



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
WASHINGTON, D.C. 20460

OFFICE OF CHEMICAL SAFETY  
AND POLLUTION PREVENTION

January 9, 2020

Lauren Seabrook  
Product Registration Manager  
BASF Corporation  
26 Davis Drive  
P.O. Box 13528  
Research Triangle Park, NC 27709

Subject: Non-PRIA (Pesticide Registration Improvement Act) Labeling Amendment – Minor Grammatical Corrections, Updated Frac Code, and Minor Adjustments to the Directions for Use  
Product Name: Integral  
EPA Registration Number: 71840-5  
Application Date: 11/18/2019  
OPP Decision Number: 558116

Dear Ms. Seabrook:

The amended labeling referred to above, submitted in connection with registration under the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA), as amended, is acceptable.

This approval does not affect any terms or conditions that were previously imposed on this registration. You continue to be subject to existing terms or conditions on your registration and any deadlines connected with them.

A stamped copy of your labeling is enclosed for your records. This labeling supersedes all previously accepted labeling. You must submit one (1) copy of the final printed labeling before you release this product for shipment with the new labeling. In accordance with 40 CFR § 152.130(c), you may distribute or sell this product under the previously approved labeling for 18 months from the date of this letter. After 18 months, you may only distribute or sell this product if it bears this new revised labeling or subsequently approved labeling. "To distribute or sell" is defined under FIFRA section 2(gg) and its implementing regulation at 40 CFR § 152.3.

Should you wish to add/retain a reference to your company's website on your label, then please be aware that the website becomes labeling under FIFRA and is subject to review by the U.S. Environmental Protection Agency (EPA). If the website is false or misleading, the product will be considered to be misbranded and sale or distribution of the product is unlawful under FIFRA section 12(a)(1)(E). 40 CFR § 156.10(a)(5) lists examples of statements the EPA may consider false or misleading. In addition, regardless of whether a website is referenced on your product's label, claims

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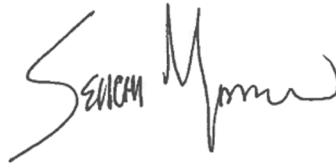
OPP Decision No. 558116

made on the website may not substantially differ from those claims approved through the registration process. Therefore, should the EPA find or if it is brought to our attention that a website contains false or misleading statements or claims substantially differing from the EPA-approved registration, the website will be referred to the EPA's Office of Enforcement and Compliance Assurance.

Your release for shipment of this product constitutes acceptance of these terms. If these terms are not complied with, this registration will be subject to cancellation in accordance with FIFRA section 6.

If you have any questions, please contact Cody Kendrick by phone at (703) 347-0468 or via email at [kendrick.cody@epa.gov](mailto:kendrick.cody@epa.gov).

Sincerely,

A handwritten signature in black ink, appearing to read "SEIICHI MURASAKI". The signature is stylized and cursive.

Seiichi Murasaki, Senior Regulatory Advisor  
Microbial Pesticides Branch  
Biopesticides and Pollution Prevention Division (7511P)  
Office of Pesticide Programs

Enclosure: Stamped Label



We create chemistry

*Bacillus amyloliquefaciens*  
strain MBI 600

Group

44

Fungicide

# Integral<sup>®</sup>

## Liquid Biofungicide

[Alternate Brand Name: **Subtilex<sup>®</sup> L**]

**ACCEPTED**

Jan 09, 2020

Under the Federal Insecticide, Fungicide  
and Rodenticide Act as amended, for the  
pesticide registered under  
EPA Reg. No. 71840-5

**For use as an in-furrow treatment; or For use as a soil or growing media treatment; or For use as a pre-plant seed treatment (“On-Farm”); or For use as a commercial seed treatment**

**Active Ingredient:**

*Bacillus amyloliquefaciens* strain MBI 600\*† ..... 6.80%

**Other Ingredients:** ..... 93.20%

**Total:** ..... 100.00%

\* **Integral<sup>®</sup> liquid biofungicide** contains a minimum of 2.2 x 10<sup>10</sup> colony forming units per mL

† Formerly named *Bacillus subtilis* strain MBI 600

**EPA Reg. No. 71840-5**

**EPA Est. No.**

**KEEP OUT OF REACH OF CHILDREN**

### CAUTION/PRECAUCION

Si usted no entiende la etiqueta, busque a alguien para que se la explique a usted en detalle. (If you do not understand the label, find someone to explain it to you in detail.)

