

GIVING FARMERS A JUMP

Strong commodity prices for corn, canola, and other crops, as well as the rising cost of fertilizer, have motivated farmers to maximize their crop yield and the efficiency of their fertilizer investment. Novozymes' JumpStart®, a phosphate inoculant, lets them do both and do them in an environmentally friendly way.

Phosphate is an essential nutrient for plant growth and as such is important to maximize a field's yield potential. Often phosphate is present in large amounts in the soil, but in a form that is unavailable to the plant.

"Even when phosphate fertilizer is applied at the time of planting, it can quickly bind with calcium, magnesium, and iron minerals in the soil, resulting in the phosphate being inaccessible to the crop," says Garry Hnatowich, Senior Agronomist at Novozymes Biologicals – BioAg in Canada. "That is where JumpStart comes in."

JumpStart is a fertility management tool that is applied as a seed treatment to the seed prior to planting or with the seed at planting. The active component in JumpStart is a naturally occurring soil fungus – *Penicillium bilaii*.

As the seeds germinate and develop a root system the JumpStart fungus and the plant form a mutually beneficial relationship. The fungus grows and multiplies along the crop roots, thriving off the root exudates and releasing organic acids into the soil. These acids break the bonds holding the phosphate nutrient in a mineral

form, releasing the phosphate into a form the plant can access. The result is enhanced phosphate uptake allowing the crop to achieve its yield potential.

Meeting many needs of the farmer

JumpStart promotes greater phosphate use efficiency, which results in quick emergence, early vigor, greater stress tolerance, and more even maturity.

"It delivers a safe method of supplying phosphate to growing plants and in some instances reduces the need to seed-place high rates of fertilizer phosphate, which can have a negative effect on sensitive crops," says Garry Hnatowich.

Cool soils, common during direct or early seeding, can reduce phosphate availability due to the limited mobility or movement of phosphate in the soil. Poor early season phosphate availability can reduce early growth. JumpStart is active in cool soils as low as 4 °C (40 °F) and supplies an immediately available source of phosphate to developing seedlings, resulting in quicker emergence and early vigor.



Plants with larger root systems have the ability to better withstand a variety of stresses like drought and seedling diseases. JumpStart promotes root growth, making the plant better able to access moisture and a range of needed nutrients, not just phosphate, so the plant is better able to withstand a variety of crop stresses.

JumpStart promotes even crop maturity as well. It increases the amount of phosphate available to the crop throughout the growing season. The amount of phosphate available in a typical field can vary from 2 to 4 times the average within very short distances. Using JumpStart helps ensure every plant gets better access to phosphate. This results in increased uniformity of crop emergence, development, and maturity. Earlier, more uniform maturity often means earlier harvests and higher quality grain.

Farmers can see the difference

Farmers see the benefits of using JumpStart and many recommend it to their neighbors.

Rick Brown, a canola farmer from Indian Head, Saskatchewan, Canada, says: "The canola that is



START ON THEIR CROPS

Inoculants are microbial-based crop input products that help plants access nutrients. JumpStart® is a phosphate inoculant containing the naturally occurring soil fungus *Penicillium bilaii*.



THE BENEFITS OF JUMPSTART®

Improved crop performance

- Root development
- Stress tolerance
- Seed quality
- Earlier, more uniform maturity
- Better fertilizer use
- Higher yield

Lower phosphate fertilizer requirements

- Handling, transportation, storage, and time savings
- Lower environmental impacts

treated with JumpStart comes out of the ground quicker and stronger than the crops not treated. JumpStart allows the canola to access the soil phosphate faster under cool conditions. I would recommend JumpStart to my neighbors. I think it's well worth the time, effort, and money."

Patrick Fabian, a seed grower from Tilly, Alberta, Canada, has this to say about JumpStart: "Over the course of three years we tried it on wheat, canola, and even on alfalfa. We realized that there was a significant [yield] difference on the alfalfa and at least a 6–8% difference in yield on the wheat and canola. So now, it has just become a standard process on our farm that we apply JumpStart when we're seeding."

And the benefits are not only common to canola farmers. Corn farmers in the US are also extremely positive about the results they see.

"With JumpStart you're putting more money in your pocket because you're helping your crop use its full yield potential," says Joel

Lampert, of Dakota Crop Services in Kensal, North Dakota. He continues, "We're seeing better emergence, a better stand, and also a better root system; so the plant can withstand stresses during the growing season like cold ground or drought. Actually, in the last three years we've seen an average of 5.2 bushels per acre yield increase using JumpStart."

Expanding a mature technology

The JumpStart technology was first commercialized in Canada in 1991. It is currently marketed in the agriculture sector in Canada and the US with launches pending in Australia and Argentina. In addition, a Novozymes R&D project, which is nearing completion, forecast a "next generation" of JumpStart that will take performance to higher levels.

With its microbial-based solutions, Novozymes is helping the world's farmers produce more and better food, feed, fuel, and fiber, while minimiz-

ing the environmental footprint of production agriculture.

"JumpStart is just one of several microbial-based products that can help farmers produce the crops that we use to eat, drink, drive, and otherwise consume, more efficiently," says Ken Bartsch, Communications Manager, Novozymes Biologicals – BioAg.

Reducing the environmental footprint of agriculture

The many positive impacts of JumpStart on crop production and yield are causing many farmers to incorporate the product into their crop fertility plans. However, a preliminary Life Cycle Assessment (LCA) has shown that JumpStart also has many potential positive environmental impacts, which will be further explored in the future. ■

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