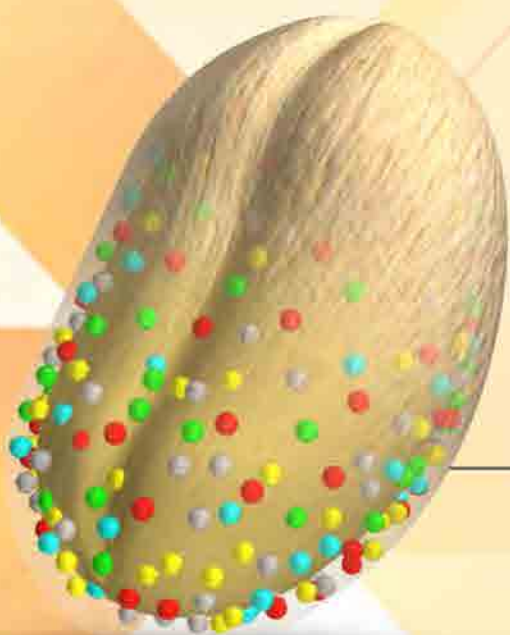




Seed
Priming



**Rural Liquid
Fertilisers**



SEED PRIMING

Fertiliser for Seeds



Seed
Delivery System



High-Analysis
Broad Spectrum



High-Performance
Formulations



World-Leading
RLF Product

Trust. Grow. Yield.

www.ruralliquidfertilisers.com



BSN Superstrike

BSN Superstrike is a Seed Priming Fertiliser that applies the RLF technology called SDS to imbibe into the seed a multi-nutrient formulation.



BSN Superstrike is a HBS (High-analysis Broad-Spectrum Solution) meaning it provides the optimum levels of seed nutrient in a single application. BSN Superstrike is easy to apply and is fast becoming the new world standard in modern farming practice where fertilising the seed is becoming as important as fertilising the plant.



BSN Ultra

BSN ULTRA is a Seed Priming Fertiliser that applies the RLF technology called SDS to imbibe into the seed a multi-nutrient formulation.



BSN ULTRA is a HBS (High-analysis Broad-Spectrum Solution) meaning it provides the optimum levels of seed nutrient in a single application. BSN ULTRA is easy to apply and is fast becoming the new world standard in modern farming practice where fertilising the seed is becoming as important as fertilising the plant.



BSN Hybrid

BSN Hybrid is a Seed Priming Fertiliser that applies the RLF technology called SDS to imbibe into the seed a multi-nutrient formulation.



BSN Hybrid is a HBS (High-analysis Broad-Spectrum Solution) meaning it provides the optimum levels of seed nutrient in a single application. BSN Hybrid is easy to apply and is fast becoming the new world standard in modern farming practice where fertilising the seed is becoming as important as fertilising the plant.

BSN Hybrid is engineered for Hybrid Seed Types.



Interceptor XS

Interceptor – XS is a Seed Priming fertiliser that applies the RLF technology called SDS to imbibe into the seed nutrient formulation designed for early root development.



Interceptor – XS is a HBS (High-analysis Broad-spectrum Solution) that provides the seed embryo with the nutrients required to stimulate more early root development from germination.

This early nutrient is used to grow a better root structure resulting in bigger root mass, more fine root hairs and a healthier and active rhizosphere.

Interceptor – XS is one of the limited products available that's function is focused on the roots.

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RLF is a specialised fertiliser company

Farmers around the world in all cropping environments use our innovative products and comprehensive solutions to address crop production limitations and continuously improve on-farm practices.

Our success is linked directly to the success of our clients. We use the tools of modern plant physiology to support our demonstrated commitment to agriculture and the business of our farmer clients.

RLF produces leading liquid fertiliser products that promote efficiency in use, protect and increase yield and provide improvements in crop quality. Researched and developed by accredited experts in the field of plant science our products are directly supported by an experienced team of practical in-field professionals.

Everyday we work side by side with farmers to deliver better on-farm profits and healthier foods to the world.





Proven to Work

RLF released the first generation BSN Seed Primers in 1999 and since that time BSN treated seed has been sown to tens of millions of acres. Ongoing Investment in Research & Development in both laboratory and field trials has lead to the latest generation Seed Primer, **BSN Ultra**. Whilst the cost of BSN is only a small part of the fertiliser budget the financial benefit to the grower is significant as demonstrated in Independent Replicated Trials. In addition Independent Data and Field Trials demonstrates that regardless of the rate of Phosphorus granular fertiliser applied to the soil BSN is effective in increasing yield.

Year in, Year out! – David and Linda Campbell

"We like our crops to jump out of the ground and BSN Superstrike helps us to achieve that year in, year out. When it comes time to foliar spraying of trace elements we apply Crop Specific Foliars (CSF) to every hectare. RLF products are very efficient which means we don't have to handle a large volume of product when compared to sulphates. RLF help manage our total fertiliser program to maximise production."

Farmers: David and Linda Campbell

Location: Esperance

Farm Enterprise: Wheat, Barley, Lupins, Beans, and Sheep

Property Size: 12000ha's

Annual Rainfall: 375mm

Time on RLF Program: 10 years+



Easy to Handle

BSN can be easily integrated into current on-farm seed treatment practices and can be applied in conjunction with many agricultural chemicals used for disease and pest prevention reducing labour costs and making the process of on-farm application simple. BSN is sprayed onto the seed. This can be as the seed is transported rapidly by auger to a silo or truck or simply manually applied and is completely imbibed by the seed in 20 minutes. Following treatment **BSN** is specially formulated to flow easily from the silo and through air seeders. Treated BSN seed can be stored for extended periods when required.





The Best Start a Crop can Get

BSN is a unique High-Analysis Broad Spectrum Liquid Seed Priming Treatment that is formulated to safely allow Phosphorus and Trace Elements to be rapidly imbibed (absorbed) by the seed.

BSN Seed Priming

The priming of the seed elevates all critical nutrients to within optimum range. The seed embryo senses that BSN has elevated the levels of nutrient and sets potential for maximum yield. BSN continues to provide benefit in the first 2-3 weeks following germination by providing Phosphorus and Trace Elements from the primed seed to the young plant when availability of granular fertiliser is often limited. Following planting BSN drives early vigour root system development improving uptake of granular fertiliser and access to moisture whilst generating increased soil organic matter, root turn over and microbial activity. The BSN mode of action combined with optimisation of seed nutrient levels deliver yield increases in the range of 5% - 20%, improved tolerance to climatic conditions and substantial financial returns to the grower.



BSN is used by over 3 million farmers

BSN seed priming products are a unique technology developed by RLF, and now used by over 3 million farmer customers world-wide. With so many farmers - and so much 'in-the-ground use' - BSN today has become the world's #1 selling seed primer.

Confidently share this experience as BSN is applied to millions of seeds by millions of farmers, knowing that you are not alone in achieving the same great results that BSN is achieving for its farmer customers throughout the world today. BSN Seed Priming is a modern farming practice.



**World-Leading
RLF Product**

Fertilising the Seed

You are not coating but fertilising the seed by using RLF SDS (Seed Delivery System) technology to transfer nutrients inside (imbibed) the seed.

