier, more uniform maturity

How It Works

Naturally occurring soil fungus to release bound mineral forms of soil and fertilizer phosphate.

Freeing Phosphate

Penicillium bilaiae releases bound mineral forms of soil and fertilizer phosphate, making it more available to the plant to use.

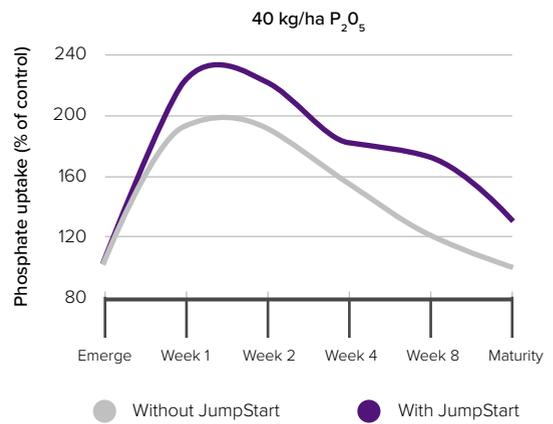
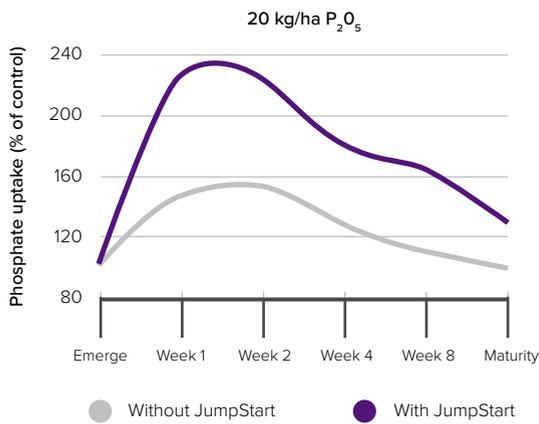
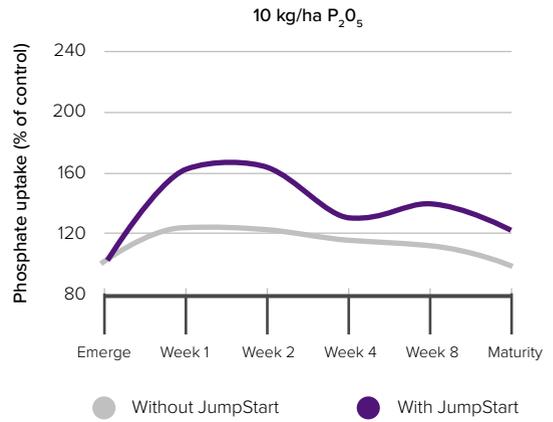
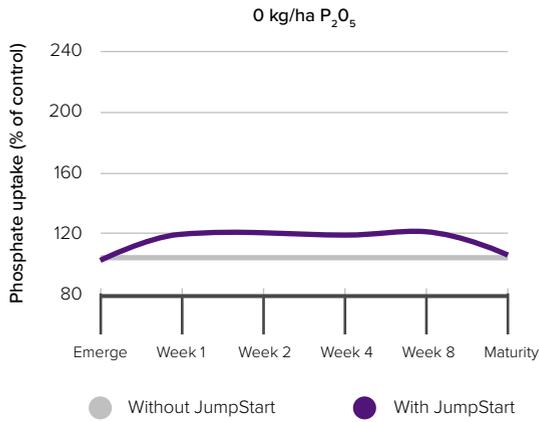


Get The Most From JumpStart

- **Seeding into cold soils:** JumpStart is active in cool soil temperatures making soil phosphate available to the plant, helping to enhance early-season vigour.
- **Seed-placed phosphate is applied more than 1.5 inches from the seed:** Phosphate fertilizer is not close enough to the seed for early-stage growth. JumpStart makes the phosphate in the soil around the seed plant available and gives the crop that pop-up effect.
- **Maturity concerns:** An adequate early-season supply of phosphate shows up at harvest time as even maturity, and a more uniform seed set. JumpStart helps ensure phosphate is available to meet early-season needs.

JumpStart increases the availability of phosphate, resulting in increased uptake by the plant

The following graphs (from University of Manitoba research), show the increase in uptake of phosphate throughout the growing season when using JumpStart on wheat.



Source: J. Chambers and J. Yeoman, MB Soc. of Soil Sci. Mfg on wheat. Six field trials on wheat, 1989-1990, University of Manitoba.



JumpStart On Winter Wheat

When it comes to a successful winter cereal crop, the beginning determines the end. Without good stand establishment in the fall, winter survival suffers and yields decline. Phosphate fertility and other key factors, including seeding date and planting depth, require careful attention to ensure a good start.

For the best winter survival, cereals must germinate uniformly in the fall and develop at least two to three leaves and crown tissue. Then, in the spring, the winter cereal plant re-grows from the crown tissue.

Development Of Root And Shoot Growth

Proper phosphate fertility helps winter cereals establish quickly and uniformly. Phosphate, which is an essential component of the energy-building process, enhances early plant development and vigorous root and shoot growth.

Better Stand Establishment

Achieving high winter wheat yields requires two critical factors: winter hardiness and rapid spring re-growth. Both factors are directly influenced by the phosphate status in the plant. Adequate phosphate nutrition promotes rapid emergence and establishment in the fall, allowing the plants to achieve optimal root and shoot growth and nutrient uptake prior to dormancy. This promotes winter hardiness and a greater probability of the crop withstanding adverse environmental conditions. A healthy, well-established stand is better able to survive over winter and is better able to exhibit rapid re-growth in the spring to set up yield potential



JumpStart On Canola

Phosphate Fertility In Canola

Ensuring phosphate is available to the plant throughout the growing season is important for high-yielding canola crops. Canola seedlings require phosphate to advance from germination through to the three and four leaf stage, as a consequence of their small seed size phosphate content in the seed can only support seedling growth for approximately one week.

Factors Limiting Phosphate Availability In Canola

- Phosphate is relatively immobile in the soil. This means phosphate must be placed within or near the seed row to be available for emerging seedlings.
- Canola is sensitive to seed-placed fertilizer. With good to excellent soil moisture, no more than 20 to 25 pounds of P_2O_5 per acre should be seed-placed.¹

¹Source: Guidelines for Safe Rates of Fertilizer Placed with Seed, Saskatchewan Ministry of Agriculture.

Benefits Of JumpStart On Canola

Increased Availability Of Soil And Fertilizer Phosphate

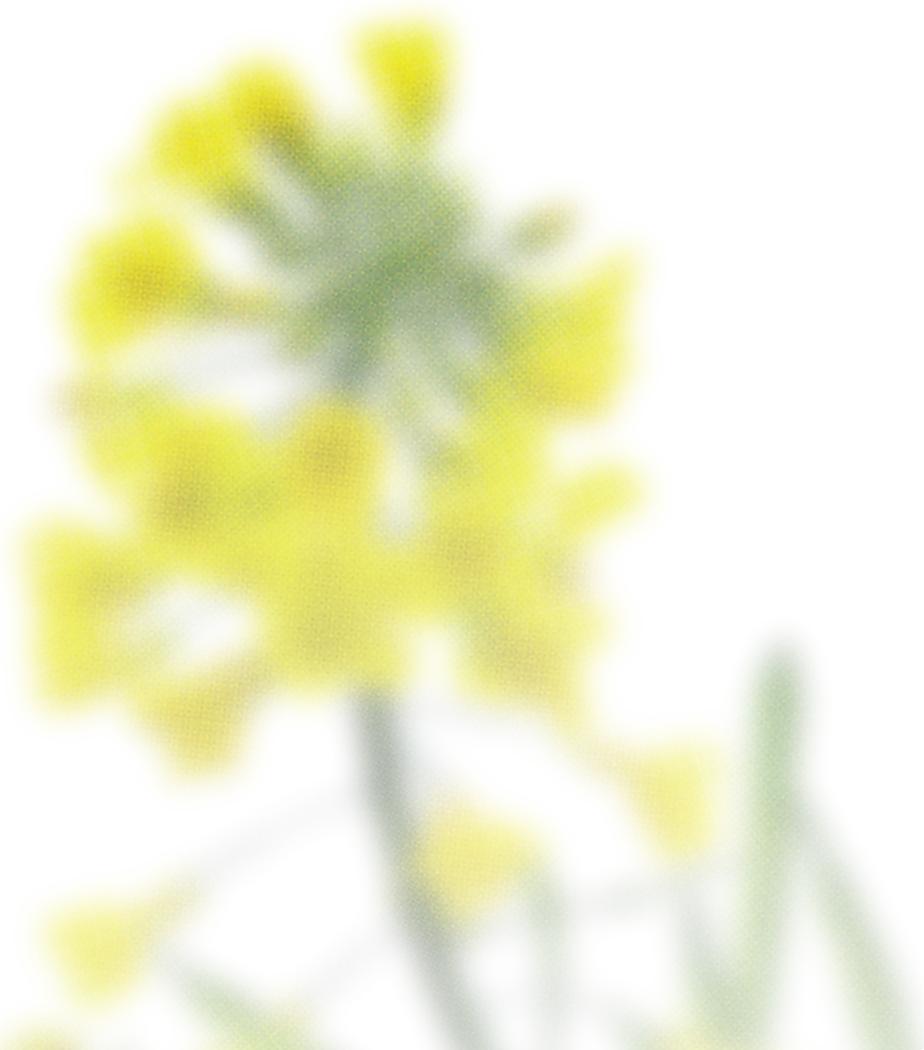
Enhanced phosphate availability results in increased root growth and increased leaf surface area. As a result, canola inoculated with JumpStart may flower earlier, have an increased number of pods and pod-bearing branches, and have earlier, more uniform maturity. Ultimately, you can help your canola crop reach its full potential.

More Even Supply Of Phosphate To Improve Crop Uniformity

A healthy uniform canola crop has more potential to withstand weed, insect and disease pressures. Timing of pesticide applications, swathing and crop dry-down are easier to assess with a uniformly developed canola crop.

Earlier Access To More Phosphate With Sensitive Seed

Top-yielding canola varieties require significant amounts of nitrogen and phosphate fertilizer to achieve their yield potential. Inoculating canola with JumpStart will help address phosphate needs with sensitive seed.



