



# Battalion

## Pro PRODUCT LABEL

For the selective suppression of the annual grass weeds cheatgrass/downy brome (*Bromus tectorum* L.), medusahead (*Taeniatherum caput-medusae* [L.] Nevski), and jointed goatgrass (*Aegilops cylindrica* L.).

**ACTIVE INGREDIENT:**

*Pseudomonas fluorescens* strain ACK55\* .....100%  
\* Contains a minimum of  $5 \times 10^8$  colony forming units (CFU) of *Pseudomonas fluorescens* strain ACK55 per mL, or a minimum of 500 million CFU/mL.

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### KEEP OUT OF REACH OF CHILDREN CAUTION

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#### FIRST AID

**IF INHALED:**

- Move person to fresh air. If person is not breathing, call 911 or an ambulance, then give artificial respiration, preferably by mouth-to-mouth, if possible.
- 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 going for treatment. For information on this pesticide product (including general health concerns or pesticide incidents) call the **National Pesticides Information Center** at 1-800-858-7378, 8:00 AM to 12:00 PM Pacific Standard Time. In the event of a medical emergency, call your poison control center 1-800-222-1222.

For additional PRECAUTIONARY STATEMENTS and DIRECTIONS FOR USE, see Battalion Pro Master Label. Use of this product indicates acceptance of CONDITIONS OF SALE AND WARRANTY.

**EPA Registration No. 91213-3**

**EPA Pesticide Establishment No. 91744-ID-001**

Net Contents: 275 Gallons (1041 L), 5500 Gallons (20819 L)

Batch#: Printed on container

Batch Date: \_\_\_\_\_

Expiration Date: Not for sale or use [6 months after Batch Date]

PRODUCED BY: BioWest Ag Solutions

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## PRECAUTIONARY STATEMENTS

### HAZARDS TO HUMANS & DOMESTIC ANIMALS

#### CAUTION

Harmful if inhaled. Avoid breathing spray mist. Remove and wash contaminated clothing before reuse. Wash thoroughly with soap and water after handling and before eating, drinking, chewing gum, using tobacco or using the toilet.

### PERSONAL PROTECTIVE EQUIPMENT (PPE)

#### Mixers, loaders and applicators must wear:

- Long-sleeved shirt and long pants
- Waterproof gloves
- Shoes plus socks
- Respiratory Protection: Avoid dusts or vapors. 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, R, or P filter; OR a NIOSH-approved powered air-purifying respirator with an HE filter. (Repeated exposures to high concentrations of microbial proteins can cause allergic sensitization.)

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

### ENGINEERING CONTROLS

When handlers use closed systems, enclosed cabs, or aircraft 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 break-down.

### 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.
- Keep and wash PPE separately from other laundry.



### ENVIRONMENTAL HAZARDS

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.



### MODE OF ACTION

This bacterium specifically inhibits downy brome/cheatgrass, medusahead, jointed goatgrass. The bacterium suppresses weed growth by the production of a labile secondary metabolite that inhibits root-cell elongation and tillering; reduces seedling vigor and overwintering; lowers seed production; and reduces viability of the seed bank.

Once applied to the soil surface the bacterium can be carried into the soil by rain or irrigation. The bacteria grow well on residue, seeds, and roots. The bacteria move to the roots of the target weeds, seeds, or young seedlings and inhibit root-cell elongation. The suppressive compound inhibits lipopolysaccharide production in the cell wall and membrane and reduces root-cell wall elongation. If this inhibition of cell elongation occurs early in the seedling life, tiller initiation can be reduced. Visual effects of the bacteria working are a red color of the plant leaves due to stress and anthocyanin production, stunted plants with few tillers, and few seeds produced. With application of the weed-suppressive bacterium, the soil seed bank is reduced. The bacteria need to establish in the soil and on roots for suppression. The suppression of cheatgrass, medusahead, and jointed goatgrass by this bacterium may take two to five years. Dry conditions do not allow the bacteria to grow in the soil and colonize soil, residue, seed, and roots, and result in only minor suppression of the weed.

## DIRECTIONS FOR USE

**It is a violation of Federal law to use this product in a manner inconsistent with its labeling.  
Read the entire label before using this product.**

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, forest, seed treatment facilities and non-commercial seed treatment activities, nurseries and greenhouses and handlers of agriculture 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 workers 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:**

- Long-sleeve shirts and long pants
- Waterproof gloves
- Shoes plus socks
- Follow manufacturer's instructions for cleaning/maintaining PPE. If no instructions are available, then use detergent and warm water for washables.