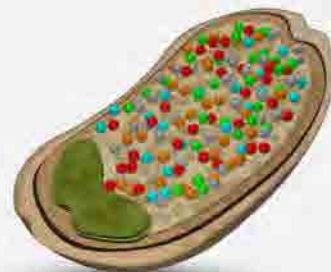
BSN is Quickly Absorbed

Nutrient is imbibed into the Seed



Primed Seed

Nutrients are on the inside of Seed

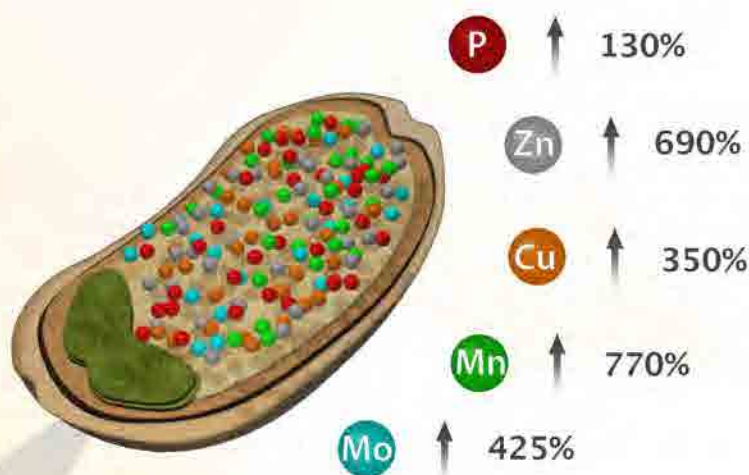
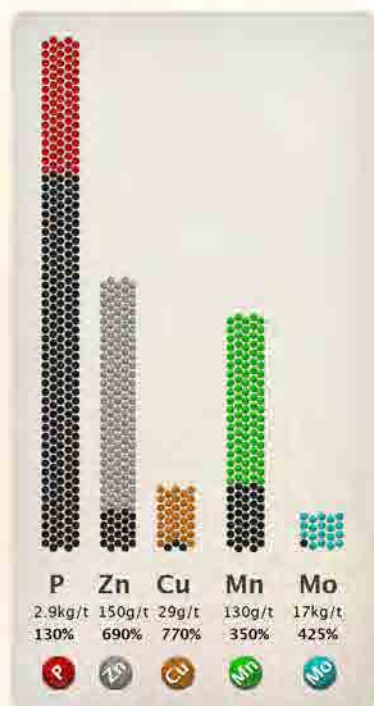


You are Fertilising the Seed

BSN fertilises the seed by supplying it with the optimum level of nutrients. BSN is engineered to safely deliver the nutrients into the seed embryo (called imbibing or imbibed). With optimum nutrient in the seed, germination, early growth and young plant formation is directly supported through the early weeks of development.

This practice, called seed priming is proven to achieve growth, yield and many other environmental benefits because the plant is able to satisfy its nutrient requirements directly from seed. The seed is primed to achieve the best possible start available to it. In fact, through priming the seed, the embryo registers and establishes the maximum yield potential of the plant. As a result this allows the plant to develop superior root mass and vigorous and strong shoots, tillers and leaf.

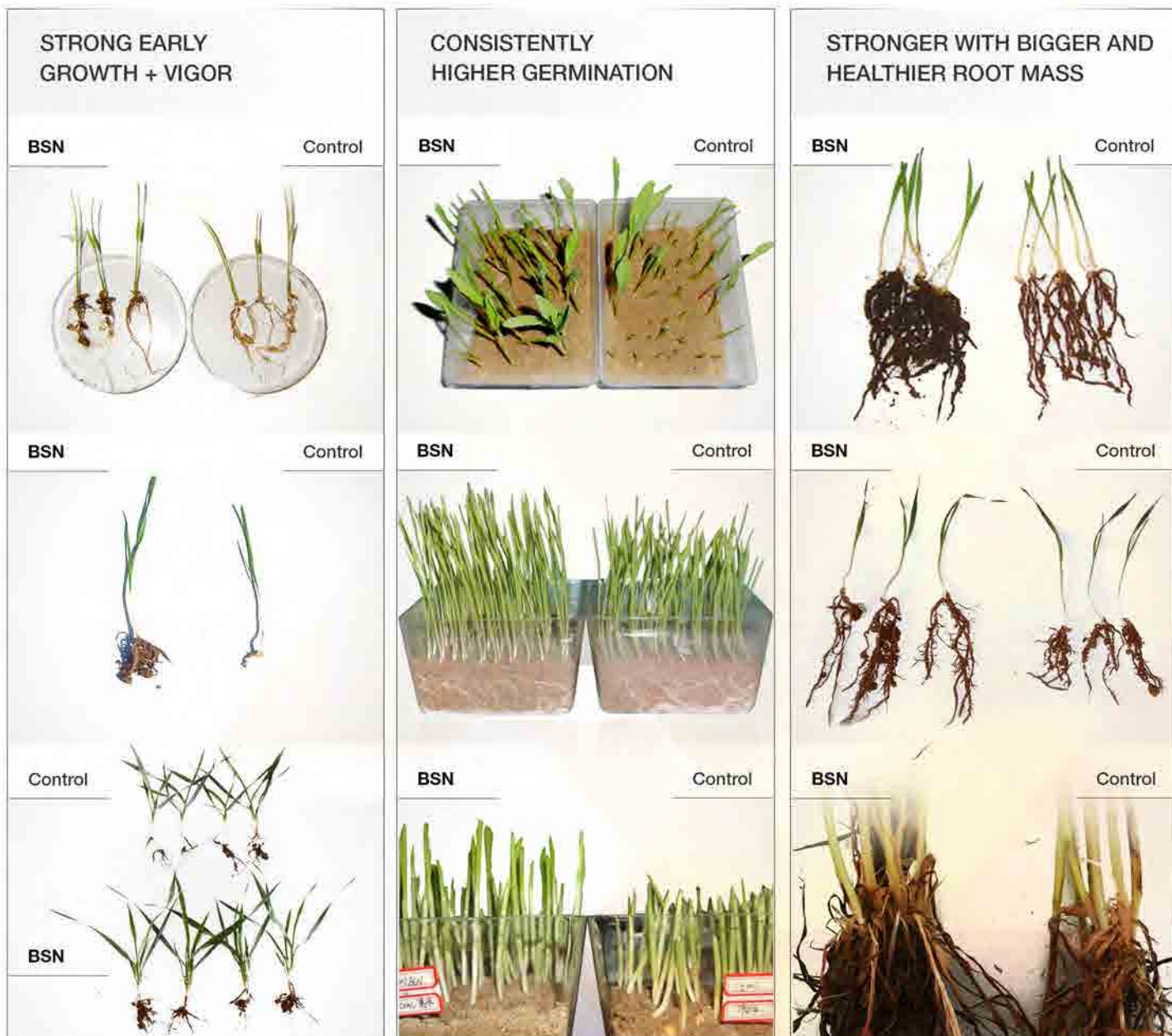
BSN is unlike almost any other seed treatment product in the market today. Fertilising the seed by using RLF seed priming technology and BSN is fast becoming the next step in modern farming practice.



Large increases in Seed internal Nutrient Concentrations are achieved with BSN

This table shows the nutrient analysis of untreated and BSN treated Seed in various crops. Following application of BSN the treated seed has been washed to remove any nutrient on the surface and then ground for analysis to demonstrate increases in Seed Nutrient Concentrations. Internal Nutrient levels are demonstrated to be raised significantly when treated with BSN.

Fertilising the Seed provides the nutrient for Early Growth



Don't Get Confused

Seed Priming is not the same as a seed coating. A seed coating uses the seed as a physical carrier to transport the coating into the soil and disperse it within close proximity to the seed. This nutrient can not be used by the seed until it has developed a suitable root structure and these roots intercept with the transported nutrient from the coating.

A seed primer imbibes seed nutrient directly into the actual seed and provides this nutrient to the seed for immediate use by the developing plant from its very first beginnings. This nutrient continues to be available during the early weeks of the plants growth and development.

The following graphic demonstrates the important principle of BSN's high-analysis broad-spectrum nutrient being imbibed by the seed as compared to a seed coating that dresses the seed.



BSN works so well because it put nutrients inside the seed.

Fertilising the seed is very efficient. The process of imbibing nutrient into the seed by using the RLF technology SDS Seed Delivery System ensure that uptake of the nutrient is reliable and effective. Since you are applying nutrient directly onto the seed when applying BSN it means when applied correctly the delivery of nutrient is up to 95% effective.

Applying a seed primer is easy and can often be done with other seed treatments such as fungicides – making it an efficient process and part of normal farm practices. The imbibing process takes no more than 20 minutes – with the BSN absorbed completely and ready for use.

Fertilising the Seed is Efficient



95% + EFFICIENCY

Delivery of nutrient via the seed is the most efficient and effective process when compared to delivery of nutrient via Seed - Leaf and Soil. Seed delivery is low input, functional and can ensure up to 95% of supplied nutrient is provided in a usable format for the seed to apply in its future growth and development.

When compared to delivery of nutrient by leaf the efficiency rating is lower due to the physical principles of leaf nutrient transfer and leaf uptake can often be effected by other less manageable variables in application and weather conditions. Soil application of nutrient is the least effective way of delivering nutrient to the plant as it relies on the root structure to intercept the nutrient in the soil – a process that results in lower uptake due to the physical processes required.



1 AFTER SEED PRIMING

During priming the BSN Seed Primer nutrients are taken up (imbibed) by the seed.



