

FLUMIOXAZIN	GROUP	14	HERBICIDE
PYROXASULFONE	GROUP	15	HERBICIDE



Piper

HERBICIDE



FOR CONTROL AND/OR SUPPRESSION OF CERTAIN WEEDS TO MAINTAIN BARE GROUND ON NON-CROP AREAS.

Active Ingredient	By Wt
Flumioxazin*	33.5%
Pyroxasulfone**	42.5%
Other Ingredients	24.0%
Total	100.0%

- *2-[7-fluoro-3,4-dihydro-3-oxo-4-(2-propynyl)-2H-1,4-benzoxazin-6-yl]-4,5,6,7-tetrahydro-1H-isoindole-1,3(2H)-dione
- **3-[[[5-(difluoromethoxy)-1-methyl-3-(trifluoromethyl)-1H-pyrazol-4-yl]methyl]sulfonyl]-4,5-dihydro-5,5-dimethylisoxazole

Piper® Herbicide is a water dispersible granule containing 76% active ingredient.

EPA Reg. No. 59639-193
EPA Est. 11773-IA-1[®], 39578-TX-1[®]
Superscript is first letter of lot number.

KEEP OUT OF REACH OF CHILDREN
CAUTION
SEE BELOW FOR ADDITIONAL PRECAUTIONARY STATEMENTS.

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 eye. Call a poison control center or doctor for treatment advice.

(continued)

FIRST AID (continued)	
If inhaled:	Move person to fresh air. If person is not breathing, call 911 or an ambulance, then give artificial respiration, preferable by mouth-to-mouth, if possible. Call a poison control center or doctor for further treatment advice.
If swallowed:	Call a 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.
HOT LINE NUMBER	
Have the product container or label with you when calling a poison control center or doctor or going for treatment. You may also contact 800-892-0099 for emergency medical treatment information.	

PRECAUTIONARY STATEMENTS

HAZARDS TO HUMANS & DOMESTIC ANIMALS CAUTION

Harmful if absorbed through skin. Harmful if swallowed. Avoid contact with skin, eyes or clothing. Prolonged or frequently repeated skin contact may cause allergic reactions in some individuals.

PERSONAL PROTECTIVE EQUIPMENT (PPE):

Applicators and other handlers must wear: long-sleeved shirt and long pants, chemical-resistant gloves made of any waterproof material such as polyethylene or polyvinyl chloride, shoes and socks.

When handlers use closed systems, enclosed cabs, or aircraft in a manner that meets the requirements listed in the Worker Protection Standards (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 Requirements

Follow manufacturer's instructions for cleaning/maintaining PPE. If there are no such instructions for washables exist, use detergent and hot water. Keep and wash PPE separately from other laundry.

USER SAFETY RECOMMENDATIONS

- Users should wash thoroughly with soap and water after handling and before eating, drinking, chewing gum, using tobacco or using the toilet.
- Users should remove clothing/PPE 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 product is toxic to non-target plants and aquatic invertebrates. Do not apply when weather conditions favor drift from treated areas. Do not contaminate water when disposing of equipment washwaters or rinsate.

This pesticide is toxic to plants and use strictly in accordance with the drift and run-off precautions on this label in order to minimize off-site exposures.

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

Surface Water Advisories: Do not apply directly to water, to areas where surface water is present, or to intertidal areas below the mean high water mark. Drift and runoff may be hazardous to aquatic organisms in water adjacent to treated areas. Do not contaminate water when disposing of equipment washwaters or rinsate.

The product may impact surface water quality due to runoff of rainwater. This is especially true for poorly draining soils and soils with shallow groundwater. 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 buffer strip between areas to which this product is applied and surface water features such as ponds, streams, and springs will reduce potential loading of pyroxasulfone and its degradation product, 5-difluoromethoxy-1H-pyrazol-4-yl) methanesulfonic acid (M1), from runoff water and sediment. Runoff of this product will be reduced by avoiding applications when rainfall is forecasted to occur within 48 hours.

DIRECTIONS FOR USE

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

READ ENTIRE LABEL. USE STRICTLY IN ACCORDANCE WITH PRECAUTIONARY STATEMENTS AND DIRECTIONS, AND WITH APPLICABLE STATE AND FEDERAL REGULATIONS.

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.

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 Standards for agricultural pesticides (40 CFR Part 170). The WPS applies when this product is used to produce agricultural plants on farms, forest, nurseries, or greenhouses.

Keep all unprotected persons out of operating areas, or vicinity where there may be drift.

Do not enter or allow others to enter treated areas until sprays have dried.