See inside for complete **Precautionary Statements, Directions For Use, Conditions of Sale and Warranty**, and state-specific crop and/or use site restrictions.

**You may contact BASF Corporation for emergency medical treatment information at 1-800-832-HELP (4357).**

### Net Contents:

**Batch Code: Located on physical container**

BASF Corporation  
26 Davis Drive, Research Triangle Park, NC 27709

## HOTLINE NUMBER

Have the product container or label with you when calling a poison control center or doctor or going for treatment. You may also contact BASF Corporation for emergency medical treatment information at 1-800-832-HELP (4357).

## Precautionary Statements

### Personal Protective Equipment (PPE)

The PPE requirements apply to both Worker Protection Standard (WPS) uses (in general, agricultural-plant uses are covered by the Worker Protection Standard (40 CFR Part 170)) and Non-WPS uses.

#### Applicators and other handlers must wear:

- Long-sleeve shirt and long pants
- Waterproof gloves
- Shoes plus socks

Mixers/loaders and applicators must wear a NIOSH-approved particulate respirator with any N, P, or R filter with NIOSH-approval number prefix TC-84A or a NIOSH-approved powered air purifying respirator with an HE filter with NIOSH-approval number prefix TC-21C. Repeated exposure to high concentrations of microbial proteins can cause allergic sensitization.

Follow the manufacturer's instructions for cleaning/maintaining PPE. If no such instructions for washables exist, use detergent and hot water. Keep and wash PPE separately from other laundry.

## USER SAFETY RECOMMENDATIONS

#### Users should:

- Wash hands before eating, drinking, chewing gum, using tobacco, or using the toilet.
- Remove clothing/PPE immediately if pesticide gets inside. Then wash thoroughly and put on clean clothing.
- Remove PPE immediately after handling this product. Wash the outside of gloves before removing. As soon as possible, wash thoroughly and change into clean clothing.

## Environmental Hazards

*Environmental hazards statements for the following container sizes: 3.4 fl ozs, 6.8 fl ozs, and 13.6 fl ozs*

For terrestrial uses: **DO NOT** apply directly to water, or to areas where surface water is present, or to intertidal areas below the mean high water mark. **DO NOT** contaminate water when disposing of equipment washwater or rinsate.

*Environmental hazards statements for the following container sizes: 30 gal and 265 gal*

**DO NOT** discharge effluent containing this product into lakes, streams, ponds, estuaries, oceans, or other waters

unless in accordance with the requirements of a National Pollutant Discharge Elimination System (NPDES) permit and the permitting authority has been notified in writing prior to discharge. **DO NOT** discharge effluent containing this product to sewer systems without previously notifying the local sewage treatment plant authority. For guidance, contact your State Water Board or Regional Office of the EPA.

## Directions For Use

It is a violation of federal law to use this product in a manner inconsistent with its labeling. **DO NOT** apply this product in a way that will contact workers or other persons, either directly or through drift. Only protected handlers may be in the area during application. For any requirements specific to your state or tribe, consult the state or tribal agency responsible for pesticide regulation.

## AGRICULTURAL USE REQUIREMENTS

Use this product only in accordance with its labeling and with the Worker Protection Standard, 40 CFR Part 170. This Standard contains requirements for the protection of agricultural workers on farms, forests, nurseries, and greenhouses, and handlers of agricultural pesticides. It contains requirements for training, decontamination, notification, and emergency assistance. It also contains specific instructions and exceptions pertaining to the statements on this label about personal protective equipment (PPE) and restricted-entry interval. The requirements in this box only apply to uses of this product that are covered by the Worker Protection Standard.

**DO NOT** enter or allow worker entry into treated areas during the restricted-entry interval (REI) of **4 hours**.

**EXCEPTION:** If the product is soil-injected or soil incorporated, the Worker Protection Standard, under certain circumstances, allows workers to enter the treated area if there will be no contact with anything that has been treated.

PPE required for early entry to treated areas that is permitted under the Worker Protection Standard and that involves contact with anything that has been treated, such as plants, soil or water is:

- Coveralls
- Chemical-resistant gloves (made of any waterproof material)
- Shoes plus socks

## NONAGRICULTURAL USE REQUIREMENTS

The requirements in this box apply to uses that are NOT within the scope of the Worker Protection Standard (WPS) for agricultural pesticides (40 CFR Part 170). The WPS applies when this product is used to produce agricultural plants on farms, forests, nurseries or greenhouses.

