



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, DC 20460

OFFICE OF CHEMICAL SAFETY
AND POLLUTION PREVENTION

June 16, 2023

Rebecca A. Clemmer
Senior Regional Regulatory Manager
UPL NA Inc.
630 Freedom Business Center, Suite 402
King of Prussia, PA 19406

Subject: PRIA Label Amendment – Removing soil pH restriction, adding first corn use for amicarbazone via liquid application, and adding an alternate brand name
Registration Review Label Amendment - Incorporating Mitigation Measures from the Registration Review Interim Decision for Amicarbazone
Product Name: ARY 0452-110 Herbicide
EPA Registration Number: 70506-501
Application Dates: March 26, 2021 and January 10, 2022
Decision Numbers: 573059 and 581179

Dear Rebecca Clemmer:

The amended label referred to above, submitted in connection with registration under the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA), as amended, is acceptable. This approval does not affect any conditions that were previously imposed on this registration. You continue to be subject to existing conditions on your registration and any deadlines connected with them.

In addition, the Agency, in accordance with FIFRA, as amended, has completed reviewing all the information submitted with your application to support the Registration Review of the above referenced product in connection with the Amicarbazone Interim Decision. The Agency has concluded that your submission is acceptable.

The alternate brand name, “**Wild Cat 4SC Herbicide**,” has been added to the product record.

A stamped copy of your labeling is enclosed for your records. This labeling supersedes all previously accepted labeling. You must submit one 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 12 months from the date of this letter. After 12 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.

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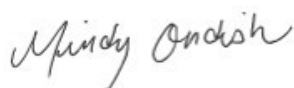
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Should you wish to add/retain a reference to the company's website on your label, then please be aware that the website becomes labeling under FIFRA and is subject to review by the Agency. If the website is false or misleading, the product would be misbranded and unlawful to sell or distribute under FIFRA section 12(a)(1)(E). 40 CFR 156.10(a)(5) lists examples of statements EPA may consider false or misleading. In addition, regardless of whether a website is referenced on your product's label, claims made on the website may not substantially differ from those claims approved through the registration process. Therefore, should the Agency find or if it is brought to our attention that a website contains false or misleading statements or claims substantially differing from the EPA approved registration, the website will be referred to the EPA's Office of Enforcement and Compliance.

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.

If you have any questions, please contact Julia Kerr by phone at 202-566-2810, or via email at kerr.julia@epa.gov.

Sincerely,



Mindy Ondish
Product Manager 23
Herbicide Branch
Registration Division (7505T)
Office of Pesticide Programs

Enclosure

[Note to reviewer: [Text] in brackets denotes optional text. {Text} in braces denotes where in the final label text will appear and notes to reviewer.]

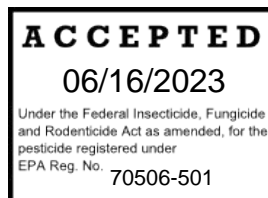
AMICARBAZONE	GROUP	5	HERBICIDE
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ARY 0452-110 Herbicide

{Alternate Brand Name:} [XONERATE 4SC HERBICIDE], [Wild Cat 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)] and [For pre-emergence and post-emergence weed control in field corn, corn grown for silage and corn post-harvest uses]]

Active Ingredient	By Wt.
Amicarbazone: 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 4.2 lb. Amicarbazone per gallon.



Read the label before use
KEEP OUT OF REACH OF CHILDREN
CAUTION/PRECAUCIÓN

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][side] Panel for First Aid Instructions and [Leaflet][Booklet] for Complete Precautionary Statements and Directions for Use or See [inside] [attached] Booklet for [additional] [complete] First Aid, Precautionary Statements and Directions for Use.]

FIRST AID	
If swallowed:	<ul style="list-style-type: none"> • Call poison control center or doctor immediately for treatment advice. • Have person sip a glass of water if able to swallow. • Do not induce vomiting unless told to do so by the poison control center or doctor. • Do not give anything by mouth to an unconscious person.
If on skin:	<ul style="list-style-type: none"> • Take off contaminated clothing. • Rinse skin immediately with plenty of water for 15 to 20 minutes. • Call a poison control center or doctor for treatment advice.
If in eyes:	<ul style="list-style-type: none"> • Hold eye open and rinse slowly and gently with warm water for 15 to 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.
Note to physician: 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. FOR 24-HOUR EMERGENCY MEDICAL ASSISTANCE CALL Rocky Mountain Poison and Drug Safety: 1-866-673-6671. FOR 24-HOUR CHEMICAL EMERGENCY (Spill, leaks, fire, exposure or accident) CALL CHEMTREC: 1-800-424-9300 or + 1-703-527-3887.	

For Product Use Information Call: 1-800-438-6071

EPA Reg. No. 70506-501

EPA Est. No.

[Batch Code will be placed on the container]

Produced for:

Net Contents:

UPL NA Inc. • 630 Freedom Business Center, Suite 402 • King of Prussia, PA 19406 • 1-800-438-6071

PRECAUTIONARY STATEMENTS

HAZARDS TO HUMANS AND DOMESTIC ANIMALS

CAUTION

Harmful if swallowed. Harmful if absorbed through skin. Causes moderate eye irritation. Avoid contact with skin, eyes or clothing. 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 barrier laminate, butyl rubber \geq 14 mils, nitrile rubber \geq 14 mils, neoprene rubber \geq 14 mils, natural rubber (includes natural rubber blends and laminates) \geq 14 mils, polyethylene, polyvinylchloride (PVC) \geq 14 mils, or Viton[®] \geq 14 mils)
- 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 §170.607(d-e)], 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.