DISCLAIMER, RISKS OF USING THIS PRODUCT, LIMITED WARRANTY AND LIMITATION OF LIABILITY

IMPORTANT: Read the entire Label including this Disclaimer, Risks of Using this Product, Limited Warranty, and Limitation of Liability before using this product. If the terms are not acceptable THEN DO NOT USE THE PRODUCT; rather, return the unopened product within 15 days of purchase for a refund of the purchase price.

RISKS OF USING THIS PRODUCT

The Buyer and User (referred to collectively herein as "Buyer") of this product should be aware that there are inherent unintended risks associated with the use of this product which are impossible to eliminate. These risks include, but are not limited to, injury to plants and crops to which this product is applied, lack of control of the target pests or weeds, resistance of the target pest or weeds to this product, injury caused by drift, and injury to rotational crops caused by carryover in the soil. Such risks of crop injury, non-performance, resistance or other unintended consequences are unavoidable and may result because of such factors as weather, soil conditions, disease, moisture conditions, irrigation practices, condition of the crop at the time of application, presence of other materials either applied in the tank mix with this product or prior to application of this product, cultural practices or the manner of use or application, (or a combination of such factors) all of which are factors beyond the control of Valent. The Buyer should be aware that these inherent unintended risks may reduce the harvested yield of the crop in all or a portion of the treated acreage, or otherwise affect the crop such that additional care, treatment and expense are required to take the crop to harvest. If the Buyer chooses not to accept these risks, THEN THIS PRODUCT SHOULD NOT BE APPLIED. By applying this product Buyer acknowledges and accepts these inherent unintended risks AND TO THE FULLEST EXTENT CONSISTENT WITH APPLICABLE LAW, BUYER AGREES THAT ALL SUCH RISKS ASSOCIATED WITH THE APPLICATION AND USE ARE
(continued)

(continued)

ASSUMED BY THE BUYER. Valent shall not be responsible for losses or damages (including, but not limited to, loss of yield, increased expenses of farming the crop or such incidental, consequential or special damages that may be claimed) resulting from use of this product in any manner not set forth on the label. Buyer assumes all risks associated with the use of this product in any manner or under conditions not specifically directed or approved on the label.

LIMITED WARRANTY

Valent warrants only that this product conforms to the chemical description on the label and is reasonably fit for the purposes stated in the label, under average use conditions, when used strictly in accordance with the label **and subject to the Risks of Using This Product as described above. To the extent consistent with applicable law AND AS SET FORTH ABOVE, VALENT MAKES NO OTHER WARRANTIES, EITHER EXPRESSED OR IMPLIED.** No agent or representative of Valent or Seller is authorized to make or create any other express or implied warranty.

LIMITATION OF LIABILITY

To the fullest extent consistent with applicable law, Valent or Seller is not liable for any incidental, consequential, indirect or special damages resulting from the use or handling of this product. The limitation includes, but is not limited to, loss of yield on all or any portion of the treated acreage, increased care, treatment or other expenses required to take the crop to harvest, increased finance charges or altered finance ratings, emotional or mental distress and/or exemplary damages. TO THE FULLEST EXTENT CONSISTENT WITH APPLICABLE LAW, THE EXCLUSIVE REMEDY OF THE BUYER, AND THE EXCLUSIVE MAXIMUM LIABILITY OF VALENT OR 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 THIS PRODUCT OR, AT THE ELECTION OF VALENT OR SELLER, THE REPLACEMENT OF THE PRODUCT.

PROMPT NOTICE OF CLAIM

To the extent consistent with applicable law allowing such requirements Valent must be provided notice as soon as Buyer has reason to believe it may have a claim, but in no event later than twenty-one days from date of planting, or twenty-one days from the date of application, whichever is latter, so that an immediate inspection of the affected property and growing crops can be made.

(continued)

(continued)

To the extent consistent with applicable law if Buyer does not notify Valent of any claims, in such period, it shall be barred from obtaining any remedy.

NO AMENDMENTS

Valent and Seller offer this product, and Buyer accepts it, subject to the foregoing **Disclaimer, Risks of Using This Product, Limited Warranty and Limitation of Liability**, which may not be modified by any oral or written agreement.

TANK MIXES

NOTICE: Tank mixing or use of this product with any other product which is not specifically and expressly authorized by the label shall be the exclusive risk of user, applicator and/or application advisor, to the extent allowed by applicable law.

It is the pesticide user's responsibility to ensure that all products are registered for the intended use. Read and follow the applicable restrictions and limitations and directions for use on all product labels involved in tank mixing. User's must follow the most restrictive directions for use and precautionary statements of each product in the tank mixture.

