



**U.S. ENVIRONMENTAL PROTECTION AGENCY**

Office of Pesticide Programs  
Biopesticides and Pollution Prevention Division (7511P)  
1200 Pennsylvania Ave., N.W.  
Washington, D.C. 20460

**EPA Reg. Number:**

91664-1

**Date of Issuance:**

5/27/2016

**NOTICE OF PESTICIDE:**

Registration  
 Reregistration  
(under FIFRA, as amended)

**Term of Issuance:**

Unconditional

**Name of Pesticide Product:**

Biorend®

**Name and Address of Registrant (include ZIP Code):**

Ag NuBio, Inc.  
11125 North Ambassador Drive, Suite 120  
Kansas City, MO 64153

**Note:** Changes in labeling differing in substance from that accepted in connection with this registration must be submitted to and accepted by the Biopesticides and Pollution Prevention Division prior to use of the label in commerce. In any correspondence on this product, always refer to the above EPA Registration Number.

On the basis of information furnished by the registrant, the above named pesticide is hereby registered under the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA or the Act).

Registration is in no way to be construed as an endorsement or recommendation of this product by the U.S. Environmental Protection Agency (EPA). In order to protect health and the environment, the Administrator, on his or her motion, may at any time suspend or cancel the registration of a pesticide in accordance with the Act. The acceptance of any name in connection with the registration of a product under the Act is not to be construed as giving the registrant a right to exclusive use of the name or to its use if it has been covered by others.

This product is unconditionally registered in accordance with FIFRA section 3(c)(5) provided that you:

1. Submit and/or cite all data required for registration or registration review of your product when the EPA requires all registrants of similar products to submit such data.
2. Submit Storage Stability and Corrosion Characteristics (Guidelines 830.6317 and 830.6320) data as these data requirements are not satisfied. A one-year study is required to satisfy these data requirements. You have 18 months from the date of this registration to provide these data to the EPA.
3. Submit one (1) copy of the final printed labeling for the record before you release this product for shipment.

**Signature of Approving Official:**

Andrew Bryceland, Team Leader  
Biochemical Pesticides Branch  
Biopesticides and Pollution Prevention Division (7511P)  
Office of Pesticide Programs

**Date:**

5/27/2016

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 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 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. A stamped copy of the labeling is enclosed for your records. Please also note that the record for this product currently contains the following acceptable Confidential Statement of Formula (CSF):

- Basic CSF dated 5/24/16.

If you have any questions, please contact Chris Pfeifer of my team by phone at 703-308-0031 or via email at [pfeifer.chris@epa.gov](mailto:pfeifer.chris@epa.gov).

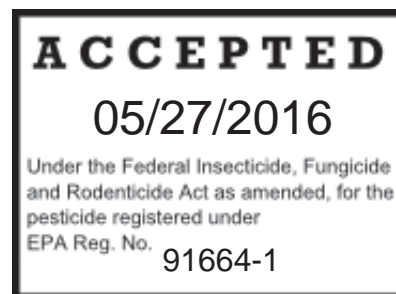
Sincerely,

A handwritten signature in blue ink that reads "Andrew C. Bryceland". The signature is fluid and cursive, with the first name being the most prominent.

Andrew Bryceland, Team Leader  
Biochemical Pesticides Branch  
Biopesticides and Pollution  
Prevention Division (7511P)  
Office of Pesticide Programs

Enclosure

**BIOREND®**  
**Plant Defense Booster**



BIOREND® is a registered trademark of BioAgro, SA

ACTIVE INGREDIENT:  
Chitosan (poly-D-glucosamine)\* .....2.5%  
OTHER INGREDIENT:.....97.5%  
Total.....100.0%

\*Contains 0.22 pounds of active ingredient per gallon of product (equivalent to 26 grams of active ingredient per liter of product)

**KEEP OUT OF REACH OF CHILDREN**

**CAUTION**

EPA Reg. No. 91664-1  
EPA Est. No.

