



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, DC 20460

OFFICE OF CHEMICAL SAFETY
AND POLLUTION PREVENTION

April 17, 2020

Jacob Moore
Federal Regulatory Manager
Makhteshim Agan of North America, Inc. (d/b/a ADAMA)
3120 Highwoods Blvd., Suite 100
Raleigh, NC 27604

Subject: Registration Review Label Mitigation for Oryzalin
Product Name: ORYZALIN 4 AS
EPA Registration Number: 66222-138
Application Dates: 10/7/19
Decision Numbers: 556045

Dear Mr. Moore:

The Agency, in accordance with the Federal Insecticide, Fungicide and Rodenticide Act (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 Oryzalin Interim Decision and has concluded that your submission is acceptable. The label referred to above, submitted in connection with registration under FIFRA, as amended, is acceptable.

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 the Federal Insecticide Fungicide and Rodenticide Act 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) list 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.

A copy of your label stamped "Accepted" is enclosed. Products shipped after 12 months from the date of this amendment must bear the new revised label. Your release for shipment of the product bearing the amended label 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.

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EPA Reg. No. 66222-138
Decision No. 556045

If you have any questions about this letter, please contact Darius Stanton by phone at 703-347-0433, or via email at Stanton.darius@epa.gov.

Sincerely,

A handwritten signature in blue ink, appearing to read "Linda Arrington".

Linda Arrington, Branch Chief
Risk Management and Implementation Branch 4
Pesticide Re-Evaluation Division
Office of Pesticide Programs

Enclosure

ACCEPTED

04/17/2020

Under the Federal Insecticide, Fungicide and Rodenticide Act as amended, for the pesticide registered under EPA Reg. No. 66222-138

Oryzalin GROUP 3 HERBICIDE

Oryzalin 4 A.S.

(ALTERNATE BRAND NAME: FUGITIVE™)

Herbicide

A PREEMERGENCE SURFACE-APPLIED HERBICIDE FOR THE CONTROL OF MANY ANNUAL GRASSES AND CERTAIN BROADLEAF WEEDS IN CITRUS, FRUIT AND NUT TREES, BERRIES, VINEYARDS, AND CHRISTMAS TREE PLANTATIONS

ACTIVE INGREDIENT:	% BY WT.
Oryzalin: 3,5-dinitro-N4, N4-dipropylsulfanilamide	41.0%
OTHER INGREDIENTS:	59.0%
	TOTAL 100.0%

Contains 4 pounds of active ingredient per gallon.

KEEP OUT OF REACH OF CHILDREN CAUTION

Manufactured for:

Makhteshim Agan of North America, Inc.
d/b/a ADAMA
3120 Highwoods Blvd., Suite 100
Raleigh, NC 27604

EPA Reg. No. 66222-138

EPA Est. No. [REDACTED]
Letter(s) in lot number correspond(s) to
superscript in EPA Est No.

How can we help? 1-866-406-6262

NET CONTENTS: _____ GALLONS

FIRST AID	
IF ON SKIN OR CLOTHING:	<ul style="list-style-type: none"> • 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:	<ul style="list-style-type: none"> • 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.
IF SWALLOWED:	<ul style="list-style-type: none"> • 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 a poison control center or doctor. • Do not give anything by mouth to an unconscious person.
IF INHALED:	<ul style="list-style-type: none"> • Move person to fresh air. • If person is not breathing, call 911 or an ambulance; then give artificial respiration, preferably by mouth-to-mouth if possible. • Call a poison control center or doctor for further treatment advice.
<p>Have the product container or label with you when calling a poison control center or doctor or going for treatment. You may also contact PROSAR at 1-877-250-9291 for emergency medical treatment information.</p>	

**PRECAUTIONARY STATEMENTS
HAZARDS TO HUMANS AND DOMESTIC ANIMALS
CAUTION**

PERSONAL PROTECTIVE EQUIPMENT (PPE)

Applicators and other handlers must wear:

- Long-sleeved shirt and long pants
- Chemical-resistant gloves
- Shoes plus socks
- Mixers and loaders must wear a chemical-resistant apron in addition to other PPE

Discard clothing and other absorbent materials that have been drenched or heavily contaminated with this product's concentrate. Do not reuse them. 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 CONTROLS STATEMENT: When handlers use closed systems or enclosed cabs in a manner that meets the requirement listed in the Worker Protection Standard (WPS) for agricultural pesticides [40 CFR 170.240(d)(4-6)], the handler PPE requirements may be reduced or modified as specified in the WPS.

