STATE OF MAINE
DEPARTMENT OF AGRICULTURE, CONSERVATION & FORESTRY
BOARD OF PESTICIDES CONTROL
28 STATE HOUSE STATION
AUGUSTA, MAINE 04333

JANET T. MILLS
GOVERNOR

AMANDA E. BEAL
COMMISSIONER

To: Board of Pesticides Control
From: Mary Tomlinson, Pesticides Registrar/Water Quality Specialist
Re: Request to extend ME-100003 EPA Special Local Need (FIFRA, Section 24(c)) registration for use of Asulox Herbicide (EPA Reg. No. 70506-139) to control bracken fern in wild blueberries
Date: February 19, 2020

The Special Local Need (SLN) registration for Asulox Herbicide (EPA Reg. No. 70506-139) was first approved in 2010 and the Board approved a five-year extension in 2014 which expired January 31, 2020. Dr. Lily Calderwood, blueberry specialist at the University of Maine Cooperative Extension requests renewal of this SLN. In the absence of other effective control measures for bracken fern, this product has proven to be effective, especially in newly cleared land and abandoned fields returned to production. The proposed SLN will expire December 31, 2024.

There are no changes to the SLN label and the application conditions, as listed below, remain the same.

- Application will be no more than once every other year.
- Application will be made during non-bearing years.
- Application will be via spot treatment.

Although the risk to surface and ground water may be reduced due to the application conditions listed above, water quality monitoring is recommended due to the potential for runoff and leaching. The presence of Asulam, the active ingredient, in groundwater has not been evaluated in Maine and would require a separate analysis from the Montana Universal method.

Please review the following documents and let me know if you have any questions.

- Letter of request, Lily Calderwood, Ph.D., Wild Blueberry Specialist, Maine Cooperative Extension
- Board Memo regarding the risk assessment, Pam Bryer, Ph.D.
- Letter of Support, Rebecca Clemmer, UPL-Ltd. Inc.
- Asulox Herbicide proposed Maine SLN label
- Asulox Herbicide Section 3 label

February 12, 2020

Dear Mary Tomlinson,

On behalf of the University of Maine Cooperative Extension and lowbush (wild) blueberry producers in Maine, I request an extension of the 24C label for Asulox herbicide for use on bracken fern. Our current 24C label recently expired on January 31, 2020. There has been an Asulox 24C label approved for use on this crop since 2010.

Bracken fern, *Pteridinium* species, are a serious weed in lowbush blueberry fields. The successional habitat in which lowbush blueberry is grown exhibit the same conditions that bracken fern lives. Through my Extension program, growers are encouraged to identify weeds in their fields and use cultural methods of weed management including sulfur application to bring the pH down and mechanical weed removal before using an herbicide method of control. Unfortunately, bracken fern grows well in the acidic soils, which must be maintained for grass weed suppression and wild blueberry growth.

There are 36,000 acres of commercial lowbush blueberry production in Maine. There are 485 total growers, 433 of which are conventional. In my recent weed survey, we found bracken fern to be one of the top two weeds that cover the most area in organic lowbush blueberry fields with very little bracken fern coverage in conventional fields. This is an indication that braken fern is prevalent on farms that have not applied Asulox. This product is one of the only products available for conventional growers to use against bracken fern, which shades lowbush blueberry with its wide fronds.

Please support extending the Asulox 24C label for lowbush blueberry in Maine. I recently sent Arysa LifeScience North America LLC (Jody Hemphill) a request for this extension. Please let me know if the Board of Pesticide Control has any questions.

Sincerely,

Lily B. Calderwood

Dr. Lily Calderwood
University of Maine
Extension Wild Blueberry Specialist
5722 Grove Street Ext.
103 Deering Hall

Orono, ME 04469

UPL NA Inc.
630 Freedom Business Center,
Suite 402
King of Prussia, PA 19406

Rebecca A. Clemmer
Sr. Regional Regulatory Manager

Feb. 17, 2020

Mary E. Tomlinson
Pesticide Registrar/Water Quality Specialist
Maine Board of Pesticides Control
28 SHA
Augusta, ME 04333

Re: Renewal of Special Local Need label

Dear Ms. Tomlinson:

UPL NA Inc. supports the renew of the Special Local Need label ME-100003, for the use of Asulam (EPA Reg. No. 70506-139) for control of bracken fern in lowbush blueberries (non-bearing fields only).