Exception: If the product is soil injected or soil incorporated, the Worker Protection Standard under certain circumstances, allows workers to enter the treated area without restrictions if there will be no contact with anything that has been treated.



### PRODUCT INFORMATION

Battalion Pro contains a naturally occurring *Pseudomonas* bacterium from soil. Battalion Pro is a liquid, preemergent bioherbicide for the selective suppression of the annual grass weeds cheatgrass/downy brome, medusahead, and jointed goatgrass. Battalion Pro is for use on crops, rangeland, forest, pasture, Conservation Reserve Program (CRP) Lands, grasses grown for forage or seed, sod production, recreational areas, roadsides, road cuts, construction sites and right-of-ways.

Apply Battalion Pro in fall or early winter before annual grass weed seed germination. For best results, apply when daily high temperatures are less than or equal to 50°F (10°C) and more than 0.2 inches of rain is imminent or will occur within 2 weeks. Activity may be low when applied to dry soil or heavy plant residue (stems and leaves), crop material or dense vegetation. Lack of rainfall within 2 weeks of application may reduce weed suppression. Application in late spring or summer will not allow the bacterium to establish in the soil and will result in low weed suppression.



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## APPLICATION INSTRUCTIONS

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### **General:**

Avoiding spray drift at the application site is the responsibility of the applicator. Equipment- and weather-related factors determine the potential for spray drift. The applicator and the grower/treatment coordinator are responsible for considering all of these factors when making decisions. Where states have more stringent regulations, they should be observed.

### **Ground:**

Be sure to maintain agitation during mixing and application to assure uniform product suspension. Thorough coverage of the soil surface is essential for effective weed control. Battalion Pro can be applied with commonly used ground equipment, including hose-end, pressurized, greenhouse and hand-held sprayers. To achieve good coverage, use proper spray pressure, gallons per acre, nozzles, nozzle spacing and ground speed. Consult spray nozzle and accessory catalogues for specific information on proper equipment calibration.

### **Aerial:**

This product can be applied by aerial application. Refer to the Aerial Drift Reduction Advisory Information section of this label for general directions and precautions. Use the application rate indicated for the appropriate crop in sufficient water to achieve thorough coverage, typically between 1 to 5 gallons of water per acre. Do not aerially apply within 200 feet of any body of water.

Aerial sprays are generally expected to have greater potential for nontarget exposure compared to spray applied from ground equipment or hand-held equipment. This bacterium, however, has been selected for the specific suppression of cheatgrass/downy brome, medusahead, and jointed goatgrass and no negative impact to crops, native plants or any broadleaf plants, which limits problems from drift. In addition, because the product is to be applied directly to the soil surface, in autumn or spring when temperatures are cooler and few plants are growing, the potential exposure of nontarget organisms to the product is expected to be limited. Spray drift from aerial applications may result in some exposure to nearby areas, including aquatic environments, although the bacterium also occurs naturally in soil and water, but does not survive in high numbers in natural waters.

### **Chemigation:**

This product can be applied through sprinkler (center pivot-, lateral move-, end tow-, side (wheel) roll-, traveler-, solid set-, and hand move-) or drip type- irrigation systems. Refer to the Chemigation Directions for Use section of this label for general directions and precautions.

### **Compatibility:**

Do not tank mix with toluene, copper, antibacterials or surfactants that are used to reduce microbial growth. This product is compatible with most fertilizers, herbicides and other bioherbicides. Adjuvants and surfactants may reduce the viability of the bacteria. Follow the most restrictive of the labeling limitations and precautions of all products used in mixtures.



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## SPECIFIC APPLICATION INSTRUCTIONS

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### **Conditions:**

Apply Battalion Pro in fall or early winter before annual grass weed seed germination. For best results, apply when daily high temperatures are less than or equal to 50°F (10°C) and more than 0.2 inches of rain is imminent or will occur within 2 weeks. Activity may be low when applied to dry soil or heavy plant residue (stems and leaves), crop material or dense vegetation. Lack of rainfall within 2 weeks of application may reduce weed suppression. Application in late spring or summer will not allow the bacterium to establish in the soil and will result in low weed suppression.