USER SAFETY RECOMMENDATIONS**Users should:**

- Wash hands before eating, drinking, chewing gum, using tobacco, or using the toilet.
- Remove clothing 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

This pesticide is toxic to fish. Do not apply directly to water, to areas where surface water is present, or to intertidal areas below the mean high water mark. Do not contaminate water when disposing of equipment washwaters. Cover or incorporate spills.

Groundwater Advisory: Oryzalin 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.

Non-target Organism Advisory Statement: 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.

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 24 hours.

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.

Workers may enter treated areas without required PPE during the reentry interval following ½–1 inch of rainfall or irrigation if they are performing tasks that do not involve contact with the soil subsurface; otherwise, 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
- Shoes plus socks

PRODUCT INFORMATION

Read all directions for use carefully before applying.

Oryzalin 4 A.S. herbicide is a preemergence, surface applied herbicide for the control of many annual grasses and certain broadleaf weeds in citrus, fruit and nut trees, berries, vineyards, and Christmas trees plantations. Oryzalin 4 A.S. controls susceptible annual weeds by disrupting plant growth processes during germination. Oryzalin 4 A.S. may be applied in liquid sprays of water or liquid fertilizer. Oryzalin 4 A.S. may be tank mixed with other herbicides to control existing vegetation or improve the spectrum of weeds controlled. Oryzalin 4 A.S. alone does not control established weeds.

Oryzalin 4 A.S. may be applied before or after transplanting of the crop. If applied prior to transplanting: (1) disturbance of surface soil should be minimized to prevent loss of weed control; and (2) exposure of the roots of transplants to treated soil should be minimized to avoid any possibility of crop injury.

USE PRECAUTIONS AND RESTRICTIONS

- Do not graze or feed forage from treated fields or orchards to livestock.
- Poor weed control may result if directions are not carefully followed.
- Do not over apply Oryzalin 4 A.S. Over application may result in crop injury or soil residue.
- Do not plant any root crop for 12 months following an Oryzalin 4 A.S. application.
- Do not use Oryzalin 4 A.S. on soils containing more than 5% organic matter.
- Apply Oryzalin 4 A.S. directly to the soil surface in orchards or vineyards.
- Carefully follow label directions to avoid poor weed control or crop injury.
- Chemigation: See instructions for chemigation in the **APPLICATION METHODS** section of this label.
- Do not aerially apply this product.

WEED RESISTANCE-MANAGEMENT

For resistance management, Oryzalin 4 A.S. is a Group 3 Herbicide. Any weed population may contain or develop plants naturally resistant to Oryzalin 4 A.S. and other Group 3 herbicides. The resistant biotypes may dominate the weed population if these 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 Oryzalin 4 A.S. or other Group 3 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 mode of action 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.
- Fields should be scouted prior to application to identify the weed species present and their growth stage to determine if the intended application will be effective. Fields should be scouted after application to verify that the treatment was effective.
- Suspected herbicide-resistant weeds may be identified by these indicators:
 - Failure to control a weed species normally controlled by the herbicide at the dose applied, especially if control is achieved on adjacent weeds;
 - A spreading patch of non-controlled plants of a particular weeds species; and
 - Surviving plants mixed with controlled individuals of the same species.
- 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.

Best Management Practices

- Plant into weed-free fields and keep fields as weed-free as possible.
- To the extent possible, use a diversified approach toward weed management. Whenever possible incorporate multiple weed-control practices such as mechanical cultivation, biological management practices, and crop rotation.
- Fields with difficult to control weeds should be rotated to crops that allow the use of herbicides with alternative mechanisms of action or different management practices.
- To the extent possible do not allow weed escapes to produce seeds, root or tubers. Manage weed seeds at harvest and post-harvest to prevent a buildup of the weed seed-bank.
- Prevent field-to-field and within-field movement of weed seeds or vegetative propagules. Thoroughly clean plant residues from equipment before leaving fields.
- Prevent an influx of weeds into the field by managing field borders.
- Identify weeds present in the field through scouting and field history and understand their biology. The weed-control program should consider all of the weeds present.
- Difficult to control weeds may require sequential applications of herbicides with differing mechanisms of action.
- Apply this herbicide at the correct timing and rate needed to control the most difficult weed in the field.
- If resistance is suspected, treat weed escapes with a different MOA or use non-chemical methods to remove escapes.

Local Resistant Weeds

Contact your local sales representative, crop advisor, or extension agent to find out if suspected resistant weeds to this MOA have been found in your region. If resistant biotypes of target weeds have been reported, use the application rates of this product specified for your local conditions. Tank mix products so that there are multiple effective mechanisms of action for each target weed.