Please contact me if you have any questions.

Sincerely,

R. A. Clemmer

Rebecca A. Clemmer
Sr. Regional Regulatory Manager
Rebecca.clemmer@upl-ltd.com
Tel: 610-491-2828

STATE OF MAINE
DEPARTMENT OF AGRICULTURE, CONSERVATION & FORESTRY
BOARD OF PESTICIDES CONTROL
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JANET T. MILLS
GOVERNOR

AMANDA E. BEAL
COMMISSIONER

Memorandum

To: Board of Pesticides Control
From: Pam Bryer, Toxicologist
Subject: Asulox Special Local Need 2020 Review

February 19, 2020

Asulam has been used in Maine for several years under a Special Local Needs (SLN) registration for the control of bracken fern in lowbush blueberry fields. Previous reviews from the BPC toxicologist in 2010 and 2015 highlight the relatively low acute toxicity to many organisms, the short residence time in sunlit water and soil, and many pieces of missing data. In 2018, EPA issued a Proposed Interim Decision supported with several supporting documents and much of the data that was missing during the BPC's last SLN registration review is now available.

The primary concerns of this review focuses on: applicator safety, residues remaining on blueberries entering the marketplace, and ecological effects. This review is focused on the proposed use on lowbush blueberry in Maine. Spot use on blueberry fields during the non-bearing year is not consistent with how EPA modeled its potential effects during registration review. For example, the label allows asulam to be applied by aircraft over sugarcane twice a year (doubling the annual lbs/A over this proposed use). As a result, it is difficult to say how the effects demonstrated by EPA's predictive modeling compare to use in Maine. The modeling used throughout EPA's recent interim decision are at the very least conservative, however, they may be so conservative as to be unhelpfully vague for this specific use.

More data on the use patterns in Maine would help better understand how comparable Maine use patterns are to the patterns used by EPA in their interim decision modeling which were largely based on sugarcane. The label submitted with this SNL application allows for 3.34 lbs a.i./A as a spot treatment only once every other year. EPA reports that sugarcane growers used 270,000 lbs of asulam from 2011-2015. If we assume that 90% (10% are under organic production) of the 36,000 acres in Maine production use asulam consistent with the SLN label, Maine growers could use as much as 53,500 lbs each year (every-other-year application). EPA modeling uses the maximum allowable rate, however, their data show that sugarcane growers do not use the 3.6 lbs a.i./A rate two times a year as allowed. Typically, sugarcane growers use 1.5 to 2.5 lbs a.i./A

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only once a year. Additional use data from Maine growers could help fully understand potential effects.

Applicator Safety Concerns:
The application scenario for Maine applicators, ground-level spot applying, is unlikely to pose undue risk to applicators when used as labeled. Asulam has low hazard to mammals and the exposure pathways do not favor uptake during application. Dermal exposures are not considered to be important in mammals based on animal testing. Mammals show high tolerance to asulam exposures, in many of the toxicity tests the maximum exposure dose was reached before any effects were found. There were no thyroid or developmental changes following long-term exposures in rats.

In contrast, based on tumors found in rat studies, EPA has classified asulam within the Group C, possible human carcinogen category. Asulam can produce eye and skin irritation. The harm from asulam is considered mitigated by following the label instruction for proper PPE and REI.

Tolerance Concerns:
There is no tolerance established for asulam on blueberry. There is a tolerance for sugarcane, molasses from sugarcane, and several livestock products (fat, milk, etc.) likely to be fed molasses. There are SLNs in other states for seed spinach and seed alfalfa growing. There are no other established asulam tolerances in the Codex Alimentarius or for other countries.

