



BioStacked® - the evolution in soybean inoculants

Only Nodulator® N/T soybean inoculants are BioStacked®.

BioStacked® inoculants use additional beneficial microorganisms that work together with the soybean root system to enhance yield. BioStacked® soybean inoculants employ two beneficial biologicals: The *Bradyrhizobium japonicum* bacteria are joined by the beneficial organism *Bacillus subtilis* which acts as a Nodulating Trigger®. This second biological promotes greater root and nodule biomass, faster canopy closure, and ultimately higher yields.

For more information on the performance and value of Nodulator® XL for peas and lentils, Nodulator® for chickpeas, dry beans and faba beans visit www.nodulatorxl.com. For information on Nodulator® N/T for soybeans visit www.nodulatornt.com. Or contact us at:



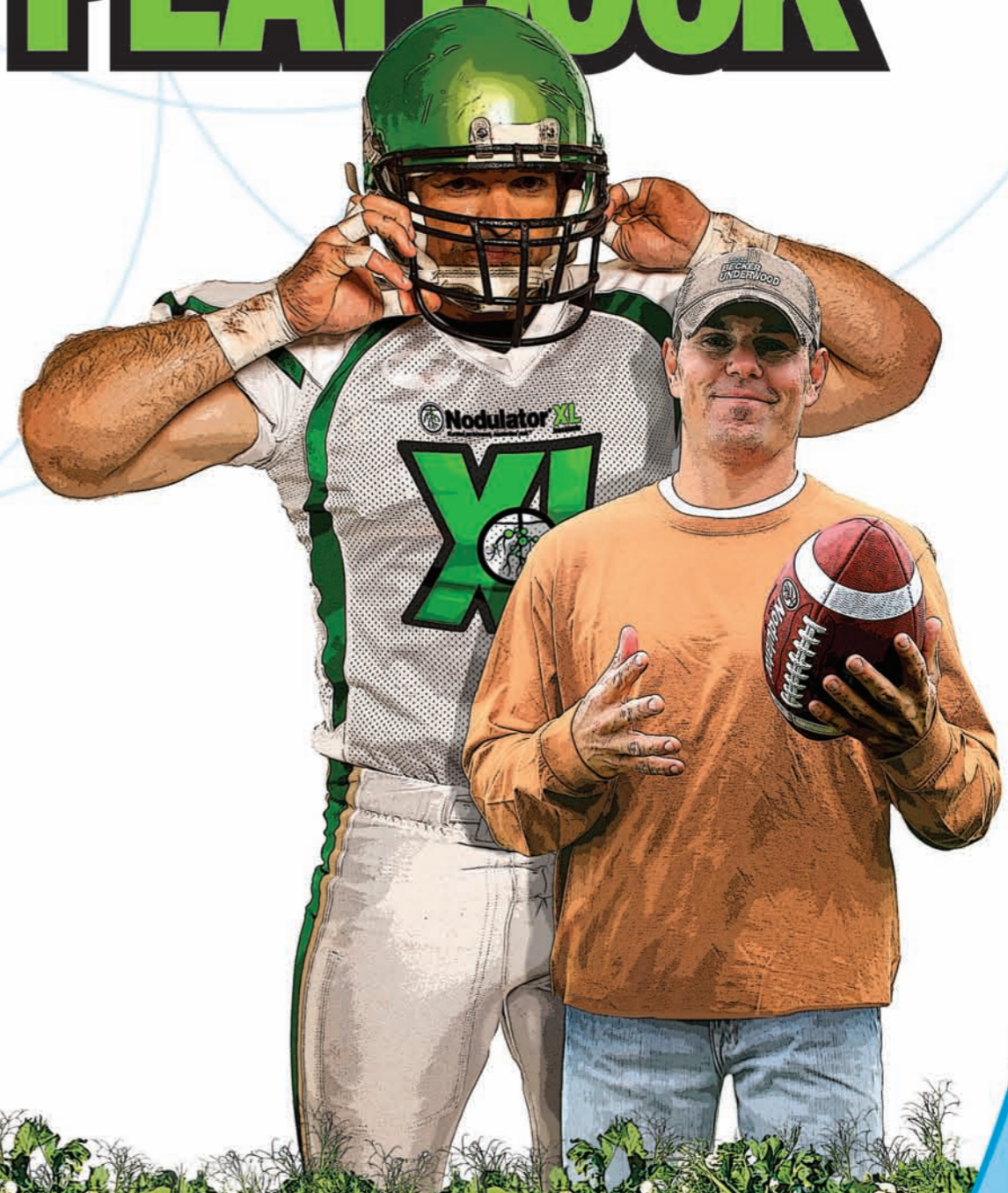
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* Source: Independently generated field data from 87 station years (peas) and 84 station years (lentils). Station years = # of trials X # of years.