Reporting

Report any incidence of non-performance of this product against a particular weed species to your ADAMA retailer, representative, or call 1-866-406-6262. If resistance is suspected, treat weed escapes with an herbicide having a different mechanism of action and/or use non-chemical means to remove escapes, as practical, with the goal of preventing further seed production.

ROTATION CROP INTERVAL

To avoid crop injury, a 24-month rotational interval is suggested when rotating from tree and vine crops to row crops.

SOIL PREPARATION

Optimum herbicidal activity occurs when Oryzalin 4 A.S. is applied to the soil surface. Prior to application, existing unwanted vegetation should be destroyed by tillage or use of contact or translocated herbicides. Crop or weed residues, pruning, and trash should be thoroughly mixed into the soil by tillage equipment or removed before treatment. Soil should be in good tilth and free of clods at the time of application.

ACTIVATION AND CULTIVATION

A single $\frac{1}{2}$ –1 inch rainfall or sprinkler irrigation is required to activate Oryzalin 4 A.S. and move the herbicide into the zone of weed germination. Rainfall or irrigation of 1 inch or more is needed to activate Oryzalin 4 A.S. on fine-textured, high organic matter soils. If weeds begin to emerge, a shallow cultivation to a depth of 1–2 inches will destroy existing weeds and place Oryzalin 4 A.S. in the zone of weed germination.

MIXING DIRECTIONS

Oryzalin 4 A.S. Alone

Oryzalin 4 A.S. may be applied in water or most liquid fertilizer materials. Prior to mixing Oryzalin 4 A.S. in liquid fertilizer, refer to **TESTING FOR COMPATIBILITY IN LIQUID FERTILIZERS** section of this label for test procedures to determine compatibility with the fertilizer product to be used. The combination of Oryzalin 4 A.S. with solution and suspension-type fertilizers provides annual weed control equal to Oryzalin 4 A.S. applied in water. Individual state regulations relating to liquid fertilizer mixing, registration, labeling, and application are the responsibility of the individual and/or company offering the fertilizer and chemical mixture for sale.

Start with a clean spray tank. Fill the sprayer to $\frac{1}{3}$ – $\frac{1}{2}$ of the required spray volume. Start agitation, shake the container well, add the correct amount of Oryzalin 4 A.S., continue agitation, and fill spray tank to required spray volume. Maintain continuous agitation from mixing through application.

Precaution: Do not allow the mixture to siphon back into the water source.

Oryzalin 4 A.S. in Tank Mix

Vigorous, continuous agitation during mixing, filling, and throughout application is required for all tank mixes. Sparger pipe agitators generally provide the most effective agitation in spray tanks. To prevent foaming in the spray tank, avoid stirring or splashing air into the spray mixture.

Oryzalin 4 A.S. may be tank mixed with label rates of other products and applied with water or most liquid fertilizer materials provided: (1) the tank mix product is labeled for the timing and method of application for the use site to be treated; (2) tank mixing is not prohibited by the label of the tank mix product; and (3) A jar test is performed to ensure the compatibility of products to be used in tank mixture.

TANK MIXING PRECAUTIONS

- Read carefully and follow all applicable use directions, precautions, and limitations on the respective product labels.
- Do not exceed application rates specified on this label.
- For products packaged in water-soluble packaging, do not tank mix with products containing boron or mix in equipment previously used to apply a product mixture containing boron unless the tank and spray equipment has been thoroughly cleaned.

Tank Mix Compatibility Testing: Perform a jar test prior to tank mixing to ensure compatibility of Oryzalin 4 A.S. and other products. Use a clear glass quart jar with lid and mix the tank mix ingredients in their relative proportions. Invert the jar containing the mixture several times and observe the mixture for approximately ½ hour. If the mixture balls-up, forms flakes, sludges, gels, oily films or layers, or other precipitates, it is not compatible and the tank mix combination should not be used.

Mixing Order (Tank Mixing with Water): Fill the spray tank to ¼–⅓ of the total spray volume. Start agitation. Add different formulation types in the order below allowing time for complete mixing and dispersion after addition of each product. Allow extra mixing and dispersion time for dry flowable products:

1. Add dry flowables; wettable powders; Oryzalin 4 A.S. or other aqueous suspensions; flowables and water-based solutions.
2. Maintain agitation and fill spray tank to ¾ of total spray volume. Then add any emulsifiable concentrates. Finish filling the spray tank. Maintain continuous agitation during mixing, final filling and throughout application. If spraying and agitation must be stopped before the spray tank is empty, the materials may settle to the bottom. Settled materials must be resuspended before spraying is resumed. A sparger agitator is particularly useful for this purpose. Settled material may be more difficult to resuspend than when originally mixed.

