



INSPIRE – SEED STARTER

Inspire is a liquid, natural seed treatment and root growth promoter formulated with macro and micro nutrients, amino acids, organic acids, root growth stimulants, enzymes, proteins, vitamins minerals and beneficial microbes. **Inspire** also contains constituents that stimulate indigenous microbes in the root zone and has proven to be a reliable performer in low and high rainfall areas and in all soil types except extreme calcareous soils.

Biological seed treatment is an affordable and effective way to optimize seed germination, plant establishment, and early growth and yield potential. It is also one of the lowest financial investments a grower can make to maximize productivity and improve the bottom line.

WHY USE SEED TREATMENTS:

Once the seed is planted, it is important that germination occurs uniformly and quickly. If the soil is too cold, germination can be delayed. This can result in seed damage and uneven emergence and, in certain cases, re-seeding may be necessary. Seed treatments are effective against problems that occur in cold wet soils, especially limited disturbance and no-till operations and it areas of low moisture. Seed treatments are also effective against a broad spectrum of problems including seed decay, seedling diseases and soil pathogens.

Natural seed treatments can make less available forms of soil phosphate available to plants, promote nitrogen fixation, root development and quick emergence, stimulate cell division and increases stress tolerance. In addition, seed treatments can increase the vigour of treated plants helping them resist damage by pathogenic fungi and damping off. Typically, this results in:

- Early root growth and larger roots resulting in better access to moisture and nutrients which translates into improved health throughout the life cycle of the crop
- A more consistent plant stand and increased yields

Plants naturally create a zone of nutrient depletion around their roots and, to access new sources of nutrients, they can either:

- Grow more roots and root hairs
- Form a symbiotic relationship with a fungus whose hyphae (threadlike filaments) can absorb nutrients for uptake by the plants

Most vascular plants can form such relationships, which are called "mycorrhizae". Mycorrhizal fungi include those living on the surface of plants and those which enter the plant itself.

Seed treatments can colonize plant roots and send out filaments into the surrounding soil. These filaments form a bridge that connects the plant roots with large areas of soil (up to 200 times larger than the root zone) and act as a "pipeline" to funnel nutrients to the plant. In return, the plant discharges compounds, through its roots, to stimulate fungal growth. The efficacy of the fungi is also enhanced by soil microbes such as bacillus. These bacteria, many of which are aerobic, affect root colonization and function by producing vitamins, hormones, and other compounds that promote fungal growth.

Fungi are best known for their ability to improve plant growth in low phosphate soils by transporting phosphate to the plant. Other benefits associated with root colonization by fungi include increased absorption of nitrogen, potassium, magnesium, copper, zinc, sulphur, boron, molybdenum etc. Due in part to the association of certain soil microbes with the fungi, many of these non-mobile elements are made water soluble by the microbes, absorbed by the fungi, and translocated to the plant through the filament "pipeline".

Fungi can increase the disease resistance of plants against root pathogens, especially when the fungi can adequately colonize the root before the pathogen attacks. Fungi are important in forming stable soil aggregates by binding soil particles in the filamentous mass as well as producing sticky substances that hold the particles together. Due mainly to improved plant nutrition, fungi colonization can also improve plant drought resistance.

Soil disturbances such as discing may destroy the filament network connections to the plant roots. Fungi are also reduced by extensive fallowing and floods. Fungal activity levels can be determined by testing plant roots for the percentage of colonization.

APPLICATION RATES:

Seed Type	Amount of ESST (Litres)	Amount of Water (Litres)	Seeds / Kilogram
Peas	1	6	725
Lentils	1	8	725
Corn	1.5	10	725
Soybean	1	6	635
Barley / Wheat	1	6	725
Oats	1	6	725
Rye	1	6	725
Canola / Flax	1	10	725
Grass	1	10	453
Tomatoes	1	12	544
Sunflower	1	10	635
Potatoes	2	18	453

Applying **ESST** requires no special equipment. The objective is to create physical contact between **ESST** and the seed. On farm treatment can be carried out prior to planting.

Typical Cost / Acre		
Seed Type	Seed Rate (kg. acre)	Cost / Acre
Barley	45	\$1.20
Wheat	55	\$1.50
Oats	40	\$1.10
Flax	18	\$0.43
Rye	25	\$0.72
Soybean	36	\$1.25

ESST FIELD TESTS:

Field tests, conducted over a 7 day period in April 2007 and 2008 at soil temperatures of 4.5C (40.1F) and 4C (39.2F) respectively, revealed the following :

- Germination rate of seed treated with **Inspire** seed treatment: 82.6%
- Germination rate of untreated seed: 0%

SAFETY:

Inspire is produced in accordance with NOSB (National Organic Standards Board) guidelines. The materials used in the production process are derived from naturally occurring and sustainable sources and are consistent with organic principals and the National List of Allowed Substances. **Inspire** does NOT contain synthetic chemicals, animal components, and animal by products, manure or manure by-products. **Inspire** is environmentally safe and is not harmful to animals, plants and humans.

COMPLIANCE:

Fully complies with EPA Toxic Substance Control Act (TSCA) and the rules, orders and regulations promulgated there under including:

- a) Sections 4, 5, 6 & 7; Title 40 Chapter 1, 707.20 thru 707.75;
- b) 40 CFR Sections 704.3, 710.2(e) and 720.3(c); and
- c) Sections 5 and 13, reference 42FR64583
- d) Does not contain marine pollutants as defined in 49 CFR 171.8.

STORAGE & HANDLING:

Do **NOT** freeze. Store in a cool location away from direct sunlight - No special handling required

PACKAGING:

2 Litre Jug
20 Litre (5 gallon) HDPE Pail
205 Litre (45 gallon) Barrel
1000 Litre Tote