** Source for yield data and prices – 5-year average: 2010 Specialty Crop Report, Saskatchewan Ministry of Agriculture using current pea prices of \$8.50 per bushel and lentils at \$17.00 per bushel.

Becker Underwood Western Canadian PLAYBOOK



Introducing Nodulator® XL, an exciting new development in inoculant technology featuring a unique, highly efficient and more active strain of rhizobia, helping to pump up yields by 3% to 8% in peas and lentils.*



Competitive inoculant



Nodulator® XL-treated crops

Which roots would you rather have?

As long as you get paid more for higher yields, we're pretty sure you'll choose the roots on the right. That's a Nodulator® XL-treated crop, clearly showing more vigorous and robust root systems and nodules compared to the other guys' inoculant on the left.

Why the massive difference in plant roots? It's the highly efficient, more active strain of rhizobia known as *Rhizobium leguminosarum* bv. *viceae* that's only available in Nodulator® XL.

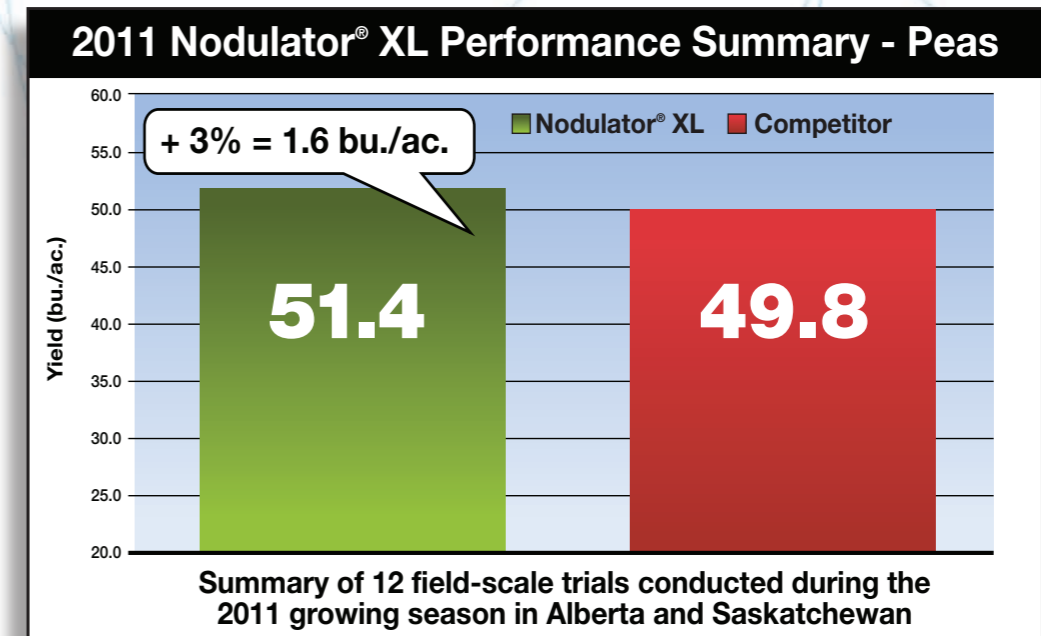
Nodulator® XL-treated crops exhibit a more advanced root system – showing more vigorous, robust and highly branching growth. The nodules stay pink longer than plants treated with other leading inoculants – a sign of increased nitrogen fixation.

Above ground, pea and lentil plants inoculated with Nodulator® XL are a darker green, with improved uniformity of growth. Increased plant vigour provides a stronger defense against pests and wet or dry growing conditions, as well as better nutrient uptake. You'll also appreciate the crop's uniformity at harvest time.

Better roots and a healthier plant produce higher yields. In fact, during 171 station years of research, Nodulator® XL increased yields by 3% to 8% compared to leading inoculants.*

Nodulator® XL is a winner!

2011 yield results are proving it. In 12 field-scale trials in peas, conducted by independent co-operators in Alberta and Saskatchewan, Nodulator® XL won 92% of the time, out-yielding our competitor's product by an average of 1.6 bu./ac. or 3.25%! And our small plot trials show even higher yield increases in lentils.



Complete trial data available at nodulatorxl.com

Let's make you some money. Here's how.

In farming, the best investment is one that costs a little and returns a lot. Because Nodulator® XL is a small investment that produces yield gains of 3% to 8% compared to competitive inoculants, your return on investment is outstanding.

