



# Herbicide

Water Dispersible Granule

For Weed Control in Field Corn, Citrus Fruit, Stone Fruit, Tree Nuts, Pome Fruit, Grapes, \*Blueberry (High and Low Bush), \*Caneberry (Raspberry, Blackberry), Potatoes, Potatoes Grown for Seed, Field-Grown Tomatoes, \*Preplant Weed Control in Cotton and Soybeans, Rangeland Restoration, Non-Crop Sites including Industrial Sites, Roadsides, Highway Medians, Utility Substations, Non-Cropland Wildlife Habitats.

**\*NOT FOR USE ON BLUEBERRIES, RASPBERRIES & BLACKBERRIES, PREPLANT BURNDOWN IN COTTON AND SOYBEAN IN THE STATE OF CALIFORNIA**

### ACTIVE INGREDIENT:

Rimsulfuron:  
N-((4,6-dimethoxypyrimidin-2-yl)aminocarbonyl)-3-(ethylsulfonyl)-2-pyridinesulfonamide ..... 25.0%

**OTHER INGREDIENTS:** ..... 75.0%

**TOTAL:** ..... 100.0%

RIMSULFURON    GROUP    2    HERBICIDE

**KEEP OUT OF REACH OF CHILDREN  
CAUTION**

Si usted no entiende la etiqueta busque a alguien para que se la explique a usted en detalle. (If you do not understand the label find someone to explain it to you in detail.)  
SEE BACK PANEL FOR FIRST AID AND ADDITIONAL PRECAUTIONARY STATEMENTS

For Chemical Spill, Leak, Fire,  
or Exposure, Call CHEMTREC  
(800) 424-9300  
For Medical Emergencies Only,  
Call (877) 325-1840

Manufactured for  
Nufarm Inc.  
11901 S. Austin Avenue  
Alsip, IL 60803

EPA Reg. No. 71368-121



**Net Weight  
20 Oz.  
(591.46 mL)**



FIRST AID	
<b>IF SWALLOWED</b>	<ul style="list-style-type: none"> <li>• Call a poison control center or doctor immediately for treatment advice.</li> <li>• Have person sip a glass of water if able to swallow.</li> <li>• Do not induce vomiting unless told to do so by a poison control center or doctor.</li> <li>• Do not give anything by mouth to an unconscious person.</li> </ul>
<b>IF ON SKIN OR CLOTHING</b>	<ul style="list-style-type: none"> <li>• Take off contaminated clothing.</li> <li>• Rinse skin immediately with plenty of water for 15 to 20 minutes.</li> <li>• Call a poison control center or doctor for treatment advice.</li> </ul>
<b>IF IN EYES</b>	<ul style="list-style-type: none"> <li>• Hold eye open and rinse slowly and gently with water for 15 to 20 minutes</li> <li>• Remove contact lenses, if present, after the first 5 minutes, then continue rinsing.</li> <li>• Call a poison control center or doctor for treatment advice.</li> </ul>
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 1-877-325-1840 for emergency medical treatment information.	

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

Harmful if swallowed and if absorbed through skin. Causes moderate eye irritation. Avoid contact with skin, eyes or clothing.

**Personal Protective Equipment (PPE)  
Applicators and other handlers must wear:**

- long-sleeved shirt and long pants,
- shoes plus socks, and
- waterproof gloves.

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.

**USER SAFETY RECOMMENDATIONS**

**Users should:**

- Wash hands thoroughly with soap and water after handling and before eating, drinking, chewing gum, using tobacco, or using the toilet.
- Remove clothing/PPE immediately if pesticide gets inside. Then wash thoroughly and put on clean clothing. Remove and wash contaminated clothing before reuse.
- 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.

## ENGINEERING CONTROLS STATEMENT

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.

## PHYSICAL-CHEMICAL HAZARDS

Do not mix or allow coming in contact with oxidizing agent. Hazardous chemical reaction may occur.

## ENVIRONMENTAL HAZARDS

Do not apply directly to water, or to areas where surface water is present or to intertidal areas below the mean high water mark. Do not contaminate water by cleaning of equipment washwaters or rinsate. **Surface Water Advisory Statement:** This product may impact surface water quality due to runoff of rain water. This is especially true for poorly draining soils and soils with shallow ground water. This product is classified as having 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 the potential loading of rimsulfuron from runoff water and sediment. Runoff of this product will be greatly reduced by avoiding applications when rainfall or irrigation is expected 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.**

Do not use this product until you have read the entire label. 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 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 4 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, shoes plus socks, and chemical resistant gloves (such as Natural Rubber).

## 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, forests, nurseries, or greenhouses. Use on non-crop sites and turf (unimproved) are not within the scope of the Worker Protection Standard. Do not enter or allow worker entry into treated areas until sprays have dried.

## PRODUCT INFORMATION

Grapple Herbicide must be used only in accordance with instructions on this label or in separate published labeling. To the extent consistent with applicable law, Nufarm will not be responsible for losses or damage resulting from the use of this product in any manner not specifically instructed by Nufarm. Grapple Herbicide is a water-soluble granule formulation that selectively controls certain grass and broadleaf weeds in pome fruit, citrus fruit, tree nut, stone fruit, and grape crops which have been established for at least one full growing season, and in blueberries and caneberries. Grapple Herbicide also selectively controls certain grass and broadleaf weeds in potatoes, potatoes grown for seed, field-grown tomatoes (direct-seeded and transplant), and field corn. Grapple Herbicide can be used for restoration of rangeland infested with invasive weed species and along roadsides and highway medians, at industrial plant sites, utility substations, and other non-agricultural or non-cropland sites.

Grapple Herbicide has postemergence and residual (preemergence to weeds) activity. Rainfall or sprinkler irrigation is needed within 2 weeks of application to activate Grapple Herbicide in the soil. For the most effective weed control, rainfall or sprinkler irrigation is needed within 5 to 7 days after application to move Grapple Herbicide into the soil.

The best postemergence control is obtained when Grapple Herbicide is applied to young, actively growing weeds. The degree and duration of control may depend on the following:

- weed spectrum and infestation intensity
- weed size at application
- environmental conditions at and following treatment.

Grapple Herbicide is registered for use in most states. Check with your state extension service or Department of Agriculture before use to be certain Grapple Herbicide is registered in your state.

## TANK MIXTURES

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. Users must follow the most restrictive directions for use and precautionary statements of each product in the tank mixture. To broaden the weed control spectrum and/or extend the residual effectiveness of Grapple Herbicide, Grapple Herbicide may be tank mixed with other registered herbicides affecting a different site of action (mode of action)

and/or adjuvants registered for use on the crops listed on Grapple Herbicide labeling. Refer to the label(s) of the tank mix partners for any additional use instructions or restrictions. Do not use Grapple Herbicide in a spray solution with additives that buffer the pH to below 4.0 or above 8.0, as degradation of Grapple Herbicide may occur.

#### **Tank Mix Compatibility**

Testing Perform a jar test prior to tank mixing to ensure compatibility of Grapple Herbicide and other pesticides. Use a clear 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 1/2 hour. If the mixture balls-up, forms flakes, sludge, gel, oily film or layers, or other precipitates, it is not compatible and the tank mix combination should not be used.

### **MANDATORY SPRAY DRIFT**

#### **Aerial Applications:**

- Do not release spray at a height greater than 10 feet above the vegetative canopy, unless a greater application height is necessary for pilot safety.
- For applications prior to the emergence of crops and target weeds, applicators are required to use a Coarse or coarser droplet size (ASABE S572.1).
- For all other applications, applicators are required to use a Medium or coarser 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 at the application site.
- Do not apply during temperature inversions.

#### **Ground Boom Applications:**

- Apply with the nozzle height recommended by the manufacturer, but no more than 3 feet above the ground or crop canopy unless making a turf, pasture, or rangeland application, in which case applicators may apply with a nozzle height no more than 4 feet above the ground.
- For applications prior to the emergence of crops and target weeds, applicators are required to use a Coarse or coarser droplet size (ASABE S572.1).
- For all other applications, applicators are required to use a Medium or coarser droplet size (ASABE S572.1).
- Do not apply when wind speeds exceed 10 miles per hour at the application site.
- Do not apply during temperature inversions.

#### **Boom-less 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**

### **SPRAY DRIFT**

#### **Boom-less Ground Applications:**

- Setting nozzles at the lowest effective height will help to reduce the potential for spray drift.

### **SPRAY DRIFT**

#### **Handheld Technology Applications:**

- Take precautions to minimize spray drift.

### **SPRAY DRIFT ADVISORIES**

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

### **IMPORTANCE OF DROPLET SIZE**

An effective way to reduce spray drift is to apply large droplets. Use the largest droplets that provide target pest control. While applying larger droplets will reduce spray drift, the potential for drift will be greater if applications are made improperly or under unfavorable environmental conditions.

#### **Controlling Droplet Size – Ground Boom**

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

#### **Controlling Droplet Size – Aircraft**

- Adjust Nozzles - Follow nozzle manufacturers 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."