**Instructions and Rates:**

- Apply as spray solution to the soil surface.
- Coverage characteristics of the spray equipment will determine the volume of water needed.
- Apply 1 gallon of Battalion Pro per acre.
- Apply Battalion Pro by ground application at a rate of 1 gallon of Battalion Pro per acre in 1 - 50 gallons of water per acre.
- Apply Battalion Pro to dense vegetation or residue at a rate of 1 gallon of Battalion Pro per acre in 20 - 50 gallons of water per acre.
- Apply Battalion Pro by aerial application at a rate of 1 gallon of Battalion Pro per acre in 1 - 5 gallons of water per acre.
- Once mixed with water, apply immediately.
- Apply one application per year.

**Avoid spray drift:**

Avoiding spray drift at the application site is the responsibility of the applicator. Equipment- and weather-related factors determine the potential for spray drift. The applicator and the grower are responsible for considering all these factors when making decisions. Do not aerially apply within 200 feet of any body of water. Do not apply with ULV Spray Equipment or in winds in excess of 15 MPH.

**TABLE 1: APPLICATION INSTRUCTIONS FOR BATTALION PRO**

| USE(S)  | WEEDS SUPPRESSED   | BATTALION PRO RATE (GALLON/ACRE) | WATER AS CARRIER RATE (GALLONS OF WATER/ACRE) | CONSIDERATIONS FOR CARRIER RATE (GALLON/ACRE)   |
|---|--|----------------------------------|---|---|
| <b>SITES:</b>   |  |                                  |   |   |
| <b>RANGELAND, FOREST LANDS, PASTURE LANDS, RECREATION AREAS, CONSERVATION RESERVE PROGRAM (CRP) LANDS</b>                               | Cheatgrass/downy brome ( <i>Bromus tectorum</i> L.)<br>Medusahead ( <i>Taeniatherum caput-medusae</i> [L.] Nevski)<br>Jointed goatgrass ( <i>Aegilops cylindrica</i> L.) | 1                                | Aerial application:<br>1 - 5                  | Steep/irregular terrain, heavy plant residue, crop material, or dense vegetation:<br>20 – 50 gal/acre |
|   |  |                                  | Ground application:<br>5 - 50                 |   |
| <b>OTHER: ROADSIDES, ROAD-CUTS, RIGHT-OF-WAYS</b> (road, rail, pipeline, electrical), <b>FIRE BREAKS, BURN SCARS, RESTORATION SITES</b> | Cheatgrass/downy brome ( <i>Bromus tectorum</i> L.)<br>Medusahead ( <i>Taeniatherum caput-medusae</i> [L.] Nevski)<br>Jointed goatgrass ( <i>Aegilops cylindrica</i> L.) | 1                                | Aerial application:<br>1 - 5                  | Steep/irregular terrain, heavy plant residue, crop material, or dense vegetation:<br>20 – 50 gal/acre |
|   |  |                                  | Ground application:<br>5 - 50                 |   |
| <b>CROPS:</b>   |  |                                  |   |   |
| <b>CEREAL GRAINS</b><br>(wheat, barley, oats, triticale, corn, sorghum, millet, rye)  | Cheatgrass/downy brome ( <i>Bromus tectorum</i> L.)<br>Medusahead ( <i>Taeniatherum caput-medusae</i> [L.] Nevski)<br>Jointed goatgrass ( <i>Aegilops cylindrica</i> L.) | 1                                | 5 - 50  | Steep/irregular terrain, heavy plant residue, crop material, or dense vegetation:<br>20 – 50 gal/acre |
| <b>GRASS FORAGE, FODDER, AND HAY</b><br>(bermuda grass, bluegrass, brome grass, fescue, timothy)  | Cheatgrass/downy brome ( <i>Bromus tectorum</i> L.)<br>Medusahead ( <i>Taeniatherum caput-medusae</i> [L.] Nevski)<br>Jointed goatgrass ( <i>Aegilops cylindrica</i> L.) | 1                                | 5 - 50  | Steep/irregular terrain, heavy plant residue, crop material, or dense vegetation:<br>20 – 50 gal/acre |
| <b>NONGRASS ANIMAL FEEDS (FORAGE, FODDER, STRAW AND HAY)</b><br>(alfalfa and clover, vetch, bean, trefoil)                              | Cheatgrass/downy brome ( <i>Bromus tectorum</i> L.)<br>Medusahead ( <i>Taeniatherum caput-medusae</i> [L.] Nevski)<br>Jointed goatgrass ( <i>Aegilops cylindrica</i> L.) | 1                                | 5 - 50  | Steep/irregular terrain, heavy plant residue, crop material, or dense vegetation:<br>20 – 50 gal/acre |

