

# SPECIMEN LABEL

# CRESCENDO™

Biological nematicide/insecticide for recreational turf and landscapes

**Active Ingredient:**

*Chromobacterium subsugae* strain PRAA4-1<sup>T</sup> cells and spent fermentation media\* ..... 30.0%

**Other Ingredients:** ..... 70.0%

**Total:** ..... 100.0%

\*Potency: Contains not less than 1,000 Cabbage Looper Killing Units (CLKU)/mg. The percent active ingredient does not indicate product performance and potency measurements are not federally standardized.

## KEEP OUT OF REACH OF CHILDREN CAUTION

### FIRST AID

**IF IN EYES**

- Hold eye open and rinse slowly and gently with water for 15 – 20 minutes. Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye.
- Call a poison control center or doctor for treatment advice.

### HOT LINE NUMBER

Have the product container or label with you when calling a poison control center or doctor, or when going for treatment. You may also contact 1-800-222-1222 for emergency medical treatment information.

**FOR CHEMICAL SPILL, LEAK, FIRE, OR EXPOSURE, CALL CHEMTREC 1-800-424-9300**

**EPA Reg. No.: 84059-27-42750**



**For Organic Use**



Manufactured For:  
**ALBAUGH, LLC**  
1525 NE 36th Street  
Ankeny, Iowa 50021

## **PRECAUTIONARY STATEMENTS HAZARDS TO HUMANS AND DOMESTIC ANIMALS**

**CAUTION:** Causes moderate eye irritation. Avoid contact with eyes or clothing. Wash thoroughly with soap and water after handling and before eating, drinking, chewing gum, using tobacco or using the toilet.

### **PERSONAL PROTECTIVE EQUIPMENT (PPE)**

Applicators and other handlers must wear:

- long-sleeved shirt and long pants
- waterproof gloves
- shoes plus socks
- protective eyewear
- Wear a minimum of a NIOSH-approved particulate filtering facepiece respirator with any N, R or P filter; OR a NIOSH-approved elastomeric particulate respirator with any N<sub>1</sub>, R, or P filter; OR a NIOSH-approved powered air purifying respirator with an HE filter. (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 are available, use detergent and hot water. Keep and wash PPE separately from other laundry.

**Engineering Controls:** When handlers use closed systems, closed systems or enclosed cabs in a manner that in a manner that meets the requirements listed in the Worker Protection Standard (WPS) for agricultural pesticides [40 CFR 170.240(d)(4-6)], the handler PPE requirements may be reduced or modified as specified in the WPS.

**IMPORTANT:** When reduced PPE is worn because a closed system is being used, handlers must be provided all PPE specified above for "applicators and other handlers" and have such PPE immediately available for use in an emergency, such as a spill or equipment breakdown.

### **USER SAFETY RECOMMENDATIONS**

Users should:

- 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**

This product is toxic to aquatic invertebrates. Drift and runoff may be hazardous to aquatic organisms in water adjacent to treated areas.

This product is toxic to certain nontarget terrestrial arthropods. Minimize spray drift away from target area to reduce effects to nontarget organisms.

This product is toxic to bees exposed to direct treatment or residues on blooming crops or weeds. Do not apply this product if bees are visiting the treatment area.

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.

### **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.

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
- Protective eyewear

**EXCEPTION:** If the product is soil incorporated or soil injected, 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.

### **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 or greenhouses.

Keep unprotected persons out of treated areas until sprays have dried.

### **PRODUCT INFORMATION**

CRESCENDO is a biological insecticide containing cells of *Chromobacterium subsugae* strain PRAA4-1<sup>T</sup> and spent fermentation media, for use on turf against the pests listed in the **APPLICATION RATES FOR SELECTED CROPS** section. CRESCENDO functions primarily as a stomach poison for use in the control or suppression of many foliar-feeding pests, including caterpillars, and certain Coleoptera. CRESCENDO has multiple effects, including reducing fecundity and oviposition, deterring feeding and acting as a stomach poison on Homoptera and Hemiptera, such as aphids, psyllids, whiteflies, *Lygus*, mealybugs, thrips, certain fruit flies, and phytophagous mites infesting labeled use sites. CRESCENDO can also be used for the control or suppression of soil-dwelling pests listed in the **APPLICATION RATES FOR SELECTED CROPS** section. CRESCENDO must be mixed with water and applied as a foliar spray with ground equipment equipped for conventional pesticide spraying, by soil treatment or by seed treatment.

