

66330-415

7/24/2014

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

OFFICE OF CHEMICAL SAFETY  
AND POLLUTION PREVENTION

Beth Anderson  
Arysta LifeScience North America, LLC  
15401 Weston Parkway, Suite 150  
Cary, NC 27513

JUL 24 2014

Subject: Label Amendment – Correction of typo in Ingredient Statement  
Product Name: ARY 0452-110 Herbicide  
Alternate Brand Name: Xonerate 4SC Herbicide  
EPA Registration Number: 66330-415  
Application Dated: July 24, 2014  
Decision Number: 493461

Dear Ms. Anderson:

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

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 the 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.

Your release for shipment of the product constitutes acceptance of these conditions. If these conditions are not complied with, the registration will be subject to cancellation in accordance with FIFRA section 6(e). If you have any questions, please contact Sarah Meadows by phone at 703-347-0505, or via email at meadows.sarah@epa.gov.

Sincerely,

A handwritten signature in black ink, appearing to read "K. Montague", written over a circular stamp.

Kathryn Montague, Product Manager 23  
Herbicide Branch  
Registration Division  
Office of Pesticide Programs

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Arysta LifeScience

GROUP 5 HERBICIDE

**ARY 0452-110 Herbicide**

**[Alternate Brand Name: XONERATE 4SC HERBICIDE]**

For Selective Control of Weeds in Turf on Golf Courses, Sod Farms, Residential and Commercial Turf Sites, Park and Recreation Areas, School Grounds and other Turf Areas and Conifers in Nurseries and Field Plantings (including Christmas Trees)

<u>Active Ingredient:</u>	<u>By Wt.</u>
<b>Amicarbazone:</b>	
4-amino-N-(1,1-dimethylethyl)-4,5-dihydro-3-(1-methylethyl)-5-oxo-1H-1,2,4-triazole-1-carboxamide .....	46.2%
Other Ingredients.....	53.8%
Total.....	100.0%

ARY 0542-110 HERBICIDE contains 4.0 lb. Amicarbazone per gallon.

**Read the label before use  
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 this label, find someone to explain it to you in detail.)  
[See back panel for additional precautionary statements]

<b>FIRST AID</b>	
<b>If swallowed:</b>	<ul style="list-style-type: none"> <li>• Call poison control center or doctor immediately for treatment advice.</li> <li>• Have person sip glass of water if able to swallow.</li> <li>• Do not induce vomiting unless told to do so by the poison control center or doctor.</li> <li>• Do not give anything by mouth to an unconscious person.</li> </ul>
<b>If on skin:</b>	<ul style="list-style-type: none"> <li>• Take off contaminated clothing.</li> <li>• Rinse skin immediately with plenty of water for 15 to 20 minutes.</li> <li>• Call a poison control center or doctor for treatment advice.</li> </ul>
<b>If in eyes:</b>	<ul style="list-style-type: none"> <li>• Hold eye open and rinse slowly and gently with warm water for 15 to 20 minutes.</li> <li>• Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye.</li> <li>• Call a poison control center or doctor for treatment advice.</li> </ul>
<b>Note to physician:</b> No specific antidote is available. Treat the patient symptomatically. Have the product container or label with you when calling a poison control center or doctor, or going for treatment.	
<b>FOR 24-HOUR MEDICAL EMERGENCY ASSISTANCE CALL PROSAR:</b> 1-866-303-6952 or 1-651-632-8946	
<b>FOR 24-HOUR CHEMICAL EMERGENCY CALL CHEMTREC:</b> Spill, Leak, Fire or Accident 1-800-424-9300 or 1-703-527-3887	
<b>For Product Information Call: 1-866-761-9397</b>	

Arysta LifeScience North America, LLC  
15401 Weston Parkway, Suite 150  
Cary, NC 27513

EPA Reg. No. 66330-415  
EPA Est. No.  
Net Weight:

**ACCEPTED**

JUL 24 2014

Under the Federal Insecticide, Fungicide, and Rodenticide Act, as amended, for the pesticides registered under EPA Reg. No. 66330-415

## PRECAUTIONARY STATEMENTS

### HAZARDS TO HUMANS AND DOMESTIC ANIMALS

#### CAUTION

Harmful if swallowed. Harmful if absorbed through skin. Avoid contact with skin, eyes or clothing. Causes moderate eye irritation. Wash thoroughly with soap and water after handling and before eating, drinking, chewing gum, using tobacco or using the toilet. Remove and wash contaminated clothing before reuse.

### PERSONAL PROTECTIVE EQUIPMENT (PPE)

Applicators and other handlers must wear:

- Long-sleeved shirt and long pants
- Chemical-resistant gloves (made of any water proof material)
- Shoes plus socks

Follow 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.

### ENGINEERING CONTROL STATEMENT

When handlers use closed systems or enclosed cabs 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.

### 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.

### Physical-Chemical Hazards

Do not mix or allow this product to come into contact with oxidizing agents. Hazardous chemical reaction may occur.

### 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 apply when weather conditions favor drift from areas treated. Do not contaminate water when disposing of equipment washwaters or rinseate. Do not use the same spray equipment for other purposes unless thoroughly cleaned.

Do not allow sprays to drift onto adjacent desirable plants. Drift or runoff may adversely affect non-target plants.

ARY 0452-110 Herbicide has properties which may result in ground water contamination. Use of ARY 0452-110 Herbicide in areas where soils are permeable and groundwater is near the surface should be avoided.