Let's dig into the numbers using average provincial yields and current market prices. In peas, the expected 3% to 8% yield increase produces 1.0 to 2.5 bushels more per acre – that's between \$8.50 and \$21.25 more per acre in your pocket.**

The revenue jump is even greater in lentils. A 3% yield increase means 0.6 bu./ac. more and \$10.20 per acre in additional revenue. 1.6 bu./ac. more in yield is an 8% increase which amounts to \$27.20 more revenue per acre over competitive inoculants.**



Nodulator® XL:

Formulations, rates and compatibility

Formulations

In 2012, its first year on the market, Nodulator® XL will be available in liquid, sterile peat and solid core formulations.

Rates

Nodulator® XL has the same application rate as the Nodulator® self-adhesive peat and liquid formulations that growers know and trust.

Nodulator® XL solid core granules have a reduced application rate. A 50-lb. pack and the 364 kg Q-Pak of Nodulator® XL solid core granules treat a larger area than a same-sized Nodulator® pack. This means less handling, less time spent loading the seeder and more time actually seeding.

Nodulator® XL Solid Core Granule Application Rates							
Row Spacing		Application Rate		Area treated per 22.6 kg bag		Area treated per 364 kg Q-Pak	
cm	inches	kg/ha	lbs/acre	ha	ac	ha	ac
17.8	7	5.3	4.7	4.3	10.6	68.7	170.2
20.3	8	4.6	4.1	4.9	12.2	79.1	195.1
22.9	9	4.0	3.6	5.7	13.9	91.0	222.2
25.4	10	3.7	3.3	6.1	15.2	97.4	242.4
27.9	11	3.4	3.0	6.6	16.7	107.1	266.7
30.5	12	3.0	2.7	7.5	18.5	121.3	296.3

Chickpea Products

	Formulation	Best fit	Description	Packaging	Rate	Application
Nodulator®	Granules (solid core)	Provides both convenience and performance in one package.	A technologically advanced carrier for rhizobia guaranteed to contain a minimum of 80 million rhizobia per gram. Low dust formulation that is highly resistant to crumbling.	22.6 kg (50 lb.) bag.	5 lb./ac. (5.6 kg/ha) one bag treats 10 acres (4 ha).	Apply directly below the seed, in-furrow.
Nodulator®	Self-adhering peat-based	Built-in adhesive qualities make inoculation quick and simple, regardless if seed is wet or dry, eliminating the need for commercial sticking agents	Self-adhering, sterile, peat-based inoculant guaranteed to contain a minimum of 1 billion rhizobia per gram.	5 x 1.2 kg bags/case.	1.2 kg/982 kg (36 bu.) of seed; one case treats 180 bu.	Apply in a slurry, or as a damp or dry inoculation. Seed should be planted within 24 hours of application.

Pea and Lentil Products

	Formulation	Best fit	Description	Packaging	Rate	Application
Nodulator® XL Tri-Pak	Liquid	A reliable liquid inoculant that can be applied up to six hours prior to seeding and is compatible with on-seed chemical seed treatments. Listed by the Organic Materials Review Institute for use in certified organic production	A convenient and easy-to-use product that can be applied directly to the seed. It is guaranteed to contain a minimum of 750 million rhizobia per gram.	3 X 7.5 L bladders per case.	One case treats 300 bu of seed. 75 mL (2.5 fl oz) of inoculant (75 grams) per 27.3 kg (1 bushel) of seed.	Shake product well before application. Apply directly to the seed while augering (DO NOT run auger at greater than HALF capacity). Seed should be planted within six hours after application.
Nodulator® XL	Self-adhering sterile peat	A reliable self-adhering, peat-based inoculant that can be applied dry, slurred or damp at the time of seeding. Is compatible with on-seed chemical seed treatments. Can be used as a stand alone on virgin sites and/or stressed soils.	Built in adhesive qualities make inoculation quick and simple, regardless if seed is wet or dry, eliminating the need for commercial sticking agents. It is guaranteed to contain a minimum of 1 billion rhizobia per gram.	5 X 1.2 kg bags per case.	One case treats 110 bu. of seed.	Apply in a slurry or as a damp or dry inoculation. Seed should be planted within 24 hours of application.
Nodulator® XL	Granules (solid core)	A free-flowing clay granular inoculant for well-placed application in the planting furrow at seeding ensuring a greater amount of bacteria in the rooting zone. Excellent performance under stressed planting conditions (virgin, loosely rotated ground, previously flooded soils, acidic or hot/dry soils).	Contains a technologically advanced granular carrier for rhizobia. Low dust formulation that is highly resistant to crumbling.	22.6 kg bag.	28.5 g/304 linear row meter – actual rate depends on row spacing. One bag will treat from 10.6 acres (7" rows) up to 18.5 acres (12" rows).†	Apply directly below the seed, in-furrow.
Nodulator® XL Q-Pak	Granules (solid core)	A free-flowing clay granular inoculant for well-placed application in the planting furrow at seeding ensuring a greater amount of bacteria in the rooting zone. Excellent performance under stressed planting conditions (virgin, loosely rotated ground, previously flooded soils, acidic or hot/dry soils).	Contains a technologically advanced granular carrier for rhizobia. Low dust formulation that is highly resistant to crumbling.	364 kg Q-Pak mini-bulk.	28.5 g/304 linear row meter – actual rate depends on row spacing. One bag will treat from 170 acres (7" rows) up to 296 acres (12" rows).†	Apply directly below the seed, in-furrow.
Nodulator®	Granules (peat based)	A crumble peat-based granular inoculant for well-placed application in the planting furrow at seeding ensuring a greater amount of bacteria in the rooting zone.	Easy-flow, granular product. The technologically advanced carrier delivers the inoculant to the root zones for better nitrogen fixation. It is guaranteed to contain a minimum of 100 million rhizobia per gram.	1 X 18.2 kg bag	5.8 kg/ha (5.2 lbs/ac). Actual rate depends on row spacing. One bag treats 6.2-7.7 acres.	Apply directly below the seed, in-furrow.