Data is lacking on the length of time asulam persists in soil. This lack of fate data is a gap identified in EPA's 2018 interim decision. How asulam behaves in various environmental media is unknown. The Asulox label reads that results will not be visible during the year of application, "Control will be observed the year following application of the Asulox." The mechanism of action is to interfere with growth so it is understandable that asulam would not produce a remarkable response following application. But, how is control in the harvest year accomplished? Bracken fern are perennial and can have robust rhizomes. Asulam has high leaching potential and therefore it is expected to also easily translocate evenly throughout the plant tissues. Just as there is asulam for weed control in the bearing year, it is possible that asulam may occur in the blueberry fruit due to stored asulam in the blueberry roots. I have not received data that speaks to the potential for this fate pathway in blueberries. We would expect large quantities asulam to affect the blueberry crop since it is an herbicide. This product is used on 30% of all US grown sugarcane without tolerance violations. Clearly, in sugarcane there is a mechanism for asulam degradation, perhaps this same process could also be at work for blueberries. Additional clarification around the issue of fate in the environment would help us better assess potential residue levels in blueberry.

Ecological Concerns:
Leaching
The main concern with asulam comes from its potential for easily leaching. In sunlight asulam is rapidly broken down. If the product moves into the ground before being photodegraded EPA considers it a risk to ground and surface water. Data reported by EPA, found 8 detections out of

the 11,269 database returns for asulam; 2 groundwater and 6 surface water. The groundwater values were 0.0047 ug/L and 0.0285 ug/L. The surface water values were 0.0495 ug/L to 0.669 ug/L. In 2002, Maine CDC established a water quality guideline of 35 ug/L for asulam.

Asulam is considered to be practically non-toxic to freshwater fish and invertebrates. There is no data on marine/estuarine organisms.

In sum, although asulam readily leaches, the short half-life and low toxicity profile prevent undue harm to freshwater aquatic organisms.

Birds & Mammals
Asulam has little acute toxicity to birds and mammals, however, it does affect reproduction in both birds and mammals as a result of chronic exposures. In multiple species of birds, asulam exposure produced eggshell thinning. In mammals, there was a reduction in the number of viable offspring. Based on the modeled exposure patterns (e.g. the sugarcane scenario) EPA predicts chronic effects to be seen in birds and mammals.

In order to mitigate the potential adverse effects on birds and mammals, EPA changed the label language to reduce drift. The changes introduced in 2018 were: ground applications must be made no more than 4 feet from the ground or canopy and the droplets must be in the medium-coarser ASABE Standard 572.1 size range. EPA considered those changes to be sufficient to allow continued use at the current application rate.

Bees
During acute exposures asulam is practically non-toxic to bees on contact, however, there is a large data gap in the honey bee data. There is only one test, the adult acute contact test, that has been performed. There is not enough data to fully determine effects on bees.

In sum, EPA indicates in their 2018 interim decision that between the label changes and the knowledge that few or no producers are likely to be using asulam at the maximum allowable rate there should be no undue harm to the environment.

SLN request summary
It seems impossible that growers in Maine would ever reach the predicted harm from the high exposures modelled under the sugarcane scenario (3.65 lbs/A twice a year by aircraft). Asulam has a consistently low toxicity profile especially when drift is managed. It has low acute toxicity to many taxa and the chronic exposure endpoints of concern should be mitigated by the current label.

The only uncertainty in this use surrounds tolerance violations because of the potential presence of asulam in blueberries at harvest.

FIFRA Section 24(c)

SPECIAL LOCAL NEED LABEL

FOR DISTRIBUTION AND USE ONLY WITHIN THE STATE OF MAINE

ASULOX® HERBICIDE

EPA Reg. No. 70506-139 EPA SLN No. ME-100003

ASULOX FOR CONTROL OF BRACKEN FERN IN LOWBUSH BLUEBERRIES
Non-bearing fields only

DIRECTIONS FOR USE

It is a violation of Federal law to use this product in a manner inconsistent with its labeling. This label and the federal label for this product must be in the possession of the user at the time of pesticide application.