Net Contents  
Ag NuBio, Inc.  
11125 N. Ambassador Dr. Ste. 120  
Kansas City, MO 64153

See side/back panels for additional precautionary statements

## PRECAUTIONARY STATEMENTS

### HAZARDS, TO HUMANS AND DOMESTIC ANIMALS

CAUTION: Wear the appropriate Personal Protective Equipment (PPE)

### PERSONAL PROTECTIVE EQUIPMENT (PPE)

Applicators, mixers, loaders and other handlers must wear:

- Long-sleeved shirt and long pants.
- Shoes plus socks.

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

### USER SAFETY RECOMMENDATIONS

Users should:

- Remove clothing 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

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 cleaning equipment or disposing of equipment wash waters or rinsate. Do not allow runoff into lakes, streams, ponds or public waterways.

### PHYSICAL OR CHEMICAL HAZARDS

For spill, leak, fire, exposure, or accident call CHEMTREC at 1-800-424-9300.

## 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.

BIOREND® is a Plant Defense Booster. The active ingredient in BIOREND® is derived from basic carbohydrate source. Application of BIOREND® elicits phytoalexins in the plant's defense system protecting against certain plant pathogens.

BIOREND® stimulates the growing of roots and culms by using the SAR (Systemic Acquired Resistance) mechanism, which allows plants to explore a greater volume of soil and, therefore, to absorb more water and nutrients, to become stronger and

healthier, less susceptible to attacks on the root system, to allow the healing of wounds, to reduce post-transplanting dehydration in sowing and transplanting species

When used as directed on this label BIOREND® can boost seed germination and vitality, stimulate emergence and sprouting, enhance plant vigor, promote root growth, promote foliar growth, increase crop yields, improve crop vigor and quality, suppress diseases and pathogens, activate plant resistance to environmental stress, drought and disease pressure, including the suppression of plant parasitic nematodes.

#### **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.

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
- Waterproof gloves
- Shoes plus socks

#### **NON-AGRICULTURAL USE REQUIREMENTS**

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

Do not enter treated area without protective clothing until sprays have dried.

## MIXING AND APPLICATION INSTRUCTIONS

**Preparation of sprays:** Fill the application container up to 1/3 of its capacity. Add BIOREND® according to the recommended dose with the agitation system on and make up to volume with water. To improve solution of water and BIOREND®, use water of pH 6.5 or lower. If pH of the water is over 6.5, use a buffer to reduce pH to 6.5.

**Compatibility:** To determine the physical compatibility of BIOREND® with any other product, use a small container to mix a small amount (e.g. 1 pint) of spray solution, containing all ingredients in the same order and ratio as the anticipated use. If any indication of physical incompatibility develops, do not use this mixture for spraying. Indications of incompatibility usually appear within 5-15 minutes after mixing. Read and follow all directions and precautions on this label and on the other labels of any products for which a tank mixture is being considered. To improve compatibility, use water of pH 6.5 or lower. If pH of the water is over 6.5, use a buffer to reduce pH to 6.5. When mixing with other products, add the other product(s) to water of pH 6.5 or lower and add the BIOREND® to the mixture last.

**Phytotoxicity:** BIOREND® is not phytotoxic in the labeled application doses and crops.

### **Chemigation Directions:**

"The system must contain a functional check valve, vacuum relief valve and low pressure drain appropriately located on the irrigation pipeline to prevent water source contamination from back flow."

"The pesticide injection pipeline must contain a functional, automatic, quick-closing check valve to prevent the flow of fluid back toward the injection pump."

"The pesticide injection pipeline must also contain a functional, normally closed, solenoid-operated valve located on the intake side of the injection pump and connected to the system interlock to prevent fluid from being withdrawn from the supply tank when the irrigation system is either automatically or manually shut down."

"The system must contain functional inter-locking controls to automatically shut off the pesticide injection pump when the water pump motor stops."

"The irrigation line or water pump must include a functional pressure switch which will stop the water pump motor when the water pressure decreases to the point where pesticide distribution is adversely affected."

"Systems must use a metering pump such as a positive displacement injection pump (e.g., diaphragm pump) effectively designed and constructed of materials that are compatible with pesticides and capable of being fitted with a system interlock."

Use a pesticide supply tank for the mixing and application of BIOREND® in chemigation systems.

Remove scale, pesticide residues, and other foreign matter from the chemical tank and entire injector system. Flush with clean water.