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 rinsate. 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.

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

Non-Target Organism Advisory

This product is toxic to plants and may adversely impact the forage and habitat of non-target organisms, including pollinators, in areas adjacent to the treated site. Protect the forage and habitat of non-target organisms by following label directions intended to minimize spray drift.

Groundwater Advisory

Amicarbazone is known to leach through soil into groundwater under certain conditions as a result of label use. This chemical may leach into groundwater if used in areas where soils are permeable, particularly where the water table is shallow.

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 for several months or more after application. A level, well maintained vegetative filter 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 rainfall is forecasted to occur within 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.

PHYSICAL AND CHEMICAL HAZARDS

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

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:

- long sleeved shirt and long pants,
- chemical-resistant gloves (made of barrier laminate, butyl rubber \geq 14 mils, nitrile rubber \geq 14 mils, neoprene rubber \geq 14 mils, natural rubber (includes natural rubber blends and laminates) \geq 14 mils, polyethylene, polyvinylchloride (PVC) \geq 14 mils, or Viton[®] \geq 14 mils); 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.

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 for weed control in conifers in nurseries and field plantings (including Christmas trees), and for the control of annual broadleaf weeds in field corn and corn grown for silage. **ARY 0452-110 HERBICIDE**, which contains the active ingredient amicarbazone is a Group 5 (photosystem II inhibitor) herbicide based on the mode of action classification system of the Weed Science Society of America (WSSA). **ARY 0452-110 HERBICIDE** has both foliar (burndown) and soil (residual) activity against broadleaf weeds with activity against select grass species. ARY 0452-110 Herbicide also has preemergence activity on certain weed species at rates of 6.75–14.0 [13.7] fl oz ARY 0452-110 Herbicide/A.

ARY 0452-110 Herbicide is formulated as a 4.2 lb a.i. per gallon suspension concentrate (SC) herbicide. ARY 0452-110 is for use in either conventional, conservation or no-tillage crop management systems and is for application to preplant surface, for preplant incorporation (mixed into the top 1 to 2 inch layer of soil), pre-emergence and post-emergence. **ARY 0452-110 HERBICIDE** will provide its most effective weed control when applied and subsequently moved into the soil by rainfall, sprinkler irrigation or mechanical tillage prior to weed emergence.

Apply ARY 0452-110 Herbicide either alone, in tank mix combinations with, or sequentially prior to or after additional herbicides. It is the pesticide user's responsibility to ensure that all products are registered for the intended use. Read and follow the applicable restrictions, limitations, and directions for use on all product labels involved in the tank mixture. Users must follow the most restrictive directions for use and precautionary statements of each product in the tank mixture.

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 injury) before treating large areas. Observe treated areas for 2 to 3 weeks after application. If injury is not considered adverse, then the remaining area may be treated.

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.

WEED RESISTANCE MANAGEMENT

Mode of action

For resistance management, ARY 0452-110 contains the active ingredient amicarbazone, which is a photosynthesis II inhibitor. Any weed population may contain or develop plants naturally resistant to ARY 0452-110 and other Group 5 herbicides. Weed species with acquired resistance to Group 5 may eventually dominate the weed population if Group 5 herbicides are used repeatedly in the same field. Appropriate resistance-management strategies should be followed.

To delay herbicide resistance take one or more of the following steps:

- Rotate the use of ARY 0452-110 or other Group 5 herbicides within a growing season sequence or among growing seasons with different herbicide groups that control the same weeds in a field. Whenever possible

incorporate multiple weed control practices such as mechanical cultivation, biological management practices, and crop rotation.

- Use tank mixtures with herbicides from a different group if such use is permitted; where information on resistance in target weed species is available, use the less resistance-prone partner at a rate that will control the target weed(s) equally as well as the more resistance-prone partner. Consult your local extension service or certified crop advisor if you are unsure as to which active ingredient is currently less prone to resistance.
- Adopt an integrated weed-management program for herbicide use that includes scouting and uses historical information related to herbicide use and crop rotation, and that considers tillage (or other mechanical control methods), cultural (e.g. higher crop seeding rates; precision fertilizer application method and timing to favor the crop and not the weeds), biological (weed-competitive crops or varieties) and other management practices.
- Fields should be scouted before and after application to identify the weed species present and their growth stage to determine if the intended application will be effective. Scout after herbicide application to monitor weed populations for early signs of resistance development. Indicators of possible herbicide resistance include: (1) failure to control a weed species normally controlled by the herbicide at the dose applied, especially if control is achieved on adjacent weeds; (2) a spreading patch of non-controlled plants of a particular weed species; (3) surviving plants mixed with controlled individuals of the same species. If resistance is suspected, prevent weed seed production in the affected area by an alternative herbicide from a different group or by a mechanical method such as hoeing or tillage. Prevent movement of resistant weed seeds to other fields by cleaning harvesting and tillage equipment when moving between fields, and planting clean seed.
- If a weed pest population continues to progress after treatment with this product, discontinue use of this product and switch to another management strategy or herbicide with a different mode of action (MOA), if available. Treat weed escapes with an herbicide with a different MOA or use non-chemical methods to remove escapes. To the extent possible do not allow weed escapes to produce seeds, roots, or tubers.
- Contact your local extension specialist, certified crop advisors, and/or manufacturer for additional herbicide resistance management and/or integrated weed management recommendations for specific crops and resistant weed biotypes. Report any incidence of non-performance of this product against a particular weed species to your retailer or UPL NA representative.