To prevent damage to crops and other desirable plants, read and follow all directions and precautions on this label before using.

### GROUND WATER ADVISORY

This chemical has properties and characteristics associated with chemicals detected in ground water. This chemical may leach into ground water if used in areas where soils are permeable, particularly where the water table is shallow.

Amicarbazone and its major degradates are known to leach through soil into ground water under certain conditions as a result of label use.

### SURFACE WATER ADVISORY

This product may contaminate surface water via runoff of rain water or drift of spray in wind. This product is classified as having a high potential for reaching surface water via runoff several months or more after application. A level, well maintained vegetative buffer strip between areas to which this product is applied and surface water features such as ponds, streams, and springs will reduce the potential loading of Amicarbazone and its degradates from runoff water and sediment. Runoff of this product will be reduced by avoiding applications when

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rainfall is forecasted to occur with 48 hours. Sound erosion control practices will reduce this product's potential to reach aquatic sediment via runoff.

This product may not be mixed or loaded within 50 feet of any wells (including abandoned wells and drainage wells), sink holes, perennial or intermittent streams and rivers and natural or impounded lakes and reservoirs. This setback does not apply to properly capped or plugged abandoned wells and does not apply to impervious pad or properly diked mixing/loading areas.

Operations that involve mixing, loading, rinsing or washing of this product into or from pesticide handling or application equipment or containers within 50 feet of any well are prohibited unless conducted on an impervious pad constructed to withstand the weight of the heaviest load that may be positioned on or moved across the pad. Such a pad shall be designed and maintained to contain any product spills or equipment leaks, container or equipment rinse or washwater and rainwater that may fall on the pad. Surface water shall not be allowed to either flow over or from the pad, which means the pad must be self contained. The pad shall be sloped to facilitate material removal. An unroofed pad shall be of sufficient capacity to contain at a minimum 110% of the capacity of the largest pesticide container or application equipment on the pad. A pad that is covered by a roof of sufficient size to completely exclude precipitation from contact with the pad shall have a minimum containment capacity of 100% of the capacity of the largest pesticide container or application equipment on the pad. Containment capacities as described above shall be maintained at all times. The above specific minimum containment capacities do not apply to vehicles when delivering pesticide shipments to the mixing/loading site. States or local tribes may have in effect additional requirements regarding wellhead setbacks and operational containment. State, Local, or Tribal regulations may be more restrictive than those listed on this product label. The most restrictive requirements must be followed.

This product must be used in a manner which will prevent back siphoning into wells, spills or improper disposal of excess pesticide, spray mixtures or rinsates.

### 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 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 12 hours following application.**

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, wear coveralls, chemical-resistant gloves (made of any waterproof material), and 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, or greenhouses.

Do not enter or allow people (or pets) to enter the treated area until sprays have dried.

Read these entire **DIRECTIONS FOR USE** and **WARRANTY AND DISCLAIMER STATEMENT** before using this product.

## PRODUCT INFORMATION

ARY 0452-110 Herbicide is a selective, postemergence herbicide that may be used for the control of certain weeds in established turf grasses. ARY 0452-110 Herbicide also has preemergence activity on certain weed species at rates of 7.1 to 14.5 fl oz ARY 0452-110 Herbicide/A.

ARY 0452-110 Herbicide is formulated as a 46.2% suspension concentrate (SC) herbicide.

Apply ARY 0452-110 Herbicide either alone, in tank mix combinations with, or sequentially prior to or after additional herbicides. When tank mixing, always observe all precautionary statements and limitations on labeling of all products.

Water is the recommended liquid carrier for ARY 0452-110 Herbicide.

## RESISTANCE MANAGEMENT

For resistance management, ARY 0452-110 Herbicide is an Herbicide Resistance Action Committee (HRAC) Group C<sub>1</sub> Herbicide, a photosynthesis II inhibitor (Weed Science Society of America (WSSA) Group 5). Any weed population may contain or develop plants naturally resistant to a herbicidal mode of action. Resistant biotypes can eventually dominate the weed population if herbicides with an identical mode of action are used repeatedly on the same site. If this happens, control of resistant biotypes will not occur unless an herbicide with a different mode of action is utilized. Whenever possible, tank mix or rotate the use of ARY 0452-110 Herbicide with herbicides that have a different mode of action.

ARY 0452-110 Herbicide will not control triazine-resistant (atrazine, simazine, metribuzin) and diuron-resistant weeds.

Other resistance mechanisms that are not linked to site of action, but specific for individual chemicals, such as enhanced metabolism, may also exist. The use of ARY 0452-110 Herbicide should conform to resistance management strategies established for the use area. Consult with your chemical dealer, consultant, extension turfgrass specialist or agricultural advisor for resistance management strategies for your area.

**Read the entire DIRECTIONS FOR USE before using ARY 0452-110 Herbicide.**

## USE RESTRICTIONS

- Do not apply this product using aerial application equipment.
- Do not apply this product if the soil pH is greater than 7.4.
- Do not mix, load or clean spray equipment within 50 feet of any wells or aquatic systems, including marshes, ponds, ditches, streams, lakes, etc.
- Do not apply within 50 feet of well-heads or the above mentioned aquatic systems.
- Do not apply more than 14.5 fl oz/A (fluid ounces per acre) of ARY 0452-110 Herbicide per season.
- Do not apply more than 14.5 fl oz/A of ARY 0452-110 Herbicide per single application.
- Do not allow this chemical to drift onto other crops or non-target plants.
- Do not apply this product through any type of irrigation system.
- Do not apply to turf under moisture stress. If necessary irrigate before application to eliminate moisture stress.
- To minimize turf injury, irrigate after application with 0.1 to 0.2 inch of water. See specific recommendations for turf species for timing of irrigation.