† For specific rates refer to chart on page 4.

Soybean Products

	Formulation	Best fit	Description	Packaging	Rate	Application
Nodulator® N/T	Liquid	A co-inoculant designed for soybean growers who want the most potent liquid inoculant (Rhizobia 3 x 10 ⁹ cfu/g and <i>B. subtilis</i> 2.2 x 10 ¹⁰ cfu/g) with the highest on-seed count of biologicals.	A highly potent liquid co-inoculant containing nitrogen fixing rhizobia and <i>B. subtilis</i> bacterium. This multi-strain inoculant is designed for ease-of-use. Guarantee: 3 x 10 ⁹ viable cells of <i>Bradyrhizobium japonicum</i> and 2.2 x 10 ⁹ viable cells of <i>Bacillus subtilis</i> per gram.	4 x 3.1 L + 4 x 100 mL bottle.	Treats 4,544 kg or 200 x 50 lb. units of seed.	Add contents of bottle (100 mL) labeled <i>B. subtilis</i> to 3.1 L bladder of rhizobium liquid inoculant and shake to mix well.
Nodulator® N/T	Self-adhering peat-based	A convenient, ready-to-apply, sterile-peat based all-in-one co-inoculant for application to seed at planting.	A sterile peat-based carrier containing nitrogen-fixing rhizobium and <i>B. subtilis</i> bacterium. Multi-strain co-inoculant providing convenience and performance in a single package. Guarantee: 2 x 10 ⁹ viable cells of <i>Bradyrhizobium japonicum</i> and 1 x 10 ⁹ viable cells of <i>Bacillus subtilis</i> per gram.	5 x 1.2 kg.	Treats 1,875 - 3,750 kg of seed.	Damp: Apply water to dampen seed. Thoroughly mix to ensure even coating. Dry: Apply layers of inoculant and seed in the drill hopper and mix thoroughly.
Nodulator®	Spherical Granules	Better handling, precise placement and performance. When germinating seeds and developing root systems have easy access to the inoculant, they nodulate and fix nitrogen, leading to more vigorous and robust plants.	A durable, uniformly-sized, dust-free granule that is more tolerant to humidity. Uniform size of Nodulator® Spherical Granules allow for superior flow, more accurate metering, and precise placement in the furrow.	1 x 18.2 kg.	Rate ranges from 5.8 to 7.3 kg/ha, depending on row width. One bag usually covers 8 acres applied at 5 lbs. per acre.	Added to the soil with the seed in the furrow, applied through the drill attachments or applicator for uniform distribution.

Dry Bean Products

	Formulation	Best fit	Description	Packaging	Rate	Application
Nodulator®	Granules (solid core)	A technologically advanced carrier in an easy-flow formulation delivering performance and convenience. Low dust formulation that is highly resistant to crumbling.	Nodulator® for dry beans applied directly to the furrow.	22.6 kg (50 lb.) bag.	Treats 10 ac. (4 ha).	Apply directly to the furrow.
Nodulator®	Self-adhering peat-based	Built-in adhesive qualities make inoculation quick and simple, regardless if seed is wet or dry, eliminating the need for commercial sticking agents.	Nodulator® for dry beans with multiple options for application.	42 oz. (1.2 kg).	Inoculates 982 kg (36 bu) of seed.	For use in a slurry application, damp inoculation or dry inoculation.