Weed Species	Rate	Special Instructions
Bracken Fern (*Pteridium aquilinum*)	1 gal/acre	Bracken should be in full frond prior to application. Use Asulox only as a spot treatment. The use of a non ionic surfactant at 0.25% v/v may improve uptake of the Asulox. Treatment is limited to non bearing fields. Do not apply more than once every other year. Control will be observed the year following application of the Asulox. No visible control symptoms will be observed the year of application.

Rev. 2/17/2020
Expires Dec. 31, 2024

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

GROUP 18 HERBICIDE

ASULOX®

HERBICIDE

FOR AGRICULTURAL OR COMMERCIAL USE ONLY
NOT FOR USE BY HOMEOWNERS

For Postemergent Weed Control in Sugarcane, Turf, Ornamentals, Christmas Tree Plantings and Non-Cropland

ACTIVE INGREDIENT:	
Sodium salt of asulam (methyl sulfanilylcarbamate)*	36.2%
OTHER INGREDIENTS:	63.8%
TOTAL:	100.0%

*Equivalent to 33.1% asulam or not less than 3.34 lbs. per gallon.

EPA Reg. No. 70506-139

KEEP OUT OF REACH OF CHILDREN

CAUTION

FIRST AID	
IF ON SKIN OR CLOTHING:	• Take off contaminated clothing. • Rinse skin immediately with plenty of water for 15-20 minutes. • Call a poison control center or doctor for treatment advice.
IF IN EYES:	• Hold eye open and rinse slowly and gently with water for 15-20 minutes. • Remove contact lenses, if present, after the first 5 minutes, then continue rinsing. • Call a poison control center or doctor for treatment advice.
Have the product container or label with you when calling a poison control center or doctor or going for treatment. You may also contact the Rocky Mountain Poison Center at 1-866-673-6671 for emergency medical treatment information.	

FOR CHEMICAL EMERGENCY: Spill, leak, fire, exposure, or accident, call CHEMTREC 1-800-424-9300.

HERBICIDE

NET CONTENTS: _____ GALLONS

UPI

United Phosphorus, Inc. • 630 Freedom Business Center, Suite 402 • King of Prussia, PA 19406 U.S.A. • 1-800-438-6071

PRECAUTIONARY STATEMENTS
HAZARD TO HUMANS AND DOMESTIC ANIMALS

CAUTION: Harmful if absorbed through skin. Avoid contact with eyes, skin or clothing. Prolonged or frequently repeated skin contact may cause allergic reaction in some individuals. Wash hands before eating, drinking, chewing gum, using tobacco or using the toilet.

PERSONAL PROTECTIVE EQUIPMENT (PPE)

Applicators and other handlers must wear long-sleeved shirt and long pants, chemical-resistant gloves (such as Nitrile, Butyl, Neoprene, and/or Barrier Laminate), and 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 STATEMENTS

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

User Safety Recommendations

Users should leave the treated area, remove clothing immediately if pesticide gets inside. Then wash thoroughly and put on clean clothing.

Users should remove PPE immediately after handling this product. Wash the outside of gloves before removing. As soon as possible, wash thoroughly and change into clean clothing.

ENVIRONMENTAL HAZARDS

This chemical is known to leach through soil into ground water under certain conditions as a result of agricultural use. Use of this chemical in areas where soils are permeable, particularly where the water table is shallow, may result in ground water contamination. Surface water contamination may occur in areas with poorly draining soils and little or no buffers or in areas where drainage systems flow directly to surface water.

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 clean equipment or dispose of equipment washwater in a manner that will contaminate resources. Do not apply when weather conditions favor drift from treated areas. Do not contaminate water by cleaning of equipment or disposal of wastes.

DIRECTIONS FOR USE

It is a violation of Federal Law to use this product in a manner inconsistent with its labeling.

Read entire label before using this product.

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 intervals. 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.

PPE required for early entry to treated areas that is permitted under the Worker Protection Standard and that involves contact with anything that has been treated such as plants, soil or water is coveralls, chemical resistant gloves, and shoes plus socks.