## USE PRECAUTIONS

- Do not apply ARY 0452-110 Herbicide where annual bluegrass is maintained as a desirable turf.
- Use on turfgrass species other than those listed in the **Cool-Season Turfgrasses** and **Warm-season Turfgrasses** tables may result in unacceptable injury.
- Do not apply ARY 0452-110 Herbicide to newly established (within six months) turfgrasses, unless otherwise directed on this label.
- Do not apply ARY 0452-110 Herbicide to turf that has been tarped within three months before the application.
- Do not apply ARY 0452-110 Herbicide within four weeks of cutting or lifting sod.

- Do not replant any crop to treated areas other than turfgrasses for a period of 12 months after the last application.
- Do not apply when turfgrasses are under stress.
- Allow at least 1 week between last application and overseeding with winter grasses.
- Apply to actively-growing weed populations.

**SPRAY DRIFT MANAGEMENT**

Spray equipment and weather affect spray drift. Consider all factors when making application decisions. Where states or tribes have more stringent regulations, they must be observed. Avoiding spray drift is the responsibility of the applicator or grower. To reduce the potential for drift, the application equipment must be set to apply medium to coarse droplets (i.e., ASAE Standard 572) with corresponding spray pressure. Use high flow rate nozzles to apply the highest practical spray volume. With most nozzle types, narrow spray angles produce larger droplets. Follow the nozzle manufacturer's directions on pressure, orientation, spray volume, etc., in order to minimize drift and optimize coverage and control.

**Wind**

Avoid making applications when spray particles may be carried by air currents to non-target areas. Do not spray if wind is gusty, below 2 mph, or in excess of 10 mph and moving in the direction of adjacent sensitive areas. Local terrain may influence wind patterns; the applicator must be familiar with local conditions and understand how they may impact spray drift.

**Sensitive Areas**

Sensitive areas to this product are defined as bodies of water (ponds, lakes, rivers, streams, and wetlands), known habitats of threatened or endangered species and non-labeled agricultural crop areas. Application must take all precautions necessary to keep spray drift from reaching sensitive areas.

**Temperature Inversions**

A surface temperature inversion (i.e., increasing temperature with increasing altitude) greatly increases the potential for drift. Presence of ground fog is a good indicator of a surface temperature inversion. Do not apply during temperature inversions. Always make applications when there is some air movement to determine the direction and distance of possible spray drift.

**Equipment**

All ground equipment must be properly maintained and calibrated using appropriate carriers or surrogates. Do not apply with a nozzle height greater than 4 ft above the ground surface.

**Sprayer Cleanup**

To avoid injury or exposure to non-target crops, thoroughly clean all mixing and spray equipment, including pumps, nozzles, lines and screens with a good quality tank cleaner, on an approved rinse pad or on a field site where an approved crop is grown.

**Recommended Turfgrass Sites**

ARY 0452-110 Herbicide may be applied to tolerant turf species on golf courses, seed and sod production fields, residential sites (including home lawns), schools, playgrounds, parks, recreational areas, sports fields, common areas and grass roadsides maintained as a lawn. Do not apply ARY 0452-110 Herbicide where annual bluegrass is maintained as a desirable turf.

**Turfgrass Tolerance**

Apply to turfgrasses established for six months unless otherwise directed on this label. With the exception of Kentucky Bluegrass, cool season turfgrasses established in the fall months can be treated the following spring. Kentucky Bluegrass should be established for twelve months before application of ARY 0452-110 Herbicide. The use of ARY 0452-110 Herbicide on turf that is not well-established, or that has been weakened by weather, pests, diseases, chemicals, mechanical injury or other related stress factors may result in adverse turf injury.

This product should only be applied to sites that are composed of the following turfgrass species unless trial use has indicated that the turf species not listed here is tolerant to ARY 0452-110 Herbicide.

<b>Cool-Season Turfgrasses<sup>1</sup></b>	
<b>Bentgrass, Creeping</b>	<i>Agrostis stolonifera</i>
<b>Bluegrass, Kentucky</b>	<i>Poa pratensis</i>
<b>Fescue, Fine</b>	<i>Festuca spp.</i>
<b>Fescue, Tall</b>	<i>Festuca arundinacea</i>
<b>Ryegrass, Perennial</b>	<i>Lolium perenne</i>
<b>Warm-Season Turfgrasses<sup>1</sup></b>	
<b>Bahiagrass</b>	<i>Paspalum notatum</i>
<b>Bermudagrass</b>	<i>Cynodon dactylon</i>
<b>Buffalograss</b>	<i>Buchloe dactyloides</i>
<b>Centipedegrass</b>	<i>Eremochloa ophiuroides</i>
<b>Kikuyugrass</b>	<i>Pennisetum clandestinum</i>
<b>Seashore Paspalum</b>	<i>Paspalum vaginatum</i>
<b>St. Augustinegrass</b>	<i>Stenotaphrum secundatum</i>
<b>Zoysiagrass</b>	<i>Zoysia japonica</i>

<sup>1</sup>Cool-season and warm-season turfgrasses have demonstrated acceptable tolerance to ARY 0452-110 Herbicide. However, not all cultivars have been evaluated.