USE RESTRICTIONS FOR ALL USES

- Do not apply this product through any type of irrigation system.
- For broadcast application, apply with ground equipment only.
- For spot treatment, use backpack and compression sprayers.
- Do not apply this product using aerial application equipment.
- 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 allow this chemical to drift onto other crops or non-target plants.

MANDATORY SPRAY DRIFT MANAGEMENT

Ground Boom Applications

- User must only apply with the release height recommended by the manufacturer, but no more than 4 feet above the ground or crop canopy.
- Applicators must select nozzle and pressure that deliver medium or coarser droplet size (ASABE S572).
- Do not apply when wind speeds exceed 15 miles per hour at the application site.
- Do not apply during temperature inversions.

SPRAY DRIFT ADVISORIES

THE APPLICATOR IS RESPONSIBLE FOR AVOIDING OFF-SITE SPRAY DRIFT. BE AWARE OF NEARBY NON-TARGET SITES AND ENVIRONMENTAL CONDITIONS.

IMPORTANCE OF DROPLET SIZE

An effective way to reduce spray drift is to apply large droplets. Use the largest droplets that provide target pest

control. While applying larger droplets will reduce spray drift, the potential for drift will be greater if applications are made improperly or under unfavorable environmental conditions.

Controlling Droplet Size – Ground Boom

- Volume – increasing the spray volume so that larger droplets are produced will reduce spray drift. Use the highest practical spray volume for the application. If a greater spray volume is needed, consider using a nozzle with a higher flow rate.
- Pressure – use the lowest spray pressure recommended for the nozzle to produce the target spray volume and droplet size.
- Spray Nozzle – use a spray nozzle that is designed for the intended application. Consider using nozzles designed to reduce drift.

BOOM HEIGHT – Ground Boom

For ground equipment, the boom should remain level with the crop and have minimal bounce.

SHIELDED SPRAYERS

Shielding the boom or individual nozzles can reduce spray drift. Consider using shielded sprayers. Verify that the shields are not interfering with the uniform deposition of the spray on the target area.

TEMPERATURE AND HUMIDITY

When making applications in hot and dry conditions, use larger droplets to reduce effects of evaporation.

TEMPERATURE INVERSIONS

Drift potential is high during a temperature inversion. Temperature inversions are characterized by increasing temperature with altitude and common on nights with limited cloud cover and light to no wind. The presence of an inversion can be indicated by ground fog or 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. Avoid applications during temperature inversions.

WIND

Drift potential generally increases with wind speed. AVOID APPLICATIONS DURING GUSTY WIND CONDITIONS. Applicators need to be familiar with local wind patterns and terrain that could affect spray drift.

Handheld Technology Applications: take precautions to minimize spray drift.

CROP ROTATION RESTRICTIONS

In the event of a crop failure, only corn can be replanted immediately. Do not retreat.

Waiting periods after ARY 0452-110 HERBICIDE application before the following crops can be planted:

Interval	Crops
0 Days	Corn
4 Months	Soybeans, winter wheat
10 Months	Spring wheat
12 Months	Cotton

Restriction: Do not rotate to food or feed crops on treated land other than those listed in the table above until an adequately sensitive bioassay or chemical test shows that no detectable amicarbazone is present in the soil.

TURFGRASS USE DIRECTIONS

Turfgrass Sites

ARY 0452-110 Herbicide may be applied to tolerant turf species on golf courses, 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. This product is intended for use by professional applicators. Not intended for consumer use on lawns or other residential areas.

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.

TURFGRASSES APPLICATION METHODS AND TIMINGS:

Cool-Season Turfgrasses ¹	
Bentgrass, Creeping	<i>Agrostis stolonifera</i>
Bluegrass, Kentucky	<i>Poa pratensis</i>
Fescue, Fine	<i>Festuca spp.</i>
Fescue, Tall	<i>Festuca arundinacea</i>
Ryegrass, Perennial	<i>Lolium perenne</i>
Warm-Season Turfgrasses ¹	
Bahiagrass	<i>Paspalum notatum</i>
Bermudagrass	<i>Cynodon dactylon</i>
Buffalograss	<i>Buchloe dactyloides</i>
Centipedegrass	<i>Eremochloa ophiuroides</i>
Kikuyugrass	<i>Pennisetum clandestinum</i>
Seashore Paspalum	<i>Paspalum vaginatum</i>
St. Augustinegrass	<i>Stenotaphrum secundatum</i>
Zoysiagrass	<i>Zoysia japonica</i>
¹ 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 1.5–14.0 fl oz/A. See additional information for specific turfgrass species in the 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 in 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.

Use Restrictions:

- Do not apply more than 14.0 fl oz amicarbazone (0.46 lb ai) per acre per year.
- Do not apply ARY 0452-110 Herbicide where annual bluegrass is maintained as a desirable turf.
- 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 for new establishment within three months before the application.
- Do not apply when turfgrasses are under stress.
- Do not apply to turf under moisture stress. If necessary, irrigate before application to eliminate moisture stress.
- Do not apply ARY 0452-110 Herbicide within four weeks of cutting or lifting sod.

Use Precautions:

- Use on turfgrass species other than those listed in the **Cool-Season Turfgrasses** and **Warm-season Turfgrasses** tables may result in unacceptable injury.
- Allow at least 1 week between last application and overseeding with winter grasses.
- Apply to actively growing weed populations.
- To minimize turf injury, irrigate after application with 0.1 to 0.2 inch of water. See specific directions for turf species for timing of irrigation.