2 AFTER SOWING

When seed is sown, the applied nutrients are within the seed. In early hours of germination, the growing embryo senses the elevated nutrient levels as nutrients are mobilised within the seed.



3 DURING GERMINATION

The root, emerging from germinating seed has already got its share of applied nutrients and is empowered for vigorous searching of soil and nutrients.



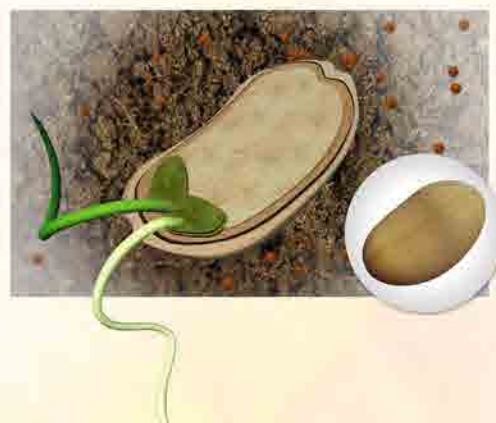
1 AFTER SEED COATING

Seed coating binds fertiliser to seed coat.



2 AFTER SOWING

When seed is sown, some of the coated particles separate from the seed and may sit inaccessible above the seed plane. In early hours of germination, the growing embryo does not sense any of the coated nutrients.



3 DURING GERMINATION

The root, emerging from germinating seed, searches for soil and coated nutrients in the surrounding soil.

KEY BENEFITS OF BSN SEED PRIMER



BSN Seed Primer is unlike any other fertiliser product on the market today. It can represent a number of direct benefits that substantially differentiate the product. These are based on plant science and physiology, trial and performance data and the basics of known and accepted agricultural principles. BSN Seed Primer is a performance product that can provide a combination of benefits as direct outcome from its application.

Listed are the 8 primary benefits of BSN Seed Primer and in the following pages are the detailed explanations and supporting information, data and results that support these principles and validate the results of BSN Seed Primer.

- 1** SAFE TRANSFER OF NUTRIENTS
- 2** INCREASES YIELD REGARDLESS OF FERTILISER RATE
- 3** EFFECTIVE IN ALL SOILS
- 4** FIX NUTRIENT VARIABILITY IN SEED LOTS
- 5** GREATER ROOT MASS
- 6** EARLY VIGOR AND STRONGER PLANT GROWTH
- 7** HIGHER YIELDS, QUALITY + VALUE
- 8** GOOD BUSINESS FOR THE GROWER

Fertiliser for Seeds

1 SDS PROVIDES SAFE TRANSFER OF NUTRIENTS

Using BSN's built in Seed Delivery Systems (SDS) the nutrients are safely transported to be in close proximity to the seed embryo; ensuring nutrients have high availability to the young seedling. Importantly, BSN then triggers the seeds own nutrient sensing mechanisms to set the plant for maximum yield potential.



2 BSN INCREASES YIELD REGARDLESS OF FERTILISER RATE

It is very common in untreated seeds for nutrient levels to be suboptimal levels. It has been scientifically demonstrated that BSN improves the seeds internal nutrient concentrations.

To ensure yield BSN adds "plant-available" Phosphorous which directly influences the yield potential regardless of fertiliser rates applied to the soil.

3 BSN IS EFFECTIVE IN ALL SOIL TYPES

BSN works effectively in all soil types regardless of the soil pH as the nutrient bypass the soil by being taken up from the seed.



4 FIX NUTRIENT VARIABILITY IN SEED LOTS



BSN corrects the nutrient variability that is naturally found in all seeds.

BSN is effectively and quickly imbibed by the seed. The resulting effect is that BSN primes the seed to the optimum range for essential nutrients including Phosphorus, Zinc, Copper, Manganese and Molybdenum; ensuring that all seeds are now in optimum nutrient condition.

5 GREATER ROOT MASS

BSN has the immediate effect of quickly growing a robust and larger root system.

This root system is bigger in overall mass, reach, and most importantly surface area. Typically this means an exponential increase in the number of fine root hairs which produce an increased amount of plant exudate and therefore stimulate greater microbial activity.



6 EARLY VIGOR AND STRONGER PLANT GROWTH

BSN when applied to the seed provides during the first 3-4 weeks of development the embryo, seedling and young plant with the nutrient required for healthy and strong growth.

BSN primed plants clearly show earlier, stronger and better plant growth as the basis for greater future yield potential.

7 HIGHER YIELDS, QUALITY + VALUE

BSN crops and fruits carry the benefits directly through to the farmer with higher yields, better quality and consistent crop and fruit produce.

These benefits all result in higher value, bigger margins and an overall greater financial outcome.



8 BSN IS GOOD BUSINESS FOR THE GROWER

BSN is good business for the grower who benefits directly from using BSN. The cost of using BSN is often a small percentage of the financial gains achieved through its application – a positive return for every dollar invested.



SDS PROVIDES SAFE TRANSFER OF NUTRIENTS

Using BSN's built in Seed Delivery System (SDS) the nutrient is safely transported to be positioned in close proximity to the seed embryo ensuring nutrients have high availability to the young seedling. Importantly, BSN then triggers the seed's own nutrient sensing mechanisms to recognise the elevated levels of available Phosphorus and Trace elements—this sets the plant for maximum yield from day one.



AFTER SEED PRIMING

During priming the BSN nutrients are taken up (imbibed) by the seed.



AFTER SOWING

When seed is sown, the applied nutrients are within the seed. In early hours of germination, the growing embryo senses the elevated nutrient levels as nutrients are mobilised within the seed.



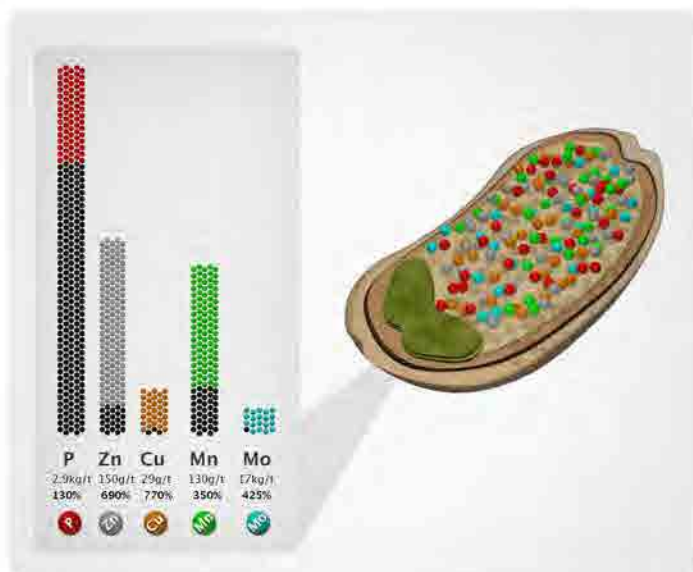
Independent results prove BSN elevates Nutrients in the Seed

Element	WHEAT		CANOLA		LUPIN		RICE	
	Control (ppm)	BSN-10 seed dressed @ 5L + 3L water/T (ppm)	Control (ppm)	BSN-10 seed dressed @ 10L + 3L water/T (ppm)	Control (ppm)	BSN-10 seed dressed @ 5L + 1L water/T (ppm)	Control (ppm)	BSN-10R seed dressed @ 5L/tonne (ppm)
Manganese (Mn)	48	189	25	500	14.2	163	106	310
Copper (Cu)	4.3	43	2.1	144	3.3	29	2.5	54
Molybdenum (Mo)	<1.1	2.1	<1.0	7.8	3.5	6.7	<0.66	4.4
Zinc (Zn)	14.7	126	23	410	36	164	12	175
Magnesium (Mg)	1050	1100	3100	3200	2100	2200	1150	1230
Phosphorus (P)	1930	2400	5700	7300	3300	3900	2700	3400
Plant Available Phosphorus(P) Est.	193	663	570	2170	330	930	270	970
		↑ 344%		↑ 380%		↑ 280%		↑ 360%

(Batten, 1985) 10% of Total Seed Phosphorus is INORGANIC Plant Available Phosphorus

Large increases in Seed internal Nutrient Concentrations are achieved with BSN

This table shows the nutrient analysis of untreated and BSN treated Seed in various crops. Following application of BSN the treated seed has been washed to remove any nutrient on the surface and then ground for analysis to demonstrate increases in Seed Nutrient Concentrations. Internal Nutrient levels are demonstrated to be raised significantly when treated with BSN.