When applied as directed under the conditions described, established turfgrasses are tolerant to this product. Temporary yellowing of the turf may occur after application. This effect is temporary and the turf will recover in 14 to 21 days.

Applications to cool-season turfgrasses when the daily high air temperature exceeds 85°F may result in unacceptable injury.

Do not apply ARY 0452-110 Herbicide to creeping bentgrass when the daily high air temperature is expected to exceed 80°F. Applications to warm-season turfgrasses when the daily high air temperature exceeds 90°F may result in unacceptable injury especially to St. Augustinegrass.

ARY 0452-110 Herbicide may be applied postemergence to tolerant turfgrasses at rates of 1.4 to 14.5 fl oz/A. See additional information for specific turfgrass species in section titled **Timing and Rates of Application**.

**Mixing Instructions - Liquid Carriers**

ARY 0452-110 Herbicide is a suspension concentrate formulation that must be mixed in water before application.

The proper mixing sequence for ARY 0452-110 Herbicide and recommended tank mixtures with the appropriate liquid carrier is as follows:

1. Fill the spray tank or nurse tank 1/4 full with the appropriate liquid carrier or water.
2. Start the recirculation and agitation system and continue throughout mixing and application.
3. If the compatibility test indicates the need for a compatibility agent, add the recommended amount to the spray tank.
4. Add the appropriate quantity of ARY 0452-110 Herbicide to the spray tank.
5. If tank mixing with wettable powders, dry flowables or water dispersible granule products in water as the carrier, these may be added now.
6. If tank mixing with suspension concentrates, add the products to the spray tank.
7. If tank mixing with emulsifiable concentrates or soluble products, add the products to the spray tank.
8. If mixing any additional spray adjuvants in the mixture, add them after all other products have been mixed.
9. ARY 0452-110 Herbicide and all registered mixtures should be kept agitated once mixed and then sprayed out.
10. Do not allow mixtures to stand for prolonged periods of time.

**Compatibility**

ARY 0452-110 Herbicide can be tank-mixed with other herbicides, pesticides and liquid fertilizers not shown on this label; compatibility needs to be determined before mixing. A compatibility test can be conducted with the following method:

1. In a small container (jar with lid), add 0.5 to 1.0 qt of the spray carrier.

2. Add all ingredients of the tank mix in the same ratio as the anticipated use into spray carrier.
3. Vigorously shake the mixture and allow to stand for 5 to 10 minutes.
4. Rapid precipitation, settling, changes in color, etc. and/or failure to re-suspend indicates that the mixture is physically incompatible and should not be applied.
5. If the mixture is physically compatible, the tank mix should be tested to determine safety (no adverse turfgrass injury) before treating large areas. Observe treated areas for 2 to 3 weeks after application. If injury is not considered adverse, then the remaining turf area may be treated.

### Sprayer Equipment Clean-out

After applying ARY 0452-110 Herbicide the sprayer must be thoroughly cleaned with the following procedure:

1. Drain the tank completely, then wash out tank, boom and hoses with clean water.
2. Drain the tank again.
3. Fill the tank half-full with water and add ammonia at a dilution rate of 1.0% v/v (i.e. one gallon household ammonia per 100 gal of rinsate). Completely fill tank with water. Operate the sprayer for 10 minutes to flush hoses, boom and nozzles.
4. Drain the sprayer system. Rinse the tank with clean water and flush the hoses, boom and nozzles. Remove and clean spray tips and screens separately.
5. Properly dispose of all cleaning solution and rinsate in accordance with Federal, State and local guidelines.

Do not drain or flush sprayer on or near desirable plants. Do not contaminate any body of water.

### SPRAY APPLICATION

#### Broadcast Treatment

Accurately calibrate the sprayer prior to mixing the herbicide treatments. Apply ARY 0452-110 Herbicide and the labeled tank mix partners in a minimum of 20 gal of total spray volume/A using broadcast boom equipment. Power sprayers equipped with a spray wand/gun may also be used for broadcast or spot application. Application must be made at a sufficient spray pressure and volume to provide accurate and uniform application of spray particles to a given area without causing spray drift to non-target areas. If mixed with other labeled herbicides, the spray volume may be no less than the minimum volume recommended by any tank mix product used or 20 gal, whichever is greater. Use appropriately sized mesh screens and in-line strainers. Agitate thoroughly before and during application with either bypass or mechanical agitation. Rinse the sprayer thoroughly with clean water immediately after each use.

**Improper spray pattern overlaps produce areas of over-application and may increase the potential for turf damage.**

#### Spot Treatment

Backpack and compression sprayers may be used for small turfgrass areas and spot treatments. Wands fitted with a flat fan nozzle tip should be held stationery at the proper height during application. A side-to-side or swinging arm motion may result in uneven spray coverage. Spray turf to the point of runoff.

For Spot Application Use the Following	
Gallons	Milliliters
1	3
2	6
4	12

Note. These rates are equivalent to approximately 4.25 fl oz/A when applied at a rate of 2 gal/1,000 sq ft

### APPLICATION METHODS AND TIMINGS

Apply ARY 0452-110 Herbicide postemergence to actively-growing broadleaf and grass weeds.

Do not apply when environmental conditions favoring drift.