| USE(S)   | WEEDS SUPPRESSED   | BATTALION PRO RATE (GALLON/ACRE) | WATER AS CARRIER RATE (GALLONS OF WATER/ACRE) | CONSIDERATIONS FOR CARRIER RATE (GALLON/ACRE)   |
|--|--|----------------------------------|---|---|
| <b>CROPS:</b>  |  |                                  |   |   |
| <b>FORAGE, FODDER AND STRAW OF CEREAL GRAINS</b>   | Cheatgrass/downy brome ( <i>Bromus tectorum</i> L.)<br>Medusahead ( <i>Taeniatherum caput-medusae</i> [L.] Nevski)<br>Jointed goatgrass ( <i>Aegilops cylindrica</i> L.) | 1                                | 5 - 50  | Steep/irregular terrain, heavy plant residue, crop material, or dense vegetation:<br>20 – 50 gal/acre |
| <b>OILSEED GROUP</b><br>(rapeseed, canola varieties, camelina, flax, sunflower seed)                           | Cheatgrass/downy brome ( <i>Bromus tectorum</i> L.)<br>Medusahead ( <i>Taeniatherum caput-medusae</i> [L.] Nevski)<br>Jointed goatgrass ( <i>Aegilops cylindrica</i> L.) | 1                                | 15 - 50                                       | Steep/irregular terrain, heavy plant residue, crop material, or dense vegetation:<br>20 – 50 gal/acre |
| <b>LEGUME VEGETABLES</b><br>(bean, pea, lentils, soybean)  | Cheatgrass/downy brome ( <i>Bromus tectorum</i> L.)<br>Medusahead ( <i>Taeniatherum caput-medusae</i> [L.] Nevski)<br>Jointed goatgrass ( <i>Aegilops cylindrica</i> L.) | 1                                | 15 - 50                                       | Steep/irregular terrain, heavy plant residue, crop material, or dense vegetation:<br>20 – 50 gal/acre |
| <b>TREE NUTS</b><br>(almond, pecan, cashew, chestnut, chinquapin, filbert, hazelnut, walnut)                   | Cheatgrass/downy brome ( <i>Bromus tectorum</i> L.)<br>Medusahead ( <i>Taeniatherum caput-medusae</i> [L.] Nevski)<br>Jointed goatgrass ( <i>Aegilops cylindrica</i> L.) | 1                                | 15 - 50                                       | Steep/irregular terrain, heavy plant residue, crop material, or dense vegetation:<br>20 – 50 gal/acre |
| <b>BERRIES AND SMALL FRUIT</b><br>(blackberry, raspberry, blueberry, elderberry, mulberry, grapes, strawberry) | Cheatgrass/downy brome ( <i>Bromus tectorum</i> L.)<br>Medusahead ( <i>Taeniatherum caput-medusae</i> [L.] Nevski)<br>Jointed goatgrass ( <i>Aegilops cylindrica</i> L.) | 1                                | 15 - 50                                       | Steep/irregular terrain, heavy plant residue, crop material, or dense vegetation:<br>20 – 50 gal/acre |
| <b>GRASSES GROWN FOR FORAGE OR SEED</b>  | Cheatgrass/downy brome ( <i>Bromus tectorum</i> L.)<br>Medusahead ( <i>Taeniatherum caput-medusae</i> [L.] Nevski)<br>Jointed goatgrass ( <i>Aegilops cylindrica</i> L.) | 1                                | 5 - 50  | Steep/irregular terrain, heavy plant residue, crop material, or dense vegetation:<br>20 – 50 gal/acre |
| <b>SOD PRODUCTION</b>  | Cheatgrass/downy brome ( <i>Bromus tectorum</i> L.)<br>Medusahead ( <i>Taeniatherum caput-medusae</i> [L.] Nevski)<br>Jointed goatgrass ( <i>Aegilops cylindrica</i> L.) | 1                                | 5 - 50  | Steep/irregular terrain, heavy plant residue, crop material, or dense vegetation:<br>20 – 50 gal/acre |
| <b>QUINOA</b>  | Cheatgrass/downy brome ( <i>Bromus tectorum</i> L.)<br>Medusahead ( <i>Taeniatherum caput-medusae</i> [L.] Nevski)<br>Jointed goatgrass ( <i>Aegilops cylindrica</i> L.) | 1                                | 15 - 50                                       | Steep/irregular terrain, heavy plant residue, crop material, or dense vegetation:<br>20 – 50 gal/acre |