Available Phosphorus

The seed and plant can only use and metabolise inorganic phosphorus – called available phosphorus. In each seed, the available phosphorus is only about 10% of the total phosphorus (Batten, 1985), which means that the phosphorus available for seed germination and early growth is often too low.

BSN provides the seed with inorganic available phosphorus that the seed embryo and the plant can immediately use. The amount of available phosphorus that BSN renders, provides a 350% increase to the embryo and importantly makes it easily available for immediate use in germination and early growth. This early development then goes on to support greater phosphorus conversion, further providing available phosphorus to the plant for its continued growth.



Available Phosphorus Table

	Wheat (ppm)	Rice (ppm)
Control Available P	193	270
BSN Available P	663	970
Increase Available P	↑ 344%	↑ 360%

What does this mean

This means that by using BSN to provide the seed with available phosphorus you are making sure that the embryo and early plant has access to the key nutrient required for yield.

If phosphorus is too low then the opportunity to set high yield potential is lost, and that is why using BSN is essential in making available phosphorus levels in the seed high enough to set the maximum yield potential for the plant.

BSN Increases Available P by ↑ 350%



BSN Increases Yield Regardless of Fertiliser Rate

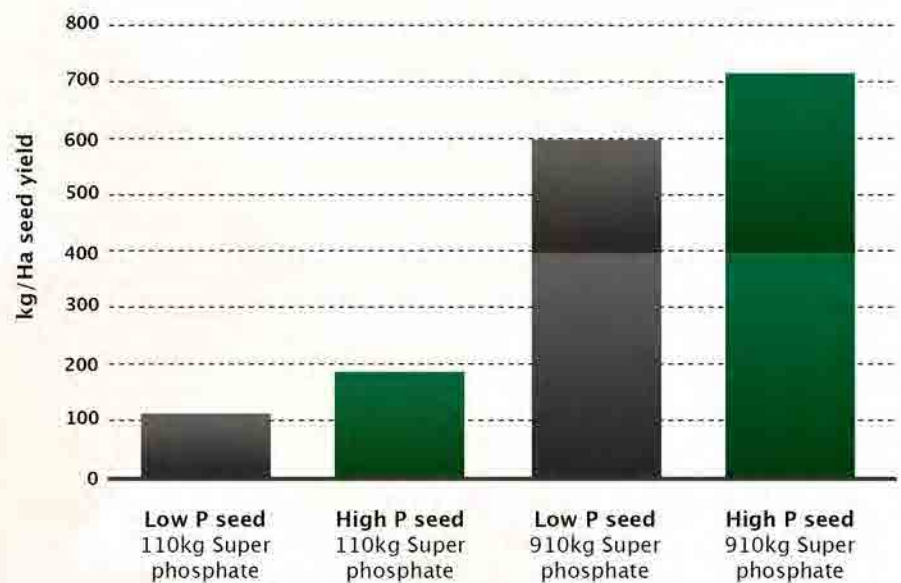
It is very common in untreated seed for nutrient levels to be at suboptimal levels, these levels are also negatively affected by annual climatic conditions including drought and flood, meaning that the seeds nutrient levels can change and be negatively impacted from one year to the next. It has been scientifically demonstrated by RLF and independent research scientists that BSN improves seed (internal) concentrations. Phosphorus and trace elements will directly influence yield potential regardless of fertiliser rate applied to the soil.



Proof that higher Phosphorus in the seed gives higher Yield regardless of fertiliser rates

Available Phosphorus

Work by Bolland and co-workers (2006), as shown in the graph to the right, shows higher yield of medic seed with high seed phosphorus regardless of the rate of super phosphate applied with seed at sowing.



Seed yield in medic having low (0.40%) and high (0.64%) phosphorus in the seed. Yield increase due to seed phosphorus was 27% and 23% higher at 110kg and 910kg Super phosphate respectively. (Adapted from Bolland et al 2006)

What does this show

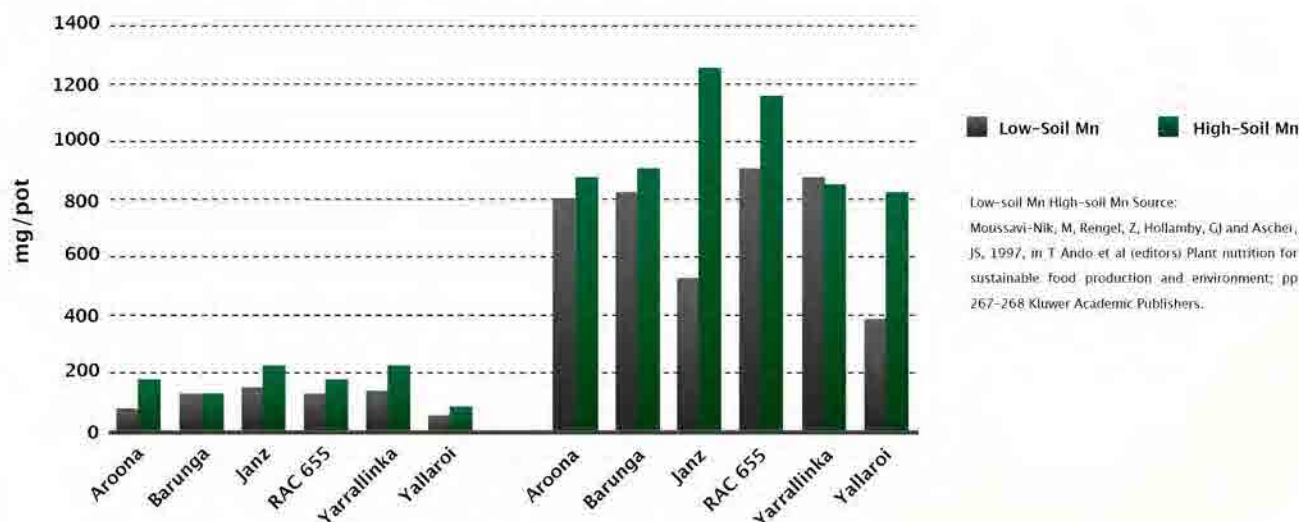
This shows how important the phosphorus levels in the seed are to future yield.

It doesn't matter how much fertiliser you use - if the phosphorus levels in the seed are higher, the yields are greater. This shows that by using BSN you can ensure that phosphorus levels in the seed are higher, and therefore the potential for yields will be greater, regardless of the rate of fertiliser used.



Seed Manganese Response

This graph demonstrates that root growth is better with high manganese in seed regardless of soil manganese supplied. Similar responses to higher levels of Seed Zinc where Zinc is deficient in the soil.



What does this show

This shows that the nutrient in the seed – in this case Manganese – has a better effect and result regardless of the availability of the element levels in the soil.

It confirms how important nutrient levels are in the seed compared to the nutrient level in the soil.

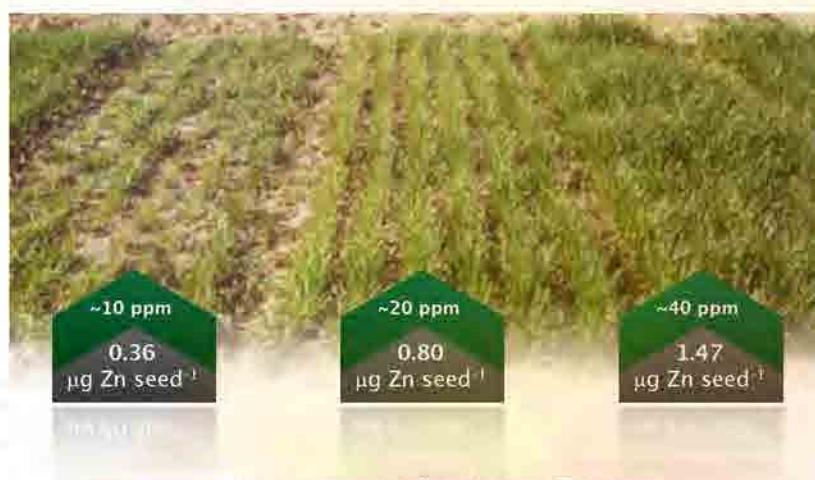
Seed Zinc Response

Trial showing visual responses to increases in concentrations of Seed Zinc in Central Anatolia

What does this show

Seed Zinc response shows us that the higher the seed nutrient level, the more response there is, regardless of levels in the soil.