## **BIOLOGICAL ACTIVITY AND ENVIRONMENTAL CONDITIONS**

Grapple Herbicide is absorbed through the roots and foliage of plants, rapidly inhibiting the growth of susceptible weeds. For preemergence weed control, rainfall or sprinkler irrigation is needed to move Grapple Herbicide into the soil. Weeds will generally not emerge from preemergence applications. In some cases, susceptible weeds may germinate and emerge a few days after application, but growth then ceases and leaves become chlorotic (yellowish) three to five days after emergence. Death of leaf tissue and growing point will follow in some species, while others will remain green but stunted and noncompetitive.

One to three weeks after postemergence application to weeds, leaves of susceptible plants appear chlorotic, and the growing point subsequently dies. In warm, moist conditions, the expression of herbicide symptoms is accelerated; in cold, dry conditions, expression of herbicide symptoms is delayed. Death of leaf tissue and growing point will follow in some species, while others will remain green but stunted and noncompetitive.

Grapple Herbicide provides the best control of weeds in vigorously growing crops that shade competitive weeds. Weed control in areas of thin crop stand or seeding skips may not provide satisfactory control. However, a crop canopy that is too dense at application can intercept spray and reduce weed control.

The herbicidal action of Grapple Herbicide may be less effective on weeds stressed from adverse environmental conditions such as abnormally hot or cold temperatures, abnormal soil conditions such as extremely dry or water-saturated soil, or hail or frost damage. Incomplete control may also result on plants injured from disruptive cultural practices, herbicide carryover from a previous crop, or injury from insects, diseases, or other pests.

Additionally, weeds hardened-off by drought stress are less susceptible to Grapple Herbicide. It is best to delay applications until stress has been alleviated.

Postemergence weed control may be reduced if rainfall occurs soon after application. Several hours of dry weather are needed to allow Grapple Herbicide to be sufficiently absorbed by weed foliage (generally Grapple Herbicide is rainfast in 4 hours).

## **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 area. Protect the forage and habitat of non-target organisms by minimizing spray drift. For further guidance and instructions on how to minimize spray drift, refer to the Spray Drift Advisory section of this label.

## **WINDBLOWN SOIL PARTICLES**

Grapple herbicide has the potential to move off-site due to wind erosion. Soils that are subject to wind erosion usually have a high silt and/or fine to very fine sand fractions and low organic matter content. Other factors which can affect the movement of windblown soil include the intensity and direction of prevailing winds, vegetative cover, site slope, rainfall, and drainage patterns. Avoid applying Grapple herbicide if prevailing local conditions may be expected to result in off-site movement.

## **WEED RESISTANCE MANAGEMENT**

For resistance management, Grapple Herbicide is a Group 2 herbicide. Any weed population may contain or develop plants naturally resistant to Grapple Herbicide and other Group 2 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.

When herbicides that affect the same biological site of action are used repeatedly over several years to control the same weed species in the same field, naturally occurring resistant biotypes may survive a correctly applied herbicide treatment, propagate, and become dominant in the field. Adequate control to these resistant weed biotypes cannot be expected. If weed control is unsatisfactory, it may be necessary to retreat the problem area using a product affecting a different site of action.

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

- Rotate the use of Grapple Herbicide or other Group 2 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.

- 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 after herbicide application to monitor weed populations for early signs of resistance development. Indicators of possible herbicide resistance include: (1) failure to control a weed species normally controlled by the herbicide at the dose applied, especially if control is achieved on adjacent weeds; (2) a spreading patch of non-controlled plants of a particular weed species; (3) surviving plants mixed with controlled individuals of the same species. If resistance is suspected, prevent weed seed production in the affected area by an alternative herbicide from a different group or by a mechanical method such as hoeing or tillage. Prevent movement of resistant weed seeds to other fields by cleaning harvesting and tillage equipment when moving between fields, and planting clean seed.
- If a weed pest population continues to progress after treatment with this product, discontinue use of this product, and switch to another management strategy or herbicide with a different mode of action, 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.

It is advisable to keep accurate records of pesticides applied to individual fields to help obtain information on the spread and dispersal of resistant biotypes. 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. Do not assume that each listed weed is being controlled by this mechanisms of action. Co-formulated active ingredients are intended to broaden the spectrum of weeds that are controlled. Some weeds may be controlled by only one of the active ingredient in this product.

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 weed species; and
- \* Surviving plants mixed with controlled individuals of the same species.

Naturally occurring weed biotypes that are resistant to Amber<sup>®</sup>, Accurate<sup>®</sup>, Report<sup>™</sup>, Report Extra<sup>™</sup>, Nuance<sup>™</sup>, and Nimble<sup>™</sup> will also be resistant to Grapple Herbicide.

## INTEGRATED PEST MANAGEMENT

To better control pests, Nufarm recommends the use of Integrated Pest Management (IPM). Grapple Herbicide may be used as part of an Integrated Pest Management program, which can include biological, cultural, and genetic practices, aimed at preventing economic pest identification, population monitoring, and treating when target pest populations reach locally determined action thresholds. Consult your agricultural dealer, consultant, applicator, and/or appropriate state agricultural extension service representative for treating specific pest/crop or site systems in your area.

## USE RESTRICTIONS

Injury to or loss of desirable trees or vegetation may result from failure to observe the following:

- Do not apply, drain, or flush equipment on or near desirable trees or other plants, or on areas where their roots may extend, or in locations where the chemical may be washed or moved into contact with their roots.
- Do not use on lawns, walks, driveways, tennis courts, or similar areas. Prevent drift of spray to desirable plants.
- Do not contaminate any body of water, including irrigation water that may be used on other crops.
- Carefully observe sprayer cleanup instructions, as spray tank residue may damage crops other than potatoes or tomatoes.
- Do not apply using Air Assisted (Air Blast) field-crop sprayers.

## BURNDOWN AND RESIDUAL CONTROL OF CERTAIN ANNUAL GRASS AND BROADLEAF WEEDS WHEN APPLIED PREEMERGENCE AND POSTEMERGENCE TO FIELD CORN - Except California\*

\*For California please see the **FOR PREEMERGENCE AND POSTEMERGENCE USE IN FIELD CORN IN THE STATE OF CALIFORNIA** section of this label.

### APPLICATION INFORMATION FOR FIELD CORN

Grapple Herbicide is a selective herbicide for burndown and residual control of certain annual grass and broadleaf weeds when applied preemergence and postemergence to field corn. Grapple Herbicide may be applied to "Roundup Ready" corn in tank mix combinations with glyphosate herbicides to add control of weeds. If cultivation is necessary because of soil crusting, soil compaction, or weed germination before rain or irrigation occurs, use shallow tillage such as a rotary hoe to lightly incorporate Grapple Herbicide and make certain corn seeds are below the tilled area.

Grapple Herbicide is best used in a planned sequential application herbicide program to be followed by an in-crop application of Grapple Herbicide and/or other postemergence-applied corn herbicides. Refer to the label of the respective sequential partner for specific use directions.

Allow at least 4 weeks between preemergence applications of Grapple Herbicide and postemergence applications of Grapple Herbicide. Make sequential applications after the corn has reached the 2-collar stage but before the corn exceeds the maximum application height listed on the respective product labels.

#### **RESTRICTIONS – FIELD CORN**

- Do not apply to field corn grown for seed or to popcorn or sweet corn.
- Do not apply preemergence to coarse-textured soils (sand, loamy sand or sandy loam) with less than 1% organic matter.
- Do not apply by air in the States of California and New York.
- Do not apply more than 2 ounces per acre (0.5 oz ai rimsulfuron) on a broadcast application basis per year. This includes combinations of preemergence or postemergence applications of Grapple Herbicide; as well as rimsulfuron from application(s) of other products containing rimsulfuron.
- Do not make more than 4 applications per year, this includes combinations of preemergence or postemergence applications.

Apply Grapple Herbicide to field corn hybrids with a relative maturity (RM) of 77 days or more, including “food grade” (yellow dent, hard endosperm), waxy, and High-Oil corn. Not all field corn hybrids of less than 77 RM and not all white corn hybrids or Hi-Lysine hybrids have been tested for crop safety, nor does Nufarm have access to all seed company data. Consequently, injury arising from the use of Grapple Herbicide on these types of corn is the responsibility of the user. Consult with your seed supplier before applying Grapple Herbicide to any of these corn types. Seed company publications indicate “Warning”, “Crop Response Warning”, or “Sensitive” notations for the use of some ALS herbicides on corn hybrids of 77 RM or higher. As noted in the seed company publications, Nufarm sulfonylurea herbicides such as Grapple Herbicide should be used with caution on these hybrids.

#### **FALLOW (BURNDOWN)**

Use Rates Apply Grapple Herbicide at 1 to 2 ounces per acre.

#### **Application Timing**

Grapple Herbicide may be used as a fallow treatment in the spring or fall when the majority of weeds have emerged and are actively growing. Field corn may be planted to this treated area at any time.

#### **Tank Mixtures in Fallow**

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. Users must follow the most restrictive directions for use and precautionary statements of each product in the tank mixture.

Grapple Herbicide may be used as a fallow treatment and may be tank mixed with other herbicides that are registered for use in fallow.