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 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 increases 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. Water thoroughly but not to the point of runoff.

For Spot Application Use the Following		
Gallons of Dilution	Milliliters of ARY 0452-110 Herbicide per 1,000 sq ft mL/1,000 sq ft	Fluid Ounce per Acre Equivalent fl oz/A
1	1.5	2.12

2	3	4.25
4	6	8.52

APPLICATION METHODS AND TIMINGS

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

Do not apply when environmental conditions favor 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.

Tolerant Grasses*

Cool Season Grasses	Maximum Use Rate Single Application	
	Fluid ounces (mL) per 1,000 sq ft	Fluid ounces per acre
Bentgrass, creeping (<i>Agrostis sp.</i>)	0.03 fl oz (1.0 mL)	1.5
Bluegrass, Kentucky (<i>Poa pratensis</i>)	0.03–0.07 fl oz (1.0-2.0 mL)	1.5–3.0
Fescue, fine (<i>Festuca rubra</i>) Fescue, tall (<i>Festuca arundinacea</i>) Ryegrass, perennial (<i>Lolium perenne</i>)	0.07–0.13 fl oz (2.0-3.7 mL)	3.0–5.5

Warm Season Grasses	Maximum Use Rate Single Application	
	Fluid ounces (mL) per 1,000 sq ft	Fluid ounces per acre
Bahiagrass (<i>Paspalum notatum</i>) Bermudagrass (<i>Cynodon dactylon</i>) & hybrids Buffalograss (<i>Buchloe dactyloides</i>) Centipedegrass (<i>Eremochloa ophiuroides</i>) Kikuyugrass (<i>Pennisetum clandestinum</i>) Seashore Paspalum (<i>Paspalum vaginatum</i>) Zoysiagrass (<i>Zoysia japonica</i>)	0.10–0.32 fl oz (3.0-9.5 mL)	4.5–14.0
Bermudagrass (<i>Cynodon dactylon</i>) & hybrids overseeded with Ryegrass, perennial (<i>Lolium perenne</i>) EARLY SPRING APPLICATION	0.10–0.13 fl oz (3.0-3.7 mL)	4.5–5.5
Bermudagrass (<i>Cynodon dactylon</i>) & hybrids overseeded with Ryegrass, perennial (<i>Lolium perenne</i>) LATE SPRING APPLICATION	0.19–0.32 fl oz (5.8-9.5 mL)	8.5–14.0
Bermudagrass (<i>Cynodon dactylon</i>) & hybrids overseeded with Ryegrass, perennial (<i>Lolium perenne</i>) FALL APPLICATION	0.14–0.32 fl oz (4.1-9.5 mL)	6.0–14.0
St. Augustinegrass (<i>Stenotaphrum secundatum</i>)	0.07–0.16 fl oz (2.0-4.7 mL)	3.0–7.0

*ARY 0452-110 Herbicide has demonstrated tolerance on both cool and warm season turfgrasses. However, not all varieties have been evaluated. Turfgrass managers desiring to treat newly released varieties should first apply

ARY 0452-110 Herbicide to a small area prior to treatment of larger areas.

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.

WEEDS CONTROLLED or SUPPRESSED by ARY 0452-110 HERBICIDE	
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)	Tropical Signalgrass
Henbit	Velvetleaf
Horsenettle (suppression)	Waterhemp, tall
Jimsonweed	Waterhemp, common
Kochia (suppression)	Whitehead broom (suppression)
Lambsquarters, common	Woodsorrel, yellow

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 1.5 fl oz ARY 0452-110 Herbicide/A. Repeat the application at 7 to 14 [10 to 14] day intervals for a maximum of up to 4 applications. Make repeat applications 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.
- 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.
- Creeping Bentgrass should be established for twelve months before application of ARY 0452-110 Herbicide.
- To minimize bentgrass injury, irrigate with 0.1 to 0.2 inch water within 3 to 4 hours after application.

- Do not apply more than 14.0 fl oz of this product per acre per year.
- 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 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 UPL NA Inc. 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 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-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 1.5 fl oz ARY 0452-110 Herbicide/A. Repeat the application at 7 to 14 [10 to 14] day intervals for a maximum of up to 4 applications. Make repeat applications 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.
- 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.
- Creeping Bentgrass should be established for twelve months before application of ARY 0452-110 Herbicide .
- To minimize bentgrass injury, irrigate with 0.1 to 0.2 inch water within 3 to 4 hours after application.
- Do not apply more than 14.0 fl oz of this product per acre per year.
- 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 increases 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

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 1.5 fl oz ARY 0452-110 Herbicide/A. Repeat the application at 7 to 14 [10 to 14] day intervals for a maximum of up to 4 applications. Make repeat applications in an alternate direction to the previous application. Improper spray pattern overlaps produce areas of over-application and increases 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.

- 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 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.
- Creeping Bentgrass should be established for twelve months before application of ARY 0452-110 Herbicide.
- To minimize bentgrass injury, irrigate with 0.1 to 0.2 inch water within 3 to 4 hours after application.
- Do not apply more than 14.0 fl oz of this product per acre per year.
- 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 that contain 2,4-D, MCP, dicamba or two and three-way herbicides that contain mixtures of carfentrazone-ethyl, 2,4-D, MCP, clopyralid, dicamba, fluroxypyr, or triclopyr to enhance control of emerged broadleaf weeds. Follow the most restrictive of the labeling limitations and precautions of all the products used in the tank mixture.

