

RLF TECHNICAL BULLETIN

TECHNICAL BULLETIN 57 / SEED TREATMENT BENEFITS AND RATES OF BSN SUPERSTRIKE AND BSN ULTRA

WHAT'S IN THIS BULLETIN

This Technical Bulletin (TB) provides a comparison of benefits and application rates between RLF's products BSN Superstrike (BSNSS) and BSN Ultra. It also gives comparative charts for a variety of crop types.

HOW THE SEED BENEFITS

Abundant published work suggests that improved content of nutrients such as phosphate and trace elements in grains has a profound effect on crop yield. BSN Superstrike and BSN Ultra were developed by RLF based on such scientific findings backed up by yield improvements recorded in independent replicated field trials. Contrary to other seed dressing products that do not penetrate the seed, BSNSS and BSN Ultra are formulated to penetrate the seed coat.

BSNSS is absorbed faster than BSN Ultra. The volume increase that occurs in seed lot after BSN treatment is around 10%, treated grains however return to their original size when extra moisture is lost.

The direct beneficiary of BSN is the seed reserves by storing more inorganic phosphate and trace elements; this increased level of nutrient signals a higher yield potential via physiological and morphological changes that are communicated in various forms such as:

1. Balancing and elevating the nutrient status of the emerging seedling.
2. Faster establishment of plant as a result of increased root activity/turnover.
3. Translating the above benefits to the growing crop by improved utilization of fertiliser and soil reserves.
4. Increased biological (e.g. microbial) activity in root rhizosphere as a result of increased root and top activity and enriching rhizosphere with energy and nutrient-rich exudates.
5. Increased humus accumulation in rhizosphere in a shorter time.

BENEFITS OF BSN SUPERSTRIKE

The benefits of seed treatment with phosphate and trace element-rich BSN are establishment of healthier seedlings with better and stronger root system. This would ensure seedling survival in adverse conditions such as drought, hard soil and adverse effect of wind and erosion. The bigger root mass that forms compensates for the herbicidal damage (e.g. pruning of roots), making the crop more resistant to pre-emergent herbicides.

Recently researches reported that use of glyphosate and its residual effects reduce uptake of trace elements by non-target crop plants; in such circumstances, boosting trace elements in young seedlings prevents such glyphosate-induced nutrient deficiencies.

BALANCED PLANTS RESIST DISEASES AND YIELD MORE

Independent replicated trials have shown upward of some 5-7% yield increase as a result of seed treatment with BSN Superstrike. Some reasons for yield increase are healthier seedlings with more efficient root system that makes the most of plant 'growth potential' by extracting more of soil water and nutrient reserves. No wonder farmers consider BSN Superstrike as the highest returning investment in their fertiliser expense

BSN Superstrike is recommended for cereal seeds such as **wheat, barley, oat, rice, sorghum and maize as well as other field crops (canola, safflower and cotton) and vegetable seeds.**

BSN Ultra is formulated for legumes such as **soya, lentil, clover, medics and lucern. BSN Ultra is also suitable for pre-soaked rice and for maize.** Neither BSNSS nor BSN Ultra can be mixed with inoculants (Rhizobia cultures); however, applying inoculants when seed is previously treated with BSN Ultra is expected to be friendly to Rhizobial function.

Chemical analysis of treated seeds shows that the concentration of copper, zinc, manganese, and molybdenum increased by some 10-20 folds and that of phosphorus by about 20% after BSN treatment. Given that inorganic phosphate (available phosphate for embryo growth) is only 10% of total seed phosphorus, BSN treatment more than doubles the available phosphorus content of seeds.

BALANCED PLANTS RESIST DISEASES AND YIELD MORE

RLF has carried out germination tests on many types of grains and have established suitable rates for different seed types; however seed cultivars and seed lots vary in physical (e.g. size and seed coat structure) and physiological properties (e.g. age and nutrient content). It is for such variability that the response to seed treatment should be tested for each seed type/lot to ensure maximum benefits.