#### **PREEMERGENCE TO FIELD CORN**

##### **RESTRICTIONS**

- Do not apply more than 2 ounces per acre (0.5 oz ai rimsulfuron) on a broadcast application basis per year from all sources.
- Do not make more than 4 applications per year.

##### **Preemergence Rates**

Grapple Herbicide may be applied at 0.5 to 2.0 oz product per acre before corn emergence. Nufarm specifies a rate of 1 to 1.5 oz per acre for most applications.

##### **Application Timing**

Grapple Herbicide may be applied preemergence or preplant to corn. Applications of Grapple Herbicide made before weed emergence will provide residual control of labeled weeds. Control of emerged weeds will require the addition of spray adjuvants as noted below.

#### **POSTEMERGENCE TO FIELD CORN**

##### **RESTRICTION**

- Do not apply more than 2 ounces per acre (0.5 oz ai rimsulfuron) on a broadcast application basis per year from all sources.
- Do not make more than 4 applications per year.

##### **Postemergence Rates**

Grapple Herbicide may be applied at 0.5 to 2 oz per acre as a postemergence broadcast application. Nufarm specifies a use rate of 1 oz per acre for most applications.

##### **Application Timing**

To crop: Apply Grapple Herbicide to corn that is up to 12 inches tall. Do not apply to corn taller than 12 inches or exhibiting 6 or more leaf collars, whichever is more restrictive. Applications of Grapple Herbicide made after weed emergence will provide contact control of labeled weeds as well as limited residual control of later emergence.

To weeds: Tank mixtures of Grapple Herbicide with glyphosate or glufosinate herbicides may be applied after weeds emerge but before they reach the maximum size listed on the glyphosate and glufosinate herbicide labels.

##### **SPRAY ADJUVANTS**

For control of emerged weeds, application of Grapple Herbicide must include a nonionic surfactant and an ammonium nitrogen fertilizer. If applied in a tank mix combination with a glyphosate herbicide product or a glufosinate product contains a built-in adjuvant system, no additional surfactant needs to be added. Crop oil

concentrate may be used in place of nonionic surfactant for burndown applications of Grapple Herbicide made before crop emergence. Products must contain only EPA-exempt ingredients (40 CFR 910 or 40 CFR 920).

**Petroleum Crop Oil Concentrate (COC) or Modified Seed Oil (MSO)**

- Apply at 1% v/v (1 gallon per 100 gallons spray solution) or 2% under arid conditions.
- MSO adjuvants may be used at 0.5% v/v (0.5 gallon per 100 gallons spray solution) if specifically noted on adjuvant product labeling.
- Oil adjuvants must contain at least 80% high quality, petroleum (mineral) or modified vegetable seed oil with at least 15% surfactant emulsifiers.

**Nonionic Surfactant (NIS)**

- Apply at 0.25% v/v (1 qt per 100 gal spray solution).
- Surfactant products must contain at least 60% nonionic surfactant with a hydrophilic/lipophilic balance (HLB) greater than 12.

**Ammonium Nitrogen Fertilizer**

- Use 2 qt per acre of a high-quality urea ammonium nitrate (UAN) such as 28%N or 32%N, or 2 lb per acre of a spray-grade ammonium sulfate (AMS).
- Do not use liquid nitrogen fertilizer as the total carrier solution after crop emergence.

**Special Adjuvant Types**

- Combination adjuvant products may be used at doses that provide the required amount of NIS and ammonium nitrogen fertilizer. Consult product labeling for use rates and restrictions.
- Do not use any other adjuvant rates or mixtures with Grapple Herbicide unless instructed to do so on Nufarm labeling.

**WEEDS IN FIELD CORN CONTROLLED/SUPPRESSED**

Preemergence Control	
Grass weeds	Broadleaf weeds
Barnyardgrass	Carpetweed*
Bluegrass, annual*	Chamomile, false
Crabgrass, large*	Cocklebur*
Foxtail (bristly, giant, green, yellow)	Filaree, Redstem
Panicum, fall*	Henbit
Signalgrass, broadleaf*	Jimsonweed*
Wheat, Volunteer	Kochia (ALS-sensitive)
Wild Oat*	Lambsquarters, common
	Morningglory, ivyleaf*
	Mustard (birdsrape, black)
	Nightshade* (hairy, black)
	Palmer, amaranth*
	Pigweed (prostrate, redroot, smooth)
	Purslane, common
	Ragweed, common*
	Russian thistle, seedling*
	Smartweed, Pennsylvania*
	Velvetleaf*
*partial control/suppression	

Postemergence Control	
Grass weeds (1 – 2")	Broadleaf weeds (1 – 3")
Barley, volunteer	Alfalfa, volunteer
Barnyardgrass	Canada, thistle*
Bluegrass, annual	Chickweed, common
Crabgrass, large (1/2")	Cocklebur*
Cupgrass, woolly (1")	Dandelion (6" diameter)
Foxtail (bristly, giant, green, yellow)	Henbit
Johnsongrass, seedling*	Kochia
Millet, wild proso*	Lambsquarters, common*
Panicum, fall	Morningglory, ivyleaf*
Quackgrass*	Mustard (birdsrape, black, wild)
Ryegrass, Italian*	Nightshade, hairy*
Shattercane (4")	Pigweed, (prostrate, redroot, smooth)
Signalgrass, broadleaf*	Purshlane, common*
Stinkgrass*	Ragweed, common*
Wheat, volunteer	Shepherd's purse
Wild oat*	Smartweed, Pennsylvania*
Yellow nutsedge*	Wild radish
	Velvetleaf*
*partial control/suppression	

#### TANK MIXTURES

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. Users must follow the most restrictive directions for use and precautionary statements of each product in the tank mixture.

Grapple Herbicide may be tank mixed with full or reduced rates of other products registered for use in corn.

#### Preemergence to Corn

##### For Additional Control of Grass and Broadleaf Weeds

Grapple Herbicide may be tank mixed with full or reduced rates of preemergence grass and broadleaf herbicides such as atrazine, metolachlor, s-metolachlor, acetochlor, dimethenamid-p, isoxaflutole, to provide added residual activity or burndown activity on emerged weeds. Consult tank mix partner labeling for rate and soil-type restrictions.

#### Postemergence to Corn

##### Tank Mixtures with Glyphosate

Grapple Herbicide may be tank mixed with glyphosate herbicides if applications are made to corn hybrids containing the "Roundup Ready" gene. **Many seed trade names are available under the Roundup Ready trait; contact the seed manufacturer or seed distributor to determine if the seed variety is designated and supported to be Roundup Ready.**

When used in a tank mixture with glyphosate herbicides, 1 oz. Grapple Herbicide will deliver improved burndown and/or residual activity on the following weeds, as compared to glyphosate used alone:

Alfalfa volunteer*	Johnsongrass seedling	Sandbur (field, longspine)
Barley volunteer	Kochia	Shepherd's purse
Barnyardgrass	Lambsquarters, common	Signalgrass, broadleaf
Bluegrass, annual	Millet, wild proso	Smartweed, Pennsylvania
Canada thistle	Morningglory, ivyleaf	Stinkgrass
Chamomile, false	Mustard (birdsrape, black, wild)	Velvetleaf
Chickweed, common	Nightshade, hairy	Wheat, volunteer
Cocklebur	Panicum, fall	Wild buckwheat
Crabgrass	Pigweed (prostrate, redroot, smooth)	Wild oat
Dandelion (6" diameter)	Purshlane, common	Wild radish
Filaree, redstem	Quackgrass	Yellow nutsedge
Foxtail (bristly, giant, green, yellow)	Ragweed, common	
Henbit	Ryegrass, Italian	
*Not for Use in California.		



### Tank Mixtures with Glufosinate

Grapple Herbicide may be tank mixed with glufosinate herbicides if applications are made to corn hybrids containing the "Liberty Link" gene. **Many seed trade names are available under the LibertyLink trait; contact the seed manufacturer or seed distributor to determine if the seed variety is designated and supported to be LibertyLink.**

When used in tank mixtures with glufosinate herbicide, 0.75 oz. Grapple Herbicide will deliver improved burndown and/or limited residual activity on the following weeds, as compared to glufosinate used alone:

Foxtail (giant, yellow)	Pigweed, redroot
Lambsquarters, common	Velvetleaf

### For Additional Control of Kochia

Grapple Herbicide may be tank mixed with labeled rate of fluroxypyr for improved control of kochia. Use higher rates when weed infestation is heavy. Refer to the specific fluroxypyr containing label for application timing and restrictions. Grapple Herbicide may be tank mixed with fluroxypyr and dicamba for broader spectrum weed control.

### For Additional Control of Broadleaf Weeds

Grapple Herbicide may be tank mixed with atrazine, s-metolachlor, mesotrione for improved burndown or residual control of several broadleaf weeds including common waterhemp, common ragweed, common lambsquarters, and velvetleaf. When applying mixtures of Grapple Herbicide plus atrazine, s-metolachlor, mesotrione the use of a nonionic surfactant is suggested. Refer to atrazine, s-metolachlor, mesotrione labels for additional information regarding application timing, tank mixtures, adjuvants, and rotational crops.