GENERAL INSTRUCTIONS AND INFORMATION

APPLICATION INSTRUCTIONS

Do not apply ASULOX® Herbicide through any type of irrigation systems.

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 regulations.

SPRAY DRIFT

SENSITIVE AREAS: This herbicide should only be applied when the potential for drift to adjacent sensitive areas (e.g., residential areas, bodies of water, known habitats for threatened or endangered species, non-target crops) is minimal (e.g., when wind is blowing away from the sensitive areas).

AVOIDING SPRAY DRIFT AT THE APPLICATION SITE IS THE RESPONSIBILITY OF THE APPLICATOR. The interaction of many equipment and weather-related factors determine the potential for spray drift. The applicator is responsible for considering all these factors when making decisions. The following drift management requirements must be followed to avoid off-target movement from aerial applications to agricultural field crops. These requirements do not apply to forestry applications, public health uses or to applications using dry formulation.

1. The distance of the outer most nozzles on the boom must not exceed 3/4 the length of the wingspan or rotor.
2. Nozzles must always point backward parallel with the air stream and never be pointed downwards more than 45 degrees.

Where states have more stringent regulations, they should be observed. The applicator should be familiar with and take into account the information covered in the Aerial Drift Reduction Advisory Information.

I**NFORMATION ON DROPLET SIZE:** (This section is advisory in nature and does not supersede the mandatory label requirements)

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

CONTROLLING DROPLET SIZE: (This section is advisory in nature and does not supersede the mandatory label requirements)

- Volume - Use high flow rate nozzles to apply the highest practical spray volume. Nozzles with higher rated flows produce larger droplets.
- Pressure - Do not exceed the nozzle manufacturer's recommended pressures. For many nozzle types lower pressure produces larger droplets. When higher flow rates are needed, use higher flow rate nozzles instead of increasing pressure.
- Number of nozzles - Use the minimum number of nozzles that provide uniform coverage.
- Nozzle Orientation - Orienting nozzles so that the spray is released parallel to the airstream produces larger droplets than other orientations and is the recommended practice. Significant deflection from horizontal will reduce droplet size and increase drift potential.
- Nozzle Type - Use a nozzle type that is designed for the intended application. With most nozzle types, narrower spray angles produce larger droplets. Consider using low-drift nozzles. Solid stream nozzles oriented straight back produce the largest droplets and the lowest drift.

BOOM LENGTH: (This section is advisory in nature and does not supersede the mandatory label requirements)

For some use patterns, reducing the effective boom length to less than 3/4 of the wingspan or rotor length may further reduce drift without reducing swath width.

APPLICATION HEIGHT: (This section is advisory in nature and does not supersede the mandatory label requirements)

Applications should not be made at a height greater than 10 feet above the top of the target plants unless a greater height is required for aircraft safety. Making applications at the lowest height that is safe reduces exposure of droplets to evaporation and wind.

SWATH ADJUSTMENT: (This section is advisory in nature and does not supersede the mandatory label requirements)

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

WIND: (This section is advisory in nature and does not supersede the mandatory label requirements)

Drift potential is lowest between wind speeds of 2 to 10 mph. However, many factors, including droplet size and equipment type determine drift potential at any given speed. Application should be avoided below 2 mph due to variable wind direction and high inversion potential. **NOTE:** Local terrain can influence wind patterns. Every applicator should be familiar with local wind patterns and how they affect spray drift.

TEMPERATURE AND HUMIDITY: (This section is advisory in nature and does not supersede the mandatory label requirements)

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

TEMPERATURE INVERSIONS: (This section is advisory in nature and does not supersede the mandatory label requirements)

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

SUGARCANE

ASULOX Herbicide can be applied to either plant cane or cane grown from stubble. Apply ASULOX as a water mix spray for ground applications. Use 15 to 100 gallons of water per acre, depending on local practice. For aerial application, ASULOX Herbicide should be mixed in 3 to 5 gallons of water per acre, except in Hawaii, where 5 to 10 gallons of water per acre should be used.