Pilot germination tests are easy to set up at rates above and below RLF recommended rates (given in the following tables) for fine-tuning application rates to maximize benefits.

As a rule of thumb, optimum rates are proportionate to seed surface area, small seeds have a greater surface to volume ratio than large seeds, also flat seeds such as carrot and dill have higher surface to volume ratio. Some seeds have appendages and minor cracks (some cotton seeds) or outgrowth in their seed coat (carrot, beet and some fluffy grass seeds); these seeds need to be tried with various rates of BSN to ensure that the product reaches the seed coat in sufficient amounts to get into the seed body. On the other hand, seeds with thick/leathery coat (such as Faba bean) do not absorb BSN and are not suitable for seed priming.

RECOMMENDED RATE OF BSN SUPERSTRIKE FOR SEEDS*

Seed Type	BSNSS L/tonne	Total L BSNSS, Water & pesticide	Fungicide/ pesticides
Corn, cotton, sunflower, pumpkin	4	5	As per label
Zucchini, squash, melon, watermelon	4	5	As per label
Wheat, barley, Triticale, oat	5-6	8	As per label
Rice (dry grain), Safflower,	5-6	8	As per label
Beet, cucumber, okra, coriander	6-7	8-9	As per label
Radish, turnip, Kohlrabi, parsnip, pepper	7-8	8-9	As per label
Onion, leek, chive, garlic, tomato, eggplant	8-9	9-10	As per label
Canola, carrot, lettuce, dill, chicory	10-12	14	As per label
Celery, non-fluffy grass pasture seeds	15-18	18-20	As per label
Fluffy grass pasture seeds	30	33	As per label

RECOMMENDED RATE OF BSN ULTRA FOR SEEDS*

Seed Type	BSN Ultra L/t	Total BSN Ultra, water& pesticide	As per label
Corn, sweet corn	4	5	As per label
Peas, beans, lentil, soya	4-5	5-6	As per label
Mungbean, Adzuki bean	5-6	6-7	As per label
Rice (pre-soaked)	5-6	5-6	As per label
Lucern and medics	12	16-18	As per label

* Pilot germination tests are easy to set up at rates above and below RLF recommended rates (given in the above tables) for fine-tuning the application rates.

Please read and observe the following precautions/instructions:

- Do not add trace elements to **BSN** as this could inhibit seed germination.
- Always use clean seeds for dressing, dusty seeds cause stickiness. Dust ties up nutrients on the seed surface reducing BSN uptake.
- For fungicide/pesticide compatibility perform jar test.
- When mixing with a liquid fungicide add water to BSN first.
- Rhizobial inoculants should not be mixed with BSN.

Treating for Storage:

- Always use fresh seeds for dressing. Old seeds may have a low germination rate when stored under substandard conditions.
- Seed viability (longevity) is maintained best when stored in cool and dry condition.
- BSN can be applied to seeds **anytime between harvest and seeding**. For best result treat seeds well before sowing time preferably during dry season after harvest.
- Allow maximum ventilation to dry the treated seed lot.
- Seed storage at high temperature and moisture reduces the rate of germination. If seeds (especially rain-affected seeds) are stored for many months, they must be tested for germination suitability before treating with BSN.

- Contamination of wild radish seeds can drastically reduce germination rates. Make sure the stored seeds and silos are free from wild radish seeds.
- Rain-affected seeds must pass the viability tests before treating with BSN.
- When seeds are treated with mixture of BSN and other chemicals, there is no guarantee that germination rate would be satisfactory over long-term storage; germination tests are recommended in such cases before sowing.

Dress at seeding time:

If you treat seeds at seeding time, you may notice that treated seed lot volume increase by some 10%, this is reversed quickly when seeds lose their extra moisture. When you drill treated seeds soon after treatment, you may need to allow for increased seed volume if volume increase is not fully reversed.

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