CRESCENDO can be used in the field, in hoop houses, or in greenhouses for the control or suppression of any labeled pest.

### **GROUND APPLICATIONS**

Apply CRESCENDO in ground with quantities of water sufficient to provide thorough coverage of infested plant parts. The amount of water needed per acre will depend upon crop development, weather, application equipment, and local experience.

For hand-held or backpack sprayer applicators, mix CRESCENDO at the rate of 1-3 tablespoons per 1 gallon of water to approximate 0.5-3 pounds of CRESCENDO per 100 gallons of water.

Do not spray when wind speed favors drift beyond the area intended for use.

Avoiding spray drift is the responsibility of the applicator.

## **Mixing directions**

**Important** - Do not add CRESCENDO to the tank mix before introducing 3/4 of the desired amount of water. Add water to the mix tank. Start the mechanical or hydraulic agitation to provide moderate circulation before adding CRESCENDO. Add the desired volume of CRESCENDO to the mix tank and continue circulation while adding the remainder of the water. Maintain circulation while loading and spraying. Do not mix more CRESCENDO than is needed for immediate use. Do not let the spray mixture stand overnight in the spray tank. Use a strainer no finer than 50 mesh in conventional spray systems.

## **Spray volume**

For conventional ground applications, use at least 10 gallons of total volume per acre (0.23 gallon per 1000 sq. ft.) (1 quart per 1000 sq. ft.) in water-based sprays. (Use a minimum of 50 gallons per acre (GPA) carrier volume (1.15 gallons per 1000 sq. ft.) for all established orchard and vine crops.)

## **Tank mixing**

Do not combine CRESCENDO in the spray tank with other pesticides, surfactants, adjuvants, or fertilizers if there has been no previous experience or use of the combination to show it is physically compatible, effective, and non-injurious under your use conditions. Observe the most restrictive of the labeling limitations and precautions of all products used in mixtures.

To ensure compatibility of tank mix combinations, they must be evaluated prior to use. To determine the physical compatibility of this product with other products, use a jar test. Using a quart jar, add the proportionate amounts of the products to one quart of water with agitation. Add dry formulations first, then flowables, and then emulsifiable concentrates last. After thoroughly mixing, let this mixture stand for 5 minutes. If the combination remains mixed or can be readily remixed, it is physically compatible. Once compatibility has been proven, use the same procedure for adding required ingredients to the spray tank.

## **GENERAL SPRAY CONSIDERATIONS**

CRESCENDO performs best under certain conditions. To preserve product spray characteristics and overall efficacy, consider the following spray parameters:

### **Tank-Mixing**

CRESCENDO does not have ovicidal activity. When significant insect/mite population or eggs are present, consider tank mixing with a complementary ovicidal/contact insecticide/miticide.

### **pH**

To maintain product properties, the pH of the mixed spray solution should be between 6-8, with the most desirable level being neutral.

### **Water Hardness**

If you know or suspect you have hard water, add ammonium sulfate (AMS) at levels of 1-2% (w/w) or 8.5 to 17 pounds per 100 gallons of water to help maintain efficacy. Add AMS together with CRESCENDO or add it to the water and thoroughly dissolve before adding CRESCENDO. Conduct a spray test to determine if your crop/variety is compatible with these AMS levels before adding CRESCENDO to the tank for spraying. For organic production, use an approved water conditioner to address suspected hard water.

### **Adjuvants/Carrier Volume**

Avoid carrier volumes and/or adjuvants alone or in combinations that result in spray runoff or a drip accumulation.

Some adjuvants have been shown to increase or decrease the effectiveness of CRESCENDO. Use of a quality adjuvant or crop oil is highly recommended.