Resistance Management

For resistance management, please note that *Piper* Herbicide contains both a Group 14/flumioxazin and a Group 15/pyroxasulfone herbicide. Any weed population may contain or develop plants naturally resistant to Group 14 and/or Group 15 herbicides. The resistant individuals may dominate the weed population if these herbicides are used repeatedly in the same fields. Appropriate resistance-management strategies should be followed.

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

- Rotate the use of *Piper* Herbicide or other Group 14/flumioxazin and/or a Group 15/pyroxasulfone herbicides within a growing season sequence or among growing seasons with different herbicide groups that control the same weeds in a field.
- 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.

(continued)

(continued)

- 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.
- Scout before and 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 for example 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, if available.
- Contact your local extension specialist or certified crop advisors for additional pesticide resistance-management and/or integrated weed-management recommendations for specific crops and weed biotypes or to find out if suspected resistant weeds have been found in their region.
- For further information or to report lack of performance or suspected resistance, contact Valent U.S.A. LLC at 800-89-VALENT (898-2536).

TABLE OF CONTENTS

Product Information

Table 1. *Piper* Herbicide Rate Summary

Directions for Use in Non-Crop Areas

Use Restrictions

Use Precautions

Application Information

Sprayer Preparation

Mixing Instructions

Application Method

1. Ground Application

2. Aerial Application

Carrier Volume and Spray Pressure

Nozzle Selection and Orientation

Adjuvants and Drift Control Additives

Mandatory Spray Drift

Sprayer Cleanup

TABLE OF CONTENTS (continued)

Additives

Jar Test to Determine Compatibility of Adjuvants and *Piper* Herbicide

Table 2. Weeds Controlled or Suppressed by Residual Activity of *Piper* Herbicide

Directions for Use to Maintain Bare Ground in Non-Crop Areas

Preemergence Application

Postemergence Application

Table 3. Suggested Tank Mix Combinations for Non-Selective Vegetation Control

Directions for Use on Bahiagrass and Bermudagrass in Non-Crop Areas

Application Timing

Preemergence Application

Postemergence Application

Storage and Disposal

PRODUCT INFORMATION

Piper Herbicide is a preemergence and early post-emergence herbicide for control of selected grass and broadleaf weeds to maintain bare ground and certain perennial grasses in non-crop areas.

Weeds controlled or suppressed by *Piper* Herbicide are listed in Table 2, Weeds Controlled or Suppressed by Residual Activity of *Piper* Herbicide.

Preemergence weed control with *Piper* Herbicide is most effective when applied to clean, weed free soil surfaces. The most effective postemergence weed control with *Piper* Herbicide occurs when applied in combination with a surfactant to weeds less than 2 inches in height. Follow specific site use directions prior to using surfactant as certain over the top applications restrict the use of the surfactants.

Table 1. *Piper* Herbicide Rate Summary

Ounces of <i>Piper</i> Herbicide	Pounds of flumioxazin	Pounds of pyroxasulfone
4.5	0.094	0.120
6.0	0.126	0.160
8.0	0.168	0.213
10.0	0.209	0.266

DIRECTIONS FOR USE IN NON-CROP AREAS

USE RESTRICTIONS

- Do not apply more than 10 oz (0.209 lb flumioxazin; 0.266 lb pyroxasulfone) per acre per application by ground.
- Do not apply more than 4.5 oz (0.094 lb flumioxazin; 0.120 lb pyroxasulfone) per acre per application by air.
- Do not make more than 1 application of *Piper* Herbicide per acre per year.
- Do not apply more than 10 oz (0.209 lb flumioxazin; 0.266 lb pyroxasulfone) per acre per year by ground.
- Do not apply more than 4.5 oz (0.094 lb flumioxazin; 0.120 lb pyroxasulfone) per acre per year by air.

- Do not rotate to food or feed crops after application to bare ground on noncrop areas.
- Do not apply in enclosed greenhouse structures.
- Do not apply when weather conditions favor spray drift from treated areas.
- Do not incorporate into soil after application.
- Do not apply this product through any type of irrigation system.
- Do not apply to residential lawns, golf courses, sod farms or production and landscape ornamentals.
- Do not apply to areas with adjacent non-dormant pome or stone fruit crops.

USE PRECAUTIONS

- Treatment of powdery, dry soil or light sandy soil, when there is little to no likelihood of rainfall soon after may result in off target movement and possible damage to actively growing susceptible crops when soil particles are moved by wind or water.