## CHEMIGATION DIRECTIONS FOR USE

### General Requirements:

- 1) Apply this product only through sprinkler (including center pivot-, lateral move-, end tow-, side (wheel) roll-, traveler-, solid set- or hand move-) or drip type- irrigation systems. Do not apply this product through any other type of irrigation system.
- 2) Crop injury or lack of effectiveness can result from non-uniform distribution of treated water.
- 3) Ensure that the irrigation system used is properly calibrated and if you have questions, call the State Extension Service specialists, the equipment manufacturer, or other experts.
- 4) Do not connect an irrigation system (including greenhouse systems) used for pesticide application to a public water system unless the pesticide label-prescribed safety devices for public water systems are in place.
- 5) A person knowledgeable of the chemigation system and responsible for its operation, or under the supervision of the responsible person, shall shut the system down and make any necessary adjustments should the need arise.

### Requirements for Chemigation Systems Connected to Public Water Systems:

- 1) Public water system means a system for the provision to the public of piped water for human consumption if such system has at least 15 service connections or regularly serves an average of 25 individuals daily at least 60 days throughout the year.
- 2) Chemigation systems connected to the public water systems must contain a functional, reduced pressure zone (RPZ), backflow preventer or the functional equivalent in the water supply upstream from the point of pesticide introduction. As an option to the RPZ, the water from the public water system should be discharged into a reservoir tank prior to pesticide introduction. There shall be a complete physical break (air gap) between the outlet end of the fill pipe and the top of the overflow rim of the reservoir tank of at least twice the inside diameter of the fill pipe.
- 3) The pesticide injection pipeline must contain a functional, automatic, quick closing check valve to prevent the flow of fluid back towards the injection pump.
- 4) The pesticide injection pipeline must 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.
- 5) The system must contain functional interlocking controls to automatically shut off the pesticide injection pump when the water pump motor stops, or in cases where there is no water pump, when the water pressure decreases to the point where pesticide distribution is adversely affected.
- 6) 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 filled with a system interlock.
- 7) Do not apply when wind speed favors drift beyond the area intended for treatment.
- 8) Remove scale, pesticide residues, and other foreign matter from the chemical supply tank and entire injector system. Flush with clean water. Failure to provide a clean tank, void of scale or residues may cause product to lose effectiveness or strength.
- 9) Do not combine with pesticides, surfactants or fertilizers for application through chemigation equipment unless prior experience has shown the combination physically compatible, effective and non-injurious under conditions of use. Has not been fully evaluated for compatibility with all adjuvants or surfactants. Conduct a spray compatibility test if mixture with adjuvants or surfactants is planned.
- 10) Maintain agitation in the pesticide supply tank.
- 11) Apply Battalion Pro during the last half of the water application.
- 12) Dilute Battalion Pro in enough water to be able to draw through system for the last half of the water application.

### **Sprinkler Chemigation Requirements:**

- 1) 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.
- 2) The pesticide injection pipeline must contain a functional, automatic, quick-closing check valve to prevent the flow of fluid back toward the injection pump.
- 3) 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.
- 4) The system must contain functional interlocking controls to automatically shut off the pesticide injection pump when the water pump motor stops.
- 5) 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.
- 6) 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.
- 7) Do not apply when wind speed favors drift beyond the area intended for treatment.
- 8) Remove scale, pesticide residues, and other foreign matter from the chemical supply tank and entire injector system. Flush with clean water. Failure to provide a clean tank, void of scale or residues may cause product to lose effectiveness or strength.
- 9) Do not combine Battalion Pro with pesticides, surfactants or fertilizers for application through chemigation equipment unless prior experience has shown the combination physically compatible, effective and non-injurious under conditions of use. Battalion Pro has not been fully evaluated for compatibility with all adjuvants or surfactants.