Tank Mixing with Liquid Fertilizer: Prior to mixing Oryzalin 4 A.S. with other products in liquid fertilizer, refer to the tank mix product manufacturer's label to determine if application in liquid fertilizer is allowed. Also refer to **TESTING FOR COMPATIBILITY IN LIQUID FERTILIZERS** section of this label for testing procedures to determine tank mix compatibility with the liquid fertilizer product to be used. The combination of Oryzalin 4 A.S. with solution and suspension-type fertilizers provides annual weed control equal to Oryzalin 4 A.S. applied in water. Individual state regulations relating to liquid fertilizer mixing, registration, labeling, and application are the responsibility of the individual and/or company offering the fertilizer and chemical mixture for sale. Read and follow all label instructions for each material to be added to the spray tank.

Vigorous continuous agitation is required for all tank mixes. Sparger pipe agitators generally provide the best agitation in spray tank. To prevent foaming, keep the end of the fill pipe below the surface of the water in the spray tank during filling to prevent air from being stirred or splashed into the mixture.

Mixing Order (Tank Mixing With Liquid Fertilizer): Fill the spray tank to ¾ of the total spray volume required. Start agitation. Add different formulation types in the following order allowing time for complete mixing and dispersion after addition of each product; allow extra mixing and dispersion time for dry flowable products: Dry flowables; wettable powders; Oryzalin 4 A.S. or other aqueous suspensions; flowables; water-based solutions; and any emulsifiable concentrates.

Finish filling spray tank. Maintain continuous agitation during mixing, final filling, and throughout application. If spraying and agitation must be stopped before the spray tank is empty, the materials may settle to the bottom.

Settled materials must be suspended before spraying is resumed. A sparger agitator is particularly useful for this purpose. Settled materials may be more difficult to resuspend than when originally mixed.

Premixing: When tank mixing, initial mixing and dispersion of certain dry flowable or wettable powder products may be improved by premixing with water (slurrying). Follow product label instructions for each material. Adding the slurried material to the spray tank through a 20–35 mesh wetting screen will help assure good initial dispersion. Line screens in the tank through a 20–35 mesh wetting screen will help assure good initial dispersion. Line screens in the tank should be no finer than 50 mesh (100 mesh is finer than 50 mesh).

TESTING FOR COMPATIBILITY IN LIQUID FERTILIZERS

Oryzalin 4 A.S. alone or in combination with dry flowable (DF), wettable powder (WP), aqueous suspension (AS), flowable (F), liquid (L), solution (S), or emulsifiable concentrate (EC) formulations may not combine properly with some liquid fertilizer materials. Small quantities of such mixtures should always be tested before full-scale mixing. Follow the testing procedure below to determine if a compatibility agent is needed or which compatibility agent works best in your liquid fertilizer plus herbicide mixture.

Testing Procedure

1. Add 1 pint of liquid fertilizer to 1 quart glass jar.
2. Add 1–4 teaspoonfuls of DF, WP, Oryzalin 4 A.S., other AS formulations, F, or L formulations depending on mixing ratio required to the liquid fertilizer. Close the jar and shake until evenly dispersed after addition of each formulation. If dry flowable or wettable powder formulations do not disperse well, it may be necessary to slurry the materials in a small amount of water before addition to the liquid fertilizer.
3. After dispersing the materials in step 2, add any S formulations to the jar and shake well. Finally, add EC formulations to the mixture and shake well. Observe the jar for about 10 minutes. If materials rise to the surface and form a thick layer that will not redisperse when agitated, a compatibility agent is needed. If the mixture is easily redispersed with slight agitation, a compatibility agent is not required. Good agitation must be provided to maintain dispersion in the spray tank from mixing through application.
4. If the need for a compatibility agent is demonstrated in step 3, follow the procedure outlined below: Using a clean clear plastic or glass container, repeat step 1 above and add ½ teaspoon of the compatibility agent to the liquid fertilizer mixture. Shake well and then repeat steps 2 and 3.

An effective compatibility agent will cause the mixture to remain uniformly mixed with little or no separation for 1/2 hour or longer. If slight separation occurs, 2–3 inversions of container should be sufficient to uniformly redisperse the mixture. If layers form which will not disperse, try adding additional compatibility agent or use an alternative compatibility agent to achieve a uniform mixture. Use a clean jar in each test. A compatible mixture will have a uniform appearance and will be relatively easy to redisperse with gentle agitation of the jar.