Application

JumpStart is not crop specific. JumpStart colonizes (grows along) the root system rather than infecting the root, so you do not have to purchase a specific type of JumpStart for a specific crop. Please see Table 2 on page 28 for a list of registered crops and their application rates. Please read the label before application for complete use instructions.

JumpStart Granular

JumpStart is available in a granular formulation for canola, barley, flax, mustard, oat, pea, lentil, soybean, wheat and canary seed. Application rates will vary according to row spacing; please refer to Table 1 for details.

Table 1. JumpStart Granular Application Rates

PACKAGE SIZE	18 KG (39.68 LB) BAG	
	Row spacing	lb/ac
6 in	5.5	7.2
8 in	4.1	9.7
9 in	3.6	11.0
10 in	3.3	12.0
12 in	2.7	14.7

Note: The bulk density of JumpStart granular is approximately 0.6 g/cm³ (37 lb/ft³).

JumpStart Wettable Powder

JumpStart is available as a wettable powder that is mixed into water and applied to the seed as a liquid. Once JumpStart is mixed into the water, apply to the seed within 24 hours.

Water volume rates vary according to the type of seed treated. These water volumes can be adjusted according to your application methods, as long as the correct amount of JumpStart is applied to the seed. Please see Table 2 for approximate water volume rates.

When tank mixing a seed treatment with JumpStart, the total liquid volume should equal the water volume listed in the table. Example: if you are using JumpStart on wheat, the total water volume required is 10 litres. If you are tank mixing with a seed treatment with an application rate of 5 litres per 60 bushels of wheat, then you only need to add another 5 litres of water for a total liquid volume of 10 litres per every 60 bushels of wheat treated.

Apply the JumpStart suspension to seed when transferring seed from the bin or bag to the truck, or from the truck to the tank or seed cart. Applicators used previously for pesticides should be triple rinsed before being used for JumpStart application. To improve coverage on small-seeded crops like canola, mustard, alfalfa and sweetclover, we recommend using a batch-treating system or purchasing pre-treated seed where available.

JumpStart can be applied to bare seed up to 60 days prior to seeding (depending on seed type) and can be used with many different seed treatments.

Visit nexusbioag.com for the most up-to-date information on seed treatment compatibility.



Table 2. JumpStart Wettable Powder Application

CONTAINER SIZE	400 G CONTAINER			80 G CONTAINER		
	Seed treated/container		Water (litres)	Seed treated/container		Water (litres)
	bu	lb		bu	lb	
Alfalfa/sweetclover	-	1,100	10	-	220	2
Canola/mustard	-	1,000	10	-	200	2
Chickpea	400	24,000	30	80	4,800	6
Corn	70 bags* (5,600,000 kernels)		19.6	14 bags* (1,120,000 kernels)		3.92
Dry bean	300	18,000	25	60	3,600	5
Lentil	300	18,000	25	60	3,600	5
Pea	500	30,000	40	100	6,000	8
Soybean	300	18,000	25	60	3,600	5
Wheat	300	18,000	50	60	3,600	10

*80,000 kernels per bag.

Table 3. JumpStart Wettable Powder Application

57 G (2.0 OZ) CONTAINER		
Crop	Seed treated/container	Approximate water volume
Soybean	50 units (1,135 kg, 2,500 lb, 42 bu)	3.5 litres (3.9 US quarts)

Product Packaging

All Crops



Wettable Powder

1

x

400 g bottle

=



Wettable Powder

4

x

80 g bottle

=



Granular

1

x

18 kg

=



Soybean



Wettable Powder

4

x

57 g bottle

=



QuickRoots®

Canola · Corn · Field Pea · Lentil · Small Grains · Soybean

Product Overview

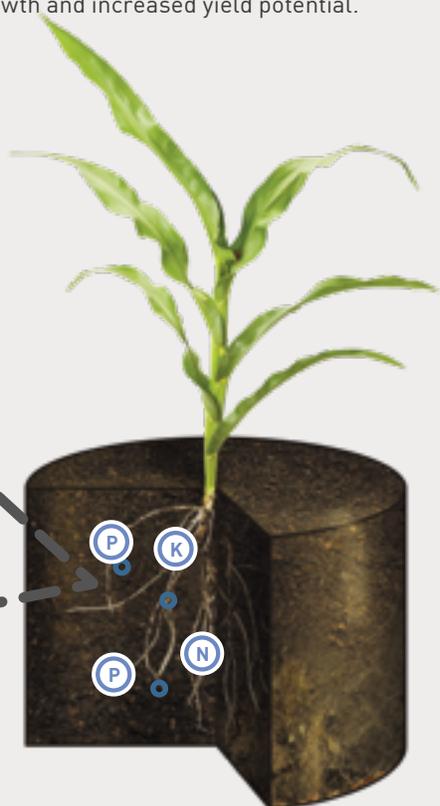
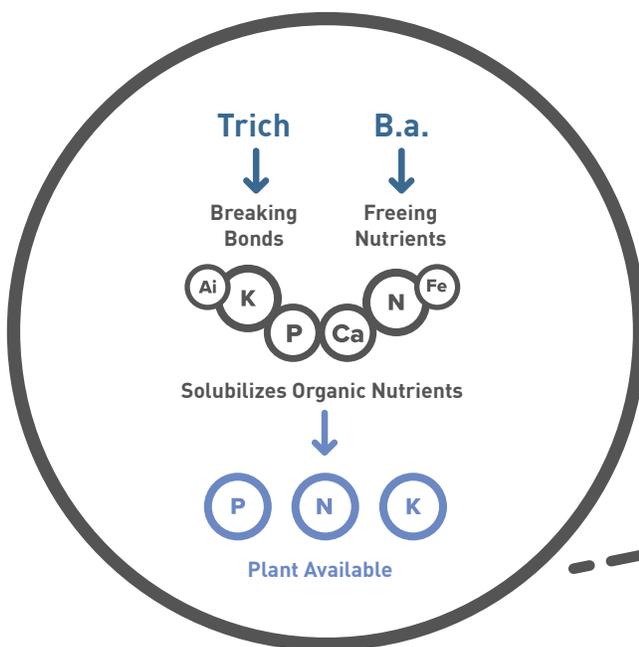
QuickRoots inoculant can improve nutrient availability and uptake. The microbial seed inoculant is available for canola, corn, field pea, lentil, small grains and soybean.

The *Bacillus amyloliquefaciens* and *Trichoderma virens* based treatment helps increase availability and uptake of nitrogen, phosphate and potassium. Its ability to release nutrients from the soil helps maximize the effectiveness of your inputs and improve your yield potential.

How It Works

Two biological actives to increase availability and uptake of nitrogen, phosphate and potassium.

- 1 The biologicals *Bacillus amyloliquefaciens* and *Trichoderma virens* have the ability to release phosphate in the soil not readily available to the plant.
- 2 Improved phosphate availability can lead to expanded root volume, which enhances nitrogen and potassium uptake.
- 3 This ultimately can enable optimal plant growth and increased yield potential.



Trich = *Trichoderma virens*

B. a. = *Bacillus amyloliquefaciens*



Features & Benefits

By growing directly on your crop's roots, QuickRoots works to improve nutrient availability and uptake. The microbial inoculant performs in a variety of soil conditions and types (including soils low in phosphate availability). This can enable optimal plant growth and increased yield potential.

NPK

Improved availability of nitrogen, phosphate and potassium



Enhanced nutrient availability, which supports root and shoot growth



Performance in a variety of soil conditions and types

QuickRoots Products

QuickRoots Wettable Powder

PRODUCT NAME	REGISTERED CROPS
Corn multi-crop	Canola, corn, cotton and sorghum
Small grains	Wheat, barley, oats, rye and spelt seed
Soybean multi-crop	Chickpea, dry bean, field pea, lentil, soybean, sugar beet, and sunflower

QuickRoots Planter Box

PRODUCT NAME	REGISTERED CROPS
Corn multi-crop	Canola, corn, cotton and sorghum

Application

Please read the label before application for complete use instructions.

QuickRoots Wettable Powder - Canola And Corn Multi-Crop (Canola, Corn, Sorghum)

CROP	PACKAGE SIZE	APPLICATION RATE	SEEDS TREATED/PACKAGE
Canola	180 g pouch	10 g/50 lb seed (bag)	18 bags
Corn	180 g pouch	7.2 g/80,000 seeds (unit)	25 units
Sorghum	180 g pouch	10 g/50 lb seed (bag)	18 bags

QuickRoots Wettable Powder - Small Grains (Wheat, Barley, Oats, Rye, Spelt Seed)

SMALL GRAINS	PACKAGE SIZE	APPLICATION RATE	SEEDS TREATED/PACKAGE
Pouch	180 g	3 g/45 kg	2,700 kg
Pail	4.5 kg	3 g/45 kg	67,500 kg

QuickRoots Wettable Powder - Pulse And Soybean Multi-Crop (Chickpea, Field Pea, Lentil, Soybean)

CHICKPEA	PACKAGE SIZE	APPLICATION RATE	SEEDS TREATED/PACKAGE
Pouch	200 g	1 g per 35,000 seeds	7 million
Pail	4.8 kg	1 g per 35,000 seeds	168 million
FIELD PEA	PACKAGE SIZE	APPLICATION RATE	SEEDS TREATED/PACKAGE
Pouch	200 g	1 g per 60,000 seeds	12 million
Pail	4.8 kg	1 g per 60,000 seeds	288 million
LENTIL	PACKAGE SIZE	APPLICATION RATE	SEEDS TREATED/PACKAGE
Pouch	200 g	1 g per 110,000 seeds	22 million
Pail	4.8 kg	1 g per 110,000 seeds	528 million
SOYBEAN	PACKAGE SIZE	APPLICATION RATE	SEEDS TREATED/PACKAGE
Pouch	200 g	4 g/unit	50 units*
Pail	4.8 kg	4 g/unit	1,200 units*

* 1 unit = 140,000 seeds

QuickRoots Dry Planter Box - Canola And Corn Multi-Crop (Canola, Corn, Sorghum)

CANOLA			
	PACKAGE SIZE	RATE (G/BAG)	BAGS TREATED
Pouch	400 g	16 g/bag	25 bags**
Pail	3.2 kg	16 g/bag	200 bags**
CORN			
	PACKAGE SIZE	RATE (G/UNIT)	UNITS TREATED
Pouch	400 g	16 g/unit	25 units***
Pail	3.2 kg	16 g/unit	200 units***
SORGHUM			
	PACKAGE SIZE	RATE (G/BAG)	BAGS TREATED
Pouch	400 g	16 g/bag	25 bags**
Pail	3.2 kg	16 g/bag	200 bags**

**1 bag = 50 lbs of seed

***1 unit = 80,000 kernels

Product Packaging

Canola and Corn Multi-Crop		Planter Box	10	X	400 g pouch	=	
		Planter Box	1	X	3.2 kg pail	=	
		Wettable Powder	10	X	180 g pouch	=	
Small Grains		Wettable Powder	10	X	180 g pouch	=	
		Wettable Powder	1	X	4.5 kg pail	=	
Pulses and Soybean Multi-Crop		Wettable Powder	10	X	200 g pouch	=	
		Wettable Powder	1	X	4.8 kg pail	=	

NEW!