This reinforces the importance of ensuring the seed has the optimum nutrient balance because the soil levels will have little direct result during germination and early growth.



Source: Yilmaz et al., J. Plant Nutr. 21: 2257-2264



BSN is Effective in All Soil Types

BSN is effective and operates in all soil types and provides the optimum nutrient requirements directly into the seed.

The Independent results shown in section two confirm that nutrient levels in the soil are not a compelling factor in germination and early growth – and BSN removes any dependence on the soil because it fertilises the seed directly. The surrounding soil conditions, and the soil types, have little influence over the availability of the seed embryo to use the nutrients provided by BSN.



BSN Bypasses the Soil

BSN fertilises the seed directly, and bypasses the soil and the soils requirement to provide nutrient for germination and early growth.

In the previous section the results of independent trials have shown that the soil types, fertiliser rates and conditions are not an influence when compared to the levels of nutrient in the seed itself. This is why BSN can bypass the soil conditions to provide the seed directly with the nutrient balance required during this growth period.

Fertiliser Efficiency is Highest in the Seed

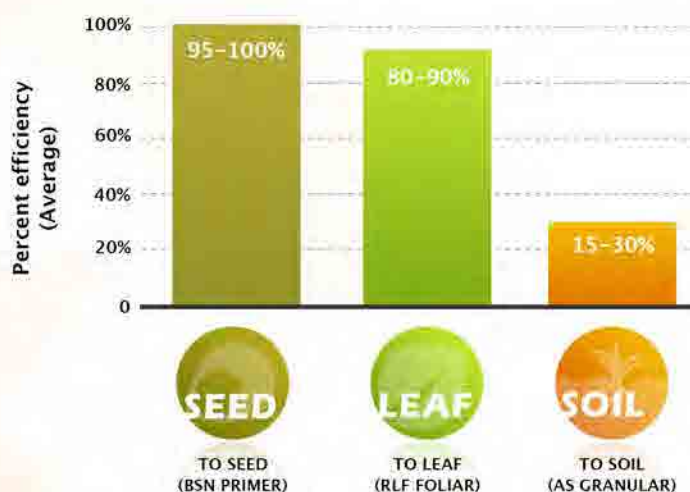
Average Fertiliser Uptake

The seed can achieve between 95 – 100% fertiliser uptake efficiency when compared with 15 – 30% uptake for plants relying on fertiliser from the soil.

What does this mean

This shows you that fertilising the seed by using BSN to imbibe a balanced nutrient package inside the seed, is the most effective and efficient method of providing nutrients directly to the plant when compared to foliar and soil-based products.

Fertiliser Uptake Efficiency





Without a root structure the nutrients for growth come only from the seed

When a seed is sown it absorbs moisture and activates its growth. At this important time the seed only has access to the nutrient value it contains inside. As a seed it has no way of finding or absorbing soil based nutrient – it depends exclusively on the nutrient stored in the seed itself. It simply doesn't matter about the soil type, quality or nutrient status of the soil as the seed is totally reliant on its own nutrient content for the early germination and growth process.

At this time the seed sets itself for future yield potential through the value of its nutrient status – based on its understanding of its potential the plant is already setting itself for future growth. BSN Seed Priming ensures maximum opportunity for future yield is set at this time.

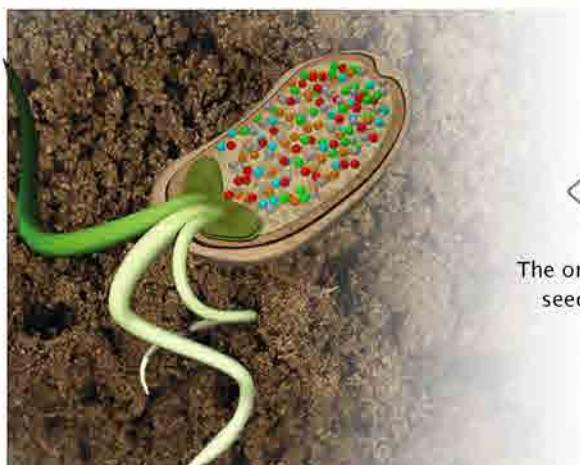
BSN

No Treatment



AT SOWING

At this stage, the seed doesn't have any root structure and must rely on seed nutrient for germination and early growth.



WEEK 1-2

The only nutrient availability is from the seed for use in germination + early growth and development.



WEEK 2-4

Only when the young plant has developed a root structure can it start to draw nutrient from the soil.



Fix Nutrient Variability in Seed Lot with BSN Seed Primers

Utilising HBS High-Analysis Broad Spectrum Technology, BSN corrects nutrient variability that is naturally found in all seeds as a result of external (e.g. drought) and internal (e.g. developmental) variability in the seed lot. Since BSN is efficiently and quickly imbibed by the seed, it results in priming the seed to the optimum range with essential nutrients including Phosphorus, Zinc, Copper, Manganese, Potassium, Sulphur, Magnesium, and Molybdenum. Each of these elements plays a critical role in the development and early vigour of the young seedling.



Every Seed Has Different Nutrient Levels

GOOD LEVELS



AVERAGE LEVELS



POOR LEVELS



Easy Application

BSN can be easily integrated into current on-farm seed treatment practices and can be applied in conjunction with many agricultural chemicals used for disease and pest prevention reducing labour costs and making the process of on-farm application simple. BSN is sprayed onto the seed. This can be as the seed is transported rapidly by auger to a silo or truck or simply manually applied and is completely imbibed by the seed in 20 minutes.



BSN elevates seed nutrient levels to optimum and therefore ensures problems with seed lot variability are fixed.

1 Every seed has different nutrient levels

Every seed lot contains seeds that vary in nutrient levels and quality because of extremes and development variation during their growth.

No seeds are the same.



2 Treat with BSN

By treating with BSN every seed has the BSN nutrient imbibed into it and ready to play a critical role in the development and early vigor of the young plant.



3 BSN Fixes nutrient variability

Treating the seed with BSN primes every seed to the optimum nutrient level effectively fixing nutrient variability in seed lots.

Now the seeds are the same.



Make Every Seed Count

GREATER ROOT MASS

The root growth and rhizosphere activity (organic matter build up) in trials with different rates of phosphorus fertiliser shows that the better root activity is related to the BSN and is independent of fertiliser regime.

This proves that the movement of phosphorus from the seed influences the root growth of seedlings more than the soil-applied phosphorus during the early stages of seedling establishment.

Independent Tests Prove the BSN Effect on Root Mass





Healthy Rhizosphere Stimulate Microbial Activity

Using BSN on the seed reliably results in the development of a large root mass.

BSN root mass has a substantial increase in the number of fine root hairs and this gives an exponentially larger root surface area. As a result, BSN roots typically have a rich, bulky and healthy rhizosphere, all created by the larger root surface area generating a higher amount of plant exudate.



The plant exudate then provides the host for stimulated microbial activity, turning a BSN root mass into an efficient bulk of microbial activity where the conversion of soil based organic matter into inorganic 'plant available' nutrient occurs.





BSN Creates Many Added Benefits

BSN seed priming has a number of physical effects and outcomes that create benefits as a direct result. 12 of these 'cause and effect' benefits are detailed here.

1 INCREASE EARLY VIGOUR

BSN assists in uniform and speedy seedling establishment. Vigorous root growth enhances growth of useful bacteria in root rhizosphere antagonising pathogenic bacteria.

2 STRONGER PLANT GROWTH WITH EARLY TILLERS THAT ARE MORE VIABLE

BSN powers stronger early plant growth from the point of germination - resulting in the earlier appearance of tillers that are thicker and stronger. This means more viable and stronger tiller formation is the precursor to better future yields.

3 TOLERANCE TO DROUGHT AND WATER LOGGING

BSN increases tolerance to drought and also water logging for higher rainfall areas, since it forms more organic matter in rhizosphere of the root.

4 IMPROVES GRANULAR FERTILISER PERFORMANCE

Importantly BSN is proven to work regardless of granular fertiliser rate or soil pH. By reducing the toxic effects of fertiliser in the furrow and growing bigger root systems meaning more granular fertiliser intercepts and uptake.