Addition of an adjuvant cleared for use on growing crops to the ASULOX Herbicide water mix spray will improve weed control when environmental conditions are not optimal. Use either a non-ionic surfactant containing a minimum of 80% active ingredient at the rate of 1 to 2 quarts per 100 gallons (0.25 to 0.5% V/V) of water mix spray or a crop oil concentrate containing 80 to 85% paraffin based petroleum oil and 15 to 20% non-ionic surfactant at the rate of 4 quarts per 100 gallons (1% V/V) of water mix spray.

The rates of ASULOX Herbicide given below are for broadcast applications. For banded application, reduce the rate proportionally to the width of the band according to the following formula:

$$\frac{\text{BAND WIDTH (inches)}}{\text{ROW WIDTH (inches)}} \times \text{Broadcast Rate} = \text{Band Rate/Acre}$$

For spot treatments, use a 5% v/v ASULOX spray (1 gallon per 20 gallons of water). Do not exceed 8 pints of ASULOX per acre per treatment.

Single Application Per Growing Season

WEED SPECIES	SPECIAL INSTRUCTIONS	RATE
Itchgrass or Raoulgrass *(Rottboellia exaltata)*	Apply when the grass is 8 inches tall or less (addition of surfactant is necessary).	8 pints/acre
Johnsongrass *(Sorghum halepense)*	Apply when the grass is between 12 to 18 inches tall. Johnsongrass should be actively growing and the average air temperature should be at least 60°F or higher.	
Paragrass or Californiagrass *(Brachiaria mutica* or *Panicum purpurascens)*	Apply when the grass is 6 to 8 inches tall or less.	
Crabgrass *(Digitaria* spp.*)*	If treatment is made before the grass reaches seed head formation then the lower rate should be used. If the grass is in early seed head formation then the higher rate should be used.	6 to 8 pints/acre
Alexandergrass *(Brachiaria plantaginea)* Foxtail *(Setaria* spp.*)* Goosegrass *(Eleusine indica)* Broadleaf Panicum *(Panicum adspersum)* Barnyardgrass *(Echinochloa crusgalli)*	If treatment is made when the grass is 6 to 8 inches tall or less, then the lower rate should be used. If the grass is greater than 8 inches tall, then the higher rate should be used.	

Two Applications Per Growing Season

This may be required when initial weed infestations are heavy and/or when rhizome Johnsongrass is present. Two applications may also be used when treating weed species which germinate at different times during one growing season.

WEED SPECIES	SPECIAL INSTRUCTIONS	1ST APPLICATION	2ND APPLICATION
Crabgrass *(Digitaria* spp.*)*	At each application the grass should be treated before seed head formation.	6 to 8 pints/acre	6 to 8 pints/acre
Itchgrass or Raoulgrass *(Rottboellia exaltata)*	At each application the grass should be 8 inches tall or less (addition of surfactant is necessary).	8 pints/acre	8 pints/acre
Johnsongrass *(Sorghum halepense)*	At each application the grass should be between 12 and 18 inches tall.	8 pints/acre	8 pints/acre

RESTRICTIONS AND PRECAUTIONS: Sugarcane

- ASULOX Herbicide should be used when the weeds are actively growing.
- Cover crops may be planted if plowed under and not grazed.
- The following pre-harvest intervals for ASULOX Herbicide applications to sugarcane must be observed: 1) Mainland U.S.A. (except Louisiana) – 140 days; 2) Louisiana only – 100 days; 3) Hawaii – 400 days.
- Do not graze or feed sugarcane fodder and forage to livestock.
- Cultivation and/or fertilizer applications or any other cultural practice that disturbs the root system of targeted weed species may result in less than optimum control when applying ASULOX Herbicide. These practices are not recommended within 7 days prior to or within 7 days after applications of ASULOX Herbicide.
- Differences in crop tolerance to ASULOX among Sugarcane varieties has been reported in Louisiana. Contact your local County Agent or University Extension Specialist for further information.