Optimize[®] LV | Optimize[®] ST

Soybean

Product Overview

Breakthrough Performance For Soybeans

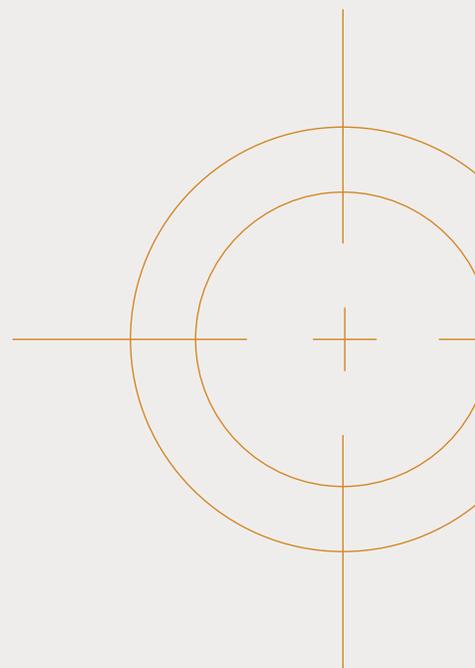
Optimize LV is a NEW concentrated formulation soybean inoculant. Optimize LV has the same biological actives, performance and benefits as Optimize ST, with a new lower application rate of 98 ml/100 kg (1.5 fl oz/100 lb).

Our Optimize products are retailer-applied dual-action products that deliver the benefits of a specially selected *Bradyrhizobium japonicum* inoculant along with LCO (lipochitooligosaccharide) technology – helping to improve your crop’s potential by enhancing nutrient availability.

With Optimize, the plant does not need to wait for the LCO signal as it is delivered on the seed, potentially reducing the time required for this process to occur naturally and therefore, accelerating nodulation and nitrogen fixation to the young crop.

What Is LCO Technology?

LCO is a molecule involved in the rhizobia legume nodulation process. When the LCO molecule is present at the time of planting, it allows for the nodulation process to begin, independent of variety, soil and environmental conditions. The benefit of earlier nodulation initiation is earlier nitrogen availability to the plant, which supports plant growth such as root and shoot development. The result of this early-season activity is better plant performance. LCO is an important component in nodulation as a key driver in the communication between plants and rhizobia.





Comparing Optimize LV and Optimize ST

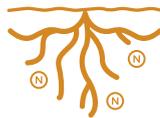
	'New' Optimize LV	Optimize ST
Actives		<i>Bradyrhizobium japonicum</i> LCO (lipochitoooligosaccharide) technology
Planting Window	220-day on seed stability with additional extender* for key seed treatments, otherwise 120-day on seed stability	
Application Rate	98 ml/100 kg (1.5 fl oz/100 lb)	182 ml/100 kg (2.8 fl oz/100 lb)
Package Size	2 x 0.686 L Optimize LV liquid, plus 0.4 L Liquid Additive	2 x 1.6 L Optimize ST liquid, plus 2 x 475 ml Liquid Additive
Seeds Treated	80 units (4,000 lb)	100 units (5,000 lb)
Package Size	6.9 L Optimize LV liquid, plus 2 L Liquid Additive	12.8 L Optimize ST liquid, plus 3.8 L Liquid Additive
Seeds Treated	400 units (20,000 lb)	400 units (20,000 lb)

The Difference

Features & Benefits



Broad seed treatment compatibility with 220-day on seed stability with additional extender for key seed treatments, otherwise 120-day on seed stability



Greater opportunity for the development of nitrogen-fixing nodules with LCO



Enhanced nutrient capability, which supports root and shoot growth



46% lower application rate than Optimize ST means even more space on seed for other additives

How It Works

Dual-action inoculant to enhance nutrient availability and development of nitrogen-fixing nodules.

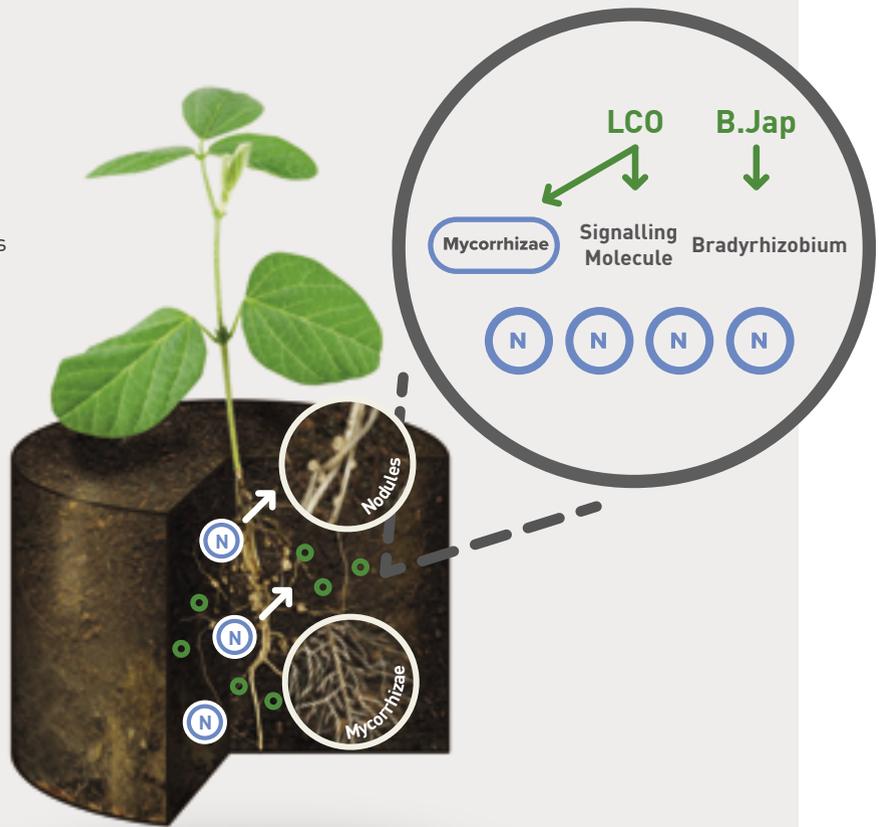
- 1 Needing nitrogen, the plant releases flavonoids to signal rhizobia.
- 2 Sensing the flavonoids, the rhizobia signal LCO back to the plant.
- 3 The plant can respond to the LCO, allowing the rhizobia to infect its roots.
- 4 This symbiotic relationship creates nodules, which can help fix atmospheric nitrogen.

LCO = Lipochitooligosaccharide

- Stress Mitigation
- Enhances Nodulation
- Increases Association with Mycorrhizae

B.Jap = *Bradyrhizobium japonicum*

- Fixes Nitrogen



Double Inoculate Your Soil To Help Maximize Yield Potential

Land that has been through less than ideal growing conditions, or has not had soybeans for a few years, requires special attention when it comes to inoculation. Double inoculation can help quickly establish high populations of rhizobia bacteria to help ensure the best possible nodulation and soybean performance. Land with a history of longer soybean rotations, or land with a history of flooding or longer periods of drought, is not conducive to rhizobia survival. It is in these soils that farmers will benefit greatly from the application of two formulations of inoculant.

Seed-applied inoculants tend to form nodules closer to where the seed is located (closer to the primary root); in-furrow applied granular inoculants tend to form nodules on the secondary or lateral roots. Combining the two formulations allows for wider distribution of nodules along the whole root system.

For best results, you may apply Optimize LV or Optimize ST with Cell-Tech or TagTeam. Consult your local NexusBioAg representative or local retailer for a customized inoculant approach.

Application

Optimize is applied to soybean seed by retailers. Please contact your seed retailer to order. Please read the label before application for complete use instructions.

Table 1. Optimize LV Liquid Application

PACKAGE SIZE AND CONTENTS	AMOUNT OF SEED TREATED /INDIVIDUAL CASE	
2 x 0.686 Optimize LV liquid, plus 1 x 0.4 L Liquid Additive	80 units	4,000 lb
6.9 L Optimize LV liquid, plus 2 L Liquid Additive	400 units	20,000 lb

Table 2. Optimize ST Liquid Application

PACKAGE SIZE AND CONTENTS	AMOUNT OF SEED TREATED /INDIVIDUAL CASE	
2 x 1.6 L Optimize ST liquid, plus 2 x 475 ml Liquid Additive	100 units	5,000 lb
12.8 L Optimize ST liquid, plus 3.8 L Liquid Additive	400 units	20,000 lb

Product Packaging

Optimize LV Soybean		Liquid	1	x	6.9 L pouch + 2 L jug (liquid additive)	=	
		Liquid	5	x	2 x 0.686 L pouches + 1 x 0.4 L jugs (liquid additive)	=	
Optimize ST Soybean		Liquid	1	x	12.8 L pouch + 3.8 L jug (liquid additive)	=	
		Liquid	4	x	2 x 1.6 L pouches + 2 x 475 ml jugs (liquid additive)	=	

Cell-Tech®

Lentil · Pea · Soybean

Product Overview

Nitrogen-Fixing Inoculant

Cell-Tech inoculant is a single-action product that contains specially selected rhizobia that can provide effective nodulation to enhance nitrogen-fixation, even in cooler soils – increasing yield potential as planting conditions change.

If phosphate is limited, Cell-Tech can be applied at the same time as JumpStart, for improved phosphate uptake.