### For Additional Control of Broadleaf Weeds

Grapple Herbicide may be tank mixed with 0.5 to 0.75 fluid ounces per acre of topramezone plus atrazine for improved burndown or residual control of several broadleaf weeds including common waterhemp, common ragweed, common lambsquarters, and velvetleaf. When applying mixtures of Grapple Herbicide plus topramezone, the use of methylated seed oil is suggested. Refer to topramezone label for additional information regarding application timing, tank mixtures, adjuvants, and rotational crops.

### USE PRECAUTIONS

- Grapple Herbicide may interact with certain insecticides previously applied to the crop. Crop response varies with field corn type, insecticide used, insecticide application methods, and soil type.
- Grapple Herbicide may be applied to corn previously treated with non-organophosphate soil insecticides regardless of soil type.

### USE RESTRICTIONS

- Allow at least 60 days between a preemergence or preplant application of Grapple Herbicide and application of organophosphate insecticide since crop injury may result.
- Do not apply Grapple Herbicide within 45 days of crop emergence where an organophosphate insecticide was applied as in-furrow treatment since crop injury may occur.
- Do not tank mix Grapple Herbicide with foliar-applied organophosphate insecticides such as chlorpyrifos, malathion, parathion, etc., as severe crop injury may occur.
- Do not tank mix Grapple Herbicide with bentazon or severe crop injury may occur.
- Do not graze, feed forage, grain or fodder (stover) from treated areas to livestock within 30 days of Grapple Herbicide application.
- Do not irrigate Grapple Herbicide into coarse soils at planting time when soils are saturated.
- Injury or loss of desirable trees or vegetation may result from failure to observe the following:
  - Do not apply Grapple Herbicide or drain or flush application equipment on or near desirable trees or other plants, or in areas where their roots may extend or in locations where the chemical may be washed or moved into contact with their roots.
  - Do not use on lawns, walks, driveways, tennis courts, or similar areas.
  - Prevent drift or spray onto desirable plants.
  - Do not contaminate any body of water.
  - Thoroughly clean application equipment immediately after use.
- Do not treat frozen soil.
- Do not apply through any type of irrigation system.
- Do not use flood or furrow irrigation to apply Grapple Herbicide.

**Crop injury may occur following an application of Grapple Herbicide if there is a prolonged period of cold weather and/or in conjunction with wet soils.**

### CHEMIGATION

Do not apply Grapple Herbicide through any type of irrigation system in field corn.

### GROUND APPLICATION

Use a minimum of 15 gallons of water per acre (GPA) to ensure thorough coverage of weeds and the best performance. Use a minimum of 10 GPA for light, scattered stands of weeds. Select nozzles and pressure that deliver Medium or coarser droplet size spray droplets, as indicated, for example, by ASABE Standard S572.1. Nozzles that deliver Coarse spray droplets may be used to reduce drift, provided spray volume is increased to maintain coverage on small weeds. For optimal product performance and minimal spray drift, adjust the spray boom to the lowest possible spray height suggested in manufacturer's specifications. Ensure that equipment is

set up to avoid applying an excessive rate directly over the rows and into the corn plant whorl. Overlaps or starting, stopping, slowing, and turning while spraying may result in crop injury.

#### **RESTRICTIONS- AERIAL APPLICATION**

- Aerial application is not permitted in the states of California and New York. Use Medium or coarser droplet size that will provide optimum spray distribution and maximum coverage at a minimum of 5 GPA.
- Do not apply during a temperature inversion.
- Do not apply when wind speeds exceed 10 miles per hour at the application site.

### **FOR PREEMERGENCE AND POSTEMERGENCE USE IN FIELD CORN IN THE STATE OF CALIFORNIA**

#### **APPLICATION INFORMATION FOR FIELD CORN IN CALIFORNIA**

Grapple Herbicide is a selective herbicide for burndown and residual control of certain annual grass and broadleaf weeds when applied fallow, preemergence and postemergence to field corn. Grapple Herbicide may be applied in tank mix combinations with other corn herbicides for improved burn-down and residual control. Residual weed control is dependent on rainfall, sprinkler irrigation, flood irrigation or furrow irrigation for herbicide activation. Furrow irrigation may not provide proper activation on tops of beds if rainfall or furrow irrigation does not drive Grapple Herbicide into the soil and weed root zones.

Grapple Herbicide is absorbed through the roots and leaf tissue of plants, rapidly inhibiting the growth of susceptible weeds. Rainfall or sprinkler irrigation is needed to move Grapple Herbicide into the soil. Susceptible weeds will generally not emerge from a preemergence application. In some cases, susceptible weeds may germinate and emerge a few days after application, but growth then ceases and leaves become chlorotic three to five days after emergence. Death of leaf tissue and growing point will follow in some species, while others will remain green, stunted and noncompetitive.

The herbicidal action of Grapple Herbicide may be less effective on weeds stressed from adverse environmental conditions (such as extreme temperatures or moisture), abnormal soil conditions, or cultural practices.

Grapple Herbicide treatments are most effective in controlling weeds when adequate rainfall or irrigation is received 5 - 7 days after application. If cultivation is necessary because of soil crusting, soil compaction or weed germination before rain or irrigation occurs, use shallow tillage such as rotary hoe to lightly incorporate Grapple Herbicide and make certain corn seeds are below the tilled area.

Grapple Herbicide is best used in a planned sequential application herbicide program, to be followed by an in-crop application of Grapple Herbicide, nicosulfuron and/or other post applied corn herbicides. Refer to the label of the respective sequential partner for specific use directions.

#### **USE RESTRICTIONS**

- Do not apply to field corn grown for seed, to popcorn or to sweet corn.
- Do not apply more than 1.5 ounce per acre preemergence to field corn.
- Do not apply more than 1.0 ounce per acre postemergence to field corn.
- Do not apply more than a total of 2.0 ounces per acre of Grapple Herbicide (0.5 oz active ingredient rimsulfuron) per year. This includes combinations of preemergence or postemergence applications of Grapple Herbicide; as well as rimsulfuron from application(s) of other products containing rimsulfuron.
- Do not make more than 4 applications per year.

Limit preemergence rates of Grapple Herbicide to a maximum of 1.25 oz product if following with postemergence applications of the rimsulfuron containing products above.

Allow at least 4 weeks between preemergence applications of Grapple Herbicide and postemergence applications of Grapple Herbicide. Make sequential applications after the corn has reached the 2-collar stage but before the corn exceeds the maximum application height listed on the respective product labels.

Restriction - Do not apply preemergence to coarse-textured soils (sand, loamy sand or sandy loam) with less than 1% organic matter.

Apply Grapple Herbicide to field corn hybrids with a relative maturity (RM) of 77 days or more, including "food grade" (yellow dent, hard endosperm), waxy and High-Oil corn. Not all field corn hybrids of less than 77 days RM, not all white corn hybrids nor Hi-Lysine hybrids have been tested for crop safety, nor does Nufarm have access to all seed company data.

Consequently, injury arising from the use of Grapple Herbicide on these types of corn is the responsibility of the user. Consult with your seed supplier before applying Grapple Herbicide to any of these corn types. Seed company publications indicate "Warning", "Crop Response Warning", or "Sensitive" notations for the use of some ALS herbicides on corn hybrids of 77 CRM or higher. As noted in the seed company publications, Nufarm sulfonylurea herbicides such as Grapple Herbicide should be used with caution on these hybrids. Consult with your local Nufarm representative for any additional information relative to potential corn hybrid sensitivity to Grapple Herbicide.

#### **APPLICATION INFORMATION**

##### **Fallow Use Rates**

Apply Grapple Herbicide at 1 to 2 ounces per acre.

##### **Application Timing**

Grapple Herbicide may be used as a fallow treatment, in the fall, winter or spring when the majority of weeds have emerged and are actively growing. Field corn may be planted to this treated area at any time.

## Field Corn

### WHEN TO APPLY- Preemergence to the Crop

Grapple Herbicide may be applied preemergence or preplant to corn. Applications of Grapple Herbicide made before weed emergence will provide residual control of labeled weeds. Control of emerged weeds will require the addition of spray adjuvants as noted below.

### Preemergence Rates

Grapple Herbicide may be applied at 1.0 - 1.5 oz product before corn emergence. See cumulative rimsulfuron rate limitations noted above.

### Timing to Crop

Grapple Herbicide may be used in either conventional, conservation tillage, or no-till crop management systems, and may be applied either preplant, preplant incorporated (less than 2" deep) or preemergence for use in field corn production. Applications of Grapple Herbicide made before weed emergence will provide residual control of labeled weeds. Control of emerged weeds will require the addition of spray adjuvants as noted in this label.

### Preplant Surface Applied

Grapple Herbicide is best used in a planned sequential application program, followed by Grapple Herbicide, nicosulfuron and other post applied corn herbicide. Refer to the label of the respective sequential partner for specific use directions.