Keep unprotected persons out of treatment area until seeds have dried or been packaged.

## STORAGE AND DISPOSAL

**DO NOT** contaminate water, food, or feed by storage or disposal.

### Pesticide Storage

Ensure container closures are tight. Store in a cool, dry place.

### Pesticide Disposal

To avoid wastes, use all material in this container by application according to label directions. If wastes cannot be avoided, offer remaining product to a waste disposal facility or pesticide disposal program (often such programs are run by state or local governments or by industry).

### Container Handling

*For containers with capacities less than or equal to 5 gallons*

**Nonrefillable container. DO NOT** reuse or refill this container. Triple rinse (or equivalent) promptly after emptying. **Triple rinse as follows:** Empty the remaining contents into application equipment or a mix tank and drain for 10 seconds after the flow begins to drip. Fill the container 1/4 full with water and recap. Shake for 10 seconds. Pour rinsate into application equipment or a mix tank or store rinsate for later use or disposal. Drain for 10 seconds after the flow begins to drip. Repeat this procedure two more times. Then offer for recycling if available, or puncture and dispose of in a sanitary landfill or by incineration. **DO NOT** burn, unless allowed by state and local ordinances. If burned, stay out of smoke.

*(continued)*

## STORAGE AND DISPOSAL *(continued)*

### Container Handling *(continued)*

*For containers with capacities more than 5 gallons*

**Nonrefillable container. DO NOT** reuse or refill this container. Triple rinse container (or equivalent) promptly after emptying. **Triple rinse as follows:** Empty the remaining contents into application equipment or a mix tank. Fill the container 1/4 full with water. Replace and tighten closures. Tip container on its side and roll it back and forth, ensuring at least one complete revolution, for 30 seconds. Stand the container on its end and tip it back and forth several times. Turn the container over onto its other end and tip it back and forth several times. Empty the rinsate into application equipment or a mix tank or store rinsate for later use or disposal. Repeat this procedure two more times. Once cleaned, some agricultural plastic pesticide containers can be taken to a container collection site or picked up for recycling. To find the nearest site, contact your chemical dealer or manufacturer, or contact Ag Container Recycling Council at 877-952-2272 or [www.acrecycle.org](http://www.acrecycle.org). Alternatively, puncture and dispose of in a sanitary landfill or by incineration. **DO NOT** burn, unless allowed by state and local ordinances. If burned, stay out of smoke.

## In Case of Emergency

In case of large-scale spill of this product, call:

- CHEMTREC 1-800-424-9300
- BASF Corporation 1-800-832-HELP (4357)

In case of medical emergency regarding this product, call:

- Your local doctor for immediate treatment
- Your local poison control center (hospital)
- BASF Corporation 1-800-832-HELP (4357)

## Product Information

**Integral® liquid biofungicide** contains bacteria that colonize germinating seeds and inhibit seed pathogens such as *Alternaria* spp. The same bacteria then colonize the developing root systems of plants and suppress disease organisms that attack such root systems (e.g., *Fusarium* spp., *Rhizoctonia* spp. and under some conditions, *Pythium* spp.). As root systems develop, the bacteria grow with the roots, extending the protection throughout the growing season. Because of this biological protection, vigorous root systems are established by plants, which often results in more uniform stands, and greater yields.

In addition, **Integral** has been shown to increase root nodulation by nitrogen-fixing bacteria when used on legumes. This increase in nodulation is a result of a healthier root system allowing formation of more sites for nitrogen-fixing nodules.

## Label statement required by the State of Oregon

Information regarding the contents and levels of metals in this product is available on the Internet at <http://www.aapfco.org/metals.html>

## Use Limitations

**Chemigation: DO NOT** apply this product through any type of irrigation system.

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## Application Instructions

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### For Use as an In-Furrow Treatment

**Mixing Instructions:** Apply **Integral**<sup>®</sup> liquid **biofungicide** as a water-based slurry alone, or with other in-furrow products (fungicides, insecticides, nematicides, fertilizers, etc.). Additionally, rhizobial inoculant products, such as BASF's **Vault**<sup>®</sup> **Liquid Peanut Rhizobial Inoculant**, can be added to the tank mix.

Prior to mixing, determine physical compatibility by mixing proportional quantities of the products in water. **DO NOT** mix **Integral** with any other in-furrow product that bears a label prohibition against such mixing. When tank mixing **Integral** with any other in-furrow product, observe the most restrictive of the labeling limitations and precautions of all products used in mixtures.