Cell-Tech Is Available In The Following Formulations

CROP	INOCULANT SPECIES	CELL-TECH FORMULATIONS AVAILABLE
Pea, Lentil	<i>Rhizobium leguminosarum</i>	Liquid, peat, non-sterile peat and granular
Soybean	<i>Bradyrhizobium japonicum</i>	Liquid, peat, and granular

Application

Please read the label before application for complete use instructions.

Cell-Tech Pea/Lentil liquid

Cell-Tech liquid should be applied directly to pea or lentil seed at a rate of 2.5 fluid ounces per bushel (60 lb) of seed (75 ml/27 kg) or 2.1 fluid ounces per 50 pounds (63 ml/23 kg). The planting window for Cell-Tech liquid on bare pea or lentil seed is 48 hours.

Cell-Tech Soybean Liquid

Cell-Tech liquid should be applied directly to soybean seed at a rate of 2.5 fluid ounces per bushel (60 lb) of seed (75 ml/27 kg) or 2.1 fluid ounces per 50 pounds (63 ml/23 kg) of seed. The planting window for Cell-Tech liquid on bare soybean seed is four days. Cell-Tech liquid can be applied with other seed treatments, but the planting window may be reduced. Visit nexusbioag.com for more details.



Table 1. Cell-Tech Liquid Application

CELL-TECH LIQUID	BAG SIZE	ONE BAG INOCULATES		
		Crop	Litres	Units
Pea, Lentil	3.0	-	40.0	2,400
	9.8	-	130.0	7,840
Soybean	3.1	50	41.7	2,502
	12.5	200	167.0	10,000

Cell-Tech Peat

Cell-Tech peat has its own sticker in the formulation so no additional stickers are required. Apply Cell-Tech dry to pre-moistened seed, or add water while applying Cell-Tech, or mix with cool, clean water and apply to seed as a slurry (refer to Table 2). Make sure that inoculated seed is evenly coated. Inoculate bare seed with Cell-Tech peat up to 48 hours before seeding.

Table 2. Cell-Tech Peat Application

CELL-TECH PEAT		ONE 2.2 KG (4.8 LB) BAG INOCULATES			WATER
Crop	Unit	bu	lb	litres	
Pea	-	50	3,000	4.0	
Lentil	-	30	1,800	2.5	

CELL-TECH PEAT		ONE 2.32 KG (5.1 LB) BAG INOCULATES			WATER
Crop	Unit	bu	lb	litres	
Soybean	30	25	1,500	N/A	

Cell-Tech NS (Non-Sterile) Peat

Cell-Tech NS peat has its own sticker in the formulation. A separate sticker is not needed. Apply Cell-Tech NS onto seed in the drill box and mix thoroughly until uniformly coated. Layering seed and inoculant while mixing will provide thorough coating of all seeds. Inoculate bare seed with Cell-Tech NS peat up to 48 hours prior to seeding.

Table 3. Cell-Tech NS (Non-Sterile) Peat Application

CELL-TECH NS PEAT	ONE 2.83 KG (6.2 LB) BAG INOCULATES	
	bu	lb
Crop		
Pea	25	1,500
Lentil	25	1,500

Cell-Tech and Cell-Tech NS peat can be used with different seed treatments, but planting windows vary according to type of seed treated and seed treatment used. Visit nexusbioag.com for the most up-to-date seed treatment compatibility information.

Cell-Tech Granular

Cell-Tech granular should be applied directly with the seed in the seed row using a granular tank for application. Application rates vary according to row spacing (refer to Table 4 below).

- Fill tank to match or slightly exceed seed requirements.
- Do not overfill tank to avoid compaction.
- Pour into tank through a screen.
- If augering, please do so at low speeds to avoid damage to Cell-Tech granular.
- Do not mix Cell-Tech granular in the same tank with seed or fertilizer.
- Do not leave Cell-Tech granular in the tank overnight as condensation can cause lumps to form.

Table 4. Cell-Tech Granular Application Rates

Package size	CELL-TECH PEA/LENTIL			CELL-TECH SOYBEAN		
	Application rate	18.0 kg bag	454 kg bag	Application rate	18.0 kg bag	454 kg bag
	lb/ac	ac/bag	ac/bag	lb/ac	ac/bag	ac/bag
7 in	6.6	6.1	151.7	6.2	6.5	161.5
8 in	5.8	6.9	172.6	5.4	7.3	185.4
9 in	5.1	7.8	196.3	4.7	8.4	213.0
10 in	4.6	8.7	217.6	4.3	9.3	232.8
12 in	3.8	10.5	263.4	3.6	11.0	278.1
15 in	3.1	13.3	333.7	2.9	13.8	345.2
24 in	-	-	-	1.8	22.2	556.1
30 in	-	-	-	1.4	28.6	715.0

Note: The bulk density of Cell-Tech granular is approximately 0.6 g/cm³ [37 lb/ft³].

Product Packaging

Pea/Lentil

	Peat	7	x	2.2 kg bag	=	
	Non-sterile peat	4	x	2.83 kg bag	=	
	Granular	1	x	18 kg	=	
	Granular	1	x	454 kg	=	
	Liquid	4	x	3 L	=	
	Liquid	1	x	9.8 L	=	

Soybean

	Peat	7	x	2.32 kg bag	=	
	Granular	1	x	18 kg	=	
	Granular	1	x	454 kg	=	
	Liquid	4	x	3.1 L	=	
	Liquid	1	x	12.5 L	=	

Nitragin® Gold

Alfalfa · Clover · Sweetclover

Product Overview

Nitragin® Gold inoculant was developed for bulk treatment by the seed processor. It is a one-step system that provides a convenient and economical inoculant for your customers.

Order your alfalfa, sweetclover or clover seed pre-treated with Nitragin Gold.



Nitragin Gold alfalfa/sweetclover is OMRI Listed for organic use. It does not contain any genetically modified organisms, sludge or waste-derived products.

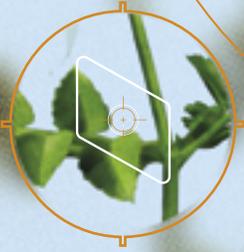
Note: Nitragin Gold clover is not OMRI Listed.

Benefits Of Nitragin Gold Inoculant

- **Yield:** Specially selected natural rhizobia strains result in high levels of nitrogen fixation for maximum yield potential.
- **Super seed adhesion:** Micron-sized particles provide optimal seed adhesion and minimal “dusting off”.
- **Quality assurance:** Drying system assures customers of high rhizobia levels on the seed.
- **Apron® XL /Allegiance® FL compatible:** Compatibility with Nitragin Gold alfalfa/sweetclover and Apron XL and Allegiance FL seed treatments will allow the combined benefits of an inoculant and a fungicide where required.

Note: Nitragin Gold clover is not compatible.

Time on seed for alfalfa and sweetclover is 24 months and 12 months on clover. If you need more information or have questions about Nitragin Gold, visit nexusbioag.com



Product Packaging

**Alfalfa/
Sweetcover**



Clay Powder

1

x

19 kg

=



Clover



Clay Powder

1

x

19 kg

=



Micronutrients

All Crops

Element Overview

Nutrients play an important role in plant growth. When critical elements are deficient or not available, growth and yield is compromised. German organic chemist Justus von Liebig discovered the law known as *Law of the Minimum*: plant growth – and thus yield – will be poor if just one nutrient is deficient, even if all other factors and nutrients are adequate. Plant growth is improved when the supply of the scarcest nutrient is increased.

NexusBioAg has a portfolio of products to help provide the most essential nutrients for healthy, productive plants.

NexusBioAg Has Three Categories Of Nutrients:

- Granular micronutrients – applied to the soil
 - This category includes three chelated solutions for copper, zinc, and manganese
- Liquid micronutrients – usually applied to the soil
- Foliar micronutrients – applied to the plant foliage

Elements

B

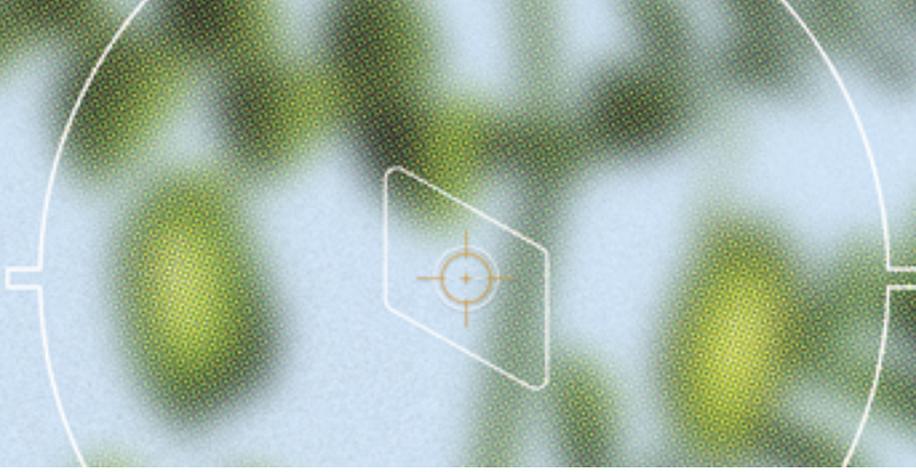
BORON

- Essential for all plant growth, aiding in the transfer of sugars and nutrients from leaves to fruit, and for specific functions in yield production by increasing pollination and seed development.
- An important nutrient for root growth, cell division, and is key for optimum pod production.
- Its main function is for plant cell division (growth) in early growth stages.
- Plants have high requirements for boron during reproductive growth, specifically pollination and seed set.

Cu

COPPER

- Essential for cell wall strength, specifically in the anther where the viability of pollen formation is crucial to the yield of the plant.
- Important for chlorophyll production, protein synthesis, respiration, and the efficient use of nitrogen.
- It's essential for standability and the metabolism of carbohydrates and proteins.
- Required for respiration within the plant.



Zn

ZINC

- Essential in a wide range of plant functions as an enzyme co-factor, in protein synthesis and protein structure, hormone regulation, early root development, energy production, and is key for seed formation.
- Plants have a high requirement for zinc during seed development and formation.
- Necessary for chlorophyll and carbohydrate production.
- Deficiencies result in stunting and reduced seed set

Mg

MAGNESIUM

- Vital for the photosynthesis process and is a building block of chlorophyll.
- Highly involved in nitrogen uptake.
- Plays a critical role in chlorophyll synthesis with nitrogen.
- An enzyme activator.
- Deficiencies result in reduced yield and great susceptibility to plant disease.