Faba Bean Products

	Formulation	Best fit	Description	Packaging	Rate	Application
Nodulator®	Self-adhering peat-based	Built-in adhesive qualities make inoculation quick and simple, regardless if seed is wet or dry, eliminating the need for commercial sticking agents.	Nodulator® for faba bean with multiple options for application.	42 oz. (1.2 kg).	Inoculates 982 kg (36 bu) of seed.	For use in a slurry application, damp inoculation or dry inoculation.

Canadian Compatibility of Becker Underwood Inoculants with Seed-Applied Pesticides

Nodulator® XL is compatible with the same seed treatments as Nodulator®. Please visit nodulatorxl.com for a complete seed treatment compatibility listing including chickpea, faba bean and dry bean compatibilities, and most recent updates. Please visit nodulatornt.com for soybean compatibilities.

LENTIL

		Nodulator® XL Liquid	Nodulator® XL Peat
Non-Pesticide treated seed		6 Hours	1 Day
ApronMaxx® RTA	Tank-mix ^{††} time on seed	Not Recommended	
	Wet Sequential	2 Hours	24 Hours
	Dry Sequential	Not Recommended	24 Hours
Crown®	Tank-mix ^{††} time on seed	Not Recommended	
	Wet Sequential	Marginal	4 Hours
	Dry Sequential	3 Hours	4 Hours
CruiserMaxx® Pulses (Cruiser® 5FS + ApronMaxx® RTA)	Tank-mix ^{††} time on seed	Not Recommended	
	Wet Sequential	1 Hour	6 Hours
	Dry Sequential	Not Recommended	6 Hours
Trilex® AL	Tank-mix ^{††} time on seed	Not Recommended	
	Wet Sequential	1-2 Hours (Marginal)	6 Hours
	Dry Sequential	Not Recommended	3 Hours
VitaFlo® 280	Tank-mix ^{††} time on seed	Not Recommended	
	Wet Sequential	Not Recommended	Marginal
	Dry Sequential	Not Recommended	6 Hours

PEA

		Nodulator® XL Liquid	Nodulator® XL Peat
Non-Pesticide treated seed		6 Hours	1 Day
ApronMaxx® RTA	Tank-mix ^{††} time on seed	Not Recommended	
	Wet Sequential	2 Hours	24 Hours
	Dry Sequential	Not Recommended	24 Hours
CruiserMaxx® Pulses (Cruiser® 5FS + ApronMaxx® RTA)	Tank-mix ^{††} time on seed	Not Recommended	
	Wet Sequential	1 Hour	6 Hours
	Dry Sequential	Not Recommended	6 Hours
CruiserMaxx® Pulses (CruiserMaxx® Beans + ApronMaxx® RTA)	Tank-mix ^{††} time on seed	Not Recommended	
	Wet Sequential	1 Hour	6 Hours
	Dry Sequential	Not Recommended	6 Hours
Trilex® AL	Tank-mix ^{††} time on seed	Not Recommended	
	Wet Sequential	2 Hours	6 Hours
	Dry Sequential	1 Hour	3 Hours
VitaFlo® 280	Tank-mix ^{††} time on seed	Not Recommended	
	Wet Sequential	Not Recommended	1-2 Hours (Marginal)
	Dry Sequential	Not Recommended	6 Hours

Notes: Not Applicable or Not Available

^{††} Note, these on-seed shelf life recommendations are based on a maximum 4-hour tank-mix period. These data are correct at the time of distribution. Please check with your dealer for updates. Updated: Oct 24, 2011

Tank mix The inoculant can be mixed with the seed treatment in a single tank and applied as a solution/suspension. In this case the inoculant and seed treatment will be applied via the same applicator. On-seed shelf recommendations are based on a maximum 4-hour tank-mix period. **Wet Sequential (Simultaneous)** The seed treatment can be applied at the same time as the inoculant from separate tanks. The important point to remember is that they must be applied by separate applicators to qualify as a wet sequential or simultaneous application. **Dry Sequential** The seed treatment must be applied first and allowed to dry prior to the inoculant being allowed to dry. The time required for the seed treatment to dry on the seed will vary based on formulation of the seed treatment used, relative humidity of the air and other factors. As a rule, a minimum period of 30 minutes is required to dry down the seed but may take the better part of the day depending on the factors listed above.

Always refer to the individual product labels for proper use instructions and use restrictions.