5 MORE NUTRIENT FROM THE SOIL AND ENVIRONMENTALLY RESPONSIBLE

BSN increases uptake of granular fertiliser providing higher availability of soil applied NPK fertilisers whilst reducing leaching of expensive and environmentally damaging nutrients from NPK fertilisers into the stream and water table. BSN has a moderating effect on loss of nitrogen and phosphate from topsoil since it creates more root interception with these nutrients in soil.

6 GENERATES GREATER PHOSPHORUS ACTIVATION AND IMPROVES UP-TAKE FROM THE SOIL

The BSN stimulated root mass causes two direct activities. Firstly, because it is physically larger and has more surface area, the plant has greater and more effective physical access to soil phosphorus. Secondly, this larger mass stimulates more microbial activity, resulting in phosphorus activation or the conversion of soil phosphorus into plant available phosphorus that the plant can then use.





7 IMPROVES NITROGEN EFFICIENCY IN THE PLANT

The uptake efficiency of nitrogen from the soil is improved, using less energy in the transfer to the plant metabolism.

8 PROMOTES BETTER RESISTANCE TO DISEASE

BSN promotes an improvement in the general performance of the plant's resistance to disease and improves the plant's ability to robustly handle disease attack from its position of greater health.

9 PROVIDES THE PLANT WITH GREATER TOLERANCE TO ENVIRONMENTAL EXTREMES OR IMPACT

BSN is shown to give the plant the ability to deal with the extremes of environmental impacts such as drought, frost and water logging.

A BSN primed plant has more tolerance to extremes, giving greater assurance against uncontrolled environmental impacts.

10 AUGMENTS THE PLANT'S STRESS-HANDLING ABILITIES

BSN has been shown to provide the plant with the ability to handle plant related stresses. A larger root structure provides the plant with the ability to harness more strength during these times – which improves the overall outcome.

11 BUFFERS FUNGICIDES AND PESTICIDES

The harsh effects of pesticides and fungicides applied to the plant are shown to be easier to handle for a BSN grown plant, as it is buffered by the stronger and healthier conditions BSN achieves.

12 IMPROVES PLANT METABOLISM

Overall plant metabolism is improved in a BSN applied plant, as it has been established for maximum growth potential from the point the seed embryo was set during the seed priming.



INDEPENDENT TRIAL RESULTS

BSN has been independently tested in trials for over 15 years.

This has made BSN one of the most trialled and tested seed priming products, and has results in support of BSN for many crops and many environments. Some of the many replicated programs are shown below.



Summary of Results in Australia

1 The results outlined, except for one large field trial, are of independent Replicated Trials. As independent replicated trials the figures represent a very high statistical relevance and some trials result show 95% or higher level of confidence. Achieving a range of Statistically Significant Results from a fertiliser that only costs \$1-\$2 per acre is exceptional and the significance of this should not be underestimated. The positive effect of BSN on yield was only obscured by paddock variability in 1 case out of 12 independent replicated trials as shown in the graph.

2 RLF has many more positive field evaluation trials available for BSN however as they are not independent we have chosen not to include them in this document. The results provided can stand up to the highest level of scientific scrutiny.

3 Whilst independent replicated trial results confirm BSN's high level of effectiveness, what counts for the grower is the 10:1 Financial Return on the Investment BSN provides.

Change in yield resulting from BSN treatment in replicated independent trials, only EP* 2003 trial is independent large-scale trial. Median yield increase is 6.1% and average yield increase is 12.5%

**12.5%
INCREASE**



RESULTS FROM THE RICHER, HIGHER QUALITY SOILS OF NORTHERN HEMISPHERE

RLF has spent over 20 years working in the Southern Hemisphere with Australian growers. The environmental and climatic condition in Australia are harsh and generally lower soil quality and harder climate means lower yield rates in the fields. During the last 6 years, RLF has worked to introduce its products to the Northern Hemisphere with its combination of higher value soils, better climate and more reliable and higher yield rates.



BSN works better in Asia's Rich conditions

Summary of Results in China

Trials have been conducted in locations throughout the world. The details here showcase a range of trial results conducted in the Northern Hemisphere in China.

18.2% INCREASE

Trial Results By Northern Hemisphere (China)

Location/Area:	Zhuma Village, Dingyuan Conty, Chuzhou City, Anhui	20.40 %	Increase	↑	1760 % ROI
Location/Area:	Luyin Village, Xiangcheng City, Henan	17.75 %	Increase	↑	1696 % ROI
Location/Area:	Gezhai Village, Zhongzhao Conty, Neihuang City, Henan	15.80 %	Increase	↑	1600 % ROI
Location/Area:	Xuyu Village, Lingbi Conty Shuzhou City, Anhui	19.50 %	Increase	↑	1888 % ROI
Location/Area:	Shanzin Village, Andu Conty Weilhui City, Henan	17.50 %	Increase	↑	1680 % ROI





Real on-farm results give our farmer customers great confidence that BSN is a permanent part of any modern farming program

RLF farmer customers using BSN achieve real results year after year.

These results can be seen both in the field, and in the balance sheet (financially) at the end of the season. BSN results assure our farmer customers and give them the confidence to include BSN as a permanent part of every crop - year after year.





Over 3 million farmer customers worldwide

BSN is used worldwide by over 3 million farmer customers.

It is this trust in BSN that has made it the world's #1 seed primer. Our success is linked directly to the success of our farmer customers. We use modern plant physiology to support our demonstrated commitment to agriculture and the business of our farmer customers.

You can rest assured, comfortable in the knowledge that BSN is working for farmers all over the world today. BSN has become a valuable and reliable part of modern farming practice.



**World-Leading
RLF Product**

3,000,000+



"BSN nutrient seed dressing is an absolute must in any season. We use foliar fertilisers to enhance crop performance according to seasonal conditions and plant requirements."

— Geoff Chase
Tottenham, Central West NSW

Results of BSN Seed Primer in Corn



BSN on Corn seed | Laboratory test

This result clearly showing the BSN seed had earlier germination and stronger out of the ground growth.



BSN on Corn seed | Field test

The randomly selected corn plants show the BSN plant with a much larger root system (4 X bigger) and a healthier amount of plant exudate on the roots stimulating higher levels of microbial activity.



BSN on Corn seed | Yield test

Corn ears visually showing the BSN yield result as much larger and higher yielding result and more likely to receive greater value on sales because of size and quality.



BSN on Corn seed | Field test

The BSN field sample has larger and far more developed plants, so much so that you can easily see the difference visually when compared to the control field.



BSN on Corn seed | Field test

When compared, the BSN field sample showing it maintains more developed and stronger growth. The plant is much thicker, the fruits are more and visually the plant has greater growth development.



BSN on Corn seed | Yield test

When compared the corn result is overwhelmingly better. A larger result, greater mass and by definition a higher nutrient value produce. Visually the produce is more appealing and shows considerable yield increase on the control item.

Results of BSN Seed Primer in Corn



BSN on Corn seed | Field test

The root growth has been increased and looks to be about 3 or 4 times larger. It is clear to see the size of the organic matter in the root mass is considerably more. Root reach, number and sheer root mass would provide the plant with a massive soil based nutrient reach advantage over the control plant.



BSN on Corn seed | Field test

The plant stalk is thicker and the number of leaf and tillers looks more. Plant height differences can easily be seen. The BSN plant is better than the control item.



BSN on Corn seed | Yield test

The corn ear difference is visually apparent and consistent with a BSN primed seed. A larger yield result would occur and the quality of produce should be easily distinguished between the better BSN item and the Control test.



BSN on Corn seed | Field test

The corn brace roots are clearly stronger providing the BSN plant with more structure and strength to with-stand climatic conditions. Generally the brace roots show the health of a plant which can be clearly distinguished between the two results.



BSN on Corn seed | Field test

Plant height and mass between the BSN and Control plants is easily differentiated. The BSN result is higher, thicker and generally a larger plant mass.



BSN on Corn seed | Field test

Root length can be clearly identified when the root organic matter is washed from the roots. The BSN plant has longer and thicker roots – providing the plant with greater reach and access to soil based NPK and nutrients. Root mass is also a reflection on plant wellbeing.

Results of BSN Seed Primer in Rice



BSN on Rice seed | Laboratory test

Higher germination rates and more vigour in germination growth can be distinguished between the BSN and control items. These tests are conducted in sand.



BSN on Rice seed | Field test

When the root system is washed of organic matter – visually the BSN result shows better root system, longer and thicker main roots. Root systems are a foundation of health in the plant.