### Preplant/Preemerge Burndown

Apply Grapple Herbicide when weeds are young and actively growing but before they exceed the sizes listed on this label. When weeds exceed listed maximum height or weeds not controlled by Grapple Herbicide are present, the addition of burndown herbicide (i.e. glyphosate, gramaxone, dicamba, and/or 2,4-D) is recommended. If giant ragweed, common cocklebur, henbit, Pennsylvania smartweed or purple deadnettle are present at the time of application, the addition of atrazine will improve control. Observe direction for use and precaution and restrictions on the label of the burndown herbicide. When mixing with liquid nitrogen fertilizer or glyphosate, substitute a non-ionic surfactant for crop oil.

### WHEN TO APPLY - Postemergence to the Crop

Apply Grapple Herbicide to corn that is up to 12 inches tall. Do not apply to corn taller than 12 inches or exhibiting 6 or more leaf collars, whichever is more restrictive.

Applications of Grapple Herbicide made after weed emergence will provide contact control of labeled weeds as well as limited residual control of later emergence.

### Postemergence Rates

Grapple Herbicide may be applied at 0.5 - 1.0 oz per acre as a postemergence broadcast application. Nufarm specifies a use rate of 1 oz per acre for most postemergence applications. See cumulative rimsulfuron rate limitations noted above.

## Timing to Emerged Weeds

- Tank mixtures of Grapple Herbicide with glyphosate or glufosinate herbicides may be applied after weeds emerge but before they reach the maximum size listed on the glyphosate or glufosinate herbicide labels.
- Adequate soil moisture is required for optimum activity. Rainfall or irrigation within 5 to 7 days after application will enhance Grapple Herbicide residual activity. If activating rainfall, flood, furrow or sprinkler irrigation (>0.5 inch) is not received within 5 to 7 days after application, follow with a cultivation or with a sequential application of nicosulfuron herbicide, if needed.

## Spray Adjuvants

For control of emerged weeds, application of Grapple Herbicide must include an appropriate adjuvant and an ammonium nitrogen fertilizer. If applied in tank mix combination with a glyphosate or glufosinate herbicide that contains a built-in adjuvant system, no additional surfactant needs to be added. Products must contain only EPA-exempt ingredients (40 CFR 1001).

Do not use with spray additives that alter the pH of the spray solution below pH 5.0 or above pH 9.0 as rapid product degradation can occur. Spray solutions of pH 6.0 - 8.0 allow for optimum stability of Grapple Herbicide.

## Petroleum Crop Oil Concentrate (COC) or Modified Seed Oil (MSO)

- Apply at 1% v/v (1 gallon per 100 gallons spray solution) or 2% under arid conditions.
- MSO adjuvants may be used at 0.5% v/v (0.5 gallon per 100 gallons spray solution) if specifically noted on adjuvant product labeling.
- Oil adjuvants must contain at least 80% high quality, petroleum (mineral) or modified vegetable seed oil with at least 15% surfactant emulsifiers

## Nonionic Surfactant (NIS)

- Apply at 0.25% v/v (1 qt per 100 gal spray solution).
- Surfactant products must contain at least 60% nonionic surfactant with a hydrophilic/lipophilic balance (HLB) greater than 12. Ammonium Nitrogen Fertilizer
- Use 2 qt/acre of a high-quality urea ammonium nitrate (UAN) such as 28%N or 32%N, or 2 lb/acre of a spray grade ammonium sulfate (AMS).

## Special Adjuvant Types

- Combination adjuvant products may be used at doses that provide the required amount of NIS and ammonium nitrogen fertilizer.

Consult product literature for use rates and restrictions.

## WEEDS IN FALLOW / FIELD CORN CONTROLLED/SUPPRESSED IN CALIFORNIA

Preemergence and Residual Control*	
Grass weeds	Broadleaf weeds
Barnyardgrass	Carpetweed
Bluegrass, annual	Chamomile, false
Crabgrass, large	Cocklebur
Foxtail (bristly, giant, green, yellow)	Filaree, Redstem
Panicum, fall	Henbit
Signalgrass, broadleaf	Jimsonweed
Wheat, Volunteer	Kochia (ALS-sensitive)
Wild Oat	Lambsquarters, common
	Morningglory, ivyleaf
	Mustard (birdsrape, black)
	Nightshade* (hairy, black)
	Palmer, amaranth
	Pigweed (prostrate, redroot, smooth)
	Purslane, common
	Ragweed, common
	Russian thistle, seedling
	Smartweed, Pennsylvania
	Velvetleaf

\*Partial control or suppression - for full season control, follow with a sequential, in-crop application of Grapple Herbicide or nicosulfuron with appropriate tank mix partners.

Postemergence Control	
Grass weeds (1 – 2")	Broadleaf weeds (1 – 2")
Barley, volunteer	Canada, thistle
Barnyardgrass	Chickweed, common
Bluegrass, annual	Cocklebur*
Crabgrass, large (1/2")	Dandelion (6" diameter)
Cupgrass, woolly (1")	Henbit
Foxtail (bristly, giant, green, yellow)	Kochia
Johnsongrass, seedling*	Lambsquarters, common*
Millet, wild proso*	Morningglory, ivyleaf*
Panicum, fall	Mustard (birdsrape, black, wild)
Quackgrass*	Nightshade, hairy*
Ryegrass, Italian*	Pigweed, (prostrate, redroot, smooth)
Shattercane (4")	Purslane, common*
Signalgrass, broadleaf*	Ragweed, common*
Stinkgrass*	Shepherd's purse
Wheat, volunteer	Smartweed, Pennsylvania*
Wild oat*	Wild radish
Yellow nutsedge*	Velvetleaf*
*partial control/suppression	

### Tank Mixtures

#### Fallow

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. Users must follow the most restrictive directions for use and precautionary statements of each product in the tank mixture.

Grapple Herbicide may be used as a fallow treatment, and may be tank mixed with other herbicides that are registered for use in fallow.

#### Field Corn

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. Users must follow the most restrictive directions for use and precautionary statements of each product in the tank mixture.

Grapple Herbicide may be tank mixed with full or reduced rates of preemergence grass and broadleaf herbicides such as atrazine, glyphosate, paraquat, dicamba, and 2,4-D to provide added residual activity or burndown activity on emerged weeds. Consult tank mix partner labeling for rate and soil-type restrictions.

#### Postemergence to the Crop

##### Tank Mixtures with Glyphosate

When used in tank mixture with glyphosate, Grapple Herbicide will deliver improved burndown and/or residual activity on the following weeds, as compared to glyphosate used alone. Glyphosate may be tank mixed with post emerge applications of Grapple Herbicide when made to corn hybrids containing the "Roundup Ready" gene.

**Many seed trade names are available under the Roundup Ready trait; contact the seed manufacturer or seed distributor to determine if the seed variety is designated and supported to be Roundup Ready.** Refer to the Spray Adjuvants section for additional information on proper adjuvant selection.

Barley volunteer	Johnsongrass seedling	Ryegrass, Italian
Barnyardgrass	Kochia	Sandbur (field, longspine)
Bluegrass, annual	Lambsquarters, common	Shepherd's purse
Canada thistle	Millet, wild proso	Signalgrass, broadleaf
Chamomile, false	Morningglory, ivyleaf	Smartweed, Pennsylvania
Chickweed, common	Mustard (birdsrape, black, wild)	Stinkgrass
Cocklebur	Nightshade, hairy	Velvetleaf
Crabgrass	Panicum, fall	Wheat, volunteer
Dandelion (6" diameter)	Pigweed (prostrate, redroot, smooth)	Wild buckwheat
Filaree, redstem	Purslane, common	Wild oat
Foxtail (bristly, giant, green, yellow)	Quackgrass	Wild radish
Henbit	Ragweed, common	Yellow nutsedge

#### Tank Mixtures with Glufosinate

Grapple Herbicide may be tank mixed with glufosinate herbicide if applications are made to corn hybrids containing the "Liberty Link" gene. **Many seed trade names are available under the LibertyLink trait; contact the seed manufacturer or seed distributor to determine if the seed variety is designated and supported to be LibertyLink.** When used in a tank mixture with glufosinate herbicide, Grapple Herbicide will deliver improved burndown and/or limited residual activity on the following weeds, as compared to glufosinate used alone:

Foxtail (giant, yellow)	Pigweed, redroot
Lambsquarters, common	Velvetleaf

#### ROTATIONAL CROP GUIDELINES - FIELD CORN IN CALIFORNIA

For crops listed below, planting prior to the interval shown may result in crop injury when using Grapple Herbicide. Rotation intervals may need to be extended to 18 months if drought conditions prevail after application and before the rotational crop is planted, unless supplemental sprinkler irrigation has been applied and totals greater than 15" during the growing season. For tank mixtures, follow the most restrictive rotational crop guideline.

Rotation Crop	Interval (months)
Beans, Dry	10
Beans, snap	10
Corn, Field	Anytime
Corn, Sweet	10
Cotton	10
Cucumber	10
Garlic	6
Potatoes	Anytime
Soybeans	10
Tomatoes	Anytime
Wheat, Winter	4
Crops Not Listed	12

Rotational crops may be planted at indicated intervals provided the fields are deep disked or plowed, and thorough soil mixing is achieved, prior to planting the rotational crop.