Fe

IRON

- Essential for plant respiration, photosynthesis, and enzyme reactions in all crops.
- An important component of the enzymes used by nitrogen-fixing bacteria in legume crops.

Mn

MANGANESE

- Essential in enzyme systems, photosynthesis, and root growth.
- Important in the synthesis of lignin for strength and stiffness of plant cell walls.

S

SULPHUR

- Has many critical functions in the plant, including the formation of chlorophyll, which is essential for photosynthesis.
- Important for yield and crop quality, and essential for enzyme activation, nitrogen metabolism; in oilseeds, sulphur is crucial for oil synthesis.
- The majority of sulphur in crops is as a constituent of three S-containing amino acids (cysteine, cystine, and methionine), which are the building blocks of protein.

Mo

MOLYBDENUM

- Its main function is to convert unusable nitrogen forms to plant-available forms.
- It is required for nitrogen fixation in pulses.
- Critical for early growth at internode elongation.

NexusBioAg Micronutrients

NexusBioAg has a range of micronutrients available, in both sulphate and oxy-sulphate forms. Sulphate form supplies nutrients to the plant when applied. Oxy-sulphate form supplies nutrients for immediate plant availability while helping with soil buildup and extended plant needs.

- Our low analysis micronutrient products ensure a better distribution throughout the fertilizer blend.
- With optimum water solubility, the products provide excellent plant availability.
- Compatible with all fertilizer blends.

The 3 Forms Of Granular Micronutrients

Not All Micronutrients Are Made Equal - The Importance of Solubility

The key to any fertilizer is how much of it is available to the plant in that growing year. Yield increases are the result of nutrient application in a plant-available form when applied at the appropriate rate and at the right time and place.

Plants are only able to take up nutrients that have been dissolved into the soil solution. This makes it imperative to evaluate the solubility of the fertilizer product to ensure the crop is receiving the necessary nutrients. Applying a low-solubility (i.e. less than 30% water soluble) micronutrient has very little benefit to the crop in the year of application and may result in that crop showing symptoms of micronutrient deficiency.

Forms Of Granular Micronutrients

Sulphates

- 100% water soluble and highly available to the crop in the year of application.
- Quickly provides nutrients to plants and soil building.

Oxides

- Relatively insoluble, making them unavailable to the crop in the year of application.
- Used to build soil nutrient levels on a long-term basis rather than to correct deficiencies in the year of application.

Oxy-Sulphates

- Combination of oxides and sulphates within the same granule.
- Availability in the year of application is dependent on the balance of sulphate and oxide nutrients.
- Effective in the correction of current deficiencies and in longer term soil building.

Application Of Granular Micronutrients

When soil tests identify a deficiency for the upcoming cropping season, a sulphate or oxy-sulphate granular micronutrient should be used to ensure the crops have sufficient nutrition for maximum yield potential. When it comes to copper, zinc, and manganese, placement is key as these nutrients only move through diffusions (even in their soluble sulphate form). The granules should be placed in the seed row – or in close proximity to the seed row – to ensure the plant roots intercept these feeding sites.

Levels In Soil (ppm)

	DEFICIENT*	MARGINAL*	ADEQUATE
Copper	0.0-0.3	0.3-1.0	1.0+
Zinc	0.0-0.5	0.5-1.0	1.0+
Iron	0.0-2.0	2.0-4.5	4.5+
Manganese	0.0-1.0	-	1.0+

*Soil micronutrient range levels

All three forms of granular micronutrients have a place for specific circumstances within a cropping system – it is vital to choose the correct form of micronutrient that will lead to the desired results.

F-212G

12.5% Copper

Barley · Wheat

Product Overview

Copper (Cu) 12.5%
Zinc (Zn) 4.5%
Sulphur (S) 4.5%

F-212G is a homogenous grade of copper oxide and copper sulphate with a low analysis to insure a better distribution throughout the fertilizer blend.

Key Benefits At A Glance

- F-212G has optimum water solubility providing excellent plant availability and compatibility with all fertilizer blends.
- Supplies an initial amount of copper sulphate for immediate needs and copper oxide for soil buildup and extended plant needs.
- A homogenous blend with a low analysis, to insure a better distribution and maximum feeding sites throughout the field.

Elements



Application

- Normal bulk blending procedures.
- This product is to be used in N-P-K blended fertilizer for soil application.
- Apply in the seed row or in close proximity to the seed row.
- 8 lbs of product = 1 lb actual copper.
- Use F-212G to match analysis where higher amounts of copper are needed.

How it works

- 1 Copper diffuses outside of granule up to 1/2".
- 2 This creates a 1" sized feeding site.
- 3 With root interception of the feeding site the plant will receive enough copper for that year.
- 4 Remaining copper is used for soil building for future crops.



All Crops

Product Overview

Boron (B) 15%

Granubor provides boron to meet the crop's demands during the growing season providing immediate availability of boron and supply for extended plant needs.

Key Benefits At A Glance

- The ore is dissolved in water and re-crystallized, removing any impurities and creating an extremely pure natural product.
- Sodium based boron is nearly 100% water soluble.
- Granubor is OMRI Listed for organic use.



Element



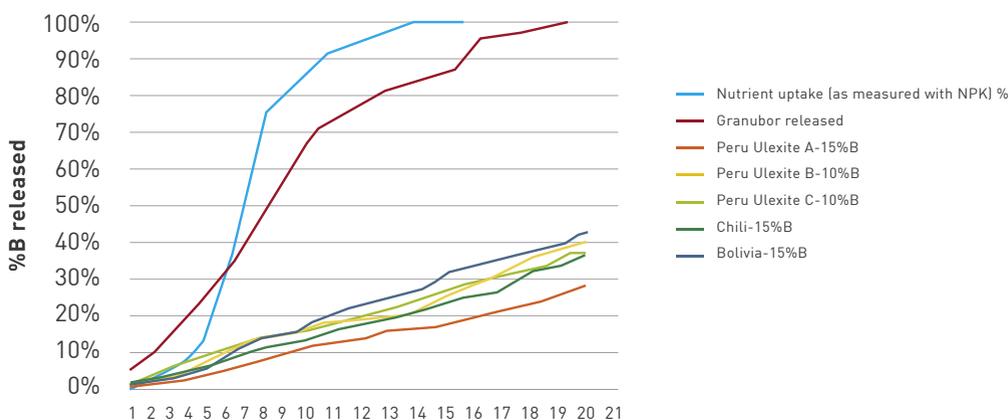
Application

- Use Granubor to match analysis where higher amounts of boron are needed.
- Can be broadcast, banded or seed placed.
- 7 lbs of product = 1 lb actual.
- If Granubor is seed placed a maximum of 7 lbs per acre of product should be used.

Agronomic consideration: A granular boron with 100% solubility that provides excellent boron plant availability. Compatibility with all fertilizer blends and provides immediate availability of boron and extended plant needs.

Handling and blending considerations: Normal bulk blending procedures. Use Granubor to match analysis where higher amounts of boron are needed.

Canola



F-156G

36% Magnesium

All Crops

F-227G

40% Iron

All Crops

Product Overview

Magnesium (Mg) 36%

F-156G is a moderately high analysis granular product for correcting magnesium deficiencies in the soil.

Key Benefits At A Glance

- A form of magnesium that resists leaching.
- Partly acidulated for immediate plant availability with the remaining magnesium in an oxide form to build soil magnesium reserves.
- Especially suitable for providing additional magnesium to grazing areas for livestock in areas susceptible to "grass tetany".

Element



Application

- Use according to soil test.
- The usual range of application is from 10 to 50 lbs magnesium per acre in bulk applications, or 2 to 5 lbs magnesium per acre in a blended starter fertilizer.
- Normal bulk blending procedures.

Product Overview

Iron (Fe) 40%

F-227G is a high analysis granular product used for short-term correction of poor plant uptake of soil iron.

Key Benefits At A Glance

- Proactive prevention of deficiency in the plant is a better agronomic practice than trying to correct chlorosis once it appears.
- An acidic granule for solubilized iron is rapidly changed to insoluble phosphates, carbonates and bicarbonates.

Element



Application

- Soil application as part of an N-P-K blend.
- 2.5 lbs of product = 1 lb actual.
- Normal bulk blending procedures.

Agronomic considerations: Prevention of deficiency in the plant is a better practice than trying to correct chlorosis once it appears.

WARNING

This product will stain sidewalks and pools.

It must be swept off before moisture reaches product.

This product will "set-up" in storage or in final product.

F-287G

28% Manganese

All Crops

F-420G

20% Zinc

All Crops

Product Overview

Manganese (Mn) 28%
Sulphur (S) 6%

F-287G is a high analysis granular product for correcting manganese deficiencies in the soil.

Key Benefits At A Glance

- Partly acidulated for rapid plant availability with the remaining manganese in finely divided oxide form for building soil reserves.
- F-287G is a form of manganese that resists leaching and resists conversion to unavailable forms.
- Approximately 40% water soluble.

Elements



Application

- Use product according to soil test.
- Typical broadcast rates are 4 to 20 lbs manganese per acre or about 1–4 lbs manganese per acre in the seed row.
- Soil application as part of an N-P-K blend.
- Normal bulk blending procedures.

Product Overview

Zinc (Zn) 20%
Sulphur (S) 8%

F-420G is a homogeneous grade of zinc sulphate and zinc oxide with a low analysis to insure a better distribution throughout the fertilizer blend and in the field.

Key Benefits At A Glance

- Optimum water solubility provides excellent plant availability.
- Supplies initial plant needs with zinc sulphate and provides zinc oxide for soil buildup and extended plant needs.
- Compatibility with all fertilizer blends.

Elements



Application

- This product is to be used in N-P-K blended fertilizer for soil application.
- 5 lbs of product = 1lb actual.
- Normally apply at a minimum of 2 lbs of actual zinc, 10 lbs of product per acre.
- Normal bulk blending procedures. Use F-420G to match analysis where higher amounts of zinc are needed. Apply in the seed row or in close proximity.