BSN on Rice seed | Field test

BSN result showing a much larger plant leaf and root mass. Thicker and taller plant with more tiller activity that should translate into an increased rice yield result.



BSN on Rice seed | Field test

Thicker and taller plant with more tiller is clearly evident in the comparison image, root mass differentiation is less clear. Plants are generally in better condition.



BSN on Rice seed | Field test

This farmer simply applied BSN to the rice seed before sowing. A month later, the dark green colour becomes visible, the whole plant is significantly stronger.

Results of BSN Seed Primer in Rice



BSN on Rice seed | Field test

The in-field visual comparison is clear between the BSN test field and control. Much visually differentiation exists between the improved and healthier looking BSN field versus the control.



BSN on Rice seed | Field test

A close-up of root structure shows the BSN plant has increased root size, number and general root mass strength. This result is typical of the effect BSN has on better root development.



BSN on Rice seed | Field test

Early germination and growth clearly shows a better result and a more developed early plant. BSN has had better germination rates and the seed nutrient has continued to support more early life growth rates when compared to the Control.



BSN on Rice seed | Yield test

Clearly more rice yield as a result of BSN when compared visually to the Control. A much higher volume, healthier, more valuable result. Colouration also supports the possibility the BSN result is a better grain with higher nutrient values.



BSN on Rice seed | Field test

Paddy field images showing the BSN crop as much thicker because the plants are physically bigger with more leaf when compared to the Control field.

Results of BSN Seed Primer in Wheat



BSN on Wheat seed | Field test

Wheat in the field showing a thicker better result from using BSN – plants are much healthier and leaf is more. Colour shows a deeper greener colour which generally indicates the higher nutrient health of the plant.



BSN on Wheat seed | Field test

A defining image for BSN effectiveness which reflects a plant that looks twice as big and far more developed in all areas. The crop went on to produce some amazing yield results.



BSN on Wheat seed | Field test

The early germination success of the BSN is clear when compared to the Control field. Much greater germination rates and the early growth is much stronger resulting in the more developed plant mass shown here.



BSN on Wheat seed | Field test

Comparison between BSN and Control are evident of the early result a BSN primed seed has when it provides access to the optimum level of available seed phosphorus and nutrients.



BSN on Wheat seed | Field test

This image clearly shows how successful BSN was in the overall end results. Plant mass, root mass and yield can be clearly seen as substantially improved when compared to the Control item. This was a stunning result for BSN.



BSN on Wheat seed | Field test

Colour says it all when looking at these results. A very deep green colour reflecting the better status of the plant having access to nutrient from the seed supplied by BSN.

Results of BSN Seed Primer in Wheat



BSN on Wheat seed | Field test

Root and early tiller numbers are better. Again it is easy to distinguish the healthier plant and to see that more tiller numbers should result in increased yield. The root results are typical of the BSN effect.



BSN on Wheat seed | Field test

Root size and health will mean that the plant can achieve many better results as it can access more soil nutrient, reach fertiliser and will have greater microbial activity meaning the plant can convert soil phosphorus for its use.



BSN on Wheat seed | Field test

Growth development is evident with the BSN plant more advanced. BSN has shown that it is important to set the seed for maximum growth potential which the plant does based on the available seed nutrient at the time of sowing. The results are shown here.



BSN on Wheat seed | Field test

BSN results show a visually healthier plant. BSN has provided more plant protection in that the plant is healthier to withstand any negative effects of climate, soil and buffers against agricultural chemical use.



BSN on Wheat seed | Field test

BSN fertilises the seed for early growth. This image clearly shows the difference results and how BSN sets the plant for its future potential by making early growth better because the seed has been given all the required nutrients and more available phosphorus.



BSN on Wheat seed | Field test

BSN results are shown to carry forward as the plant gets the best start it can get from the seed nutrient and then it appears development carries forward to continue advanced growth based from this early stage.

Results of BSN Seed Primer in Fruits and Veggies



BSN on Fruits or Vegetable seed | Field test

Excellent BSN results are witnessed on vegetable seeds. Supplying the vegetable seed with optimum levels of seed nutrient should see the same effects in early growth and vigour.



BSN on Fruits or Vegetable seed | Laboratory test

Clearly more advanced in height and stalk width. Root mass again is typical of a BSN seed being larger.



BSN on Fruits or Vegetable seed | Field test

Substantial growth difference is visually apparent between BSN and Control. Leaf cover and the different in colour is massive. The BSN treated plants are definitively better in all measures as seen in the image.



BSN on Fruits or Vegetable seed | Field test

The increase in produce yield is substantial and can easily be seen in the comparison of the BSN produce versus the Control. Not only is it a much higher yield, but colour, quality and nutrient value must have translated through the healthier plant to the final product – it may even taste much better.



BSN on Fruits or Vegetable seed | Laboratory test

Test done in sand. Germination rates are higher. The darker colour of the stalk reflects better early growth dynamics. A larger leaf size is very evident in this image.



BSN on Fruits or Vegetable seed | Laboratory test

Test done in sand. BSN seed has a clear advantage when compared to the Control. The substantial difference is visually easy to identify and you can just make out the root mass is about twice as thick at the bottom of the container.

Results of BSN Seed Primer in Fruits and Veggies



BSN on Fruits or Vegetable seed | Field test

BSN is very effective in this result. Whilst the root mass in this image looks less, it is clear to distinguish that the growth is well over twice that of the Control plant.



BSN on Fruits or Vegetable seed | Laboratory test

The benefit of using plain sand which is devoid of nutrient – is that it forces the plant to grow based on the seed nutrient available to it. The reinforces that BSN is imbibed into the seed and makes readily available seed nutrient for plant growth.



BSN on Fruits or Vegetable seed | Laboratory test

Evidentiary results of BSN effect on early growth and plant success is visually apparent between the samples.



BSN on Fruits or Vegetable seed | Field test

BSN on Niger seed shows a stunning results in comparison. Visually the difference is apparent with colour, height and plant mass evident to the difference that BSN has made on the growth and development.



BSN on Fruits or Vegetable seed | Field test

BSN on Chinese cabbage seed. It is clear that the BSN seed has produced a much healthier, better colour green and bigger yielding result – the cabbage looks like it is of a much greater quality and should be nutritional better when eaten.

What a BSN 5% Yield Increase Means | Moderate Result

Input
BSN Investment

Output/Production Improvement
BSN Yield Return

Total extra grain
from your Crop

20L drum of BSN
treats approx 80ha



Produces an extra
x6 bulk bags of wheat

~6 tonnes



5% ↑

Based on a 5% yield increase on a
1.5T/ha crop for a wheat crop

1.21T/ha crop for a wheat
based on a 1.5T/ha yield



200L drum of BSN
treats 40t of seed approx 800ha



Produces an extra
x60 bulk bags of wheat

~60 tonnes



32x20L drums
640L pallet of BSN
treats 128t of seed approx 2,560ha



Produces an extra
x192 bulk bags of wheat (4 road trains)

~200 tonnes



1,000L shuttle of BSN
treats 200t of seed approx 4,000ha



Produces an extra
x300 bulk bags of wheat (6 road trains)

~300 tonnes



What a BSN 12.5% Yield Increase Means | Australian Result

Input
BSN Investment

Output/Production Improvement
BSN Yield Return

Total extra grain
from your Crop

20L drum of BSN
treats approx 80ha



Produces an extra
x15 bulk bags of wheat ~15 tonnes



12.5% ↑

Based on a 12.5% yield increase on a
1.5T/ha crop for a wheat crop



1.21/ha crop for a wheat
crop 1.5T/ha crop for a wheat

200L drum of BSN
treats 40t of seed approx 800ha



Produces an extra
x150 bulk bags of wheat

~150 tonnes



32x20L drums
640L pallet of BSN
treats 128t of seed approx 2,560ha



Produces an extra
x500 bulk bags of wheat (10 road trains)

~500 tonnes



1,000L shuttle of BSN
treats 200t of seed approx 4,000ha



Produces an extra
x750 bulk bags of wheat (15 road trains)

~750 tonnes



What a BSN 18.2% Yield Increase Means | China Result

Input
BSN Investment

Output/Production Improvement
BSN Yield Return

Total extra grain
from your Crop

20L drum of BSN
treats approx 80ha



Produces an extra
x22 bulk bags of wheat ~22 tonnes



18.2% ↑

Based on a 18.2% yield increase on a
1.5T/ha crop.