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

Fine Fescues, and Tall Fescue, Perennial Ryegrass

For annual bluegrass control, ARY 0452-110 Herbicide may be applied twice at 3.0–5.5 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. 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 labeled herbicides that contain mesotrione, carfentrazone-ethyl, sulfentrazone, 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. Follow the most restrictive of the labeling limitations and precautions of all the products used in the tank mixture.

ARY 0452-110 Herbicide may also be tank mixed with preemergence herbicides labeled for these uses 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.

Fine Fescues, and Tall Fescue, Perennial Ryegrass should be established for six months before application of ARY 0452-110 Herbicide.

Kentucky Bluegrass

For annual bluegrass control, ARY 0452-110 Herbicide may be applied twice at 3.0 fl oz/A at 10 to 21 day intervals in the spring months for turfgrass cut at 2.5" or higher. Alternatively, apply ARY 0452-110 Herbicide in the spring months at 1.5 fl oz ARY 0452-110 Herbicide/A for turfgrass cut at 2.5" or lower. Repeat the application at 7 [10 to 14] day intervals for a maximum of up to 4 applications. Make repeat applications 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.
- 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 3 to 6 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 labeled herbicides that contain mesotrione, carfentrazone-ethyl, sulfentrazone, 2,4-D, MCPP, dicamba or two and three-way herbicides that contain mixtures of 2,4-D, MCPP, clopyralid, dicamba, fluroxypyr, or triclopyr to enhance control of emerged broadleaf weeds. Follow the most restrictive of the labeling limitations and precautions of all the products used in the tank mixture.
- ARY 0452-110 Herbicide may also be tank mixed with preemergence herbicides labeled for these uses 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 3.0–14.0 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 (3.0–7.0 fl oz/A), repeat applications are recommended but the maximum rate per season must not exceed 14.0 fl oz of ARY 0452-110 Herbicide/A. Make repeat applications 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, MCPP, clopyralid, dicamba, fluroxypyr, 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 containing sulfentrazone. Consult the tank mix partner label for turfgrass species tolerance, weeds controlled and maximum weed sizes at applications. Follow the most restrictive labeled timing, limitations, and precautions between ARY 0452-110 Herbicide and any tank mix partner.

ARY 0452-110 Herbicide may also be tank mixed with preemergence herbicides labeled for these uses 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 7.1–14.0 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 4.5–5.5 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 of 4.5–5.5 fl oz/A 14 to 21 days after the first application or make up to three applications 4.5 fl oz/A at 14 to 21 day intervals. Do not apply more than 14.0 fl oz of this product per acre per year. 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.
- **Perennial Ryegrass should be established for 3 months before application of ARY 0452-110 Herbicide.**
- 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 to suppress or remove it.

For control of *Poa annua* in late spring and to aid in transition of perennial ryegrass to Bermudagrass make one application at 8.5–14 fl oz/A of ARY 0452-110 Herbicide.

ARY 0452-110 Herbicide may be tank mixed with labeled herbicides that contain 2,4-D, MCPP, dicamba or two and three-way herbicides that contain mixtures of 2,4-D, MCPP, clopyralid, dicamba, fluroxypyr, or triclopyr to enhance control of emerged broadleaf weeds. Follow the most restrictive of the labeling limitations and precautions of all the products used in the tank mixture.

ARY 0452-110 Herbicide may also be tank mixed with preemergence herbicides labeled for these uses 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.

Tropical Signalgrass Control in Seashore Paspalum, Zoysiagrass and Bermudagrass Tees and Fairways

Apply ARY 0452-110 Herbicide at 6.0–14.0 fl oz/A starting when tropical signalgrass starts actively growing in spring or fall. Make two sequential applications at 14 day intervals of 6.0–7.0 fl oz/A ARY 0452-110 Herbicide alone or two sequential applications at 14 day intervals of 6.0–7.0 fl oz/A ARY 0452-110 Herbicide as a tank mix with sulfentrazone + imazethapyr, foramsulfuron + halosulfuron + thiencazabone, or foramsulfuron. Tank mix combinations applied in the fall have shown to provide better control than applications made in spring. Refer to labels for appropriate application rates.

Crabgrass Species Control in St. Augustinegrass

ARY 0452-110 Herbicide at 3.0–7.0 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 7 to 21 day interval for up to three applications but do not exceed a maximum of 14.0 fl oz/A per year. St. Augustinegrass may be moderately injured by ARY 0452-110 Herbicide. Complete recovery of St. Augustinegrass will occur two to four weeks after the last application.

WEED CONTROL IN CONIFERS IN NURSERIES AND FIELD PLANTING (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 5.5–14.0 fl oz/A to actively growing weeds listed above. Repeat applications may be made but do not exceed 14.0 fl oz/A per year.

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

CORN USE DIRECTIONS

For use in field corn or corn grown for silage

CORN APPLICATION METHODS AND TIMINGS

Apply **ARY 0452-110 HERBICIDE** in combination with other herbicides registered for this use in conventional, conservation or no-till crop management systems as a preplant surface, preplant incorporated, preemergence or post-emergence application.

ARY 0452-110 HERBICIDE can be applied using either water or sprayable grade fluid fertilizer as a liquid carrier.