**ATTENTION:** If rhizobial inoculants are to be used in the tank mix with other in-furrow treatments (fungicides, insecticides, nematicides, fertilizers, etc.), make sure that they are compatible (not harmful) to the *Rhizobia*. Likewise, use only cool, chlorine-free water in the tank mix. If one or more treatments are not compatible (harmful), mix those products in, and apply them from, a separate mix tank.

To mix, first add the other in-furrow product(s) and/or the rhizobial inoculant product(s) to the mix tank with approximately 1/2 of the required water. Slowly add **Integral** to the slurry until a uniform suspension is obtained. Add the remainder of the water while maintaining constant agitation. **DO NOT** store mixed slurries for longer than 24 hours.

**Application Instructions:** For preventative control and suppression of seed pathogens (e.g., *Alternaria* spp.) and plant root pathogens (e.g., *Rhizoctonia* spp. and *Fusarium* spp.), apply **Integral** in 2.5 to 20 gal (9 to 76 L) of water per acre via standard agricultural application machinery. Some ingredients in **Integral** may not completely solubilize; therefore, it is important to maintain a uniform suspension by continuously agitating the solution throughout the application process. **DO NOT** exceed label application dosage rates.

## Cotton, Sunflower, Olives, Sesame, Sugar Beet, Potato, Sweet Potato, Wheat, Sorghum, Legume Vegetables (Succulent or Dried) Crop Group, Soybeans, and Corn (Field, Seed, Sweet and Popcorn)

Apply at a rate of 0.1 to 16 fl ozs (3 to 473 mL) of **Integral** per acre, after following the mixing and dilution procedures described above. Use the high end of the specified application rate when severe disease pressure is anticipated.

### Peanuts - Integral Only

Apply at a rate of 0.1 to 1.2 fl ozs (3 to 35 mL) of **Integral** per acre, after following the mixing and application procedures described above. Use the high end of the specified application rate when severe disease pressure is anticipated.

### Peanuts - Vault Liquid Peanut Rhizobial Inoculant Plus Integral

**Integral** can also be used in conjunction with *Rhizobia*-based inoculant products, such as BASF's **Vault Liquid Peanut Rhizobial Inoculant**. When used in combination with the **Vault Liquid Peanut Rhizobial Inoculant**, **Integral** provides the additional benefit of improving the nodulation of the roots by *Rhizobia* bacteria in the **Vault Liquid Peanut Rhizobial Inoculant**.

The **Vault Liquid Peanut Rhizobial Inoculant** consists of one (1) plastic bladder containing 1.1 gal (4.2 L).

The **Vault Liquid Peanut Rhizobial Inoculant** is co-packed in the same box with one (1) 3.4 fl ozs (100 mL) plastic bottle of **Integral**.

One (1) **Vault Liquid Peanut Rhizobial Inoculant** and one (1) 3.4 fl ozs (100 mL) bottle of **Integral** are designed to be used together to treat approximately 10 acres of peanuts.

Note that **Integral** is designed to work with the **Vault Liquid Peanut Rhizobial Inoculant**. Furthermore, the **Vault Liquid Peanut Rhizobial Inoculant** does not affect the activity of **Integral**.

Mix the one (1) plastic bottle of **Integral** with the one (1) plastic bladder of **Vault Liquid Peanut Rhizobial Inoculant**, and an appropriate quantity of chlorine-free water. For more detailed mixing instructions see directions on the outside panel of the **Vault Liquid Peanut Rhizobial Inoculant Plus Integral** co-pack box.

## For Use as a Soil or Growing Media Treatment

**Mixing Instructions:** Apply **Integral® liquid biofungicide** as a water-based slurry alone, or with other soil or growing media treatment products (fungicides, insecticides, nematicides, fertilizers, etc.).

Prior to mixing, determine physical compatibility by mixing proportional quantities of the products in water. **DO NOT** mix **Integral** with any other soil and growing media treatment product that bears a label prohibition against such mixing. When tank mixing **Integral** with any other soil or growing media treatment product, observe the most restrictive of the labeling limitations and precautions of all products used in mixtures.

To mix, first add the other soil and growing media treatment product(s) to the mix tank with approximately 1/2 of the required water. Slowly add **Integral** to the slurry until a uniform suspension is obtained. Add the remainder of the water while maintaining constant agitation. **DO NOT** store mixed slurries for longer than 24 hours.