First prepare a suspension of BIOREND® in the supply tank by filling the tank with  $\frac{1}{2}$  to  $\frac{3}{4}$  the desired amount of water. Start mechanical or hydraulic agitation. Add the required amount of BIOREND® and then the remaining volume of water. When mixing with other products, add the other product(s) to water of pH 6.5 or lower and add the BIOREND to the mixture last. The suspension of BIOREND® must be injected with a positive displacement pump into the main line ahead of a right angle turn to insure adequate mixing.

Maintain continuous agitation in the supply tank during mixing and application to assure a uniform suspension.

For center pivot and other continuously moving sprinkler systems, set system to apply 0.1 to 0.3 inches of water with the required amount of mixture evenly and continuously throughout the irrigation cycle.

For solid set, wheel-line, drip, microsprinkler or other stationary system applications, introduce the correct amount of BIOREND® mixture from the supply tank into the irrigation water during the middle one-third of the irrigation cycle.

#### **Cleaning Application Equipment**

To prevent contamination of the dilute solution of BIOREND® by possible pesticides or other chemical residues in the spraying equipment, make sure that the equipment is thoroughly clean before and after use.

### Use Rates, Crops, Application Timing and Method

| Crop   | BIOREND®<br>Use Rate   | Number of<br>Applications  | Application<br>Time                                     | Application<br>Methods  |
|--|--|--|---|---|
| Grapes,<br>Kiwi,<br>Lemons,<br>Oranges,<br>Clementine,<br>Grapefruit,<br>Limes,<br>Tangerines,<br>Peaches,<br>Apricot,<br>Nectarines,<br>Cherry,<br>Apple,<br>Pear,<br>Olive,<br>Blueberry,<br>Raspberry,<br>Blackberry,<br>Avocado,<br>Walnut,<br>Almond,<br>Hazelnut | New Plantings<br>1.1<br>gallons/acre<br>(0.24 lbs.<br>ai./acre)<br><br>Mature<br>Plantings<br>2.1<br>gallons/acre<br>(0.46 lbs.<br>ai./acre) | 1-2<br>depending on<br>the general<br>condition of<br>the plants | At peak activity<br>in the roots                        | Inject into drip<br>or sprinkler<br>irrigation<br>system              |
| Strawberry   | ½ gallon/acre<br>(0.11 lbs.<br>ai./acre)   | 2-4  | At peak activity<br>in the roots                        | Inject into drip<br>or sprinkler<br>irrigation<br>system              |
| Potato   | 0.8<br>gallons/acre<br>(0.19 lbs.<br>ai./acre)   | 4  | Every 10 days,<br>starting 30<br>days after<br>planting | Inject into drip<br>or sprinkler<br>irrigation<br>system              |
| Garlic   | 5% by volume<br>mixture<br>(64 fluid<br>ounces/10<br>gallons<br>mixture)<br>(0.11 lbs. ai./10<br>gallons<br>mixture)                         | 1  | Seed  | Immerse seed<br>in solution for<br>15 minutes<br>prior to<br>planting |