F-425G

25% Zinc

All Crops

Nexus^{Zinc Sulphate} Granular

All Crops

Product Overview

Zinc (Zn) 25%
Sulphur (S) 8%

F-425G is a homogeneous grade of zinc sulphate and zinc oxide with a low analysis to insure a better distribution throughout the fertilizer blend and in the field.

Key Benefits At A Glance

- Product analysis of 25% zinc will supply initial amount of zinc sulphate for immediate plant availability, and zinc oxide for soil buildup and extended plant needs.
- Low analysis zinc for excellent field distribution which enhances nutrient uptake at low application rates.
- Optimum water solubility provides excellent plant availability and compatibility with all fertilizer blends.

Elements



Application

- This product is to be used in N-P-K blended fertilizer for soil application.
- Use 4 lbs of F-425G for every pound of zinc required to meet needs.
- Normally apply at a minimum of 2 lbs of actual zinc, 8 lbs of product per acre.
- Normal bulk blending procedures. Use F-425G to match analysis where higher amounts of zinc are needed. Apply in the seed row or in close proximity to the seed row.

Product Overview

Zinc (Zn) 35.5%
Sulphur (S) 18%

Nexus Zinc Sulphate Granular is a micronutrient fertilizer to be used where soil or leaf analysis has indicated a deficiency to exist.

Key Benefits At A Glance

- Optimum water solubility provides excellent plant availability.
- Product analysis of 35.5% zinc for use in blends will supply initial amount of zinc sulphate for immediate needs, and zinc oxide for soil buildup and extended plant needs.

Elements



Application

- 2.8 lbs of product = 1 lb actual.
- Normally apply at a minimum of 3 lbs of actual zinc, 8.45 lbs of product per acre.
- Normal bulk blending procedures. Use Nexus Zinc Sulphate Granular to match analysis where higher amounts of zinc are needed. Apply in the seed row or in close proximity to the seed row.
- Nexus Zinc Sulphate Granular may cause quality issues in high nitrogen/sulphur blends.

Nexus Copper

7.5% EDTA

All Crops

Nexus Zinc

9% EDTA

All Crops

Product Overview

Copper (Cu) 7.5%

Key Benefits At A Glance

Nexus Copper 7.5% EDTA is a fully chelated solution of copper EDTA and is recommended for the prevention and correction of copper deficiency in crops.

Rates

Nexus Copper 7.5% EDTA Rates - Soil Applied

RATE	PRODUCT LITRES/ACRE	ACTUAL CU/ACRE (LBS)	ACRE PER 10 LITRES
Low rate	0.5	0.11	20
Medium low rate	0.66	0.15	15
Medium high rate	0.75	0.17	13
High rate	1	0.22	10

Element



Application

For soil application in combination with liquid fertilizer blends.

General recommendations: Use rates vary from 0.5 litres to 1 litre/acre, depending on copper deficiency.

Handling and blending considerations: Best practice is to add the Nexus Copper 7.5% EDTA into the blend after the UAN, then the phosphate product, followed by the liquid sulphur. Do not exceed the sulphur product by more than 10% of the total blend.

Product Overview

Zinc (Zn) 9%

Key Benefits At A Glance

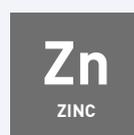
Nexus Zinc 9% EDTA is a fully chelated solution of zinc EDTA and is recommended for the prevention and correction of zinc deficiencies in crops.

Rates

Nexus Zinc 9% EDTA Rates - Soil Applied

RATE	PRODUCT LITRES/ACRE	ACTUAL ZN/ACRE (LBS)	ACRE PER 10 LITRES
Low rate	0.5	0.13	20
Medium low rate	1	0.26	10
Medium high rate	1.5	0.39	6.67
High rate	2	0.52	5

Element



Application

For soil application in combination with liquid fertilizer blends.

General recommendations: Use rates vary from 0.5 litres to 2 litres/acre, depending on zinc deficiency.

Handling and blending considerations: For blending with liquid fertilizer products. Order of adding products or the amount of various products does not matter.

Nexus Liquid

10% Boron

All Crops

Nexus Manganese

5% EDTA

All Crops

Product Overview

Boron (B) 10%

Key Benefits At A Glance

Nexus Boron 10% is an effective, readily available source of boron for soil and foliar applications to crops.

Rates

Nexus Boron 10% Rates - Soil Applied

RATE	PRODUCT LITRES/ACRE	ACTUAL B/ACRE (LBS)	ACRE PER 10 LITRES
Low rate	0.5	0.15	20
Medium rate	0.75	0.2	13.33
High rate	1	0.3	10

Element

B

BORON

Application

Compatible with and may be applied in water or mixed with most liquid fertilizers, micronutrients, or crop production products.

General recommendations: Usage rates vary from 0.5 litres to 1 litre/acre, depending on boron deficiency.

Handling and blending considerations: For blending with liquid fertilizer products. The order in adding products or amounts does not matter.

Product Overview

Manganese (Mn) 5%

Key Benefits At A Glance

Nexus Manganese 5% EDTA is a fully chelated solution of manganese EDTA and is recommended for the prevention and correction of manganese deficiency in crops.

Rates

Nexus Manganese 5% EDTA Rates - Soil Applied

RATE	PRODUCT LITRES/ACRE	ACTUAL MN/ACRE (LBS)	ACRE PER 10 LITRES
Low rate	0.75	0.1	13.33
Medium low rate	1	0.13	10
Medium high rate	1.5	0.2	6.66
High rate	2	0.26	5

Element

Mn

MANGANESE

Application

The preferred use is as a soil application to prevent deficiency and may also be used as a foliar spray to provide correction when a soil application is impractical.

General recommendations: Use rates vary from 0.75 litres to 2 litre/acre, depending on manganese deficiency.

Handling and blending considerations: For blending with liquid fertilizer products. The order in adding products or amounts does not matter.

YieldMax Liquid

10-10-10

All Crops

Product Overview

Nitrogen (N) 10%
Phosphate (P) 10%
Potassium (K) 10%
Boron (B) 0.05%
Copper (Cu) 0.05%
Manganese (Mn) 0.05%
Molybdenum (Mo) 0.0005%
Zinc (Zn) 0.05%

Complete package of macro and micronutrients which are essential building blocks to maximize yield potential. Feed the need with a foliar application of YieldMax.

Key Benefits At A Glance

- Variable rates to meet the specific nutrient needs of the crop.
- Flexible foliar application, compatible with crop protection products, with other fertilizers or can be applied alone.
- Flexible application by ground sprayer, airplane or overhead sprinklers.

Rates

YieldMax 10-10-10 liquid rates - foliar

RATE	LITRES/ACRE
Regular rate	3
Pea rate	1.5

Elements



Application

YieldMax Liquid may be applied by ground sprayer, airplane or overhead sprinklers. YieldMax Liquid (10-10-10) is recommended for use as a source of plant nutrients in a fertilization program that relates to the fertility of the soil.

A normal rate of this product is 3.5 pounds per acre (5.61 kg/ha). YieldMax Liquid should be mixed with between 10 liters/ac and 100 liters/ac of water. YieldMax Liquid may be applied many times throughout the growing season. Applications are generally 10 to 14 days apart.

YieldMax WS

18-20-20

All Crops

Product Overview

Nitrogen (N) 18%
Phosphate (P) 20%
Potassium (K) 20%
Boron (B) 0.08%
Copper (Cu) 0.15%
Manganese (Mn) 0.1%
Molybdenum (Mo) 0.0005%
Zinc (Zn) 0.1%

Complete package of macro and micronutrients which are essential building blocks to maximize yield potential. Feed the need with a foliar application of YieldMax.

Key Benefits At A Glance

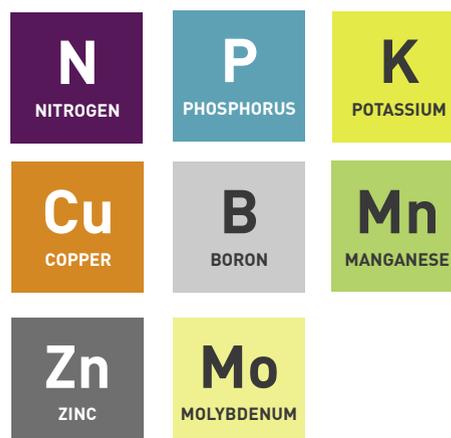
- Variable rates to meet the specific nutrient needs of the crop.
- Flexible foliar application, compatible with crop protection products, with other fertilizers or can be applied alone.
- Flexible application by ground sprayer, airplane or overhead sprinklers.

Rates

YieldMax 18-20-20 rates - foliar

RATE	PRODUCT PER ACRE (LBS)	ACRES PER BAG
Regular rate	5	11
Pea rate	2.75	20

Elements



Application

Agronomic considerations: YieldMax is a foliar feed product and should be applied to green growing leaves. Can be applied alone, with pesticides, or with other fertilizers. YieldMax may be applied via ground sprayers (high-volume or low-volume), aircraft or fertigation systems.

General recommendations: Use rates vary from 2 lbs to 5 lbs/acre, depending on level of nutrient deficiency.

Nexus Liquid

5% Copper

All Crops

Product Overview

Copper (Cu) 5%
Sulphur (S) 3%

Key Benefits At A Glance

- Nexus Liquid Copper 5% is recommended to prevent and correct copper deficiencies of field, row, and turf crops.
- For foliar application in cereal crops.

Rates

Nexus Liquid Copper 5% Rates - Foliar

RATE	PRODUCT LITRES/ACRE	ACTUAL CU/ACRE (LBS)	ACRE PER 10 LITRES
Regular rate	1	0.13	10
Flag leaf rate wheat	0.5	0.065	20

Regular rate:

- Should be used on all crops prior to flag leaf.
- This rate can be used on barley at all stages.

Flag leaf rate on wheat:

- Should be used at flag leaf on Hard Red Spring Wheat prior to any head emergence.

Water volume:

- May use minimum of 5 gallons of water prior to flag leaf.
- May use a minimum of 10 gallons of water at flag leaf application.

*Do not apply to crops if the head has emerged from the boot.

Elements



Application

Foliar applications for all crops:

Apply 5-10 L/Ha (2-4 liters/acre) as needed on a 7-14 day schedule. Avoid foliar applications of this product when plants are under moisture stress. Avoid foliar applications to deciduous tree crops during bloom.