APPLICATION INFORMATION

SPRAYER PREPARATION

Before applying *Piper* Herbicide, start with clean, well maintained application equipment. The spray tank, as well as all hoses and booms, must be cleaned to ensure no residue from the previous spraying operation remains in the sprayer. Some pesticides, including but not limited to, the sulfonyleurea and phenoxy herbicides, are active at very small amounts and can cause crop injury when applied to susceptible crops. The spray equipment must be cleaned according to the manufacturer's directions for the last product used before the equipment is used to apply *Piper* Herbicide. Follow the most restrictive cleanup procedure if two or more products were tank mixed prior to *Piper* Herbicide application.

MIXING INSTRUCTIONS

1. Fill clean spray tank 1/2 to 2/3 of desired level with clean water.
2. If a drift retardant is to be used, add 10 pounds of spray grade ammonium sulfate per 100 gallons of spray solution.
3. While agitating, slowly add *Piper* Herbicide to the spray tank. Agitation creates a rippling or rolling action on the water surface.
4. If tank mixing *Piper* Herbicide with other labeled herbicides, add water soluble bags first, followed by dry formulations, flowables, emulsifiable concentrates and then solutions. Prepare no more spray mixture than is required for the immediate spray operation.
5. Add any required adjuvants.
6. Fill spray tank to desired level with water. **Continue agitation until all spray solution has been applied.**
7. Mix only the amount of spray solution that can be applied the day of mixing.

APPLICATION METHOD

Piper Herbicide is applied by ground or by air. Ensure application equipment be clean and in good repair, nozzles uniformly spaced on boom and frequently checked for accuracy.

1. GROUND APPLICATION

Apply *Piper* Herbicide, and *Piper* Herbicide tank mixes, with ground equipment using standard commercial sprayers equipped with flat fan (pre-plant or preemergence applications only) designed to deliver the desired spray pressure and spray volume.

2. AERIAL APPLICATION

Spray drift away from the site of application may cause damage to non-target vegetation. To minimize drift, apply the largest droplet size consistent with uniform coverage and satisfactory weed control.

CARRIER VOLUME AND SPRAY PRESSURE

When used as part of a burndown or preemergence weed control program, apply *Piper* Herbicide in a minimum of 7 gallons of water per acre. Application at less than 7 gallons per acre may provide inadequate control. Do not exceed the nozzle manufacturer's guidelines 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.

NOZZLE SELECTION AND ORIENTATION

Use nozzles that produce flat or hollow cone spray patterns. Use non-drip type nozzles, such as diaphragm type nozzles, to avoid unwanted discharge of spray solution. The nozzles must be directed toward the rear of the aircraft, at an angle between 0 and 15° downward. Do not place nozzles on the outer 25% of the wings or rotors.

ADJUVANTS AND DRIFT CONTROL ADDITIVES

Refer to tank mix partner's label for adjuvant. Drift control additives may be used. When a drift control additive is used, read and carefully observe the cautionary statements and all other information appearing on the additive label.

MANDATORY SPRAY DRIFT

Aerial Applications

- Do not release spray at a height greater than 10 ft above the vegetative canopy, unless a greater application height is necessary for pilot safety.
- For all applications, applicators are required to use a medium to ultra-coarse spray droplet size (ASABE S572.1).
- The boom length must not exceed 65% of the wingspan for airplanes or 75% of the rotor blade diameter for helicopters.
- Applicators must use 1/2 swath displacement upwind at the downwind edge of the field.
- Nozzles must be oriented so the spray is directed toward the back of the aircraft.
- Do not apply when wind speeds exceed 10 miles per hour or are less than 2 mph at the application site.
- Do not apply during temperature inversions.

(continued)

(continued)

Ground Applications

- Apply with the nozzle height recommended by the manufacturer, but no more than 3 feet above the ground or crop canopy.
- For all applications, applicators are required to use a medium or ultra-coarse droplet size (ASABE S572.1).
- Do not apply when wind speeds exceed 10 miles per hour or are less than 2 mph 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.
- **Handheld Technology Applications**
Take precautions to minimize spray drift.

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.

Controlling Droplet Size – Aircraft

- Adjust Nozzles – Follow nozzle manufacturer's recommendations for setting up nozzles. Generally, to reduce fine droplets, nozzles should be oriented parallel with the airflow in flight.
- **BOOM HEIGHT – Ground Boom**
Use the lowest boom height that is compatible with the spray nozzles that will provide uniform coverage. For ground equipment, the boom should remain level with the crop and have minimal bounce.
- **RELEASE HEIGHT – Aircraft**
Higher release heights increase the potential for spray drift. When applying aurally to crops, do not release spray at a height greater than 10 feet above the crop canopy, unless a greater application height is necessary for pilot safety.

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 are 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.

BUFFER RESTRICTIONS

Aerial Buffer Zones

- Do not apply this product by air within 40 feet of non-target plants including non-target crops.
- Do not apply this product by air within 100 feet of emerged cotton crops.
- Do not apply this product by air within 40 feet of streams, wetlands, marshes, ponds, lakes and reservoirs.