**Application Instructions:** For preventative control and suppression of seed pathogens (e.g., *Alternaria* spp.) and plant root pathogens (e.g., *Rhizoctonia* spp. and *Fusarium* spp.), apply **Integral**, as indicated below, for pre-plant growing media amendment applications and post-plant applications (field and greenhouse). **Integral** is also effective in controlling *Pythium* spp. when growing conditions are at elevated temperatures as they would be in a greenhouse. Some ingredients in **Integral** may not completely solubilize; therefore, it is important to maintain a uniform suspension by continuously agitating the solution throughout the application process. **DO NOT** exceed label application dosage rates.

### For Pre-plant Growing Media Amendment Applications

Apply at a rate of 0.12 to 0.17 fl oz of **Integral**/cubic yard (4.64 to 6.58 mL/cubic meter) of soil or growing media. Use the higher rate when environmental conditions are favorable for disease development. Apply **Integral** as a water-based slurry in a volume of water sufficient for uniform distribution. Typical application volume is 1 to 20 gal of slurry/cubic yard (5 to 100 L/cubic meter) of soil or growing media. Ensure product is thoroughly mixed into the soil or growing media.

### For Field and Greenhouse Post-plant Applications

Mix 0.5 to 1.0 fl oz (39 to 78 mL/1000 L) of **Integral** in 100 gal of water. Use the higher rate when environmental conditions are favorable for disease development. Apply evenly with conventional application equipment to thoroughly soak the growing media or soil through the root zone.

For containerized soil or growing media, refer to the table listed below for minimum drench volumes and

approximate number of pots treated per 100 gal of diluted product.

Begin applications during or after seeding, sticking of cuttings, or transplanting to pots, trays or containers, or when environmental conditions are favorable for disease development. For optimal control, use every 21 to 28 days throughout the growing cycle.

Container size	Min. drench volume of diluted product (fl ozs [mL])	Approximate number of containers treated per 100 gallons of diluted product
Standard 4 inch (10 cm) round pots	1.5 [44]	8530
Standard 6 inch (15 cm) round pots	5.5 [163]	2330
Standard 8 inch (20 cm) round pots	12.75 [377]	1000

## For Use as a Pre-plant Seed Treatment (“On-Farm”)

**DO NOT** use treated seed for food or feed purposes or process for oil. Treat only those seeds needed for immediate use, minimizing the interval between treatment and planting. **DO NOT** store excess treated seeds beyond planting time.

**Mixing Instructions:** Apply **Integral** as a water-based slurry alone or with other seed treatment products (fungicides, insecticides, nematicides, fertilizers, rhizobial inoculants, etc.).

Prior to mixing, determine physical compatibility by mixing proportional quantities of the products in water. **DO NOT** mix **Integral** with any other seed treatment product that bears a label prohibition against such mixing. When tank mixing **Integral** with any other seed treatment product, observe the most restrictive of the labeling limitations and precautions of all products used in mixtures.

**ATTENTION:** If rhizobial inoculants are to be used in the tank mix with other seed treatments (fungicides, insecticides, nematicides, fertilizers, etc.), make sure that they are compatible (not harmful) to the *Rhizobia*. Likewise, use only cool, chlorine-free water in the tank mix. If one or more treatments are not compatible (harmful), mix those products in, and apply them from, a separate mix tank.

To mix, first add the other seed treatment product(s) and/or the rhizobial inoculant product(s) to the mix tank with approximately 1/2 of the required water. Slowly add **Integral** to the slurry until a uniform suspension is obtained. Add the remainder of the water while maintaining constant agitation. **DO NOT** store mixed slurries for longer than 24 hours.

**Application Instructions:** For preventative control and suppression of seed pathogens (e.g. *Alternaria* spp.) and plant root pathogens (e.g., *Rhizoctonia* spp. and *Fusarium* spp.) and/or to increase the amount of nutrient uptake and root nodulation by nitrogen-fixing bacteria (legumes), use the application rates specified below. Apply at least 5.0 fl ozs of total slurry per 100 lb of seed or at least 3.9 gal of total slurry per 10,000 lb of seed.

Some ingredients in **Integral® liquid biofungicide** may not completely solubilize; therefore, it is important to maintain a uniform suspension by continuously agitating the solution throughout the application process. **DO NOT** exceed label application dosage rates.