#### **Mixing Instructions**

Grapple Herbicide must be completely dissolved in clean water before adding to spray tanks that do not have continuous agitation during loading and mixing. Water Carrier Instructions

1. Fill the tank 1/4 to 1/3 full of water.
2. While agitating, add the required amount of Grapple Herbicide.
3. Continue agitation until the Grapple Herbicide is fully dissolved, at least 5 minutes.
4. Once the Grapple Herbicide is fully dissolved, maintain agitation and continue filling tank with water.
5. As the tank is filling, add tank mix partners and then add the required volume of spray adjuvant. Always add spray adjuvant last. Antifoaming agents may be used.
6. Dispersed tank mix partners can settle if the tank mixture is not continually agitated. If settling occurs, thoroughly re-agitate before using.
7. Apply Grapple Herbicide spray mixture within 24 hours of mixing to avoid product degradation.
8. If Grapple Herbicide and a tank mix partner are to be applied in multiple loads, fully dissolve the Grapple Herbicide in clean water prior to adding to the tank.

If the selected companion herbicide(s) has a ground water advisory, consider this advisory when using the companion herbicide.

#### **Application and Spray Volumes**

##### **Ground**

Use a minimum of 15 gallons of water per acre (GPA) to ensure thorough coverage of the weeds and the best performance. Use a minimum of 10 GPA for light, scattered stands of weeds. For best performance, select nozzles and pressure that deliver Medium or coarser droplet size, as indicated, for example, by ASABE Standard S572.1. Nozzles that deliver Coarse spray droplets may be used to reduce drift, provided spray volume is increased to maintain coverage on small weeds.

For optimal product performance and minimal spray drift, adjust the spray boom to the lowest possible spray height recommended in manufacturers' specifications. Ensure that equipment is set up to avoid applying an excessive rate directly over the rows and into the corn plant whorl. Overlaps or starting, stopping, slowing, and turning while spraying may result in crop injury.

##### **Aerial**

Do not apply by air in California on Field Corn.

#### **USE PRECAUTIONS**

Grapple Herbicide may interact with certain insecticides previously applied to the crop. Crop response varies with field corn type, insecticide used, insecticide application methods, and soil type.

Grapple Herbicide may be applied to corn previously treated with non-organophosphate soil insecticides regardless of soil type.

#### **USE RESTRICTIONS**

- Allow at least 60 days between a preemergence or preplant application of Grapple Herbicide and application of organophosphate insecticide since crop injury may result.
- Do not apply Grapple Herbicide within 45 days of crop emergence where an organophosphate insecticide was applied as an in-furrow treatment since crop injury may occur.
- Do not tank mix Grapple Herbicide with foliar-applied organophosphate insecticides such as chlorpyrifos, malathion, parathion, etc., as severe crop injury may occur.
- Do not tank mix Grapple Herbicide with bentazon or severe crop injury may occur.
- Do not graze, feed forage, grain or fodder (stover) from treated areas to livestock within 30 days of Grapple Herbicide application.
- Do not irrigate Grapple Herbicide into coarse soils at planting time when soils are saturated.
- Injury or loss of desirable trees or vegetation may result from failure to follow all precaution, restriction, use instructions and directions for use:
  - Do not apply Grapple Herbicide or drain or flush application equipment on or near desirable trees or other plants, or in areas where their roots may extend or in locations where the chemical may be washed or moved into contact with their roots.
  - Do not use on lawns, walks, driveways, tennis courts, or similar areas.
  - Prevent drift or spray onto desirable plants.
  - Do not contaminate any body of water.
  - Thoroughly clean application equipment immediately after use.
- Do not treat frozen soil.
- Do not apply through any type of irrigation system.
- Do not use flood or furrow irrigation to apply Grapple Herbicide.
- Do not apply by air on Field Corn in the state of California.

Crop injury may occur following an application of Grapple Herbicide if there is a prolonged period of cold weather and / or in conjunction with wet soils.

## COTTON/SOYBEAN – PREPLANT ONLY\*

\*Not for use in California

### APPLICATION INFORMATION

#### Rate

Apply Grapple Herbicide at 1.0 ounce per acre.

#### Timing to Crop

Grapple Herbicide may be applied preplant after fall harvest through early spring 30 days or more prior to planting, whenever the ground is not frozen, to control emerged weeds and to provide limited residual control of early-emerging spring weeds.

#### Burndown Tank Mixtures

Grapple Herbicide may be used as a preplant residual burndown treatment and may be tank mixed with other herbicides that are registered for preplant in cotton/soybean, including glyphosate, paraquat, glufosinate, 2,4-D and dicamba. Read and follow all instructions on this label and the labels of any tank mix partner before using in mixtures with Grapple Herbicide. If the instructions on the tank mix label conflict with this Grapple Herbicide label, do not use in a tank mixture with Grapple Herbicide. Always follow directions of the most restrictive label.

#### Sequential Application – Soybeans

Grapple Herbicide may be used in a sequential herbicide program in soybean. Apply Grapple Herbicide for burndown and residual weed control 30 days or more prior to planting. Refer to the product labels for use restrictions, application information, rotational crop guidelines, and cautionary statements prior to application.

#### Additional Control of Grass and Broadleaf Weeds

Grapple Herbicide may be tank mixed with full or reduced rates of preplant herbicides registered for cotton and soybean.

### SPRAY ADJUVANTS

For control of emerged weeds, application of Grapple Herbicide must contain an appropriate adjuvant. If applied in a tank mix combination with a glyphosate herbicide product or a glufosinate product that contains a built-in adjuvant system, no additional surfactant needs to be added. Product must contain only EPA-exempt ingredients.

#### Petroleum Crop Oil Concentrate (COC) or Modified Seed Oil (MSO)

- Apply at 1% v/v (1 gallon per 100 gallons spray solution) or 2% under arid conditions.
- MSO adjuvants may be used at 0.5% v/v (0.5 gallon per 100 gallons spray solution) if specifically noted on adjuvant product labeling.

- Oil adjuvants must contain at least 80% high quality, petroleum (mineral) or modified vegetable seed oil with at least 15% surfactant emulsifiers.

#### Nonionic Surfactant (NIS)

- Apply at 0.25% v/v (1 qt per 100 gallons spray solution).
- Surfactant products must contain at least 60% nonionic surfactant with a hydrophilic/lipophilic balance (HLB) greater than 12.

#### Ammonium Nitrogen Fertilizer

In addition to a spray adjuvant, an ammonium nitrogen fertilizer may be used.

- Use 2 qt per acre of a high-quality urea ammonium nitrate (UAN) such as 28%N or 32%N, or 2 lb per acre of a spray-grade ammonium sulfate (AMS).

#### Special Adjuvant Types

- Combination adjuvant products may be used at doses that provide the required amount of NIS and ammonium nitrogen fertilizer. Consult product labeling for use rates and restrictions.
- Do not use any other adjuvant rates or mixtures with Grapple Herbicide unless instructed to do so on Nufarm labeling.

#### Mixing Instructions Fertilizer Carrier Instructions

Grapple Herbicide may be mixed with water or pre-dissolved in water and added to liquid fertilizer for preemergence application. When using liquid fertilizer as the carrier, always pre-slurry Grapple Herbicide in water before adding fertilizer solutions. Add the Grapple Herbicide slurry to the final complete liquid fertilizer mixture – do not add Grapple Herbicide during the fertilizer mixing process.

Always use good agitation while adding the Grapple Herbicide slurry to liquid fertilizers and maintain good agitation until sprayed. When using liquid fertilizer as the carrier, conduct a compatibility test with all components prior to mixing.

Do not use with spray additives or liquid fertilizer carriers that alter the pH of the spray solution below pH 5.0 or above pH 9.0 as rapid product degradation can occur. Spray solutions of pH 6.0-8.0 allow for optimum stability of Grapple Herbicide.

#### Ground Application

Use a minimum of 15 gallons of water per acre (GPA) to ensure thorough coverage of the weeds and the best performance. Use a minimum of 10 GPA for light, scattered stands of weeds. For best performance, select nozzles and pressure that deliver Medium or coarser droplet size spray droplets, as indicated, for example, by ASABE Standard S572.1. Nozzles that deliver Coarse spray droplets may be used to reduce drift, provided spray volume is increased to maintain coverage on small weeds.

For optimal product performance and minimal spray drift, adjust the spray boom to the lowest possible spray height recommended in manufacturers' specifications.

#### **Aerial Application**

Use nozzle types and arrangements that will provide optimum spray distribution and maximum coverage at a minimum of 5 GPA.

#### **RESTRICTION**

- Do not apply during a temperature inversion, when winds are gusty, or when conditions favor poor coverage and/or off target spray movement.