USE RESTRICTIONS:

- Do not apply more than one application per crop season.
- Do not apply more than 13.7 fl oz amicarbazone (0.45 lb ai) per acre per year.
- Do not apply when environmental conditions favor drift.
- Do not use on popcorn, sweet corn, high oil corn hybrids or corn grown for seed.

USE PRECAUTIONS

Corn seed should be completely covered with soil or reduced crop stand or injury may occur.

ARY 0452-110 HERBICIDE applied preplant or preemergence can cause corn injury. Under stressful conditions (such as inadequate or excessive moisture, frost, cool or hot temperatures, compacted soils, injury from other pesticides, disease or other pest damage, mechanical injury, nutrient imbalances, or other conditions known to cause plant stress), ARY 0452-110 HERBICIDE injury will be intensified.

RATE SELECTION/SOIL TEXTURE

The product rates of **ARY 0452-110 HERBICIDE** are defined by texture and organic matter content of the soil being treated. Unless a specific soil texture is mentioned, rate tables throughout this label refer to the following three soil texture groups: coarse, medium and fine. If you are not sure how to classify your soil, contact your UPL representative, the cooperative extension service or other knowledgeable person. The following chart includes a complete listing of soil textures included in each of the soil textures grouping:

COARSE	MEDIUM	FINE
Sand	Loam	Silty clay loam
Loamy sand	Silt loam	Silty clay
Sandy loam	Silt	Clay loam
	Sandy clay loam	Clay
	Sandy clay	

USE RATES

Apply **ARY 0452-110 HERBICIDE** in tank-mixture with, or sequentially with additional registered herbicides to provide control of certain annual broadleaf weeds. Application rates vary according to application timing and soil characteristics. Choose the correct rate of **ARY 0452-110 HERBICIDE** according to your cropping management and soil characteristics.

Ground Broadcast Treatment

Apply **ARY 0452-110 HERBICIDE** and the labeled tank-mixtures in a minimum of 10 gallons of total spray volume per acre using broadcast boom equipment. 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 10 gallons whichever is greater.

Early Preplant / Preplant Surface

Apply **ARY 0452-110 HERBICIDE** as a tank-mixture as a broadcast-spray before planting corn. Tank mix with appropriate post-emergence herbicides to control any weeds present at the time of application. **ARY 0452-110 HERBICIDE** applications made greater than 15 days prior to planting require an appropriate sequential herbicide application to maintain commercially acceptable weed control throughout the season. If possible, do not move treated soil out of the row or move untreated soil to the soil surface during planting, since weed control may be reduced.

Preplant Incorporation

Apply **ARY 0452-110 HERBICIDE** in tank-mixes as a broadcast-spray and incorporate into the upper 1 to 2 inches of

the soil. Avoid deep incorporation since reduced weed control and/or crop injury may result. Incorporate with implements which provide uniform, shallow incorporation (Example: finishing disk, harrow, rolling cultivator, field cultivator, etc.)

RECOMMENDED PRE-PLANT AND PRE-EMERGENT HERBICIDES TANK-MIXED WITH ARY 0452-110 HERBICIDE		
2,4-D ester	flumioxazin ¹	S-metolachlor
acetochlor	glyphosate	pendimethalin
atrazine	glufosinate	pyroxasulfone
dicamba	isoxaflutole	saflufenacil
dimethenamid-P ¹	mesotrione	metribuzin

¹ Pre-plant applications only with ARY 0452-110 HERBICIDE

Preemergence

Apply **ARY 0452-110 HERBICIDE** broadcast in tank-mixes to the soil surface after planting of the crop but prior to crop emergence. Rainfall and/or overhead sprinkler irrigation is necessary to move **ARY 0452-110 Herbicide** into the upper soil surface where weed seeds germinate. Dry weather conditions following application may reduce weed control. If adequate moisture is not received within 7 to 10 days after application and weeds begin to emerge from the soil, a light rotary hoeing or shallow incorporation (no deeper than 1/2 inch deep) will improve performance. Excessive rainfall or irrigation after application may reduce weed control and / or increase crop damage.

Postemergence

Apply **ARY 0452-110 HERBICIDE** in tank-mixes after emergence through the 10-leaf collar stage (V10). Use drop nozzles and appropriate spacing to direct spray below the corn whorl and upper leaves. Consult the tank-mix partner label for the appropriate crop stage and size at application; make the application within the most restrictive labeled timing between **ARY 0452-110 HERBICIDE** and any selected tank-mix partner. (See **RECOMMENDED HERBICIDES TANK-MIXED WITH ARY 0452-110 HERBICIDE** section of this label). The maximum seasonal rate for post-emergence treatment is 4.5 fl oz/A (0.15 lb amicarbazone/A).

Adjuvants for Post-Emergence Use

When an adjuvant is to be used with this product, UPL NA Inc. recommends the use of a Chemical Producers and Distributors Association (CPDA) certified adjuvant. Use only a non-ionic surfactant (NIS) and ammonium sulfate (AMS) at 8.5 lbs/100 gallons of spray mixture with **ARY 0452-110 HERBICIDE** post emergence. DO NOT use crop oil concentrate (COC), methylated seed oils (MSO), or any adjuvant containing vegetable or petroleum oils with **ARY 0452-110 HERBICIDE** post-emergence or crop injury may occur.

Fall and Early Spring Applications

ARY 0452-110 HERBICIDE possesses both foliar and soil activity resulting in burndown and residual control of many weed species. If weeds are present at the time of treatment, apply **ARY 0452-110 HERBICIDE** with crop oil concentrate (COC) or methylated seed oil (MSO) to control labeled weeds less than 3 inches in height or diameter. Tank mixes with various herbicides can enhanced control of weeds greater than 3 inches in height or diameter, or those weeds present may not be fully controlled by **ARY 0452-110 HERBICIDE alone** (see table for **FALL AND EARLY SPRING TANK MIX**).