Because smaller seed has a greater surface area to volume ratio than larger seed, the average size of the seed being treated influences the application rate. Therefore, for each crop that has a range in the rate of application, apply **Integral** at rates from the higher end of the specified application rate range when treating smaller seed. Additionally, use the higher end of the specified application range when treated seed is to be planted in fields that historically experience severe disease pressure.

### Cotton

For preventative control and suppression of seed pathogens (e.g. *Alternaria* spp.) and plant root pathogens (e.g., *Rhizoctonia* spp. and *Fusarium* spp.), apply at a rate of 0.6 to 2.4 fl ozs (18 to 71 mL) of **Integral** per 100 lb (45 kg) of delinted cotton seed. Follow the mixing and dilution procedures described above.

### Legume Vegetables (Succulent or Dried) Crop Group

For preventative control and suppression of seed pathogens (e.g. *Alternaria* spp.) and plant root pathogens (e.g., *Rhizoctonia* spp. and *Fusarium* spp.), apply at a rate of 0.6 to 2.4 fl ozs (18 to 71 mL) of **Integral** per 100 lb (45 kg) of seed. Follow the mixing and dilution procedures described above.

For improvement of nodulation by *Rhizobia* in fields where appropriate strains are detectable, apply at a rate of 0.6 to 1.2 fl ozs (18 to 35 mL) of **Integral** per 100 lb (45 kg) of seed. Follow the mixing and dilution procedures described above.

### Alfalfa, Forage and Turf Grasses

For preventative control and suppression of seed pathogens (e.g. *Alternaria* spp.) and plant root pathogens (e.g., *Rhizoctonia* spp. and *Fusarium* spp.) and stimulation of germination and plant vigor, apply at a rate of 0.2 to 2.4 fl ozs (6 to 71 mL) of **Integral** per 100 lb (45 kg) of seed. Follow the mixing and dilution procedures described above.

### Wheat and Barley

For preventative control and suppression of seed pathogens (e.g. *Alternaria* spp.) and plant root pathogens (e.g., *Rhizoctonia* spp. and *Fusarium* spp.), apply at a rate of 0.1 to 0.6 fl oz (3 to 18 mL) of **Integral** per 100 lb (45 kg)

of seed. Follow the mixing and dilution procedures described above.

### Corn (Field and Sweet)

For suppression of root disease caused by *Fusarium* spp., apply at a rate of 0.6 to 2.4 fl ozs (18 to 71 mL) of **Integral** per 100 lb (45 kg) of seed. Follow the mixing and dilution procedures described above.

### Soybeans - Integral Only

For preventative control and suppression of seed pathogens (e.g. *Alternaria* spp.) and plant root pathogens (e.g., *Rhizoctonia* spp. and *Fusarium* spp.) and to increase the nutrient uptake and amount of nodulation by nitrogen-fixing bacteria, apply at a rate of 0.136 fl oz (4 mL) of **Integral** per 100 lb (45 kg) of soybean seed. Follow the mixing and dilution procedures described above.

## For Use as a Commercial Seed Treatment

**Note:** This product does not contain dye and is not covered by an appropriate tolerance, tolerance exemption, or other clearance under the Federal Food, Drug and Cosmetic Act. To comply with 40 CFR 153.155, therefore, all seed treated commercially with this product must be colored with an EPA-approved dye or colorant of a suitable color to prevent accidental use as food for man or feed for animals.

The Federal Seed Act requires that bags containing seed treated with this product shall be labeled with the following information: "This seed has been treated with *Bacillus amyloliquefaciens* strain MBI 600. **DO NOT** use for food, feed, or oil purposes."

**Mixing Instructions:** Apply **Integral** as a water-based slurry alone, or with other seed treatment products (fungicides, insecticides, nematicides, fertilizers, etc.). Additionally, rhizobial inoculant products can be added to the tank mix.

Prior to mixing, determine physical compatibility by mixing proportional quantities of the products in water. **DO NOT** mix **Integral** with any other seed treatment product that bears a label prohibition against such mixing. When tank mixing **Integral** with any other seed treatment product, observe the most restrictive of the labeling limitations and precautions of all products used in mixtures.

**ATTENTION:** If rhizobial inoculants are to be used in the tank mix with other seed treatments (fungicides, insecticides, nematicides, fertilizers, etc.), make sure that they are compatible (not harmful) to the *Rhizobia*. Likewise, use only cool, chlorine-free water in the tank mix. If one or more treatments are not compatible (harmful), mix those products in, and apply them from, a separate mix tank.