NON-CROPLAND

ASULOX Herbicide may be used as a postemergent treatment to control weeds on non-cropland areas such as:

Boundary fences
Fence rows
Highway and roadside rights-of-way
Lumberyards
Pipeline rights-of-way
Railroad rights-of-way and yards
Storage areas and industrial plant sites
Utility rights-of-way and yards
Warehouse lots

A surfactant may be added to the spray solution at 0.25% by volume. (Use an approved non-ionic surfactant.)

Apply ASULOX as a single water-mix spray for ground applications using 20 to 100 gallons of solution per acre, depending on local practice, to control the following weed species. Apply one application per season. Aerial application is prohibited.

WEED SPECIES	SPECIAL INSTRUCTIONS	RATE
Crabgrass *(Digitaria* spp.*)*	Apply before the grass reaches seed head formation.	1 gal/acre
Johnsongrass *(Sorghum halepense)*	Apply when the grass is 18 inches or taller. Use the higher rate in well established heavy infestations. For spot treatment in Hawaii, use the higher rate in 100 gallons of solution and apply an amount not to exceed 50 gallons of total solution per acre.	
Paragrass or Californiagrass *(Brachiaria mutica* or *Panicum purpurascens)*	Apply before the grass reaches seed head formation. For spot treatment in Hawaii, use the same rate in 100 gallons of solution and apply an amount not to exceed 50 gallons of total solution per acre.	
Western Bracken *(Pteridium aquilinum* var. *pubescens)*	Apply when the fern is in full frond.	7 to 8 pints/acre

CHRISTMAS TREE PLANTINGS

ASULOX Herbicide may be used as a postemergent treatment in Christmas Tree Plantings where Douglas Fir, Grand Fir, Noble Fir or Scotch Pine are grown. Do not graze or feed foliage from treated areas to livestock.

ASULOX Herbicide should be applied as a water mix spray. For ground application, use a minimum of 20 gallons of solution per acre. Do not use a wetting agent with ASULOX Herbicide. Apply one application per season. Aerial application is prohibited.

WEED SPECIES	SPECIAL INSTRUCTIONS	RATE
Western Bracken *(Pteridium aquilinum* var. *pubescens)*	Apply after bud break and hardening or firming of new tree growth. Bracken should be in full frond prior to treatment.	1 gal/acre

TURF
(Sod Farms Only)

ASULOX Herbicide can be applied on St. Augustinegrass and Tifway 419 Bermudagrass turf. Apply one application per season postemergence to the weeds listed below. Use 20 to 50 gallons of water per acre in the spray solution.

TURF SPECIES	WEED SPECIES	RATE
St. Augustinegrass	Bullgrass *(Paspalum supinum)* Crabgrass *(Digitaria* sp.*)* Goosegrass *(Eleusine indica)*	5 pints/acre
Tifway 419 Bermudagrass	Sandbur *(Cenchrus* sp.*)*	

Do not use a surfactant. Do not apply to turf which is under stress or freshly mowed.

ORNAMENTALS

ASULOX Herbicide can be applied as a single, postemergent, broadcast application on the following ornamentals:

JUNIPERS		YEWS	
Juniperus andorra	Juniperus horizontalis	Taxus cuspidata	Podocarpus macrophyllus
Juniperus chinensis	Juniperus litoralis	Taxus media	
Juniperus conferta	Juniperus sabina		

Treatment should be made with a minimum of 20 gallons of water per acre. Do not use a surfactant.

WEED SPECIES	SPECIAL INSTRUCTIONS	RATE
Barnyardgrass *(Echinochloa crusgalli)* Crabgrass *(Digitaria* sp.*)* Fall Panicum *(Panicum dichotomiflorum)* Foxtails *(Setaria* sp.*)* Goosegrass *(Eleusine indica)* Horseweed (marestail) *(Conyza canadensis)*	Apply when the weeds are between the stages of early seedling and early seed head formation.	1 gal/acre

Local conditions may affect the use of this chemical. Consult State Agricultural Extension or Experiment Station weed specialists for specific recommendations for local weed problems and for information on possible lower dosages.