COMPATIBILITY AGENTS

Use a phosphate ester-type surfactant designed for use with liquid fertilizers mixed at rates as low as 1½– 2 pints per ton of liquid fertilizer. This type of surfactant usually doesn't work well as a compatibility agent for tank mixes in plain water. Add the compatibility agent just before adding herbicides. Read and follow label directions for the compatibility agent.

APPLICATION METHODS

Ground Broadcast Application

Apply Oryzalin 4 A.S. directly to the soil surface of the orchard or vineyard in a total spray volume of 20–40 gallons per acre (broadcast basis) using any properly calibrated low pressure herbicide sprayer that will apply the spray uniformly. Use herbicide nozzle tips and screens no finer than 50 mesh for nozzle and inline strainers. As the amount of spray volume per acre decreases, the importance of accurate calibration and uniform application increases. Check the sprayer daily to insure proper calibration and uniform application. Avoid boom overlaps that will increase rates above labeled rates.

Band Application

For band application, use the following formula to calculate the required amount of product per acre.

$$\frac{\text{Band Width (inches)}}{\text{Row Width (inches)}} \times \text{Broadcast rate per acre} = \text{Amount required per acre}$$

CHEMIGATION

Oryzalin 4 A.S. may be applied through properly equipped chemigation systems for weed control in fruit and nut orchards or vineyards. Read and follow all label instructions outlined below concerning chemigation before applying Oryzalin 4 A.S. by this method.

Chemigation Use Precautions: Apply this product only through solid set or hand move systems designed to distribute sprinkler irrigation beneath the tree canopy. Solid set systems utilizing tall risers for overhead application are excluded except for dormant season applications of Oryzalin 4 A.S. Do not apply this product through any other type of irrigation system.

Crop injury, lack of effectiveness, or illegal pesticide residues in the crop can result from nonuniform distribution of treated water.

If you have questions about calibration you should contact state extension specialists, equipment manufacturers, or other experts.

Do not connect an irrigation system (including greenhouse systems) used for pesticide application to a public water system.

A person knowledgeable of the chemigation system and responsible for its operation, or under the supervision of the responsible person, shall shut the system down and make necessary adjustments should the need arise.

Sprinkler Chemigation Directions: The following directions must be followed for all sprinkler irrigation systems (solid set and hand move systems):

1. The system must contain a functional check valve, vacuum relief valve, and low pressure drain appropriately located on the irrigation pipeline to prevent water source contamination from back flow.
2. The pesticide injection pipeline must contain a functional, automatic, quick-closing check valve to prevent the flow of fluid back toward the injection pump.
3. The pesticide injection pipeline must also contain a functional, normally closed, solenoid-operated valve located on the intake side of the injection pump and connected to the system interlock to prevent fluid from being withdrawn from the supply tank when the irrigation system is either automatically or manually shut down.
4. The system must contain functional interlocking controls to automatically shut off the pesticide injection pump when the water pump motor stops.
5. The irrigation line or water pump must include a functional pressure switch which will stop the water pump motor when the water pressure decreases to the point that pesticide distribution is adversely affected.
6. Systems must use a metering pump, such as a positive displacement injection pump (e.g., diaphragm pump) effectively designed and constructed of materials that are compatible with pesticides and capable of being fitted with a system interlock.
7. Do not apply when wind speed favors drift beyond the area intended for treatment.
8. Oryzalin 4 A.S. should be injected continuously throughout the chemigation period. The chemigation metering pump should be checked periodically during application to insure proper operation.
9. The injection metering pump must be calibrated as specified by the manufacturer.
10. During chemigation, maintain agitation in supply tank at all times.
11. Oryzalin 4 A.S. may cause some staining of plastic hoses and tanks.
12. Apply Oryzalin 4 A.S. in sprinkler irrigation equal to 1/2 to 1 inch of water.