#### **USE RESTRICTIONS**

- Do not plant cotton or soybean fewer than 30 days following an application of Grapple Herbicide.
- Do not apply more than 4 ounces per acre (1.0 oz ai rimsulfuron) on a broadcast application basis per year from all sources.
- Do not make more than 8 applications per year
- Do not apply preemergence to crops planted into coarse-textured soils (sand, loamy sand or sandy loam) with less than 1% organic matter.
- Do not apply through any type of irrigation system
- Do not graze, feed forage, grain, or fodder (stover) from treated areas to livestock within 30 days of Grapple Herbicide application.
- Allow at least 3 weeks between preemergence applications of Grapple Herbicide and postemergence applications of rimsulfuron-containing products.
- Grapple Herbicide may interact with certain insecticides applied to soybean, cotton, or corn. Crop response varies with field crop, insecticide used, insecticide application method, and soil type.
- Grapple Herbicide may be applied to crops previously treated with triallate, trifluralin, tebupirimfos, cyfluthrin, tefluthrin insecticides or other non-organophosphate (OP) soil insecticides regardless of soil type.
- Preplant/Preemergence applications of Grapple Herbicide where an application of chlorpyrifos or phorate is planned may cause unacceptable crop injury, especially on soils of less than 4% organic matter.
- Do not tank mix Grapple Herbicide with bentazon or severe crop injury may occur.
- Crop injury may occur following an application of Grapple Herbicide if there is a prolonged period of cold weather and/or in conjunction with wet soils.
- Do not apply to frozen soil.

- Do not contaminate any body of water.
- Thoroughly clean application equipment immediately after use. (See Sprayer Cleanup section of this label for instructions.)

To avoid injury or loss of desirable trees or vegetation observe the following:

- Do not apply Grapple Herbicide or drain or flush application equipment on or near desirable trees or other plants, on areas where their roots may extend, or in locations where the chemical may be washed or moved into contact with their roots.
- Prevent drift or spray to desirable plants (See "Spray Drift" section of this label for instructions)
- Do not use on lawns, walks, driveways, tennis courts, or similar areas.
- Do not contaminate any body of water.

#### **GRAPPLE HERBICIDE ROTATIONAL CROP GUIDELINES (COTTON, FIELD CORN\*, SOYBEAN)**

\* For Rotation Interval from Field Corn in California see the ROTATIONAL CROP GUIDELINES - FIELD CORN IN CALIFORNIA Table.

**The following rotational intervals must be observed when using Grapple Herbicide:**

<b>1 OZ. MAXIMUM USE RATE</b>	
<b>Rotation Crop</b>	<b>Interval (months)</b>
Corn, field	Anytime
Potatoes	Anytime
Soybeans	1
Cotton	1
Tomato	1
Cereals, Winter (wheat)	3
Cereals, Spring (wheat, oats, barley)	9

*(continued)*



**1 OZ. MAXIMUM USE RATE** *(continued)*

Rotation Crop	Interval (months)
Alfalfa <sup>1, 2</sup>	10
Canola <sup>2</sup>	10
Cucumber	10
Flax	10
Peas	10
Rice <sup>3</sup>	10
Red Clover <sup>2</sup>	10
Sorghum <sup>2</sup>	10
Corn, pop or sweet	10
Snap beans, dry beans	10
Sunflower	10
Sugarbeets <sup>2</sup>	10
Crops Not Listed	18

<sup>1</sup> - On sprinkler irrigated fields in Idaho, Utah, and Northern Nevada it is best to use deep fall tillage such as plowing prior to planting alfalfa. Product degradation may be less on furrow-irrigated soils and may result in some crop injury.

<sup>2</sup> - 18 months in the Red River Valley region of ND and MN. In all other areas, the rotation intervals must be extended to 18 months if drought conditions prevail after application and before the rotational crop is planted, unless sprinkler irrigation has been applied and totals greater than 15" during the growing season.

<sup>3</sup> - For soils with pH less than 6.5

**2 OZ. MAXIMUM USE RATE**

Rotation Crop	Interval (months)
Corn, field	Anytime
Potatoes	Anytime
Optimum GAT Soybeans	Anytime
Tomato	1
STS Soybeans <sup>5</sup>	4
Cereals, Winter (wheat)	4
Cereals, Spring (wheat, oats, barley)	9
Corn, pop or sweet	10
Cotton <sup>4</sup>	10
Cucumber	10
Flax	10
Soybeans	10
Snap beans, dry beans	10
Sunflower	10
Crops Not Listed	18

<sup>4</sup> - The rotation interval must be extended to 18 months if drought conditions prevail after application and before the rotation crop is planted, unless sprinkler irrigation has been applied and totals greater than 15" during the growing season.

<sup>5</sup> - STS Soybeans

NOTE: Grapple Herbicide must not be used in a tank mix or sequential application program with other soil residual ALS-inhibiting herbicides as the combined effects of these herbicides on the planting of subsequent crops have not been thoroughly investigated and injury to the following rotation crop may occur.

**ROTATIONAL CROP GUIDELINES FOR CERTAIN AREAS OF OREGON AND WASHINGTON**

Field corn grown under sprinkler irrigation with a minimum of 18" of water per season. This rotation interval is for sand, loamy sand, and sandy loam soils having not more than 1.5% organic matter where a minimum of 18" of sprinkler irrigation is used on the previous corn crop. Injury to the rotated crop may occur if less than 18" of irrigation is used on the previous field corn crop. For tank mixtures, follow the most restrictive rotational crop guideline.

The following rotational intervals must be observed when using Grapple Herbicide on field corn (Oregon and Washington):

Rotation Crop	Interval (months)
Alfalfa	4
Carrots	10
Cucumber	10
Grass, pasture, hay, seed	4
Mint	4
Onions	10
Peas	10

#### **For Rotation to Alfalfa**

Grapple Herbicide in field corn not to exceed 1 ounce per year in Adams, Grant, Douglas and Lincoln counties of Washington, and Grapple Herbicide in field corn not to exceed 1.5 ounces per acre per year in Benton, Franklin, Klickitat, Walla Walla and Yakima counties in Washington and Morrow and Umatilla counties in Oregon.

#### **For Rotation to Onions and Carrots**

Grapple Herbicide in field corn not to exceed 1.5 ounces per acre per year in Adams, Grant, Douglas and Lincoln counties of Washington, and Grapple Herbicide in field corn not to exceed 2.0 ounces per acre per year in Benton, Franklin, Klickitat, Walla Walla and Yakima counties in Washington and Morrow and Umatilla counties in Oregon.

#### **For Rotation to Grass Crops Grown for Seed, Hay or Pasture**

Grapple Herbicide in field corn not to exceed 1.5 ounces per acre per year in Adams, Grant, Douglas and Lincoln counties of Washington, and Grapple Herbicide in field corn not to exceed 2.0 ounces per acre per year in Benton, Franklin, Klickitat, Walla Walla and Yakima counties in Washington and Morrow and Umatilla counties in Oregon.

#### **For Rotation to Peas and Mints**

Grapple Herbicide in field corn not to exceed 1.5 ounces per acre per year in all areas.

## **CITRUS FRUIT, TREE NUTS, POME FRUIT, STONE FRUITS, GRAPES**

### **APPLICATION INFORMATION**

Grapple Herbicide should be applied as a uniform broadcast application to the orchard or vineyard floor or as a uniform band application directed at the base of the trunk or vine.

For broadcast applications, make a single application of Grapple Herbicide at 4 ounces per acre per year. For improved weed management, Grapple Herbicide should be applied in tank mixture with other registered preemergence herbicides.

When applied as a banded treatment (50% band or less), Grapple Herbicide may be applied twice a year. However, do not apply more than 4 ounces per acre on a broadcast application basis per year. Unless otherwise specified on this label, allow a minimum of 30 days between applications.

To help ensure uniform coverage, use a minimum of 10 gallons of spray solution per acre. Nozzle selection should meet manufacturer's spray volume and pressure instructions for preemergence or postemergence herbicide applications.

Apply only to crops that have been established for one full growing season and are in good health and vigor. Best results are obtained when the soil is moist at the time of application, and ½ inch of rainfall or sprinkler irrigation occurs within 2 weeks after application. Time the application(s) to take advantage of normal rainfall patterns and cool temperatures. Moisture for activation should occur within 2-3 weeks after application. Avoid direct or indirect spray contact with crop foliage or fruit, except undesirable suckers.

### **RESTRICTIONS**

- Do not apply Grapple Herbicide by air. Use ground application equipment only.
- Grapple Herbicide may also be applied by certain chemigation methods, such as micro-sprinkler. However, do not apply by overhead, flood, or drip irrigation.
- Do not use Grapple Herbicide in a spray solution with a pH of below 4.0 or above 8.0 with spray additives that buffer the pH to below 4.0 or above 8.0, since degradation of Grapple Herbicide may occur.
- Do not apply more than 4 ounces per acre (1.0 oz ai rimsulfuron) on a broadcast application basis per year.
- Do not make more than 8 applications per year.