Agronomic considerations: Can be applied alone, with crop protection products, other fertilizers, or may be applied directly to the foliage of growing crops. Nexus Liquid Copper 5% may be applied via ground sprayers (high-volume or low-volume), aircraft or fertigation systems.

General recommendations: Use rates vary from 0.5 litres to 1 litre/acre, depending on copper deficiency.

Nexus Liquid

10% Boron

All Crops

Product Overview

Boron (B) 10%

Key Benefits At A Glance

- Nexus Boron 10% is an effective, readily available source of boron for soil and foliar applications to crops.

Rates

Nexus Liquid Boron 10% Rates - Foliar

RATE	PRODUCT LITRES/ACRE	ACTUAL B/ACRE (LBS)	ACRE PER 10 LITRES
Regular rate	0.5	0.15	20

Element



Application

Compatible with and may be applied in water or mixed with most liquid fertilizers, micronutrients, or crop production products.

Agronomic considerations: Nexus Boron 10% is an effective, readily available source of boron for soil and foliar applications for plants.

General recommendations: Use rates vary from 0.5 litres to 1 litre/acre, depending on boron deficiency.

Handling and blending considerations: For foliar application a rate of 0.5 litres/acre is generally adequate.

Nexus Liquid

7% Zinc

All Crops

Product Overview

Zinc (Zn) 7%
Sulphur (S) 3.4%

Key Benefits At A Glance

- Nexus Liquid Zinc 7% is recommended to prevent and correct zinc deficiencies of field, row, vegetable and turf crops.
- For foliar application in all crops.

Rates

Nexus Liquid Zinc 7% Rates - Foliar

RATE	PRODUCT LITRES/ACRE	ACTUAL ZN/ACRE (LBS)	ACRE PER 10 LITRES
Regular rate	1	0.19	10
High rate	2	0.38	5

Elements



Application

Agronomic considerations: Nexus Liquid Zinc 7% is recommended to prevent and correct zinc deficiencies of field, row, vegetable, and turf crops. Can be applied alone, with crop protection products, other fertilizers, or may be applied directly to the foliage of growing crops. Nexus Liquid Zinc 7% may be applied via ground sprayers (high-volume or low-volume), aircraft or fertigation systems.

General recommendations: Use rates vary from 1 litre to 2 litres/acre, depending on level of zinc deficiency.

Nexus Liquid

7.5% Manganese

All Crops

Product Overview

Manganese (Mn) 7.5%
Sulphur (S) 4%

Key Benefits At A Glance

- Nexus Liquid Manganese 7.5% is recommended to prevent and correct manganese deficiencies of field, row, vegetable, and turf crops.
- For foliar application in all crops and can be applied in combination with most crop protection products.

Rates

Nexus Liquid Manganese 7.5% Rates - Foliar

RATE	PRODUCT LITRES/ACRE	ACTUAL MN/ACRE (LBS)	ACRE PER 10 LITRES
Regular rate	0.67	0.14	15

Elements



Application

Agronomic considerations: Use alone, with crop protection products, with other fertilizers, or may be applied directly to the foliage of growing crops. Nexus Liquid Manganese 7.5% may be applied via ground sprayers (high-volume or low-volume), aircraft or fertigation systems. For foliar application in all crops except with RoundUp Ready® crops.

General recommendations: Use rates vary from 0.5 litres to 1 litre/acre, depending on level of manganese deficiency.

Nitrogen Stabilizers

All Crops

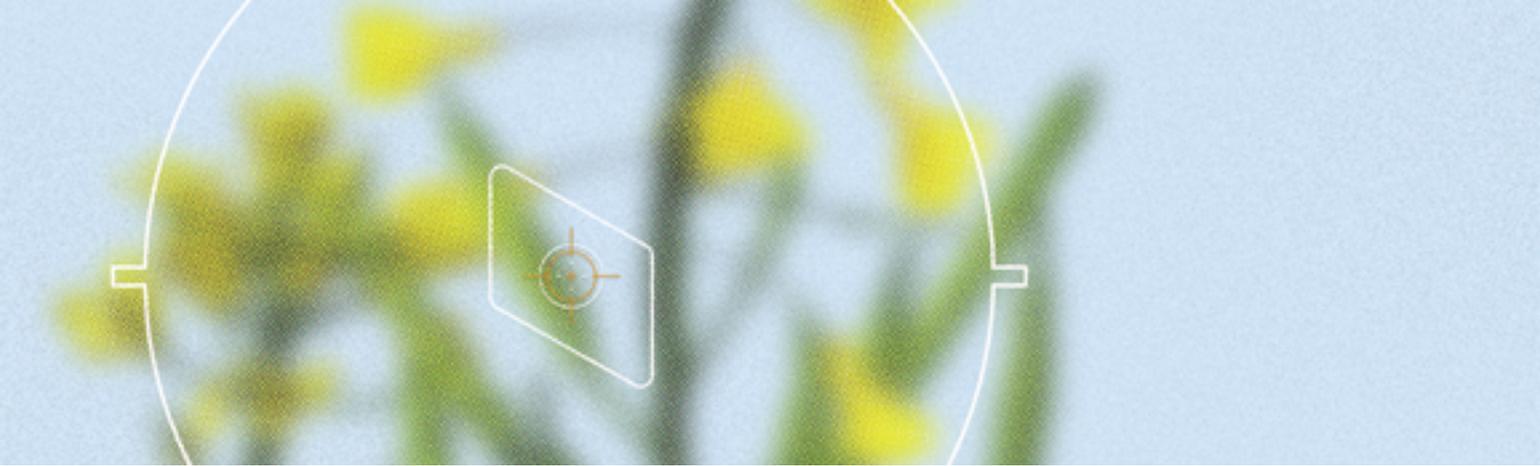
Product Overview

- Protect your nitrogen against leaching, denitrification and volatilization with our full line up of Nitrogen Stabilizer products.
- Triple action protection with our line up of NEON products.
- Available for fall/spring for UAN, Urea and NH3.

Benefits of NexusBioAg's Line Up Of Nitrogen Stabilizers

- Select the right stabilizer to protect nitrogen against loss.
- Take advantage of fall applications of nitrogen.
- Insure that your plants have available nitrogen longer into the growing season for optimal yields and proteins.
- Using a stabilizer is insurance to protect valuable nitrogen investment.
- We don't know what the growing season will bring, hedge your investment with the proper stabilizer.

PRODUCT	APPLICATION
	Spring/Fall Primary for applications on the soil surface where volatilization is the challenge with the added protection from losses to denitrification and leaching.
	Spring/Fall Designed for broadcast or shallow banding applications with triple protection against volatilization, leaching and denitrification.



Nitrogen

PRODUCT	UAN			UREA			NH3		
TIMING	Spring ▼	Summer ▼	Fall ▼	Spring ▼	Summer ▼	Fall ▼	Spring ▼	Summer ▼	Fall ▼
METHOD	Band/Broadcast ▼			Band/Broadcast ▼			Band ▼		
STABILIZER	NEON SURFACE	NEON AIR	NEON SURFACE	NEON SURFACE	NEON AIR	NEON SURFACE	DRIVE-N™ For Anhydrous Ammonia		
ACTIVES	17% NBPT & 25% DCD	30% NBPT & 15% DCD	17% NBPT & 25% DCD	17% NBPT & 25% DCD	30% NBPT & 15% DCD	17% NBPT & 25% DCD	34% DCD		
RATE	1.5 L/MT	1 L/MT	1.5 L/MT	3 L/MT	2 L/MT	3 L/MT	14 L/MT		
WHY	UAN will be incorporated/ banded in typically cool, wet soils. Here there is balanced protection from losses, if the weather turns hot and dry volatilization will be reduced. If the region receives rainfall, the DCD will aid in protection from leaching & denitrification.	UAN sidebanded/ top dressed will be applied with a large potential for volatilization losses if weather conditions are hot/dry. This is why there is the added protection in NEON Air. At the same time there is protection from leaching and denitrification, if the nitrogen receives rainfall shortly after application.	Broadcast applications are highly not recommended. Banding UAN in fall/post harvest will require a focused protection against losses to denitrification & leaching. Using NEON Surface will aid in keeping NH4 stable and also protect from volatilization losses.	UREA will be incorporated/ banded in typically cool, wet soils. Here there is balanced protection from losses, if the weather turns hot and dry volatilization will be reduced. If the region receives rainfall, the DCD will aid in protection from leaching & denitrification.	UREA sidebanded/ top dressed will be applied with a large potential for volatilization losses if weather conditions are hot/dry. This is why there is the added protection in NEON Air. At the same time there is protection from leaching and denitrification, if the nitrogen receives rainfall shortly after application.	Broadcast and banding UREA in fall/post harvest will require a focused protection against losses to denitrification & leaching. Using NEON Surface will aid in keeping NH4 stable and also protect from volatilization losses.	Anhydrous Ammonia applications inject NH3 (Ammonia) and convert this gas into the ammonium form in the soil. The DCD that is in DRIVE-N inhibits nitrosomonas bacteria activity, helping keep nitrogen in the NH4+ (Ammonium) stable form for longer vs untreated Anhydrous Ammonia.		
DEFINITIONS	<p>NBPT (N-butyl-thiophosphoric -triamide) strongly blocks the urease enzyme in soil, which in turn reduces nitrogen losses to volatilization. Keeping nitrogen in the stable NH4+ (Ammonium) form.</p> <p>DCD (Dicyandiamide) inhibits the activity of the nitrosomonas bacteria in the soil, slowing the conversion of NH4+ (Ammonium) to NO3- (Nitrate), both of which are plant available forms. Once nitrogen is in the NO3- (Nitrate) form it is highly susceptible to rapid conversion to NO2- (Nitrogen Dioxide)/NO (Nitric Oxide)/N2O (Nitrous Oxide) all of which are easily lost due to being gaseous forms of nitrogen.</p> <p>VOLATILIZATION is the loss of plant available nitrogen gassing off through the conversion of NH4+ (Ammonium) to NH3 (Ammonia).</p> <p>DENITRIFICATION is the loss of nitrogen through the conversion of plant available nitrate to gaseous forms of N, such as: NO (Nitric Oxide), N2O (Nitrous Oxide), N2 (Dinitrogen gas).</p> <p>LEACHING is the loss of plant available nitrogen in the form of nitrates, physically moving away from the root zone with water. Both nitrate and soil are negatively charged so NO3- (Nitrate) cannot be bound by the soil and is at risk of leaching.</p>								



All Crops

Active Ingredients

NBPT 30%
DCD 15%

Primarily for application on the soil surface where volatilization is the challenge, with the added protection from losses to denitrification and leaching.