ARY 0452-110 Herbicide may be tank mixed with herbicides registered for use on turfgrass sites. See tank mix instructions listed under specific turfgrass species for more information.



**WEEDS CONTROLLED or SUPPRESSED**

Depending on the use rate, ARY 0452-110 Herbicide will control or suppress the following broadleaf and grass weeds in turf.

<b>WEEDS CONTROLLED or SUPPRESSED by ARY 0452-110 HERBICIDE</b>	
Alexandergrass	Lovegrass, India (suppression)
Betony, Florida	Morningglory spp.
Bittercress, hairy	Mustard, wild
Bluegrass, annual (annua biotypes)	Nightshade, eastern black (suppression)
Bluegrass, annual (perennial biotypes)	Panicum, fall
Bluegrass, roughstalk ( <i>Poa trivialis</i> )	Parsley-piert
Burweed, lawn (spurweed)	Pennycress, field
Carpetweed	Pepperweed, Virginia
Cheat (suppression)	Pigweed spp.
Chickweed, common	Prickly sida (suppression)
Chickweed, sticky	Purslane, common
Clover, hop (suppression)	Radish, wild
Cocklebur, common (suppression)	Ragweed, common
Crabgrass spp. (suppression) (does not control India crabgrass ( <i>Digitaria longiflora</i> ))	Ragweed, giant (suppression)
Creeping beggarweed (suppression)	Shepherd's purse
Cudweed spp.	Sida, prickly (suppression)
Diamond-flower, old world (suppression)	Smartweed, Pennsylvania
Dichondra	Speedwell spp.
Drymary, heartleaf	Spurge, spotted
Foxtail sp. (suppression)	Toadflax, oldfield
Hemp sesbania (suppression)	Velvetleaf
Henbit	Waterhemp, tall
Horsenettle (suppression)	Waterhemp, common
Jimsonweed	Whitehead broom (suppression)
Kochia (suppression)	Woodsorrel, yellow
Lambsquarters, common	

**Cool-Season Turfgrasses**

**Annual bluegrass weed control in established creeping bentgrass, Kentucky bluegrass, fine fescues, tall fescue and perennial ryegrass.**

**Creeping Bentgrass-Putting Greens**

Creeping bentgrass ('A1', 'A4', G6, 'L93', 'Crenshaw' and 'Penncross') maintained at putting green clipping heights has demonstrated acceptable tolerance to ARY 0452-110 Herbicide. Other creeping bentgrass cultivars may be tolerant; however, the end user is advised to do a tolerance test on a small area before spraying all the intended turfgrass areas.

For annual bluegrass control, apply ARY 0452-110 Herbicide in the spring months, two to four weeks after the resumption of active bentgrass growth, at 1.4 fl oz ARY 0452-110 Herbicide/A. Repeat the application at 7 day intervals for a maximum of up to 4 applications. **Repeat applications should be made in a perpendicular direction to the previous application.**

- Apply ARY 0452-110 Herbicide at air temperatures ranging from 55 to 80° F.
- Do not apply ARY 0452-110 Herbicide to creeping bentgrass greens when the daytime air temperature is expected to exceed 80°F, or for 14 to 21 days before or after application, or immediately before or after periods of higher air temperatures.
- Do not apply ARY 0452-110 Herbicide to creeping bentgrass greens in the summer or early fall months.
- Do not apply ARY 0452-110 Herbicide to creeping bentgrass greens exhibiting stress from adverse weather, pests, diseases, chemicals, mechanical injury or other related stress factors.
- **Do not apply to bentgrass under moisture stress. If necessary, irrigate before application to eliminate moisture stress.**

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- To minimize bentgrass injury, irrigate with 0.1 to 0.2 inch water within 1 to 4 hours after application.
- Do not apply ARY 0452-110 Herbicide to creeping bentgrass that has received an application of products that contain mefluidide within the previous 3 months.

**Improper spray pattern overlaps produce areas of over-application and may increase the potential for turf damage. Additionally, all potential tank mixtures with fungicides, insecticides and other herbicides have not been evaluated and are not recommended by Arysta LifeScience North America, LLC for use on putting greens.**

ARY 0452-110 Herbicide is effective in controlling *Poa annua* and is recommended only for creeping bentgrass with 10% or less population density of *Poa annua*. Applications to creeping bentgrass greens with high populations (> 10%) of *Poa annua* can result in a decrease of overall turf quality due to the elimination of *Poa annua*.

Results from controlling *Poa annua* infestations may be mistaken as temporary injury to creeping bentgrass or by thinning of the turf. Creeping bentgrass will gradually fill in the resultant bare areas. The implementation of cultural practices to hasten the growth of creeping bentgrass will aid in the healing process. Treated areas may be reseeded at 7 or more days after the last application of ARY 0452-110 Herbicide.

### Creeping Bentgrass-Tees

Creeping bentgrass ('A1', 'A4', G6, 'L93', 'Pennway', 'Penncross', and 'Seaside') maintained at tee clipping heights has demonstrated acceptable tolerance to ARY 0452-110 Herbicide. Other creeping bentgrass cultivars may be tolerant; however, the end user is advised to do a tolerance test on a small area before spraying all the intended turfgrass areas.