| <b>Crop</b>                       | <b>BIOREND®<br/>Use Rate</b>   | <b>Number of<br/>Applications</b> | <b>Application<br/>Time</b>   | <b>Application<br/>Methods</b>   |
|-----------------------------------|--|-----------------------------------|---|--|
| Onion<br>Transplant<br>production | 1% by volume<br>mixture<br>(12.8 fluid<br>ounces/10<br>gallons<br>mixture)<br>(0.022 lbs.<br>ai./10 gallons)   | 3                                 | Make weekly<br>applications<br>starting 30<br>days prior to<br>transplanting.                   | Sprinkle soil to<br>wet surface or<br>seedlings to<br>point of runoff      |
| Onion<br>Transplanting            | 3% by volume<br>mixture<br>(38.4 fluid<br>ounces/10<br>gallons<br>mixture)<br>(0.066 lbs.<br>ai./10 gallons)   | 1                                 | Transplanting   | Immerse roots<br>in mixture for<br>30 seconds<br>prior to<br>transplanting |
| Greenhouse<br>Tomato              | 1.5% by<br>volume mixture<br>(19.2 fluid<br>ounces/10<br>gallons<br>mixture)<br>(0.033 lbs.<br>ai./10 gallons) | 1                                 | Seed  | Immerse seeds<br>in mixture for<br>30-second<br>prior to<br>planting       |
|                                   | 0.54 to 1.1<br>gallons/acre<br>(0.12 to 0.24<br>lbs. ai/acre)  | 4                                 | Apply every 7<br>days starting<br>10 days after<br>planting                                     | Inject into drip<br>or sprinkler<br>irrigation<br>system                   |
|                                   | 1.1 to 1.6<br>gallons/acre<br>(0.24 to 0.35<br>lbs. ai/acre)   | 4                                 | Apply every 7<br>days starting at<br>beginning of<br>physiological<br>maturity                  | Inject into drip<br>or sprinkler<br>irrigation<br>system                   |
| Grapes,<br>Kiwi                   | 0.55 to 1.1<br>Gallons/Acre<br>(0.12 to 0.24<br>lbs. ai./acre)   | 5 – 6                             | 2 apps at 20 cm<br>shoots then 3 to<br>4 apps from fruit<br>set up to 20 days<br>before harvest | Foliar spray   |

| <b>Crop</b>   | <b>BIOREND®<br/>Use Rate</b>                                   | <b>Number of<br/>Applications</b> | <b>Application<br/>Time</b>  | <b>Application<br/>Methods</b> |
|---|--|-----------------------------------|--|--------------------------------|
| Lemon,<br>Orange,<br>Clementine,<br>Grapefruit,<br>Lime,<br>Tangerine   | 0.55 to 1.1<br>Gallons/Acre<br>(0.12 to 0.24<br>lbs. ai./acre) | 3 - 4                             | Spring -<br>Summer   | Foliar Spray                   |
| Peach,<br>Apricot,<br>Nectarine,<br>Cherry,<br>Plum,<br>Prune,<br>Olive | 0.55 to 1.1<br>Gallons/Acre<br>(0.12 to 0.24<br>lbs. ai./acre) | 3 - 4                             | Starting at<br>Bloom and every<br>7 days, up to 4<br>applications  | Foliar Spray                   |
| Apple,<br>Pear  | 0.55 to 1.1<br>Gallons/Acre<br>(0.12 to 0.24<br>lbs. ai./acre) | 3 - 4                             | One application<br>at fruit set. Then<br>starting in mid-<br>June every 10<br>days up to 4<br>applications | Foliar Spray                   |
| Blueberry,<br>Raspberry,<br>Blackberry                                  | 0.55 to 1.1<br>Gallons/Acre<br>(0.12 to 0.24<br>lbs. ai./acre) | 3-4                               | From sprouting<br>up to fruit-set  | Foliar Spray                   |
| Walnut,<br>Almond,<br>Hazelnut  | 0.55 to 1.1<br>Gallons/Acre<br>(0.12 to 0.24<br>lbs. ai./acre) | 4-6                               | Start in bloom<br>with female<br>flower exposed<br>Repeat every 7<br>to 10 days                            | Foliar Spray                   |