Ground Buffer Zones

- To avoid potential adverse effects to non-target areas, applicators must maintain a 10-foot buffer between the application area and the closest downwind edge of non-target terrestrial habitats (including grasslands, forested areas, shelter belts, woodlots, hedgerows, riparian areas, shrub lands, and crop lands).
- Refer to Spray Drift Advisories section for further information about ground application mitigation measures.

SPRAYER CLEANUP

Spray equipment, including mixing vessels and nurse tanks, must be cleaned each day following *Piper* Herbicide application. After *Piper* Herbicide is applied, the following steps must be used to clean the spray equipment:

- Completely drain the spray tank, rinse the sprayer thoroughly, including the inside and outside of the tank and all in-line screens.

- Fill the spray tank with clean water and flush all hoses, booms, screens and nozzles.
- Top off tank, add 1 gallon of 3% household ammonia (or equivalent) for every 100 gallons of water, circulate through sprayer for 5 minutes, and then flush all hoses, booms, screens and nozzles for a minimum of 15 minutes. If diaphragms are being used on the spray boom, loosen diaphragms before flushing the spray system, allowing cleaning solution to spray through the open diaphragm. If spray lines have any end caps, they must be loosened before flushing the system, allowing cleaning solution to spray through the loosened caps. To enhance removal of *Piper* Herbicide from the spray system, add a tank cleaner such as "Valent Tank Cleaner", in place of ammonia and allow the cleaning solution to remain in the pressurized spray system (spray tank, hoses and boom) for 8 hours before flushing the system for a minimum of 15 minutes.
- Drain tank completely.
- Add enough clean water to the spray tank to allow all hoses, booms, screens and nozzles to be flushed for 2 minutes.
- Remove all nozzles and screens and rinse them in clean water.

Thoroughly clean the spray equipment, including all tanks, hoses, booms, screens and nozzles, before it is used to apply postemergence pesticides. Equipment with *Piper* Herbicide residue remaining in the system may result in crop injury to the subsequently treated crop.

ADDITIVES

When an adjuvant is to be used with this product, use a Chemical Producers and Distributors Association certified adjuvant. Mix *Piper* Herbicide with a crop oil concentrate that contains at least 15% emulsifiers and 80% oil or a non-ionic surfactant containing at least 80% active ingredient when applying *Piper* Herbicide as part of a postemergence weed control program. Verify the mixing compatibility by a jar test before using.

A spray-grade nitrogen source (either ammonium sulfate at 2.0 to 2.5 lb/A or a 28 to 32% nitrogen solution at 1 to 2 qt/A) may be added to the spray mixture along with a crop oil concentrate or non-ionic surfactant to enhance weed control. The addition of a nitrogen source does not replace the need for crop oil concentrate or non-ionic surfactant.

JAR TEST TO DETERMINE COMPATIBILITY OF ADJUVANTS AND *PIPER* HERBICIDE

When using *Piper* Herbicide and an adjuvant, such as in stale seed bed or reduced tillage situations, perform a jar test before mixing commercial quantities of *Piper* Herbicide, when using *Piper* Herbicide for the first time, when using a new adjuvant or when a new water source is being used.

1. Add 1 pt of the water to a quart jar. Use the water from the same source and temperature as which will be used in the spray tank mixing operation.
2. Add 1 g of *Piper* Herbicide to the quart jar for every 3 oz of *Piper* Herbicide per acre being applied (2 g if 6 oz/A is the desired *Piper* Herbicide rate), gently mix until product goes into suspension.
3. Add 60 ml (4 Tbsp or 2 fl oz) of the crop oil or methylated seed oil to the quart jar or 1 ml of non-ionic surfactant if it is being used in place of oil, gently mix.
4. If nitrogen is being used, add 16 ml (1 Tbsp or 0.5 oz) of the 28 to 32% nitrogen source to the quart jar. If ammonium sulfate is being used, add 19 g AMS to the quart jar in place of the 28 to 32% nitrogen.
5. Place cap on jar, invert 10 times, let stand for 15 minutes, evaluate.
6. An ideal tank mix combination will be uniform and free of suspended particles. If any of the following conditions are observed, question the choice of adjuvant:
 - a) Layer of oil or globules on the mixture's surface.
 - b) Flocculation: fine particles in suspension or as a layer on the bottom of the jar.
 - c) Clabbering: thickening texture (coagulated) like gelatin.