To mix, first add the other seed treatment product(s) and/or the rhizobial inoculant product(s) to the mix tank with approximately 1/2 of the required water. Slowly add **Integral** to the slurry until a uniform suspension is obtained. Add the remainder of the water while maintaining constant agitation. **DO NOT** store mixed slurries for longer than 24 hours.



**Application Instructions:** For preventative control and suppression of seed pathogens (e.g. *Alternaria* spp.) and plant root pathogens (e.g., *Rhizoctonia* spp. and *Fusarium* spp.) and/or to increase nutrient uptake and the amount of nodulation by nitrogen-fixing bacteria (legumes), apply at least 5.0 fl ozs of total slurry per 100 lb of seed or at least 3.9 gal of total slurry per 10,000 lb of seed. Some ingredients in **Integral® liquid biofungicide** may not completely solubilize; therefore, it is important to maintain a uniform suspension by continuously agitating the solution throughout the application process. **DO NOT** exceed label application dosage rates.

Because smaller seed has a greater surface area to volume ratio than larger seed, the average size of the seed being treated influences the application rate. Therefore, for each crop that has a range in the rate of application, apply **Integral** at rates from the higher end of the specified application rate range when treating smaller seed. Additionally, use the higher end of the specified application range when treated seed is to be planted in fields that historically experience severe disease pressure.

## Canola

**3.4 fl ozs, 6.8 fl ozs, and 13.6 fl ozs**

### Container Sizes

For preventative control and suppression of seed pathogens (e.g. *Alternaria* spp.) and plant root pathogens (e.g., *Rhizoctonia* spp. and *Fusarium* spp.), apply at a rate of 2.44 fl ozs (72.2 mL) of **Integral** per 100 lb (45 kg) of canola seed. Follow the mixing and dilution procedures described above.

### 30 gal and 265 gal Container Sizes

For preventative control and suppression of seed pathogens (e.g. *Alternaria* spp.) and plant root pathogens (e.g., *Rhizoctonia* spp. and *Fusarium* spp.), apply at a rate of 1.91 gal (7.2 L) of **Integral** per 10,000 lb (4,536 kg) of canola seed. Follow the mixing and dilution procedures described above.

## Cotton

For preventative control and suppression of seed pathogens (e.g. *Alternaria* spp.) and plant root pathogens (e.g., *Rhizoctonia* spp. and *Fusarium* spp.), apply at a rate of 0.6 to 2.4 fl ozs (18 to 71 mL) of **Integral** per 100 lb (45 kg) of delinted cotton seed. Follow the mixing and dilution procedures described above.

## Legume Vegetables

### (Succulent or Dried) Crop Group

For preventative control and suppression of seed pathogens (e.g. *Alternaria* spp.) and plant root pathogens (e.g., *Rhizoctonia* spp. and *Fusarium* spp.), apply at a rate of 0.6 to 2.4 fl ozs (18 to 71 mL) of **Integral** per 100 lb (45 kg) of seed. Follow the mixing and dilution procedures described above.

For improvement of nodulation by *Rhizobia* in fields where appropriate strains are detectable, apply at a rate of 0.6 to 1.2 fl ozs (18 to 35 mL) of **Integral** per 100 lb (45 kg) of seed. Follow the mixing and dilution procedures described above.

## Alfalfa, Forage and Turf Grasses

For preventative control and suppression of seed pathogens (e.g. *Alternaria* spp.) and plant root pathogens (e.g., *Rhizoctonia* spp. and *Fusarium* spp.) and stimulation of germination and plant vigor, apply at a rate of 0.2 to 2.4 fl ozs (6 to 71 mL) of **Integral** per 100 lb (45 kg) of seed. Follow the mixing and dilution procedures described above.

## Wheat and Barley

For preventative control and suppression of seed pathogens (e.g. *Alternaria* spp.) and plant root pathogens (e.g., *Rhizoctonia* spp. and *Fusarium* spp.), apply at a rate of 0.1 to 0.6 fl oz (3 to 18 mL) of **Integral** per 100 lb (45 kg) of seed. Follow the mixing and dilution procedures described above.

## Corn (Field and Sweet)

For preventative control and suppression of plant root pathogens such as *Fusarium* spp., apply at a rate of 0.6 to 2.4 fl ozs (18 to 71 mL) of **Integral** per 100 lb (45 kg) of seed. Follow the mixing and dilution procedures described above.