<b>CONVERSION RATES</b>	
Unit conversion table for CRESCENDO.	
Pounds per acre (lb./ac.)	Weighed ounces per 1000 square feet (wt. oz./1000 ft. <sup>2</sup> )
0.5	0.2
1	0.5
2	0.75
3	1.0
4	1.5
5	1.75
6	2.25
10 (turf only)	3.75
15 (turf only)	5.5
20 (turf only)	7.5

### APPLICATION RATES FOR SELECTED CROPS

#### **FOR USE ON THE FOLLOWING CROPS FOR CONTROL OR SUPPRESSION OF SPECIFIED NEMATODES/INSECTS/MITES:**

Tank mix CRESCENDO with a contact miticide/insecticide/nematicide for control or improved suppression.

#### **Bedding Plants**

##### **0.5 - 3 pounds of CRESCENDO per acre or 1-3 pounds of CRESCENDO per 100 gallons of water**

Loopers, tobacco budworm, omnivorous looper, omnivorous leafroller, diamondback moth, armyworms, ello moth, lo moth, oleander moth, and azalea caterpillar

##### **2-3 pounds of CRESCENDO per acre or 2-3 pounds of CRESCENDO per 100 gallons of water**

Whiteflies, aphids, thrips, azalea lace bug, *Lygus*, and mites

##### **2-6 pounds of CRESCENDO per acre**

For control of low to medium infestation levels of nematodes, use as a pre-plant or at-plant in furrow drench application in 100 to 150 gallons of water per acre or as an in-furrow spray in 20 to 50 gallons of water per acre. When very high pest infestation levels are anticipated or encountered, other effective soil treatments may be necessary.

Use against the following nematodes: awl (*Dolichodorus spp.*), cyst (*Heterodera spp.*), reniform (*Rotylenchulus reniformis*), dagger (*Xiphinema spp.*), root-knot (*Meloidogyne spp.*), lance (*Hoplolaimus galeatus*), lesion (*Pratylenchus spp.*), pin (*Paratylenchus spp.*), sting (*Belonolaimus spp.*)

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## Ornamental Plants

### **0.5-3 pounds of CRESCENDO per acre or 0.5-3 pounds of CRESCENDO per 100 gallons of water**

Loopers, tobacco budworm, omnivorous looper, omnivorous leafroller, diamondback moth, armyworms, ello moth, lo moth, oleander moth, and azalea caterpillar

### **2-3 pounds of CRESCENDO per acre or 2-3 pounds of CRESCENDO per 100 gallons of water**

Whiteflies, aphids, thrips, azalea lace bug, *Lygus*, and mites

### **2-6 pounds of CRESCENDO per acre**

For control of low to medium infestation levels of nematodes, use as a pre-plant or at-plant in furrow drench application in 100 to 150 gallons of water per acre or as an in-furrow spray in 20 to 50 gallons of water per acre. When very high pest infestation levels are anticipated or encountered, other effective soil treatments may be necessary.

Use against the following nematodes: awl (*Dolichodorus spp.*), cyst (*Heterodera spp.*), reniform (*Rotylenchulus reniformis*), dagger (*Xiphinema spp.*), root-knot (*Meloidogyne spp.*), lance (*Hoplolaimus galeatus*), lesion (*Pratylenchus spp.*), pin (*Paratylenchus spp.*), sting (*Belonolaimus spp.*)

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## Shade and Ornamental Trees

### **0.5-3 pounds of CRESCENDO per acre or 0.5-3 pounds of CRESCENDO per 100 gallons of water**

Blackheaded budworm, California oakworm, Douglas fir tussock moth, elm spanworm, fruittree leafroller, greenstriped mapleworm, hemlock looper, jack pine budworm, mimosa webworm, pine butterfly, saddleback caterpillar, saddle prominent caterpillar, spruce budworm, tent caterpillar, western tussock moth, and gypsy moth

### **2-3 pounds of CRESCENDO per acre or 2-3 pounds of CRESCENDO per 100 gallons of water**

Aphids, lace bugs, mites, whiteflies, and wooly adelgid

Elm leaf beetle, imported willow leaf beetle, and viburnum beetle – Apply to newly hatched to 2<sup>nd</sup> instar larvae. If adult beetles are also present, tank mix with a knockdown insecticide. Heavy infestations may require repeat applications.