Table 2. Weeds Controlled or Suppressed by Residual Activity of Piper Herbicide

Common Name	Scientific Name	C = Control S = Suppression
BROADLEAF WEED SPECIES		
Bristly Starbur	<i>Acanthospermum hispidum</i>	S
Carpetweed	<i>Mollugo verticillata</i>	C
Chickweeds		
Common	<i>Stellaria media</i>	C
Mouseear	<i>Cerastium vulgatum</i>	C
Coffee Senna	<i>Cassia occidentalis</i>	C
Common Ragweed	<i>Ambrosia artemisiifolia</i>	C
Copperleaf, Hophornbeam	<i>Acalypha ostryifolia</i>	S
Dandelion	<i>Taraxacum officinale</i>	C
Eclipta	<i>Eclipta prostrata</i>	C
Evening-primrose, Cutleaf	<i>Oenothera laciniata</i>	C
False Chamomile	<i>Tripleurospermum maritima</i>	C
Fleabane, Hairy	<i>Conyza bonariensis</i>	C
Flixweed	<i>Descurainia sophia</i>	S
Florida Beggarweed	<i>Desmodium tortuosum</i>	C
Florida Pusley	<i>Richardia scabra</i>	C
Golden Crownbeard	<i>Verbesina encelioides</i>	C
Groundsel, Common	<i>Senecio vulgaris</i>	C
Hairy Indigo	<i>Indigofera hirsuta</i>	C
Hemp Sesbania	<i>Sesbania exaltata</i>	C
Henbit	<i>Lamium amplexicaule</i>	C
Jimsonweed	<i>Datura stramonium</i>	C
Kochia	<i>Kochia scoparia</i>	C
Lambsquarters, Common	<i>Chenopodium album</i>	C
Little Mallow	<i>Malva parviflora</i>	C
Marestail/Horseweed	<i>Conyza canadensis</i>	C
Morningglories		
Entireleaf	<i>Ipomoea hederacea</i> var. <i>integriuscula</i>	C
Ivyleaf	<i>Ipomoea hederacea</i>	C
Red/Scarlet	<i>Ipomoea coccinea</i>	C
Smallflower	<i>Jacquemontia tamnifolia</i>	C
Tall	<i>Ipomoea purpurea</i>	C
Mustard		
Tansy	<i>Descurainia pinnata</i>	C
Tumble	<i>Sisymbrium altissimum</i>	C
Wild	<i>Brassica kaber</i>	C
Nightshades		
Black	<i>Solanum nigrum</i>	C
Eastern Black	<i>Solanum ptycanthum</i>	C
Hairy	<i>Solanum sarrachoides</i>	C
Palmer Amaranth	<i>Amaranthus palmeri</i>	C
Pigweeds		
Redroot	<i>Amaranthus retroflexus</i>	C
Smooth	<i>Amaranthus hybridus</i>	C
Spiny Amaranth	<i>Amaranthus spinosus</i>	C
Tumble	<i>Amaranthus albus</i>	C
Prickly Lettuce	<i>Lactuca serriola</i>	C
Prickly Sida (Teaweed)	<i>Sida spinosa</i>	C
Puncturevine	<i>Tribulus terrestris</i>	C

(continued)

Table 2. Weeds Controlled or Suppressed by Residual Activity of Piper Herbicide (continued)

Common Name	Scientific Name	C = Control S = Suppression
BROADLEAF WEED SPECIES (continued)		
Purslane		
Common	<i>Portulaca oleracea</i>	C
Horse	<i>Trianthema portulacastrum</i>	C
Radish, Wild	<i>Raphanus raphanistrum</i>	C
Ragweed		
Common	<i>Ambrosia arteminiifolia</i>	C
Giant	<i>Ambrosia trifida</i>	S
Redmaids	<i>Calandrinia ciliata</i> var. <i>menziesii</i>	C
Russian Thistle	<i>Salsola iberica</i>	C
Shepherd's-purse	<i>Capsella bursa-pastoris</i>	C
Smartweeds		
Ladysthumb	<i>Polygonum persicaria</i>	S
Pennsylvania	<i>Polygonum pennsylvanicum</i>	S
Spotted Spurge	<i>Euphorbia maculata</i>	C
Spurred Anoda	<i>Anoda cristata</i>	C
Tropic Croton	<i>Croton glandulosus</i>	C
Velvetleaf	<i>Abutilon theophrasti</i>	C
Venice Mallow	<i>Hibiscus trionum</i>	C
Waterhemp		
Common	<i>Amaranthus rudis</i>	C
Tall	<i>Amaranthus tuberculatus</i>	C
Wild Buckwheat	<i>Polygonum convolvulus</i>	S
Wild Poinsettia	<i>Euphorbia heterophylla</i>	C
Wormwood, Biennial	<i>Artemisia biennis</i>	S
GRASS WEED SPECIES		
Barnyardgrass	<i>Echinochloa crus-galli</i>	C
Bluegrass, Annual	<i>Poa annua</i>	C
Cheat	<i>Bromus secalinus</i>	C
Crabgrass		
Large	<i>Digitaria sanguinalis</i>	C
Smooth	<i>Digitaria ischaemum</i>	C
Cupgrass, Southwestern	<i>Eriochloa gracilis</i>	C
Downy Brome	<i>Bromus tectorum</i>	C
Foxtails		
Giant	<i>Setaria faberi</i>	C
Green	<i>Setaria viridis</i>	C
Yellow	<i>Setaria glauca</i>	C
Goosegrass	<i>Eleusine indica</i>	C
Johnsongrass (seedling)	<i>Sorghum halepense</i>	C
Lovegrass, California	<i>Eragrostis diffusa</i>	C
Panicums		
Fall	<i>Panicum dichotomiflorum</i>	C
Texas	<i>Panicum texanum</i>	C
Red Rice	<i>Oryza sativa</i>	C
Ryegrass		
Italian	<i>Lolium multiflorum</i>	C
Rigid	<i>Lolium rigidum</i>	C
Signalgrass, Broadleaf	<i>Brachiaria platyphylla</i>	C
Sprangletop	<i>Leptochloa</i> spp.	C