1.5T/ha crop
18.2% yield increase



200L drum of BSN
treats 40t of seed approx 800ha



Produces an extra
x218 bulk bags of wheat ~218 tonnes



32x20L drums
640L pallet of BSN
treats 128t of seed approx 2,560ha



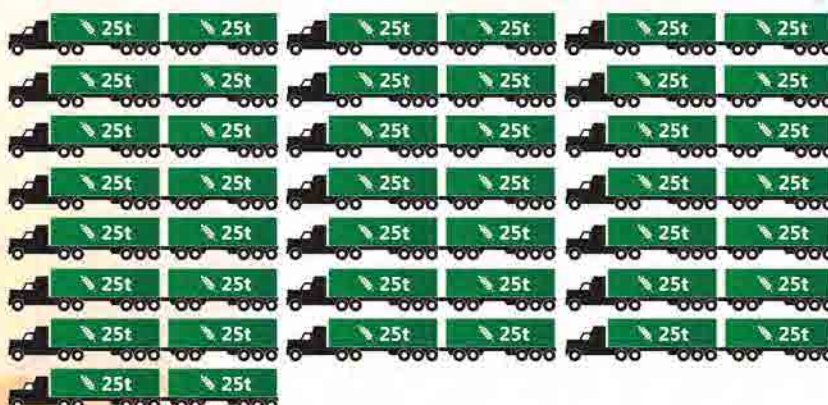
Produces an extra
x728 bulk bags of wheat (14.5 road trains) ~728 tonnes



1,000L shuttle of BSN
treats 200t of seed approx 4,000ha



Produces an extra
x1092 bulk bags of wheat (22 road trains) ~1092 tonnes





BSN Superstrike



BSN Ultra



BSN Hybrid



Available Sizes

Sizes in Litres



1000 Litres

Description

Intermediate Bulk Container (IBC). Stainless steel frame for the transport and storage of bulk liquid fertilisers.

Dimensions

Height 1160mm
Width 1200mm
Length 1000mm



20 Litres

Description

Drum (Small Size). Leak proof, narrow mouth, tight end made with HDPE (High Density Polyethylene).

Dimensions

Height 450mm
Depth 280mm
Width 280mm



200 Litres

Description

Drum (Large Size). It is made of UHMWPE (Ultra-High Molecular Weight and High Density Polyethylene). Tamper evident feature.

Dimensions

Height 950mm
Diameter 590mm



5 Litres

Description

Bottle (Large). Leak proof, narrow mouth, tight end made with HDPE (High Density Polyethylene).

Dimensions

Height 295mm
Depth 190mm
Width 140mm



110 Litres

Description

Drum (Medium Size). Total opening with screw lid. Water tight closure. Tamper evident feature. HDPE (High Density Polyethylene) material.

Dimensions

Height 770mm
Diameter 485mm



1 Litre

Description

Bottle. Leak proof, narrow mouth, tight end made with HDPE (High Density Polyethylene).

Dimensions

Height 250mm
Depth 85mm
Width 85mm

Sizes in Millilitres (Bottles)



500 Millilitres

Description

Bottle. Leak proof wide mouth rounds with screw cap. Made with HDPE (High Density Polyethylene).

Dimensions

Height 190mm
Width 70mm



200 Millilitres

Description

Bottle. Leak proof wide mouth rounds with screw cap. Made with HDPE (High Density Polyethylene).

Dimensions

Height 125mm
Width 60mm



250 Millilitres

Description

Bottle. Leak proof wide mouth rounds with screw cap. Made with HDPE (High Density Polyethylene).

Dimensions

Height 135mm
Width 62mm



100 Millilitres

Description

Bottle. Leak proof wide mouth rounds with screw cap. Made with HDPE (High Density Polyethylene).

Dimensions

Height 100mm
Width 50mm

Sizes in Millilitres (Sachets)



30 Millilitres

Description

Sachet. A small disposable pouch made from plastic lined foil which contains single-use quantity of the liquid fertiliser product.

Dimensions

Height 130mm
Width 90mm



10 Millilitres

Description

Sachet. A small disposable pouch made from plastic lined foil which contains single-use quantity of the liquid fertiliser product.

Dimensions

Height 105mm
Width 75mm

Sizes in Bulk

60K Litres, 20K Litres, 10K Litres

Description

Road Train also known as "C" Train, 316 stainless steel, 550 horsepower freightliner with 18 Speed road ranger transmission.



Dimensions

Height 13,000mm
Width 2500mm
Length 36,500mm



RLF Technology

RLF is a high-technology developer and manufacturer of liquid fertiliser products for agriculture – all of which are engineered and based on plant science. RLF products are based on two key developed and proprietary technologies:

-  **Nutrient Delivery Technology** has allowed RLF to formulate products that can be quickly and efficiently be delivered into the seed (imbibed) or into the plant through the leaf and cell walls.
-  **High-analysis Broad-spectrum Solutions** - RLF has developed technology to allow for the safe and stable formulation of products that contain up to 12 nutrients without any element antagonism or conflict.

This means that RLF products are able to achieve the safe delivery of a broad-spectrum of nutrients directly to the seed or plant – with reliability and integrity – ensuring the maximum chance for effectiveness and results for the farmer and grower customers.

RLF has developed a fully integrated and complete range of liquid fertiliser products designed for the needs of your farmer and growers:



Seed Priming



Ultra Foliar



Rapid Foliar



Foliar



Fertigation



Root Boost



Crop-Specific

RLF Product Features



High-analysis, Broad-spectrum Solutions

RLF's world-leading technology that enables the safe formulation and manufacture of fertiliser in a concentrated solution that contain many nutrients – all stable and safely engineered for the plant.



SDS - Seed Delivery System

World-leading first RLF-developed technology that bonds with the nutrient elements to efficiently and safely transport them directly into the seed embryo. This process is called imbibing and it is essential in the success of fertilising the seed directly with nutrient.



NDS - Nutrient Delivery System

World-leading RLF's specially formulated nutrient carrier-technology that bonds with the nutrient elements in solution to transfer them straight into the plant through the leaf cell walls and then directly into the cells themselves.



RDS - Rapid Delivery System

RLF's specially formulated technology that utilises a balance of high-quality chelates and RLF nutrient carrier-technology to enact nutrient transfer rapidly with high-efficiency into the plant and throughout its cells.



High-Performance Formulations

RLF High-analysis Broad-spectrum products have up to 12 nutrient elements delivered to the plant or seed in a single application – meaning that this one product can perform many functions and achieve many outcomes in this high performance formulation.



Plant Physiology + Chemistry

RLF products are developed based on the plants own detailed and individual physiology and related chemistry, in order to achieve the desired results from every formulation. This is the basis of all RLF products. This ensures the correct types of nutrient are delivered to the plant safely and efficiently.



Crop Nutrient Removal

RLF applies the science of nutrient removal in the development and formulation of its high technology products. Crop Nutrient Removal science allows RLF to calculate the quantity of nutrients for every formulation as to balance those nutrients removed during the plant cycle.



Stable Solution

RLF products are high concentration at specific gravity values between 1.2 and 1.5 – they are engineered in the formulation to ensure that they maintain full integrity. RLF products are tested, accredited and in quality solution that assures stability and longevity.



Build + Increase Organic Matter

RLF high-technology products build and increase organic matter through the development of a larger root mass, greatly increased fine root hairs and a higher rate of root turnover caused by increased microbial activity and the resulting increase in plant exudate. This is supported by the increase in plant nutrient levels and the increase in the mass of growth matter – both returning to the soil at harvest.



Quality Assured

Accredited ISO9001:2008 certification enables RLF to demonstrate high levels of service quality and to show that internationally recognised quality management principles are followed.



World-Leading RLF Product

RLF have delivered products to the market that are recognised as world-leading and innovative. Its technologies are scientifically advanced and provide solutions that support modern farming practice.



Proven to Work

All RLF products are scientifically tested, trialled and proven in both laboratory and field evaluations.

BSN seed priming products are a unique technology, and now used by over 3 million farmer customers world-wide. With so many farmers – and so much 'in-the-ground use' – BSN today has become the world's #1 selling seed primer.

Global Product Range

 Seed Priming			
 Ultra Foliar			
 Rapid Foliar			
 Foliar			
 Fertigation			
 Root Boost			



See:

www.ruralliquidfertilisers.com

www.bsnseed.com



**Rural Liquid
Fertilisers**