For annual bluegrass control, apply ARY 0452-110 Herbicide in the spring months, two to four weeks after the resumption of active bentgrass growth, at 1.4 fl oz ARY 0452-110 Herbicide/A. Repeat the application at 7 to 12 day intervals for a maximum of up to 4 applications. **Repeat applications should be made in an alternate direction to the previous application.**

- Apply ARY 0452-110 Herbicide at air temperatures ranging from 55 to 80°F.
- Do not apply ARY 0452-110 Herbicide to creeping bentgrass tees when the daytime air temperature is expected to exceed 80°F, or for 14 to 21 days before or after application.
- Do not apply ARY 0452-110 Herbicide to creeping bentgrass tees in the summer or early fall months.
- Do not apply ARY 0452-110 Herbicide to creeping bentgrass tees exhibiting stress from adverse weather, pests, diseases, chemicals, mechanical injury or other related stress factors.
- **Do not apply to bentgrass under moisture stress. If necessary, irrigate before application to eliminate moisture stress.**
- **To minimize bentgrass injury, irrigate with 0.1 to 0.2 inch water within 1 to 4 hours after application.**
- Do not apply ARY 0452-110 Herbicide to creeping bentgrass that has received an application of products that contain mefluidide within the previous 3 months.

Improper spray pattern overlaps produce areas of over-application and may increase the potential for turf damage. Additionally, all potential tank mixtures with fungicides, insecticides, other herbicides have not been evaluated and should be tested on a small scale basis before widespread use.

**ARY 0452-110 Herbicide is effective in controlling *Poa annua* and is recommended only for creeping bentgrass with a 10% or less population density of *Poa annua*.** Applications to creeping bentgrass with high populations (>10%) of *Poa annua* can result in a decrease of overall turf quality due to the rapid elimination of *Poa annua*.

**Results from controlling *Poa annua* infestations may be mistaken as temporary injury to creeping bentgrass or by thinning of the turf.** Creeping bentgrass will gradually fill in the resultant bare areas. The implementation of cultural practices to hasten the growth of creeping bentgrass will aid in the healing process. Treated areas may be reseeded at 7 or more days after the last application of ARY 0452-110 Herbicide.

### Creeping Bentgrass- Fairways and Roughs

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Creeping bentgrass ('A1', 'A4', 'G6', 'L93', 'Pennway', 'Penncross' and 'Seaside') has demonstrated acceptable tolerance to ARY 0452-110 Herbicide. Other creeping bentgrass cultivars may be tolerant; however, the end user is advised to do a tolerance test on a small area before spraying all the intended turfgrass areas.

For annual bluegrass control, apply ARY 0452-110 Herbicide in the spring months, two to four weeks after the resumption of active bentgrass growth, at 1.4 fl oz ARY 0452-110 Herbicide/A. Repeat the application at 7 day intervals for a maximum of up to 4 applications. Repeat applications should be made in an alternate direction to the previous application. Improper spray pattern overlaps produce areas of over-application and may increase the potential for turf damage. Additionally, all potential tank mixtures with fungicides, insecticides, and other herbicides should be tested on a small scale basis before widespread use.

Alternatively, apply ARY 0452-110 Herbicide in the spring months, two to four weeks after the resumption of active bentgrass growth, at 2.0 to 3.0 fl oz ARY 0452-110 Herbicide/A for annual bluegrass control. Repeat the application at 14 to 21 day intervals for a maximum of 2 applications.

Apply ARY 0452-110 Herbicide at air temperatures ranging from 55 to 80° F.

- **Do not apply ARY 0452-110 Herbicide to creeping bentgrass fairways when the daytime air temperature is expected to exceed 80°F, or for 14 to 21 days before or after application.**
- Do not apply ARY 0452-110 Herbicide to creeping bentgrass fairways when the daytime air temperature is expected to exceed 80°F, or immediately before or after periods of higher air temperatures.
- Do not apply ARY 0452-110 Herbicide to creeping bentgrass in the summer or early fall months.
- Do not apply ARY 0452-110 Herbicide to creeping bentgrass exhibiting stress from adverse weather, pests, diseases, chemicals, mechanical injury or other related stress factors.
- **Do not apply to bentgrass under moisture stress. If necessary, irrigate before application to eliminate moisture stress.**
- **To minimize bentgrass injury, irrigate with 0.1 to 0.2 inch water within 1 to 4 hours after application.**
- **Do not apply ARY 0452-110 Herbicide to creeping bentgrass that has received an application of products that contain mefluidide within the previous 3 months.**

ARY 0452-110 Herbicide is effective in controlling *Poa annua* and is recommended only for creeping bentgrass with a 10% or less population/density of *Poa annua*. Applications to creeping bentgrass with high populations (>10%) of *Poa annua* can result in a decrease of overall turf quality due to the rapid elimination of *Poa annua*. **Results from controlling *Poa annua* infestations may be mistaken as temporary injury to creeping bentgrass or by thinning of the turf.**

Creeping bentgrass will gradually fill in the resultant bare areas. Treated areas may be reseeded at 7 or more days after the last application ARY 0452-110 Herbicide.

ARY 0452-110 Herbicide may be tank mixed with labeled herbicides such as 2,4-D, MCP, dicamba or two and three-way herbicides that contain mixtures of 2,4-D, MCP, clopyralid, dicamba, fluroxypyr, or triclopyr to enhance control of emerged broadleaf weeds.

ARY 0452-110 Herbicide may also be tank mixed with preemergence herbicides for residual control of crabgrass species and other summer annual weeds.