Chemigation System Calibration: Sample calculation for use of Oryzalin 4 A.S. in a chemigation system:

- Assume, in this example, 35 acres are to be covered by a chemigation treatment.
- Product required, assuming 1 quart per acre is 35 quarts (8.75 gallons).
- Prepare a mixture containing 1 part water and 1 part Oryzalin 4 A.S. by adding 8.75 gallons of product to the supply tank containing an equal amount of water (total volume = 17.5 gallons).
- Adjust the injection system to deliver 17.5 gallons during the time required to apply 1 inch of water to 35 acres.
- If the irrigation system requires 5 hours to apply 1 inch of water to 35 acres, the injection rate is 3.5 gallons per hour and is calculated as follows:
 $17.5 \text{ gallons} / 5 \text{ hours} = 3.5 \text{ gallons/hour}$
[3.5 gallons = 448 fluid ounces (fl oz)]

Proper calibration requires the injection pump to be adjusted to deliver 7.47 fl oz per minute and is calculated as follows:

$$448 \text{ fl oz per hr} / 60 \text{ min per hr} = 7.47 \text{ fl oz/min.}$$

Chemigation Mixing Directions: The injection mixture (slurry) with minimum volume may be prepared by adding the required amount of Oryzalin 4 A.S. to an equal amount of water in the injection tank (ratio Oryzalin 4 A.S. to water = 1:1). Meter the mixture into the irrigation system during the entire irrigation period. Additional dilution of Oryzalin 4 A.S. may be necessary for accurate calibration of equipment designed to deliver a larger injection volume per hour. Maintain supply tank agitation throughout the irrigation period.

Undiluted Oryzalin 4 A.S. should not be injected into chemigation systems.

MANDATORY SPRAY DRIFT

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 are required to use a medium or coarser droplet size (ASABE S572.1).
- Do not apply when wind speeds exceed 15 miles per hour at the application site.
- Do not apply during temperature inversions.

Boomless Ground Applications:

- Applicators are required to use a medium or coarser droplet size (ASABE S572.1) for all applications.
- Do not apply when wind speeds exceed 10 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 large 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 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.

WEEDS AND GRASSES CONTROLLED

ANNUAL GRASSES

Common Name	Scientific Name
Barley, little	<i>Hordeum pusillum</i>
Barnyardgrass (water grass)	<i>Echinochloa crus-galli</i>
Bluegrass, annual (poa)	<i>Poa annua</i>
Brachiaria (signalgrass)	<i>Brachiaria</i> spp.
Browntop panicum	<i>Panicum fasciculatum</i>
Crabgrass (large crabgrass) (smooth crabgrass)	<i>Digitaria</i> spp.
crowfootgrass	<i>Dactyloctenium aegyptium</i>
cupgrass	<i>Eriochloa gracilis</i>
downy brome	<i>Bromus tectorum</i>
Fall panicum (spreading panicgrass)	<i>Panicum dichotomiflorum</i>
foxtails (bottlegrass) (bristlegrass) (giant foxtail) (green foxtail) (pigeongrass) (robust foxtail) (yellow foxtail)	<i>Setaria</i> spp.
guineagrass (narrowleaf panicum)	<i>Panicum maximum</i>
goosegrass	<i>Eleusine indica</i>
johnsongrass (seedling only)	<i>Sorghum halepense</i>
junglerice	<i>Echinochloa colinum</i>
lovegrass, Mexican	<i>Eragrostis mexicana</i>
lovegrass, orcutt	<i>Eragrostis orcuttiana</i>
oat, wild	<i>Avena fatua</i>
ryegrass, annual (Italian)	<i>Lolium multiflorum</i>
sandbur, field	<i>Cenchrus incertus</i>
sprangletop, red	<i>Leptochloa filiformis</i>
Texas panicum (buffalograss) (Coloradograss)	<i>Panicum texanum</i>
witchgrass	<i>Panicum capillare</i>

ANNUAL BROADLEAF WEEDS

Common Name	Scientific Name
Carpet weed	<i>Mollugo verticillata</i>
Chickweed	<i>Stellaria media</i>
Cudweed	<i>Gnaphalium chilense</i>
Fiddleneck, coast	<i>Amsinckia intermedia</i>
Florida pusley (Florida purslane) (Mexican clover) (pusley)	<i>Richardia scabra</i>
henbit	<i>Lamium amplexicaule</i>
knotweed, prostrate	<i>Polygonum aviculare</i>
lambsquarters	<i>Chenopodium album</i>

pigweeds (carelessweed) (prostrate pigweed) (redroot pigweed) (rough pigweed) (smooth pigweed) (spiny pigweed) (tumble pigweed)	<i>Amaranthus</i> spp.
puncturevine purslane, common rockpurslane, redmaids shepherdspurse	<i>Tribulus terrestris</i> <i>Portulaca oleracea</i> <i>Calandrinia caulescens</i> <i>Capsella bursa-pastoris</i>

ORYZALIN 4 A.S. PROVIDES PARTIAL CONTROL OR SUPPRESSION OF:

Common Name	Scientific Name
Filaree, redstem	<i>Erodium cicutarium</i>
Filaree, whitestem	<i>Erodium moschatum</i>
Groundsel, common	<i>Senecio vulgaris</i>
Ladysthumb	<i>Polygonum persicaria</i>
Lettuce, prickly	<i>Lactuca serriola</i>
Mallow, common	<i>Malva neglecta</i>
Milkweed, climbing	<i>Sarcostemma cynanchoides</i>
Morningglory, annual	<i>Ipomoea</i> spp.
Mustard, black	<i>Brassica nigra</i>
Mustard, wild	<i>Sinapis arvensis</i>
Nightshade, black	<i>Solanum nigrum</i>
Prickly sida (teaweed)	<i>Sida spinosa</i>
Ragweed, common	<i>Ambrosia artemisiifolia</i>
Ragweed, giant	<i>Ambrosia trifida</i>
Rocket, London	<i>Sisymbrium irio</i>
Smartweed, annual	<i>Polygonum</i> spp.
Sowthistle, annual	<i>Sonchus oleraceus</i>
Spurge, prostrate	<i>Euphorbia humistrata</i>
Spurge, spotted	<i>Euphorbia maculata</i>
Velvetleaf	<i>Abutilon theophrasti</i>

CROP USE INSTRUCTIONS

TREE AND VINE CROPS – CITRUS, STONE FRUIT, POME FRUIT, AND NUT TREES, BERRIES AND VINEYARDS (NON-BEARING AND BEARING)

Apply Oryzalin 4 A.S. as a preemergence treatment to control annual grasses and broadleaf weeds listed in **PRODUCT INFORMATION** section.

For orchard crops including citrus, pome fruits, stone fruits, and tree nuts, apply product only as a strip treatment in the tree rows; do not apply to row middles or drive rows.

Crop Listing: Oryzalin 4 A.S. may be used in the following crop groupings:

Citrus Fruits Crop Group such as:	Pome & Stone Fruits Crop Group such as:	Tree Nuts Crop Group such as:
citrus citron	apple	almond
citrus hybrids	apricot	chestnut
grapefruit	cherry	chinquapin
kumquat	crabapple	filbert
lime	loquat	hickory nut
lemon	mayhaw	macadamia nut
mandarin (tangerine)	nectarine	pecan
orange	peach	pistachio
pummelo	pear	walnut
	plum	

prune
quince

**Berries Crop Group
such as:**

Vineyards

blackberry
blueberry*
boysenberry
currant
dewberry
elderberry
gooseberry
loganberry
raspberry

grapes

*Do not apply Oryzalin 4 A.S. to lowbush blueberries.

In addition to the crops within crop groupings listed above, Oryzalin 4 A.S. may be used in the following crops: avocado, fig, guava, kiwi fruit, olive, papaya, and pomegranate.

Broadcast Application Rates

Soil Texture	Length of Control	Oryzalin 4 A.S. (qt/acre) [lb AI/acre]	Minimum Time Between Applications (months)	Total Amount Allowed Per Year (qt/acre) [lb AI/acre]
All Soil Textures	Short Term (2–4 months)	2 [2]	2.5	12 [12]
	Long Term (6–8 months)	4 [4]	2.5	12 [12]
	(8–12 months)	6 [6]	2.5	12 [12]

Chemigation

Oryzalin 4 A.S. may be applied through properly equipped chemigation systems for weed control in fruit and nut orchards and vineyards. Refer to the **CHEMIGATION** section of this label for use directions. Do not apply Oryzalin 4 A.S. by chemigation unless use directions are carefully followed.

Apply Oryzalin 4 A.S. by chemigation prior to weed germination or immediately after existing weeds have been controlled. Control existing unwanted vegetation by tillage or with a contact or translocated herbicide. Use broadcast application rates for Oryzalin 4 A.S. alone. Apply in sprinkler irrigation equal to ½-1 inch of water on medium- to fine-textured or high organic matter soils.

Oryzalin 4 A.S. Tank Mix Instructions

To broaden the spectrum of weed control, Oryzalin 4 A.S. may be applied in tank mix combination with labeled rates of other herbicide products, including, but not limited to Goal, Gramoxone Super, Princep (Simazine), Roundup/glyphosate, or Solicam herbicide. Performance and risk of carryover from tank mixed products used in combination with Oryzalin 4 A.S. at labeled rates is the same as when each product is used separately.