DIRECTIONS FOR USE TO MAINTAIN BARE GROUND IN NON-CROP AREAS

Piper Herbicide, when used as directed, can be used for non-selective vegetation control to maintain bare ground in non-crop areas that must be kept weed-free. Apply *Piper* Herbicide only to:

- Bare ground under guardrails, pipelines, railroad beds, railroad yards and surrounding areas.
- Bare ground in parking and storage areas, plant sites, substations, pumping stations, and tank farms.
- Bare ground areas of airports, brickyards, industrial plant sites, lumber yards and military installations, and storage areas.
- Bare ground around farm buildings and along ungrazed fencerows, wind breaks, and shelter belts.
- Road surfaces, improved roadside areas and gravel shoulders.

Piper Herbicide offers residual and postemergence control of susceptible broadleaf and grass weeds as well as an additional mode of action to assist in the control of ALS (acetolactate synthase) resistant weeds listed in Table 2, Weeds Controlled or Suppressed by Residual Activity of *Piper* Herbicide. *Piper* Herbicide can be tank mixed with the herbicides listed in Table 3 for increased residual or postemergence control. The length of residual control is dependent on the rate applied as well as on rainfall and temperature conditions. Length of residual control will decrease as temperature and precipitation increase.

PREEMERGENCE APPLICATION

Apply *Piper* Herbicide at 8 to 10 oz/A by ground or 4.5 oz/A by air as a preemergence application on all soil types (up to 5% organic matter). Make the preemergence (to weed emergence) applications of *Piper* Herbicide to a weed-free soil surface. Preemergence applications of *Piper* Herbicide must be com-

pleted prior to weed emergence. Moisture is necessary to activate *Piper* Herbicide on soil for residual weed control. Dry weather following application of *Piper* Herbicide may reduce effectiveness. However, when adequate moisture is received after dry conditions, *Piper* Herbicide will control susceptible germinating weeds.

POSTEMERGENCE APPLICATION

Apply *Piper* Herbicide at 8 to 10 oz/A by ground or 4.5 oz/A by air plus an adjuvant (0.25% v/v non-ionic surfactant or 1 qt/A crop oil concentrate). The addition of an adjuvant enhances *Piper* Herbicide activity on emerged weeds. Thorough spray coverage is necessary to maximize the postemergence activity of *Piper* Herbicide. Small emerged weeds are controlled or suppressed with *Piper* Herbicide, however, translocation of *Piper* Herbicide within a weed is limited, and optimal control requires thorough spray coverage and by the addition of an adjuvant. The most effective postemergence weed control with *Piper* Herbicide occurs when applied in combination with a surfactant to weeds less than 2 inches in height. Use a tank mix partner in combination with *Piper* Herbicide for the postemergence control of weeds larger than 2 inches. Tank mix partners are listed in Table 3, Suggested Tank Mix Combinations for Non-Selective Vegetation Control.

Piper Herbicide is rainfast one hour after application. Postemergent activity may be reduced if rainfall occurs within one hour after application.

IMPORTANT: Completely read and follow the label of any potential tank mix partner with *Piper* Herbicide. When using tank mixtures, use conditions must be in accordance with the most restrictive of the label limitations and precautions on either herbicide label.