### **2-6 pounds of CRESCENDO per acre**

For control of low to medium infestation levels of nematodes, use as a pre-plant or at-plant in furrow drench application in 100 to 150 gallons of water per acre or as an in-furrow spray in 20 to 50 gallons of water per acre. When very high pest infestation levels are anticipated or encountered, other effective soil treatments may be necessary.

Use against the following nematodes: awl (*Dolichodorus spp.*), cyst (*Heterodera spp.*), reniform (*Rotylenchulus reniformis*), dagger (*Xiphinema spp.*), root-knot (*Meloidogyne spp.*), lance (*Hoplolaimus galeatus*), lesion (*Pratylenchus spp.*), pin (*Paratylenchus spp.*), sting (*Belonolaimus spp.*)

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## Tree Farms and Plantations

### **Conifers, Including Christmas Trees and Deciduous Trees and other farmed trees**

#### **0.5-3 pounds of CRESCENDO per acre or 0.5-3 pounds of CRESCENDO per 100 gallons of water**

Bagworm, fall webworm, gypsy moth, hemlock looper, jack pine budworm, pine tip moth, redhumped caterpillar, spruce budworm, tent caterpillar, and tussock moths

#### **2-3 pounds of CRESCENDO per acre or 2-3 pounds of CRESCENDO per 100 gallons of water**

Cottonwood leaf beetle - Apply to newly hatched to 2<sup>nd</sup> instar larvae. If adult beetles are also present, tank mix with a knockdown insecticide. Heavy infestations may require repeat applications.

## **2-6 pounds of CRESCENDO per acre**

For control of low to medium infestation levels of nematodes, use as a pre-plant or at-plant in furrow drench application in 100 to 150 gallons of water per acre or as an in-furrow spray in 20 to 50 gallons of water per acre. When very high pest infestation levels are anticipated or encountered, other effective soil treatments may be necessary.

Use against the following nematodes: awl (*Dolichodorus spp.*), cyst (*Heterodera spp.*), reniform (*Rotylenchulus reniformis*), dagger (*Xiphinema spp.*), root-knot (*Meloidigyne spp.*), lance (*Hoplolaimus galeatus*), lesion (*Pratylenchus spp.*), pin (*Paratylenchus spp.*), sting (*Belonolaimus spp.*)

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## **Turf(grass), Including Grass Grown for Seed, Lawns and Recreational Turf**

### **Bluegrass, Bentgrass, Bermudagrass, Dichondra, Fescue, Orchardgrass, *Poa annua*, Ryegrass, St. Augustine, Zoysia mixtures, and other grasses including grasses grown for seed**

For use on sod farms, turf on golf courses, sport fields, residential, institutional, municipal, commercial, and other turfgrass areas

#### **For foliar applications,**

#### **2.5-20 pounds<sup>(††)</sup> of CRESCENDO per acre**

Armyworms, Chinch bug, cutworms, leafhoppers, and sod webworms (do not irrigate following application)

#### **0.5-4 pounds of CRESCENDO per 1/5 acre (2.5-20 pounds<sup>(††)</sup> of CRESCENDO per acre)**

White grubs (such as larvae of, black turfgrass ataenius, European chafer, green June beetle, *Aphodius spp.*, May or June beetles (*Phyllophaga spp.*), northern and southern masked chafers (*Cyclocephala spp.*), and sugarcane grub (*Tomarus spp.*)). Apply CRESCENDO soon after egg hatch when grubs are 1<sup>st</sup> or 2<sup>nd</sup> instar.)

Mix specified dosage of CRESCENDO in sufficient water to provide thorough coverage of turf.

For control of white grubs and annual bluegrass weevils, use a minimum of 100 gallons of water per acre or 300 fluid ounces of water per 1,000 square feet (or 9 quarts of water per 1000 sq. ft.).

Thoroughly irrigate following application to moisten the top inch of soil. There should be no more than ½ inch of thatch present at the time of application. Time applications to occur shortly after egg hatch when grubs are 1<sup>st</sup> or 2<sup>nd</sup> instar.