FALL AND EARLY SPRING TANK MIX HERBICIDES RECOMMENDED WITH ARY 0452-110 HERBICIDE	
Fall	Early Spring
2,4-D ester	2,4-D ester
atrazine	acetochlor
dicamba	atrazine
flumioxazin	dicamba
glufosinate	flumioxazin
glyphosate	glufosinate
metribuzin	glyphosate
paraquat	mesotrione

	metribuzin
	paraquat
	S-metolachlor

Observe directions for use, precautions and restrictions on the labels of all products selected for a burndown tank-mixture. Tank-mixtures containing atrazine will result in the burndown of labeled broadleaf weeds less than 6 inches in height.

Post-Harvest Applications

Fall Post-Harvest Application

ARY 0452-110 HERBICIDE may be soil applied into crop stubble after October 15, when the sustained soil temperature at the four-inch soil depth is less than 50° F, but before the ground is frozen. In locations where soils do not freeze in fall or winter, apply starting in November. Apply at 6.75 to 13.7 fl oz/A (0.22 to 0.45 lb ai/A amicarbazone). If a tank mix is desired, use an approved tank mix combination only, (see table above). If a fall application of **ARY 0452-110 HERBICIDE** has been made, the total amount of **ARY 0452-110 HERBICIDE** product for fall and a subsequent spring application in corn for that crop year must not exceed 13.7 fl oz/A (0.45 lb ai/A amicarbazone).

ARY 0452-110 HERBICIDE may be applied into crop stubble in the fall following the harvest of any previous crops but before the ground is frozen. In locations where soils do not freeze in fall or winter, apply starting in November. Apply at 6.75 to 13.7 fl oz/A (0.22 to 0.45 lb ai/A amicarbazone). If a tank mix is desired, use an approved tank mix combination compatible with the anticipated rotational crop.

Post-Harvest Weed Control

ARY 0452-110 HERBICIDE may be applied into crop stubble following the harvest of any previous crops. Apply at 6.75 to 13.7 fl oz/A (0.22 to 0.45 lb ai/A amicarbazone). If a fall application of **ARY 0452-110 HERBICIDE** has been made, the total amount of **ARY 0452-110 HERBICIDE** product for fall and a subsequent spring application in corn for that crop year must not exceed 13.7 fl oz/A (0.45 lb ai/A amicarbazone).

Restriction: Do not rotate to food or feed crops on treated land other than those listed in the **Rotation Restrictions** table above until an adequately sensitive bioassay or chemical test shows that no detectable amicarbazone is present in the soil or illegal residues may result.

WEEDS CONTROLLED

ARY 0452-110 HERBICIDE applied at full dosages and labeled application timings will control many annual broadleaf weeds, including ALS resistant weed populations.

BROADLEAF WEEDS CONTROLLED	
Carpetweed	Pennycress, Field
Clover, white	Pepperweed, Virginia
Chickweed	Pigweed spp. ^{1,2}
Dandelion (seedling)	Purslane (Common, Horse)
Horseweed ¹	Ragweed, Common
Jimsonweed	Shepherd's Purse
Kochia ²	Smartweed, Pennsylvania
Lambsquarters, Common ²	Speedwell spp.
Mallow, Venice	Spurge, Spotted
Morning glory spp. ¹	Sunflower, Wild
Mustard (Wild, Tansy)	Velvetleaf
Palmer amaranth ^{1,2}	Waterhemp (Common, Tall) ^{1,2}

¹ Due to extended periods of germination and/or dry weather conditions, control of these weeds may be erratic and may require cultivation or an appropriate postemergence herbicide application for control of late season escapes.

² Certain biotypes may have developed resistance to photosynthesis inhibiting herbicides (ex. Triazines). If weed resistance is known or suspected use in combination or in sequence with a registered non-photosynthesis inhibiting herbicide.

WEEDS PARTIALLY CONTROLLED

ARY 0452-110 HERBICIDE applied at full dosages and labeled application timings, especially at timings closer to planting, will provide partial control (suppression) of many difficult to control annual grass and broadleaf weeds.

WEEDS PARTIALLY CONTROLLED ¹	
BROADLEAVES	GRASSES
Cocklebur, Common	Barnyardgrass
Hemp Sesbania	Crabgrass spp.
Henbit	Cheat
Horsenettle	Foxtail spp.
Nightshade, Eastern Black	Goosegrass
Prickly sida	Lovegrass
Ragweed, Giant	Panicum, Fall
Thistle, Russian	

¹ These weeds will be suppressed or be reduced in competition. Reduced competition weeds will be stunted in growth and/or be of reduced populations as compared to non-treated areas. Commercially acceptable control may require the application of an appropriate preemergence tank-mixture or sequential postemergence herbicide treatment.

