

## Novozymes Inoculants for Organic Production

### Novozymes BioAg Inoculants

Novozymes BioAg, formerly Philom Bios, manufactures and markets the following microbial inoculants:

- **JumpStart®**, the phosphate inoculant;
- **TagTeam®**, the *MultiAction* phosphate and nitrogen inoculant;
- **N-Prove®**, the single-action nitrogen inoculant.

None of our inoculants are currently certified by an organic certifying body. However, some of our inoculants may be accepted. We provide this information on our products to help you and your certifier determine the suitability of our inoculants for organic production.

### The active ingredients/microorganisms in our inoculants

All the active ingredients in Novozymes BioAg inoculants are naturally occurring microorganisms isolated from the soil. We do not manufacture any inoculants that have been genetically modified. (Note: for products containing the fungus *Penicillium bilaii*, this fungus does not produce the antibiotic penicillin.)

- **JumpStart**, for all wheat, pea, lentil, chickpea, dry bean, alfalfa, sweetclover, canola, mustard (and corn, soybean, sunflower and sugar beet in the US) contains *Penicillium bilaii* fungus. Sold as a wettable powder.
- **Next Generation TagTeam pea/lentil** contains *Rhizobium leguminosarum* bacteria and *Penicillium bilaii* fungi. Sold in peat, granular and liquid formulations.
- **TagTeam chickpea** contains *Mesorhizobium ciceri* bacteria and *Penicillium bilaii* fungi. Sold in peat and granular formulations.
- **TagTeam soybean** contains *Bradyrhizobium japonicum* bacteria and *Penicillium bilaii* fungi. Sold in peat, granular and liquid formulations.
- **TagTeam alfalfa/sweetclover** contains *Sinrhizobium meliloti* bacteria and *Penicillium bilaii* fungi. Sold in a peat formulation.
- **TagTeam dry bean** contains *Rhizobium leguminosarum* biovar *phaseoli* and *Penicillium bilaii* fungi. Sold in a peat formulation.
- **N-Prove pea and lentil** contains *Rhizobium leguminosarum* bacteria. Sold in peat, granular and liquid formulations.
- **N-Prove soybean** contains *Bradyrhizobium japonicum* bacteria. Sold in a liquid formulation.

### Corn Substrates

Our peat-based inoculants use natural graphite as a sticker. We do not use corn based stickers in our peat inoculant formulations.

We do however use a corn based ingredient in our TagTeam and N-prove liquid soybean inoculants. These are the only Novozymes BioAg products to be sold in 2008 that will contain any type of corn based ingredient. For organically grown soybeans – TagTeam peat or granular may be a better choice.

## Pre-sterilization

- Natural peat may contain human and plant pathogens. If present, these pathogens can grow and compete with rhizobia, especially when nutrients are added. In order to provide our customers with high performance peat inoculants that are safe to use, our peat is pre-sterilized using gamma &/or electron beam irradiation methods.
- *Penicillium bilaii*, one of the actives in TagTeam as well as the active in JumpStart, is processed using a material that has been irradiated to sterilize but is not present in the final product.
- TagTeam granular inoculants are peat based. The granulated peat carrier is not sterilized using gamma irradiation or electron beam methods but does contain the *P. bilaii* that was processed using a material that was irradiated.
- N-Prove granular is gypsum based. It contains a material that has been sterilized by either gamma irradiation or electron beam methods.
- Liquid formulations are manufactured in a way that does not require irradiation for pre-sterilization. Steam and/or filter-sterilization is used to sterilize liquid formulations. However, the bags that are used to ship/store liquid inoculants are sterilized using irradiation prior to use.

In 2001, a major international certifying body made amendments to their standards to allow for the use of inoculants containing gamma irradiated peat. Other certifying bodies have followed suit. Check with your local chapter or certifying body to confirm their position on pre-sterilized inoculants before use.

## JumpStart and Rock Phosphate

JumpStart is a microbial seed inoculant that increases the availability of phosphate to your crops. The active ingredient in JumpStart, a naturally occurring soil fungus *Penicillium bilaii*, colonizes plant roots and solubilizes mineral forms of less available residual soil phosphate making them immediately available for crop use. This fungus does not produce the antibiotic penicillin.

Dr. Reg Kucey with the Agriculture Canada Research Station in Lethbridge, Alberta, discovered the active ingredient in JumpStart in the early 1980's. Rock phosphate is relatively insoluble and unavailable to plants. Kucey found that inoculation with *P. bilaii* (JumpStart) solubilized the rock phosphate, making it as available to crops as commercial phosphate fertilizers. The grain yield of wheat inoculated with *P. bilaii* and supplied with rock phosphate equaled that obtained by using mono-ammonium phosphate alone (Figure 1).

This means that an organic grower could use JumpStart along with rock phosphate and see the same type of yield response as a conventional farmer who uses MAP as their source of phosphate.

**For more information please call - 1-888-744-5662**

**Note:** TagTeam liquid pea and N-Prove granular are not yet registered in Canada.

They will be available in various US states in 2008.

© JumpStart, TagTeam and N-Prove are registered trademarks of Philom Bios Inc. © 2008 Philom Bios Inc. All rights reserved.