## Soybeans - Integral Only

For preventative control and suppression of plant root pathogens (e.g., *Rhizoctonia* spp. and *Fusarium* spp.) and to increase the amount of nodulation by nitrogen-fixing bacteria, apply at a rate of 0.136 fl oz (4 mL) of **Integral** per 100 lb (45 kg) of soybean seed. Follow the mixing and dilution procedures described above.

## Soybeans - Vault® HP Liquid Rhizobial Inoculant Growth Enhancement System for Soybean Seed Plus Integral

**Integral** can also be used in conjunction with *Rhizobia*-based inoculant products, such as BASF's **Vault HP Growth Enhancement System**. When used in combination with **Vault HP Growth Enhancement System**, **Integral** provides the additional benefit of improving root nodulation by *Bradyrhizobium japonicum* bacteria in the **Vault HP Growth Enhancement System**.

The **Vault® HP Liquid Rhizobial Inoculant Growth Enhancement System** consists of two (2) components -

- Liquid Growth Enhancer\* - a liquid mixture packaged in plastic bladders.
- Liquid Rhizobial Inoculant - packaged in plastic bladders.

Both **Integral® liquid biofungicide** and the Liquid Growth Enhancer are designed to work with the Liquid Rhizobial Inoculant. Furthermore, neither the Liquid Growth Enhancer nor the Liquid Rhizobial Inoculant affects the activity of **Integral**.

The **Vault HP Growth Enhancement System Plus Integral** co-pack is available in three (3) package designations (see **Vault HP Plus Integral Package Configurations** table). The “4 x 50” case contains four (4) individual 1 x 50 packages; the “2 x 100” case contains

two (2) individual 1 x 100 packages and the “2 x 200” case contains two (2) individual 1 x 200 packages.

Mix one (1) bottle of **Integral** with one (1) bladder of Liquid Growth Enhancer, one (1) bladder of Liquid Rhizobial Inoculant, and a sufficient quantity of cool, chlorine-free water to equal at least 5.0 fl ozs of total slurry per 100 lb of seed or 3.9 gal of slurry per 10,000 lb of seed when not used with additional treatments (see - **Vault HP Growth Enhancement System for Soybean Seed Plus Integral** co-pack insert for more detailed mixing instructions).

The final mixture will result in an application rate of 13.6 fl ozs of **Integral** per 10,000 lbs of soybean seed.

\* Use is optional. On-seed rhizobia survival reduced to 60 days without use of **Vault® Liquid Growth Enhancer**.

**Vault HP Plus Integral Package Configurations**

Package Designation	Total Pounds of Seed Treated <sup>1</sup>	Integral Liquid Biofungicide		Vault Liquid Rhizobial Inoculant		Vault Liquid Growth Enhancer <sup>2</sup>	
		# of Bottles	Contents Per Bottle	# of Bladders	Contents Per Bladder	# of Bladders	Contents Per Bladder
“4 x 50”	10,000	4	3.4 fl ozs	4	25 fl ozs	4	21.6 fl ozs
“2 x 100”	10,000	2	6.8 fl ozs	2	50 fl ozs	2	43.2 fl ozs
“2 x 200”	20,000	2	13.6 fl ozs	2	100 fl ozs	2	86.4 fl ozs

<sup>1</sup> At an average seed size of 3,000 seeds per pound.

<sup>2</sup> Use is optional. On-seed rhizobia survival reduced to 60 days without use of **Vault Liquid Growth Enhancer**.

## Conditions of Sale and Warranty

The **Directions For Use** of this product reflect the opinion of experts based on field use and tests. The directions are believed to be reliable and must be followed carefully. However, it is impossible to eliminate all risks inherently associated with the use of this product. Crop injury, ineffectiveness or other unintended consequences may result because of such factors as the presence of other or untested or unapproved materials, seed of low quality or low vigor or low germination, use of the product in a manner inconsistent with its labeling, misapplication of this product, or weather conditions at planting or environmental conditions during seed storage, all of which are beyond the control of BASF CORPORATION ("BASF") or the Seller. To the extent consistent with applicable law, all such risks shall be assumed by the Buyer.

BASF warrants that this product conforms to the chemical description on the label and is reasonably fit for the purposes referred to in the **Directions For Use**, subject to the inherent risks, referred to above.

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BASF Corporation  
26 Davis Drive  
Research Triangle Park, NC 27709

  
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