### **Center-pivot, Lateral Move-, End Tow-, and Traveler Irrigation Equipment (Use only with electric or oil hydraulic drive systems which provide a uniform water distribution):**

- 1) Determine size of area to be treated.
- 2) Determine the time required to apply no more than ¼-inch water (6,750 gallons water per acre) over the area to be treated when the system and injection equipment are operated at normal pressures recommended by the equipment manufacturer. Run system at 80 to 95% of manufacturer's rated capacity.
- 3) Using only water, determine the injection pump output when operated at normal line pressure.
- 4) Determine the amount of Battalion Pro required to treat area.
- 5) Add required amount of Battalion Pro and sufficient water to meet the injection time requirements of the solution tank.
- 6) Maintain constant solution tank agitation during the injection period.
- 7) Stop injection equipment after treatment is completed. Continue to operate the system until Battalion Pro solution has cleared the sprinkler head.

### **Solid-set-, Side (wheel) Roll-, and Hand Move- Irrigation Equipment:**

- 1) Determine acreage covered by sprinkler.
- 2) Fill injector solution tank with water and adjust flow rate to use contents over a 10 to 30-minute interval.
- 3) Determine the amount of Battalion Pro required to treat area.
- 4) Add the required amount of Battalion Pro into the same quantity of water used to calibrate the injection equipment.
- 5) Maintain constant solution tank agitation during the injection period.
- 6) Operate system at normal pressures recommended by the manufacturer of the injection equipment and used for the time interval established during calibration.
- 7) Inject Battalion Pro at the end of the irrigation cycle or as a separate application to maximize foliar bioherbicide retention.
- 8) Stop injection equipment after treatment is completed. Continue to operate the system until Battalion Pro solution has cleared the last sprinkler head.



### **Drip Chemigation Requirements:**

- 1) 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.
- 2) The pesticide injection pipeline must contain a functional, automatic, quick-closing check valve to prevent the flow of fluid back toward the injection pump.
- 3) 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.
- 4) The system must contain functional inter-locking controls to automatically shut off the pesticide injection pump when the water pump motor stops.
- 5) 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.
- 6) 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.
- 7) Remove scale, pesticide residues, and other foreign matter from the chemical supply tank and entire injector system. Flush with clean water. Failure to provide a clean tank, void of scale or residues may cause product to lose effectiveness or strength.
- 8) Do not combine Battalion Pro with pesticides, surfactants or fertilizers for application through chemigation equipment unless prior experience has shown the combination physically compatible, effective and non-injurious under conditions of use. Battalion Pro has not been fully evaluated for compatibility with all adjuvants or surfactants. Conduct a spray compatibility test if mixture with adjuvants or surfactants is planned.
- 9) Maintain agitation in the pesticide supply tank.
- 10) Apply Battalion Pro during the last half of the water application.
- 11) Dilute Battalion Pro in enough water to be able to draw through system for the last half of the water application.



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### **AERIAL DRIFT REDUCTION ADVISORY INFORMATION**

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#### **General:**

Avoiding spray drift at the application site is the responsibility of the applicator. The interaction of many equipment and weather-related factors determine the potential for spray drift. The applicator and the grower are responsible for considering all these factors when making decisions. Where states have more stringent regulations, they should be observed. Note: This section is advisory in nature and does not supersede the mandatory label requirements.



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### **DROPLET SIZE INFORMATION**

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The most effective way to reduce drift potential is to apply large droplets. The best drift management strategy is to apply the largest droplets that provide sufficient coverage and control. Applying larger droplets reduces drift potential but will not prevent drift if applications are made improperly or under unfavorable environmental conditions (see Wind, Temperature and Humidity, and temperature inversions).

#### **Controlling Droplet Size:**

- **Volume** - Use high flow rate nozzles to apply the highest practical spray volume. Nozzles with higher rated flows produce larger droplets.
- **Pressure** - Do not exceed the nozzle manufacturer's recommended pressures. For many nozzle types, lower pressure produces larger droplets. When higher flow rates are needed, use higher flow rate nozzles instead of increasing pressure.
- **Number of Nozzles** - Use the minimum number of nozzles that provide uniform coverage.
- **Nozzle Orientation** - Orienting nozzles so that the spray is released parallel to the airstream produces larger droplets than other orientations and is the recommended practice. Significant deflection from horizontal will reduce droplet size and increase drift potential.

- **Nozzle Type** - Use a nozzle type that is designed for the intended application.
- With most nozzle types, narrower spray angles produce larger droplets. Consider using low-drift nozzles. Solid stream nozzles oriented straight back produce the largest droplets and the lowest drift.