Table 3. Suggested Tank Mix Combinations for Non-Selective Vegetation Control

2,4-D	hexazinone	prodiamine
aminocyclopyrachlor	imazapic	rimsulfuron
aminopyralid	imazapyr	saflufenacil
bromacil	metsulfuron methyl	simazine
chlorsulfuron	norflurazon	sulfentrazone
chlorpyralid	oryzalin	sulfometuron methyl
dicamba	pendimethalin	tebuthiuron
diuron	picloram	topramezone
glyphosate	pramitol	triclopyr

DIRECTIONS FOR USE ON BAHIAGRASS AND BERMUDAGRASS IN NON-CROP AREAS

Piper Herbicide may be used to promote the growth of (release of) bermudagrass and bahiagrass in non-crop sites where *Piper* Herbicide is labeled for bare ground weed control and low maintenance vegetation and erosion control is desired. These sites include roadsides, utility rights-of-way, railroad crossings and airports. Application of *Piper* Herbicide may result in unacceptable injury to other

grasses. Do not apply *Piper* Herbicide to turfgrass in residential and commercial landscapes, golf courses or sod farms.

APPLICATION TIMING

Apply *Piper* Herbicide during the fall, winter or spring when bahiagrass and bermudagrass are dormant or semi dormant (not actively growing). Optimal application timing is before germination of target weeds, but *Piper* Herbicide will also provide early postemergent control of small emerged weeds. Application

of *Piper* Herbicide to actively growing bahiagrass and bermudagrass may injure foliage and temporarily suppress growth, but *Piper* Herbicide has limited systemic activity and bahiagrass and bermudagrass will typically outgrow injury.

PREEMERGENCE APPLICATION

Apply *Piper* Herbicide at 6 to 10 oz/A as a preemergence application. Moisture is necessary to activate *Piper* Herbicide on soil for residual weed control. Dry weather following application of *Piper* Herbicide may reduce effectiveness.

POSTEMERGENCE APPLICATION

Apply *Piper* Herbicide at 6 to 10 oz/A plus an adjuvant (0.25% v/v non-ionic surfactant or 1 qt/A crop oil concentrate). The addition of an adjuvant enhances *Piper* Herbicide activity on emerged weeds. Thorough spray coverage is necessary to maximize the postemergence activity of *Piper* Herbicide. Small emerged weeds are suppressed or controlled with *Piper* Herbicide; however, translocation of *Piper* Herbicide within a weed is limited, and optimal control requires thorough spray coverage and the addition of an adjuvant. The most effective postemergence weed control with *Piper* Herbicide occurs when applied in combination with a surfactant to weeds less than 2 inches in height. Use a tank mix partner in combination with *Piper* Herbicide for the postemergence control of weeds larger than 2 inches. Tank mixing *Piper* Herbicide with other herbicides may increase the potential for bahiagrass and bermudagrass injury or growth suppression.

IMPORTANT: Read and follow label directions for all tank mix products before using. Confirm that the tank mix partners are registered for use on bahiagrass and bermudagrass. Always follow the most restrictive labeling of any tank mix product.

STORAGE AND DISPOSAL

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

PESTICIDE STORAGE

Keep pesticide in original container.
Store in a cool, dry, secure place.
Do not put formulation or dilute spray solution into food or drink containers.
Do not contaminate food or foodstuffs.
Do not store or transport near feed or food.
Not for use or storage in or around the home.
For help with any spill, leak, fire or exposure involving this material, call day or night **(800) 892-0099**.

PESTICIDE DISPOSAL

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

CONTAINER HANDLING

Nonrefillable container. Do not reuse or refill this container. Offer for recycling, if available. Clean container promptly after emptying. 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. 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.

Piper and *Products That Work, From People Who Care* are registered trademarks of Valent U.S.A. LLC. Valent Tank Cleaner is a product of Valent U.S.A. LLC

Manufactured for:

Valent U.S.A. LLC

P.O. Box 8025
Walnut Creek CA 94596-8025
Made in U.S.A.
Form 1891-E
EPA Reg. No. 59639-193
EPA Est. 11773-IA-1[®], 39578-TX-1[®]
Superscript is first letter of lot number.

Information contained in this booklet is accurate at the time of printing. Since product testing is a continuous process, please read and follow the directions on the product label for the most current directions and precautionary statements.

Always check with your state to verify state registration status or call 800-89-VALENT (898-2536).



For state registration and/or supplemental labels, please call or visit us online.

Products That Work, From People Who Care[®] | valentpro.com | 800-89-VALENT (898-2536)

Always read and follow label instructions.

©2019 Valent U.S.A. LLC. All rights reserved. Printed in the U.S.A.