| <b>Crop</b>  | <b>BIOREND®<br/>Use Rate</b>  | <b>Number of<br/>Applications</b> | <b>Application<br/>Time</b>   | <b>Application<br/>Methods</b>   |
|--|---|-----------------------------------|---|--|
| Beans,<br>Carrots,<br>Celery,<br>Cucumbers,<br>Eggplant,<br>Garlic,<br>Ginseng,<br>Herbs,<br>Leek,<br>Lentils,<br>Lettuce,<br>Melons,<br>Onions,<br>Peas,<br>Peppers,<br>Potatoes,<br>Pumpkins,<br>Squash,<br>Strawberries,<br>Sweet Potatoe<br>Tomatoes | 0.55 to 1.1<br>Gallons/Acre<br>(0.12 to 0.24<br>lbs. ai./acre)  | 4 - 6                             | Start 25 days<br>after<br>transplanting.<br>Repeat every 10<br>days up to 6<br>applications | Foliar Spray   |
| <u>Greenhouse and<br/>Nursery Plant:</u><br>Potted plants<br>Flowers (roses,<br>etc)<br>Vegetables<br>Herbs<br>Shrubs,<br>Fruit trees<br>Vines,<br>Avocado   | 1% by<br>volume<br>mixture<br>(12.8 fluid<br>ounces/10<br>gallons<br>mixture)<br>(0.022 lbs.<br>ai./10 gallons) | 4 - 6                             | Apply every 7<br>days up to 6<br>applications   | Foliar spray to<br>run-off (25 to<br>200 gallons /<br>acre).(0.06 to<br>0.44 lbs.<br>ai./acre) |
| <u>Nurseries</u><br>Eucalyptus and<br>Pine Trees   | 5 % by<br>volume<br>mixture<br>(0.5 gallons<br>/10 gallons<br>mixture)<br>(0.11 lbs.<br>ai./10 gallons)         | 2                                 | 30 and 60 days<br>after<br>emergence  | Foliar spray<br>0.35 fluid<br>ounces of 5%<br>mixture/plant                                    |
| <b>Crop</b>  | <b>BIOREND®</b>   | <b>Number of</b>                  | <b>Application</b>  | <b>Application</b>   |

|   | <b>Use Rate</b>   | <b>Applications</b> | <b>Time</b>   | <b>Methods</b>   |
|---|---|---------------------|---|--|
| Eucalyptus transplants  | 15% by volume mixture (1.5 gallons/10 gallons mixture) (0.33 lbs. ai./10 gallons) | 1                   | Transplanting   | Dip roots of seedlings in mixture prior to transplanting |
| Pine tree transplants   | 20% by volume mixture (2 gallons/10 gallons mixture) (0.44 lbs. ai./10 gallons)   | 1                   | Transplanting   | Dip roots of seedlings in mixture prior to transplanting |
| <u>Turf:</u><br>Bent grass<br>Bermuda grass<br>Bluegrass<br>Centipede grass<br>Dichondra<br>Fescue<br>Rye grass<br>Wheat grass<br>Zoysia grass<br>St. Augustine | 0.55 to 1.1 Gallons/Acre (0.12 to 0.24 lbs. ai./acre)                             | 4 - 6               | When grass is actively growing Repeat applications on 7 day intervals as needed                                   | Inject into irrigation line or apply as a Foliar Spray   |
| <u>Cereal Grains:</u><br>Barley<br>Oats<br>Rice<br>Wheat  | 0.55 to 1.1 Gallons/Acre (0.12 to 0.24 lbs. ai./acre)                             | 4 - 6               | Begin applications prior to period of normal disease development Repeat applications on 7 day intervals as needed | Inject into irrigation line or apply as a Foliar Spray   |

### **STORAGE AND DISPOSAL**

Do not contaminate water, food or feed by storage or disposal

**Pesticide Storage:** Store in a cool dry place. Avoid freezing.

**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).

Do not contaminate water when disposing of equipment wash water or rinsate. Pesticide wastes may be toxic. Improper disposal of unused pesticide, wash water or rinse water is a violation of federal law.

**Container Disposal:** Non-refillable 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 and drain 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 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 ordinance.

### **Warranty Statement**

Ag NuBio warrants that this product conforms to the chemical description on the label thereof and is reasonably fit for purposes stated on such label only when used in accordance with directions under normal use conditions. It is impossible to eliminate all risks inherently associated with use of this product. Crop injury, ineffectiveness or other unintended consequences may result because of such factors as weather conditions, presence of other materials or the manner of use or application, all of which are beyond the control of Ag NuBio. To the extent consistent with applicable law, Ag NuBio shall not be liable for consequential, special or indirect damages resulting from the use or handling of this product. All such risks shall be assumed by the Buyer. To the extent consistent with applicable law, the exclusive remedy of any buyer or user of this product for any and all losses, injuries, or damages resulting from or in any way arising from the use, handling, or application of this product, whether in contract, warranty, tort, negligence, strict liability, or otherwise, shall not exceed the purchase price paid for this product or at Ag NuBio election, the replacement of this product. Ag NuBio MAKES NO WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR ANY OTHER EXPRESS OR IMPLIED WARRANTY EXCEPT AS STATED ABOVE.