Non-Bearing Tree and Vine Crops: For additional broad spectrum control of broadleaf weeds in non-bearing fruit and nut trees, berries, and vineyards, Oryzalin 4 A.S. may be applied in tank mix combination with labeled rates of Gallery 75 Dry Flowable herbicide. Non-bearing crops are defined as plants that will not bear fruit for at least one year after treatment.

Follow tank mixing instructions in the **MIXING DIRECTIONS** section of this label when mixing Oryzalin 4 A.S. with other products.

Users should always consult the manufacturer's label for the products to be tank mixed with Oryzalin 4 A.S. for specific information on use rates, additional weeds controlled, rotational crop restrictions or risk of carryover, special tank mix instructions, additional use directions, precautions and limitations.

CHRISTMAS TREE PLANTATIONS

Oryzalin 4 A.S. Alone

Apply Oryzalin 4 A.S. as a directed spray to the soil surface or as an overtop spray to established plantings of field grown Christmas tree species, including fir (*Abies* spp.), pine (*Pinus* spp.), and spruce (*Picea* spp.). Do not apply to Douglas-fir (*Pseudotsuga menziesii*). Do not apply to seedbeds or seedling transplant beds. Apply only to established plantings. Established plantings are defined as those that have been transplanted into their final growing location for a sufficient period of time to allow the soil to be firmly settled around the roots from packing and rainfall or irrigation. Follow all instructions provided in the **PRODUCT INFORMATION** section of this label.

Broadcast Application Rates

Length of Control	Amount of Oryzalin		Minimum Time Between Applications (months)	Total Amount Allowed Per Year (qt/acre) [lb Al/acre]
	(qt/acre) [lb Al/acre]	(fl oz/ 1000 sq ft) [lb Al/1000 sq ft]		
2–4 months	2 [2]	1.5 [0.05]	2	8 [8]
4–8 months	4 [4]	3 [0.09]	2	8 [8]

Tank Mix Combinations

Tank mix combinations of Oryzalin 4 A.S. plus other labeled herbicides may be used as directed sprays or overtop sprays in established Christmas tree plantings. When applied according to use directions, these tank mixes will provide control of susceptible weed species listed on the respective product labels. Refer to label of the product to be tank mixed with Oryzalin 4 A.S. for specific use directions, precautions, and limitations before use.

Oryzalin 4 A.S. Herbicide Plus Roundup/Glyphosate Herbicide:

Apply tank mix combinations of Oryzalin 4 A.S. plus Roundup only as directed sprays in Christmas tree plantings. When applied according to use directions, Oryzalin 4 A.S. plus Roundup will provide postemergence control of susceptible weed species listed on the label for Roundup and residual preemergence control of susceptible weed species listed on the label for Oryzalin 4 A.S. Refer to the label for Roundup for specific use directions, precautions, and limitations before use.

Precautions:

- Do not apply sprays containing Roundup over the top of Christmas tree plantings.
- Extreme care must be exercised to avoid contact of spray containing Roundup with foliage and stems of Christmas trees or severe damage or death may result.

STORAGE AND DISPOSAL

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

PESTICIDE STORAGE: Store in original container only. In case of leak or spill, use absorbent materials to contain liquids and dispose as waste.

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

CONTAINER DISPOSAL:

Nonrefillable Container (five gallons or less): Nonrefillable container. Do not reuse or refill this container. Offer for recycling, if available. Clean container 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 ¼ 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 or reconditioning, 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.

Nonrefillable Container (greater than five gallons): Nonrefillable container. Do not reuse or refill this container. Offer for recycling, if available. Clean container promptly after emptying. Triple rinse as follows: Empty the remaining contents into application equipment or a mix tank. Fill the container ¼ 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 or reconditioning, 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.

Refillable Container: Refillable container. Refill this container with oryzalin 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. For final disposal, offer for recycling or reconditioning if appropriate, or puncture and dispose of in a sanitary landfill, or by other procedures approved by state and local authorities.

LIMITATION OF WARRANTY AND LIABILITY

Read the entire directions for use, conditions of warranties and limitations of liability before using this product. If terms are not acceptable, return the unopened product container at once.

By using this product, user or buyer accepts the following **CONDITIONS, DISCLAIMER OF WARRANTIES and LIMITATIONS OF LIABILITY**.

CONDITIONS: The directions for use of this product are believed to be adequate and must be followed carefully. However, it is impossible to eliminate all risks associated with the use of this product. Crop injury, ineffectiveness or other unintended consequences may result because of such factors as weather conditions, presence of other materials, or the manner of use or application, all of which are beyond the control of ADAMA. All such risks shall be assumed by the user or buyer.

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