#### **Boom Width:**

For aerial applications, the boom width must not exceed 75% of the wingspan or 90% of the rotary blade. Use upwind swath displacement and apply only when wind speed is 3 - 10 mph as measured by an anemometer. Use medium or coarser spray according to ASAE 572 definition for standard nozzles or VMD for spinning atomizer nozzles. If application includes a no-spray zone, do not release spray at a height greater than 10 feet above the ground or the crop canopy.

#### **Application Height:**

Do not make application at a height greater than 10 feet above the top of the largest plants unless a greater height is required for aircraft safety. Making applications at the lowest height that is safe reduces exposure of droplets to evaporation and wind.

#### **Swath Adjustment:**

When applications are made with a crosswind, the swath will be displaced downward. Therefore, on the up and downwind edges of the field, the applicator must compensate for this displacement by adjusting the path of the aircraft upwind. Swath adjustment distance should increase with increasing drift potential (higher wind, smaller drops, etc.).

#### **Wind:**

Drift potential is lowest between wind speeds of 3 - 10 mph. However, many factors, including droplet size and equipment type determine drift potential at any given speed. Application should be avoided below 3 mph due to variable wind direction and high inversion potential. NOTE: Local terrain can influence wind patterns. Every applicator should be familiar with local wind patterns and how they affect spray drift.

#### **Temperature and Humidity:**

When making applications in low relative humidity, set up equipment to produce larger droplets to compensate for evaporation. Droplet evaporation is most severe when conditions are both hot and dry.

#### **Temperature Inversions:**

Do not apply during a temperature inversion because drift potential is high. Temperature inversions restrict vertical air mixing, which causes small, suspended droplets to remain in a concentrated cloud. This cloud can move in unpredictable directions due to the light variable winds common during inversions. Temperature inversions are characterized by increasing temperatures with altitude and are common on nights with limited cloud cover and light to no wind. They begin to form as the sun sets and often continue into the morning. Their presence can be indicated by ground fog; however, if fog is not present, inversions can also be identified by the movement of smoke from a ground source or an aircraft smoke generator. Smoke that layers and moves laterally in a concentrated cloud (under low wind conditions) indicates an inversion, while smoke that moves upward and rapidly dissipates indicates good vertical air mixing.

#### **Sensitive Areas:**

The pesticide should only be applied when the potential for drift to adjacent sensitive areas (e.g. residential areas, bodies of water, known habitat for threatened or endangered species, non-target crops) is minimal (e.g. when wind is blowing away from the sensitive areas). Do not allow spray to drift from the application site and contact people, structures people occupy at any time and the associated property, parks and recreation areas, non-target crops, aquatic and wetland areas, woodlands, pastures, rangelands, or animals. Do not aerially apply within 200 feet of any body of water.

## STORAGE AND DISPOSAL

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

### **Pesticide Storage:**

Store in a cool, dry place. Material is stable and the bacterial populations are viable for 6 months after Batch Date if stored at less than or equal to 70°F (21°C). Do not freeze. Store in such a manner as to prevent cross contamination with other pesticides, fertilizers, seeds, food, feed and veterinary supplies. Store in original container only. Store in area inaccessible to children. Keep container closed when not in use. Keep away from direct sunlight.

### **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 275-gallon containers (heavy-duty cardboard IBC totes with plastic liners) -**

Nonrefillable container. Do not reuse or refill this container. Dispose of empty liner in a sanitary landfill or by incineration if allowed by state and local ordinances. If incinerated, stay out of smoke.

#### **For 5500-gallon or larger bulk vehicle (stainless steel tank trucks) -**

Refillable container. Refill this container with pesticide only. Do not reuse this container for any other purpose. It is the responsibility of truck hauler/refiller to clean the entire tank system before refilling.

## CONDITIONS OF SALE AND LIMITATION OF WARRANTY AND LIABILITY

**NOTICE:** Read the entire Directions for Use and Conditions of Sale and Limitation of Warranty and Liability before buying or using this product. If the terms are not acceptable, return the unopened product at once for a refund of the purchase price.

By using this product, the user accepts the following Conditions, Disclaimer of Warranties, and Limitations of Liability. These terms may only be modified by a written document signed by a duly authorized representative of BioWest Ag Solutions.

**CONDITIONS:** The Directions for Use of this product are believed to be adequate and must be followed carefully, it is impossible to eliminate all the risks inherently associated with the use of this product. Crop injury, ineffectiveness, or other unintended consequences may result due to such factors as weather conditions, presence or absence of other materials, or the manner of use or application, all of which are beyond the control of BioWest Ag Solutions, or the seller.

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