STORAGE AND DISPOSAL

PESTICIDE STORAGE: Do not contaminate water, food or feed by storage or disposal. Open dumping is prohibited. Store at temperatures above 20° F.

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

CONTAINER DISPOSAL: Nonrefillable container. Do not reuse or refill this container.

[for containers less than 5 gallons] 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 rinse 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. Then offer for recycling if available, or puncture and dispose of in a sanitary landfill, or by incineration, or, if allowed by state and local authorities, by burning. If burned, stay out of smoke.

[for containers greater than 5 gallons] Triple rinse or pressure rinse as follows:

Triple rinse: empty the 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. Then offer for recycling if available, or puncture and dispose of in a sanitary landfill, or by incineration, or, if allowed by state and local authorities, by burning. If burned, stay out of smoke.

Pressure rinse: Empty the remaining contents into application equipment or a mix tank and continue to drain for 10 seconds after the flow begins to drip. Hold container upside down over application equipment or mix tank or collect rinsate for later use or disposal. Insert pressure rinsing nozzle in the side of the container, and rinse at about 40 PSI for at least 30 seconds. Drain for 10 seconds after flow begins to drip. Then offer for recycling if available, or puncture and dispose of in a sanitary landfill, or by incineration, or by other procedures allowed by state and local authorities.

CONTAINER DISPOSAL: Refillable container. Refill this container with pesticide only. Do not reuse this container for any other purpose.

Cleaning the container before final disposal is the responsibility of the person disposing of the container. Cleaning before refilling is the responsibility of the refiller. To clean the container before final disposal, empty the remaining contents from this container into application equipment or mix tank. Fill the container about 10 percent full with water. Agitate vigorously or recirculate water with the pump for 2 minutes. Pour or pump rinsate into application equipment or rinsate collection system. Repeat this rinsing procedure two more times.

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 United Phosphorus, Inc. or Seller. Handling, storage, and use of the product by Buyer or User are beyond the control of United Phosphorus, Inc. and Seller. All such risks shall be assumed by Buyer and User, and Buyer and User agree to hold United Phosphorus, Inc. and Seller harmless for any claims relating to such factors.

To the extent consistent with applicable law, United Phosphorus, Inc. 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 referred to above, when used in accordance with directions under normal use conditions. This warranty does not extend to the use of this product contrary to label instructions, or under abnormal conditions or under conditions not reasonably foreseeable to or beyond the control of Seller or United Phosphorus, Inc., and Buyer and User assume the risk of any such use. To the extent consistent with applicable law, UNITED PHOSPHORUS, INC. MAKES NO WARRANTIES OF MERCHANTABILITY OR OF FITNESS FOR A PARTICULAR PURPOSE NOR ANY OTHER EXPRESS OR IMPLIED WARRANTY EXCEPT AS STATED ABOVE.

To the extent consistent with applicable law, United Phosphorus, Inc. or Seller shall not be liable for any incidental, consequential or special damages resulting from the use or handling of this product and **THE EXCLUSIVE REMEDY OF THE USER OR BUYER, AND THE EXCLUSIVE LIABILITY OF UNITED PHOSPHORUS, INC. AND SELLER FOR ANY AND ALL CLAIMS, LOSSES, INJURIES OR DAMAGES (INCLUDING CLAIMS BASED ON BREACH OF WARRANTY, CONTRACT, NEGLIGENCE, TORT, STRICT LIABILITY OR OTHERWISE) RESULTING FROM THE USE OR HANDLING OF THIS PRODUCT, SHALL BE THE RETURN OF THE PURCHASE PRICE OF THE PRODUCT OR, AT THE ELECTION OF UNITED PHOSPHORUS, INC. OR SELLER, THE REPLACEMENT OF THE PRODUCT**.

United Phosphorus, Inc. and Seller offer this product, and Buyer and User accept it, subject to the foregoing conditions of sale and limitations of warranty and of liability, which may not be modified except by written agreement signed by the duly authorized representative of United Phosphorus, Inc.

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