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### **Fine Fescues, and Tall Fescue, Perennial Ryegrass**

For annual bluegrass control, ARY 0452-110 Herbicide may be applied twice at 2.8 to 5.6 fl oz ARY 0452-110 Herbicide /A at 10 to 21 day intervals.

- Do not apply ARY 0452-110 Herbicide to cool season turfgrasses when the daytime air temperature is expected to exceed 85°F, or for 14 to 21 days before or after application. Application of ARY 0452-110 Herbicide to cool season turfgrasses exhibiting stress from adverse weather, pests, diseases, chemicals, mechanical injury or other related stress factors may increase the potential for unacceptable injury.

Perennial ryegrass and tall fescue may be seeded at 7 or more days after the last application of ARY 0452-110 Herbicide.

ARY 0452-110 Herbicide may be tank mixed with various recommended herbicides such as 2,4-D, MCP, dicamba or two and three-way herbicides that contain mixtures of 2,4-D, MCP, clopyralid, dicamba, fluroxypyr, or triclopyr to enhance control of emerged broadleaf weeds.

ARY 0452-110 Herbicide may also be tank mixed with preemergence herbicides for residual control of crabgrass species and other summer annual weeds.

Do not apply ARY 0452-110 Herbicide to perennial ryegrass, tall fescue, or fine fescue that has received an application of products that contain mefluidide within the previous 3 months.

### **Kentucky Bluegrass**

For annual bluegrass control, ARY 0452-110 Herbicide may be applied twice at 2.8 fl oz/A at 10-21 day intervals in the spring months. Alternatively, apply ARY 0452-110 Herbicide in the spring months at 1.4 fl oz ARY 0452-110 Herbicide/A. Repeat the application at 7 day intervals for a maximum of up to 4 applications. Repeat applications should be made in an alternate direction to the previous application.

- ARY 0452-110 Herbicide should not be applied to Kentucky Bluegrass when the daytime air temperature is expected to exceed 85°F, or for 14 to 21 days before or after application.
- Application of ARY 0452-110 Herbicide to cool season turfgrasses exhibiting stress from adverse weather, pests, diseases, chemicals, mechanical injury or other related stress factors may increase the potential for unacceptable injury.
- **Kentucky Bluegrass should be established for twelve months before application of ARY 0452-110 Herbicide.**
- Do not apply to Kentucky bluegrass under moisture stress. If necessary, irrigate before application to eliminate moisture stress.
- **To minimize Kentucky bluegrass injury, irrigate with 0.1 to 0.2 inch water within 2 to 12 hours after application.**
- **Do not apply ARY 0452-110 Herbicide to Kentucky bluegrass that has received an application of products that contain mefluidide within the previous 3 months.**
- ARY 0452-110 Herbicide may be tank mixed with various recommended herbicides such as 2,4-D, MCP, dicamba or two and three-way herbicides that contain mixtures of 2,4-D, MCP, clopyralid, dicamba, fluroxypyr, or triclopyr to enhance control of emerged broadleaf weeds.
- ARY 0452-110 Herbicide may also be tank mixed with preemergence herbicides for residual control of crabgrass species and other summer annual weeds.

### **Warm-Season Turfgrasses**

**Annual bluegrass and broadleaf weed control in established bahiagrass, bermudagrass, buffalograss, centipedegrass, kikuyugrass, seashore paspalum, St. Augustinegrass and zoysiagrass.**

**Annual bluegrass and annual broadleaf weed control.**

ARY 0452-110 Herbicide may be applied postemergence to tolerant warm-season turf at rates of 7.1 to 14.5 fl oz/A. ARY 0452-110 Herbicide may be applied to warm-season turfgrasses that are dormant, partially dormant or actively-growing.

**NOTE:** Do not use ARY 0452-110 Herbicide on St. Augustinegrass in the summer months when air temperatures are greater than 90°F. When using low rates (4.2 to 7.1 fl oz/A), repeat applications are recommended but the maximum rate per season must not exceed 14.5 fl oz of ARY 0452-110 Herbicide/A. Repeat applications should be made 2 to 3 weeks after the initial application.

- Do not apply to turf under moisture stress. If necessary, irrigate before application to eliminate moisture stress.
- To minimize injury, irrigate with 0.1 to 0.2 inch water within 12 hours after application.

ARY 0452-110 Herbicide can be tank mixed with labeled herbicides that contain metsulfuron, 2,4-D, dicamba or mixtures of 2,4-D, MCP, clopyralid, dicamba, fluroxpyr, or triclopyr to enhance control of emerged broadleaf weeds. If sedge species are present on the site, ARY 0452-110 Herbicide can be tank mixed with herbicides labeled for control of sedges. Consult the tank mix partner label for turfgrass species tolerance, weeds controlled and maximum weed sizes at applications. Follow the most restrictive labeled timing between ARY 0452-110 Herbicide and any tank mix partner.

ARY 0452-110 Herbicide may also be tank mixed with preemergence herbicides for residual control of crabgrass species and other summer annual weeds.

**Bermudagrass Tees and Fairways Overseeded in the Fall with Perennial Ryegrass or *Poa trivialis* (Roughstalk Bluegrass)**

ARY 0452-110 Herbicide may be applied at 7.1 to 14.5 fl oz/A one or more weeks before overseeding bermudagrass with either perennial ryegrass or *Poa trivialis* for control of emerged annual bluegrass.