Features

- Protection of nitrogen from potential losses.
- Helps to create an efficient nitrogen source for all crops.
- Added to UAN to become a homogeneous liquid solution.
- Added to UREA to evenly coat and penetrate each granule to the core.
- Used in early spring and fall application of UREA or UAN.

Rates

NEON AIR Rates

FERTILIZER	LITRES/TONNE
Urea	2
UAN	1

Primary Protection From:

- Volatilization

Additional Protection From:

- Denitrification
- Leaching

Application

Agronomic considerations: NEON AIR nitrogen stabilizer with PENXCEL™ technology is a uniquely formulated fertilizer additive for urea and urea ammonium nitrate (UAN) fertilizers. NEON AIR represents a family of products that combine two high concentrated actives for triple action control of nitrogen losses.

General recommendations: This nitrogen stabilizer is combined with urea or urea containing fertilizers prior to application. The combination, recognized as an enhanced efficiency fertilizer, can be incorporated or applied pre-plant, side-dress or used for surface applications. It helps to create an efficient nitrogen source for all crops. This product protects against nitrogen losses through volatilization, denitrification and leaching.

Handling Conditions

General rate recommendations are based on average conditions. Rates may be adjusted higher as needed based on the field conditions, including the following:

- 1 Days of control needed: 20 millimeters of rain or irrigation are required to move urea into the soil.
- 2 Residue Level – Residues in excess of 30% present higher levels of urease and higher volatility can be expected.



All Crops

Active Ingredients

NBPT 17%
DCD 25%

Designed for broadcast or shallow banding applications with balanced protection against nitrogen loss.

Features

- Protection of nitrogen from potential losses.
- Helps to create an efficient nitrogen source for all crops.
- Added to UAN to become a homogeneous liquid solution.
- Added to UREA to evenly coat and penetrate each granule to the core.
- Used with early spring and fall applications of UREA or UAN.

Rates

NEON SURFACE Rates

FERTILIZER	LITRES/TONNE
Urea	3
UAN	1.5

Triple Protection From:

- Volatilization
- Denitrification
- Leaching

Application

Agronomic considerations: NEON SURFACE nitrogen stabilizer with PENXCEL™ technology is a uniquely formulated fertilizer additive for urea and urea ammonium nitrate (UAN) fertilizers. NEON SURFACE represents a family of products that combine two high concentrated actives for triple action control of nitrogen losses.

General recommendations: This nitrogen stabilizer is combined with urea or urea containing fertilizers prior to application. The combination, recognized as an enhanced efficiency fertilizer, can be incorporated or applied pre-plant, side-dress or used for surface applications. It helps to create an efficient nitrogen source for all crops. This product protects against nitrogen losses through volatilization, denitrification and leaching.

3 Soil pH – Values higher than 7.0 pose risk of higher potential for volatility.

4 Poorly drained, waterlogged or heavily compacted soil.

5 Fields with porous soils, in areas with excessive water or rainfall.

6 Fields and crops that benefit from keeping the ammonium form of nitrogen available for a longer time.

DRIVE-NTM

For Anhydrous Ammonia

All Crops

Active Ingredients

DCD 34%

Apply Anhydrous Ammonia (NH₃) with the peace of mind that nitrogen will be there when your crop needs it in the spring. Nitrogen is a valuable and vital part of your yield goals, protect it against leaching and denitrification.

Features

- Protection of nitrogen from potential losses.
- With 34% DCD, Drive-N helps keep nitrogen in the NH₄⁺ (Ammonium) stable form for longer vs untreated Anhydrous Ammonia.
- Non-corrosive and non-staining formulation for NH₃ (Ammonia) components.

Rates

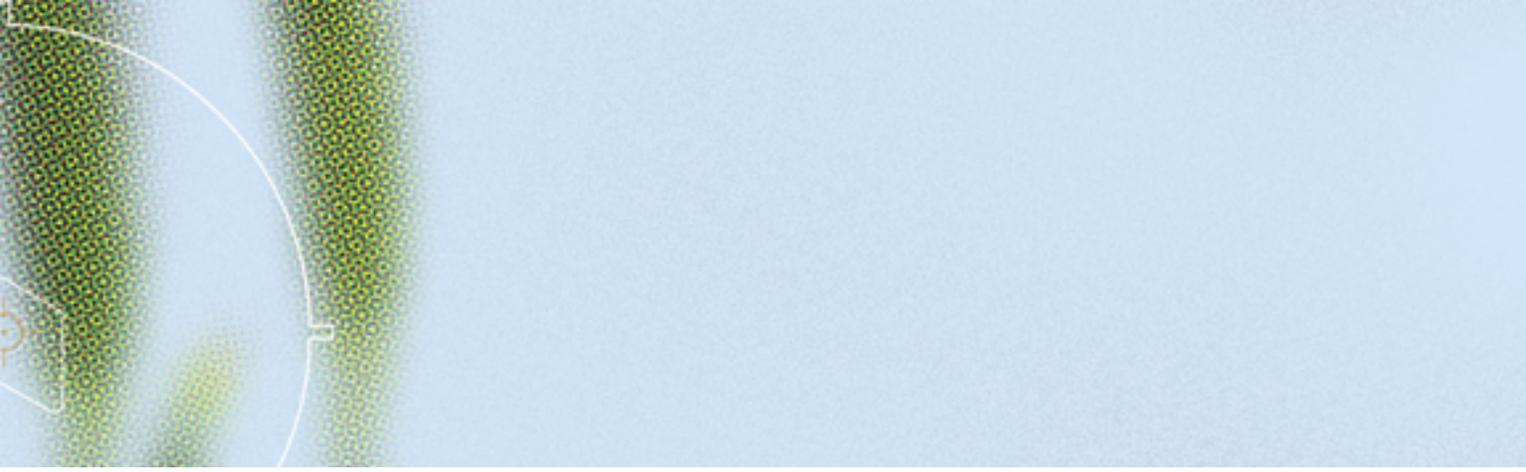
DRIVE-N rate of 14 L/MT of NH₃.

Protection From:

- Denitrification
- Leaching

Elements

- Nitrogen is the most important component for supporting plant growth and crops use large amounts for growth and yield production
- Nitrogen is part of the chlorophyll molecule, is the primary building block for plant protoplasm, is essential for protein production and healthy crop growth.



Key Benefits At A Gance

- Select the right stabilizer to protect nitrogen against loss.
- Take advantage of fall and spring applications of nitrogen.
- Insure that your crops have available nitrogen longer into the growing season for optimal yield and protein.
- Using a stabilizer is great insurance to protect your valuable nitrogen investment.
- We can't predict what the growing season will bring, hedge your investment with the proper stabilizer.

Special Fertilizers

All Crops

POWER MAG 15[®]

Product Overview

Magnesium (Mg) 15%
Sulphur (S) 21%

Particle size: Size Guide Number (SGN) - 250

Application

Agronomic considerations: A homogeneous product of sulphate sulphur and magnesium. 100% water soluble to provide excellent plant availability and compatibility with all fertilizer blends. Will supply initial amount of magnesium for immediate needs and for soil buildup and extended plant needs.

General recommendations: Use 6.6 pounds of Power Mag 15 for every pound of magnesium required to meet needs. Generally we apply 5 to 10 lbs of actual magnesium per acre. This would be 33 to 67 lbs of product. Apply in the seed row or in close proximity to the seed row.

Handling and blending considerations: Normal bulk blending procedures. Use Power Mag 15 to match analysis where higher amounts of magnesium is needed.

SuperCAL S04

Product Overview

Calcium (Ca) 21%
Sulphur (S) 17%

Particle size: Size Guide Number (SGN) - 250

Pelletized Calcium Sulphate

SuperCAL S04 is OMRI listed.

Application

Agronomic considerations: Pelletized calcium sulphate is an effective source of both calcium and sulphur. It is produced from high quality mined calcium sulphate, finely ground for maximum utility, blended with a special water-soluble organic binder and manufactured into mini pellets. It is then dried to less than 1% moisture and screened to size.

General recommendations: Apply to soils high in sodium where the water is percolating through the soil profile. The calcium in gypsum will displace the sodium off of the soil colloid. This will effectively help to leach the displaced sodium out of the soil profile.

For best results SuperCAL S04 should be broadcast and incorporated.



SuperCAL 98G

Product Overview

Calcium (Ca) 35%
Magnesium (Mg) <0.05%

Particle size: Size Guide Number (SGN) - 300

Pelletized Calcium Sulphate

SuperCAL 98G is OMRI listed

Product Features

Manufactured from high quality calcitic limestone. Calcitic limestone pellets are designed for fast, easy, safe, and accurate use in agriculture, turf and ornamental applications. Blendable with other granular fertilizer products. For acidic correction for maximum fertilizer availability or soil and plant health.

Application

General recommendations: Apply to soils with low pH. Product can be blended with regular seed placed fertilizer to create a micro area of higher pH. It can also be broadcast and incorporated to increase soil pH.

Handling and blending considerations: Normal bulk blending procedures.

SuperCAL HI CAL

Product Overview

Calcium (Ca) 38.6%
Calcium Carbonate (CaCo₃) 96.3%

Particle size: Size Guide Number (SGN) - 12

Product Features

Manufactured from high quality calcitic limestone. This product is a very fine grind product designed for broadcasting at high rates of 2 to 5 tonne per acre and incorporating for remediation of low pH soils. For acidic correction for maximum fertilizer availability or soil and plant health.

Application

General recommendations: Apply to soils with low pH. Product should be broadcast and incorporated to increase soil pH.

Handling and blending considerations: A fine product that needs to be handled with belt conveyors and broadcast with a special limestone spreader.



If you would like more information or have questions, contact your local NexusBioAg Representative or visit nexusbioag.com

Your solution for crop nutrition

Inoculants | Nitrogen Stabilizers | Micronutrients | Foliars

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