Under dry conditions where thatch is present, prewatering is recommended prior to application for grub or weevil control.

For control of armyworms, cutworms, webworms, chinch bugs or leafhoppers, do not irrigate following application.

#### **0.5-2.0 pounds<sup>(††)</sup> of CRESCENDO per acre**

For control of low to medium infestation levels of nematodes, use as a pre-plant or at-plant in furrow drench application in 100 to 150 gallons of water per acre or as an in-furrow spray in 20 to 50 gallons of water per acre. When very high pest infestation levels are anticipated or encountered, other effective soil treatments may be necessary.

Use against the following nematodes: awl (*Dolichodorus spp.*), cyst (*Heterodera spp.*), reniform (*Rotylenchulus reniformis*), dagger (*Xiphinema spp.*), root-knot (*Meloidigyne spp.*), lance (*Hoplolaimus galeatus*), lesion (*Pratylenchus spp.*), pin (*Paratylenchus spp.*), sting (*Belonolaimus spp.*)

<sup>††</sup>Please confirm your CRESCENDO package size to ensure it accommodates the specified rate before following.

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## ORNAMENTAL GRASSES

**(Blue Fescue, Blue Oatgrass, Big Bluestem, Cordgrass, Dwarf Pampasgrass, Feather Reedgrass, Fiber Opticgrass, Fountaingrass, Hairgrass, Japanese Forestgrass, Japanese Fountaingrass, Liriope, Little Bluestem, Mexican Feathergrass, Northern Sea Oats, Purple Fountaingrass, Purple Millet, Ravennagrass, Rush, Switchgrass, and Zebragrass and other ornamental grasses)**

For use on sod farms, ornamental grass on golf courses, sport fields, residential, institutional, municipal, commercial, and other ornamental grass areas

Foliar, followed by irrigation, 2-4 pounds CRESCENDO per 1/5<sup>th</sup> acre, or 10-20<sup>††</sup> pounds CRESCENDO per acre), or 4 – 8 ounces CRESCENDO per 1,000 sq. ft.

For control of white grubs and annual bluegrass weevils, use a minimum of 100 gallons of water per acre or 300 fluid ounces per 1,000 square feet.

Thoroughly irrigate to moisten the top inch of soil. There should be no more than ½ inch of thatch present at the time of application. Time applications to occur shortly after egg hatch when grubs are 1<sup>st</sup> or 2<sup>nd</sup> instar.

Under dry conditions where thatch is present, pre-watering is recommended prior to application for grub or weevil control.

### **2-20 pounds of CRESCENDO per acre for turf applications only**

For control of low to medium infestation levels of nematodes, use as a pre-plant or at-plant in-furrow drench application in 100 to 150 gallons of water per acre or as an in-furrow spray in 20 to 50 gallons of water per acre. When very high pest infestation levels are anticipated or encountered, other effective soil treatments may be necessary.

Use against the following nematodes: awl (*Dolichodorus spp.*), cyst (*Heterodera spp.*), reniform (*Rotylenchulus reniformis*), dagger (*Xiphinema spp.*), root-knot (*Meloidogyne spp.*), lance (*Hoplolaimus galeatus*), lesion (*Pratylenchus spp.*), pin (*Paratylenchus spp.*), sting (*Belonolaimus spp.*)

††Please confirm your CRESCENDO package size to ensure it accommodates the specified application rate before applications.

## STORAGE AND DISPOSAL

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

**Pesticide Storage:** Store in original container 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:** Nonrefillable container. Do not reuse or refill this container.

Completely empty bag into application equipment. Then offer for recycling if available, or dispose of empty bag in a sanitary landfill or by incineration. Do not burn, unless allowed by state and local ordinances. If burned, stay out of smoke.

## WARRANTY

To the extent consistent with applicable law, the seller makes no warranty, expressed or implied, of merchantability, fitness or otherwise concerning use of this product. To the extent consistent with applicable law, the user assumes all risks of use, storage or handling that are not in accordance with the accompanying directions.

Label date:

Made in the U.S.A.