**ARY 0452-110 HERBICIDE APPLIED TO SEEDLING OR ESTABLISHED *POA TRIVIALIS* WILL RESULT IN SEVERE TURF INJURY.**

- In early- to mid-spring months ARY 0452-110 Herbicide at 2.8 to 5.6 fl oz/A may be used to control annual bluegrass and certain winter annual broadleaf weeds in bermudagrass overseeded the previous fall with perennial ryegrass. Make a second application 14 to 21 days after the first application. Delay the spring applications until perennial ryegrass is actively-growing and has recovered from winter-induced stress but no sooner than three to four months after seeding. Temporary injury to perennial ryegrass may occur for 1 to 2 weeks after application. ARY 0452-110 Herbicide should not be applied to perennial ryegrass when the daytime air temperature is expected to exceed 85°F, or for 14 to 21 days before or after application.
- Application of ARY 0452-110 Herbicide to perennial ryegrass exhibiting stress from adverse weather, pests, diseases, chemicals, mechanical injury or other related stress factors may increase the potential for unacceptable injury.

As there are numerous cultivars of perennial ryegrass as well as a wide range of clipping heights, end users are advised to determine perennial ryegrass tolerance on a small trial area on their site. Observe trial areas for two to three weeks after application. If injury is not considered adverse, then the remaining turf area may be treated. Do not apply ARY 0452-110 Herbicide to emerged *Poa trivialis* unless the objective is suppress or remove it.

ARY 0452-110 Herbicide may be tank mixed with various recommended herbicides such as 2,4-D, MCP, dicamba or two and three-way herbicides that contain mixtures of 2,4-D, MCP, clopyralid, dicamba, fluroxpyr, or triclopyr to enhance control of emerged broadleaf weeds.

ARY 0452-110 Herbicide may also be tank mixed with preemergence herbicides for residual control of crabgrass species and other summer annual weeds.

Do not apply ARY 0452-110 Herbicide to perennial ryegrass that has received an application of products that contain mefluidide within the previous 3 months unless severe injury and/or removal is acceptable.

**Crabgrass Species Control in St. Augustinegrass**

ARY 0452-110 Herbicide at 4.2 to 7.1 fl oz/A may be used for the control of emerged blanket crabgrass and other crabgrass species (with the exception of India crabgrass) in established St. Augustinegrass. Apply this rate on a 1 to 3 week interval for up to three applications but do not exceed a maximum of 14.5 fl oz/A per year. St. Augustinegrass may be moderately injured by ARY 0452-110 Herbicide. Complete recovery will occur two to four weeks after the last application.

**Weed Control in Conifers in Nurseries and Field Plantings (including Christmas trees)**

ARY 0452-110 Herbicide can be used over-the-top or as a directed spray under the canopy in conifer nurseries and field plantings (including Christmas trees). Apply ARY 0452-110 Herbicide at 5.6 to 14.5 fl oz/A to actively growing weeds listed above. Repeat applications may be made but do not exceed 14.5 fl oz/A per year.

**RESTRICTION:** Do not use a mechanically pressurized handgun for application to Christmas trees.

## STORAGE AND DISPOSAL

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

### **PESTICIDE STORAGE**

Store in a cool, dry place and in such a manner as to prevent cross contamination with other pesticides, fertilizers, food, and feed. Store in original container and out of reach of children, preferably in a locked storage area. Handle and open container in a manner as to prevent spillage. If the container is leaking or material spilled for any reason or cause, carefully sweep material into a pile. Refer to Precautionary Statements on label for hazards associated with the handling of this material. Do not walk through spilled material. Dispose of pesticide as directed below. In spill or leak incidents, keep unauthorized people away. For help with any spill, leak, fire or exposure involving this material, call day or night CHEMTREC (703) 527-3887 or (800) 424-9300.

### **PESTICIDE DISPOSAL:**

Wastes resulting from the use of this product may be disposed of on site or at an approved waste disposal facility.

### **CONTAINER HANDLING:**

**Rigid, nonrefillable in containers small enough to shake (5 gallons or 50 pounds or less)**

#### **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 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. Offer for recycling if available or dispose of in a sanitary landfill or by incineration.

**Rigid, nonrefillable in containers too large to shake (greater than 5 gallons or 50 pounds)**

#### **Nonrefillable container.**

Do not reuse or refill this container. Triple rinse container (or equivalent) promptly after emptying. Triple Rinse as follows: Empty 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. Offer for recycling if available or dispose of in a sanitary landfill.

**Warranty and Disclaimer Statement**

The directions for use of this product are believed to be adequate and must be followed carefully. However, it is impossible to eliminate all risks associated with the use of this product. Such risks may arise from weather conditions, soil factors, off-target movement, unconventional turf management techniques, the presence of other materials, the manner of use or application, or other unknown factors, all of which are beyond the control of Arysta LifeScience North America, LLC, and can cause crop injury, injury to non-target crops or plants, ineffectiveness of the product, or other unintended consequences. To the extent consistent with applicable law, all such risks shall be assumed by the user or buyer.

Arysta LifeScience North America, LLC warrants that this product conforms to the chemical description on the label and is reasonably fit for the purposes stated in the Directions for Use, subject to the inherent risks described above, when used in accordance with the Directions for Use under normal conditions. This warranty does not extend to the use of this product contrary to label instructions or under conditions not reasonably foreseeable to Arysta LifeScience North America, LLC, and is subject to the inherent risks described above.

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