Soil Applied Corn Use Rates –

Soil applied Conventional tillage / Conservation tillage / No-till Corn		
Application Timing Prior to a planned sequential soil applied or postemergence application, or in tank-mixture with full rates of a broad spectrum herbicide treatment:	Product fl oz/A (lb ai/A)	
	Less than or equal to 2% Soil Organic Matter*	Greater than 2% Soil Organic Matter
Fall Post-Harvest	6.75 to 13.7 fl oz/A (0.22 to 0.45 lb ai/A)	6.75 to 13.7 fl oz/A (0.22 to 0.45 lb ai/A)
Spring Early Preplant, Preplant Incorporated, Preplant, and Preemergence	6.75 to 10 fl oz/A (0.22 to 0.33 lb ai/A)	6.75 to 13.7 fl oz/A (0.22 to 0.45 lb ai/A)

Use the higher rate of **ARY 0452-110 HERBICIDE** within the applicable rate range when applying at or prior to planting for full season broadleaf weed control.

Use the lower rate of **ARY 0452-110 HERBICIDE** within the applicable rate range when applying in combination with full rates of additional broadleaf herbicides, or when planning a sequential application of a broad spectrum herbicide.

ARY 0452-110 HERBICIDE applied preplant or preemergence can cause corn injury. Under stressful conditions (such as inadequate or excessive moisture, frost, cool or hot temperatures, compacted soils, injury from other pesticides, disease or other pest damage, mechanical injury, nutrient imbalances, or other conditions known to cause plant stress), ARY 0452-110 HERBICIDE injury will be intensified.

ARY 0452-110 HERBICIDE applications made greater than 15 days prior to planting may require an appropriate sequential herbicide application to maintain commercially acceptable weed control throughout the season.

POST-EMERGENCE	
Application Timing Use in combination with other broadleaf and/or grass and broadleaf post-emergence herbicides at rates of the tank-mix partners recommended on their respective labels ¹	Rate fl oz/A
Post-Emergence (apply to corn from emergence through the 10-leaf collar stage V10)	1.2 to 4.5 fl oz/A (0.04 to 0.15 lb ai/A)
¹ Do not use crop oil concentrate (COC), methylated seed oils (MSO), or any adjuvant containing vegetable or petroleum oils with ARY 0452-110 HERBICIDE post emergence as crop damage may occur. When an adjuvant is to be used with this product, UPL recommends the use of a Chemical Producers and Distributors Association (CPDA) certified adjuvant.	

Post-emergence Restrictions

- Do not make post-emergence applications using sprayable grade fluid fertilizers as the carrier because severe crop injury may occur.
- Do not apply when corn is under stress (see **Stress** statement section).

Post-emergence Precautions

- Corn injury could occur with a post over-the-top application greater than V5, it is recommended to use drop nozzles or post-directed applications up to V10.

Stress is any condition or combination of conditions which impairs normal crop growth. Weather, disease, insect damage, fertility or other factors may cause stress. Applications made before or after the crop is under stress from these factors or from periods of prolonged cool, wet and cloudy weather, or widely fluctuating day and nighttime temperatures may result in temporary leaf burn, yellowing and/or stunting of the crop. Recovery from damage is generally rapid with no lasting effects on new growth. Under extreme stress, stand reductions may occur.

Refer to the individual product labels for additional information concerning use rates, precautions and / or restrictions. Always follow the most restrictive label use directions.

TANK-MIX AND SEQUENTIAL HERBICIDE COMBINATIONS

Apply **ARY 0452-110 HERBICIDE** as a tank-mix or in sequence with additional herbicides to provide improved spectrum of weed control. Control of grassy weeds and additional control of certain hard-to-control broadleaf weeds is provided with various tank-mixtures, applied in either conventional, conservation or no-till crop management systems. Apply tank-mix partners with similar timings and methods as **ARY 0452-110 HERBICIDE** alone unless specifically prohibited in the tank-mix partner's product label, or otherwise indicated in the table **RECOMMENDED HERBICIDES TANK-MIXED WITH ARY 0452-110 HERBICIDE**. Three-way or multiple tank-mixtures are permitted unless restricted by any tank-mix partner's label. (See Compatibility Section) Refer to the individual product labels for labeled use rates (unless mentioned specifically on this label), precautions and restrictions.

Refer to the individual product labels for additional information concerning use rates, precautions and/or restrictions. Always follow the most restrictive label use directions.

STORAGE AND DISPOSAL

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

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. Do not walk through spilled material. Dispose of pesticide as directed below. In spill or leak incidents, keep unauthorized people away.

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

CONTAINER HANDLING: Rigid, nonrefillable in containers small enough to shake (less than or equal to 5 gallons) Nonrefillable container. Do not reuse or refill this container. Triple rinse container (or equivalent) promptly after emptying. Triple Rinse as follows: Empty the remaining contents into application equipment or a mix tank and drain for 10 seconds after the flow begins to drip. Fill the container 1/4 full with water and recap. Shake for 10 seconds. Pour rinsate into application equipment or a mix tank or store rinsate for later use or disposal. Drain for 10 seconds after the flow begins to drip. Repeat this procedure two more times. 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)

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.

**IMPORTANT INFORMATION
READ BEFORE USING PRODUCT**

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 product at once, unopened, and the purchase price will be refunded.

The Directions for Use of this product reflect the opinion of experts based on field use and tests, and must be followed carefully. It is impossible to eliminate all risks associated with the use of this product. Crop injury, ineffectiveness or other unintended consequences may result because of such factors as manner of use or application, weather or crop conditions, presence of other materials or other influencing factors in the use of the product, which are beyond the control of UPL NA Inc or Seller. Handling, storage, and use of the product by Buyer or User are beyond the control of UPL NA Inc and Seller. To the extent consistent with applicable law, all such risks shall be assumed by Buyer and User, and Buyer and User agree to hold UPL NA Inc and Seller harmless for any claims relating to such factors.

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