**PRE-HARVEST INTERVAL (PHI)**

CROP GROUP	PRE-HARVEST INTERVAL (PHI)
<b>Citrus Fruit (Crop Group 10):</b> Calamondin; Citrus citron; Citrus hybrids (includes chironja, tangelo, tangor); Grapefruit; Kumquat; Lemon; Lime; Mandarin (tangerine); Orange (sweet and sour); Pummelo; Satsuma mandarin	3 days
<b>Pome Fruit (Crop Group 11):</b> Apple; Crabapple; Loquat; Mayhaw; Pear; Oriental pear; Quince	7 days
<b>Tree Nuts (Crop Group 14):</b> Almond; Beech nut; Brazil nut; Butternut; Cashew; Chestnut; Chinquapin; Filbert (hazelnut); Hickory nut; Macadamia nut (bush nut); Pecan; Pistachio; Walnut (black and English)	14 days
<b>Stone Fruit (Crop Group 12):</b> Apricot; Cherry (sweet and tart); Nectarine; Peach; Plum; Plum (Chickasaw); Plum (Damson); Plum (Japanese); Plumcot; Prune (fresh)	14 days
<b>Grapes</b>	14 days

**WEEDS CONTROLLED**

Susceptible weeds are controlled for 60 to 90 days after application of Grapple Herbicide. Rainfall or irrigation is needed for herbicide activation. Length of control is a function of moisture for activation, soil temperature, soil texture, and amount of moisture after application.

When weeds are present at application, include a labeled burndown herbicide, such as glyphosate, paraquat, or glufosinate, with an appropriate adjuvant. Grapple Herbicide will help provide postemergence control of the weeds listed in this label. For best results, make postemergence applications to young, actively growing weeds and include a spray adjuvant.

Residual weed control may be reduced when Grapple Herbicide is applied where heavy crop trash and/or weed residue exists.

Weed control may also be reduced when applications of Grapple Herbicide are made to weeds under stress from drought, excessive water, temperature extremes, disease, or low humidity.

**WEEDS IN CITRUS FRUIT, TREE NUTS, POME FRUIT, STONE FRUITS, GRAPES CONTROLLED OR PARTIALLY CONTROLLED**

Preemergence Control	
Grass weeds	Broadleaf weeds
Barnyardgrass	Chamomile, false
Crabgrass, large* 1	Dandelion, common (seedling)
Foxtail (giant, green, yellow)	Filaree, redstem
Quackgrass	Fleabane, hairy
Wheat, volunteer	Groundsel, common
	Henbit
	Kochia
	Mallow, common
	Marestail/horseweed
	Mustard (birdsrape, black)
	Pigweed (redroot, smooth)
	Puncturevine
	Purslane, Common
	Spurge (prostrate, spotted)

Preemergence Partial Control*	
Grass weeds	Broadleaf weeds
Wild Oats	Cocklebur
	Dandelion, common (established)
	Lambsquarters, common
	Nightshade (black, hairy)
	Nutsedge, yellow
	Pigweed, Prostrate
	Ragweed, Common
	Velvetleaf

\* Weed partial control is a reduction in weed competition (reduced population and/or vigor) as visually compared to an untreated area.  
<sup>1</sup> – Not for use in California

Postemergence Control	
Grass weeds (1 – 2")	Broadleaf weeds (1 – 3")
Barley, Volunteer	Chamomile, false
Barnyardgrass	Chickweed, common
Bluegrass, Annual	Henbit
Crabgrass, large (1/2 inch)	Kochia
Foxtail (bristly, giant, green, yellow)	Mustard (black, wild)
Panicum, fall	Pigweed (redroot, smooth)
Wheat, Volunteer	Puncturevine
	Purslane, common
	Shepherd's purse
	Wild radish

Postemergence Partial Control*	
Grass weeds	Broadleaf weeds
Johnsongrass, seedling	Cocklebur
Millet, wild-proso	Dandelion, common (>6 inches in diameter)
Oat, wild	Lambsquarters, common
Quackgrass	Mallow, common
Stinkgrass	Nightshade, hairy
	Nutsedge, yellow
	Pigweed, prostrate
	Ragweed, common
	Smartweed, Pennsylvania
	Thistle, Canada
	Velvetleaf

\* Weed partial control is a reduction in weed competition (reduced population and/or vigor) as visually compared to an untreated area. The degree of partial control varies with the rate used, the size of weeds, and the environmental conditions following treatment.

## SPECIFIC WEED PROBLEMS

**COMMON DANDELION AND MALLOW:** Grapple Herbicide provides excellent preemergence control of common dandelion and mallow germinating from seed. In high rainfall areas or where sprinkler irrigation is used, a second application may be needed to extend residual control throughout the growing season. When applications are made postemergence to these weeds, always add a suitable burndown herbicide such as glyphosate or paraquat. Small and medium-sized plants (up to 6 inches in diameter) are controlled by postemergence applications of Grapple Herbicide plus a burndown herbicide; however, plants that are larger than 6 inches in diameter may only be suppressed and may require a second application 4 to 6 weeks later.

**MARESTAIL/HORSEWEED AND FLEABANE:** Where marestail (horseweed) and fleabane are the target weeds, applications prior to emergence provide best results. This may require a fall application to help prevent fall-germinating seedlings from becoming established during the winter. A foliar active herbicide with activity on fleabane and marestail/horseweed (such as paraquat, glyphosate, and glufosinate) must be tank mixed with

Grapple Herbicide for best control and resistance management. After fall application, a second application in the spring may be required to provide extended weed control in the summer. Where Grapple Herbicide is applied for control of marestail/horseweed and fleabane, another soil-residual herbicide should be included as a tank mix or rotational partner to aid in resistance management.

**PUNCTUREVINE:** For best results, apply early in the spring when you can expect rainfall or overhead irrigation to move Grapple Herbicide into the weed root zone before puncturevine germinates. Puncturevine emerges over a long period of time and late-season germinations may not be controlled.

**YELLOW NUTSEDGE:** Grapple Herbicide provides suppression of yellow nutsedge. To obtain the most effective results, use the highest rate allowed based on width of your spray band and make two applications. For applications made postemergence to nutsedge, always add the appropriate rate of glyphosate and an effective adjuvant if required. On soils with high organic matter (6% or higher) always apply postemergence to weeds since preemergence applications are not as effective on these soils.

#### **Application Timing – Yellow Nutsedge**

**Preemergence plus Early Postemergence:** Make the preemergence application when you can expect rainfall or overhead irrigation to move Grapple Herbicide into the nutsedge root zone prior to nutsedge emergence. Make a second application when emerging nutsedge is 2 to 4 inches tall.

**Postemergence plus Postemergence:** Make first application when emerging nutsedge is 2 to 4 inches tall. Repeat application 14 days later. Note: If yellow nutsedge is greater than 6 inches tall at the first application, weed control effectiveness will be greatly reduced.

**ANNUAL SUMMER GRASS Weeds (such as Barnyardgrass, Green Foxtail, and Crabgrass):** Where sprinkler irrigation is used, a fall or early spring application of Grapple Herbicide will not provide season-long control of summer grasses like foxtail, barnyardgrass, and crabgrass. For best results, use Grapple Herbicide with a suitable tank mix herbicide such as oryzalin or pendimethalin. A second application may be needed to provide extended control of summer grasses.

#### **USE PRECAUTIONS**

- Direct sprays to minimize spray contact with fruit or foliage.
- Avoid spray drift to any adjacent crops or desirable plants as injury may occur.
- Draining or flushing equipment on or near desirable trees or other plants, or in areas where their roots may extend, or in locations where the chemical may be washed or moved into contact with their roots may injure these plants. Trees or desirable plants whose roots extend into a treated crop use area may be injured.
- For best results, maintain spray tank solution at pH 5 to 7.
- If the selected companion herbicide has a ground or surface water advisory, consider the advisory when using the companion herbicide.
- Crop injury may occur from applications made to poorly drained soils.

#### **USE RESTRICTIONS**

- Do not apply to frozen or snow-covered soil.

**Diuron-Containing Products (Washington and Oregon):** On coarse-textured soils where crops are grown under sprinkler irrigation, avoid using diuron-containing products as a tank-mix partner with Grapple Herbicide between June 1 and September 30 since crop injury may result. Grapple Herbicide tank mixed with diuron products can be used in the fall (after September 30) or early spring when temperatures are cool to moderate.

#### **CROP ROTATION – (Fruit, Nut, and Vine Crops)**

Prior to planting, fields to be rotated to the above crops should have a thorough soil mixing – for example, two diskings, or a plowing and a disking. To help ensure rotational crop safety, a field bioassay should be completed prior to planting any other desired crops. The results of this bioassay may require the crop rotation interval to be extended. A successful field bioassay means growing to maturity a test strip of the crop(s) intended for production. The test strip should cross the entire field including knolls and low areas.

#### **RESTRICTION**

- Do not plant any crops, except field corn, tomatoes, potatoes, and those listed on this label in the PRODUCT INFORMATION section, within one year of the last Grapple Herbicide application.

#### **MICRO-SPRINKLER CHEMIGATION – (Fruit, Nut, and Vine Crops)**

Grapple Herbicide may be applied via micro-sprinkler chemigation. The chemigation 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 backflow. 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. The system must contain functional interlocking controls to automatically shut off the pesticide injection pump when the water pump motor stops. The irrigation line or water pump must include a functional pressure switch that will stop the water pump motor when the water pressure decreases to the point where pesticide distribution is adversely affected. Systems must use a metering pump (e.g., diaphragm pump) effectively designed and constructed of materials that are compatible with pesticide(s) and capable of being fitted with a system interlock. **Do not apply Grapple Herbicide through any other chemigation equipment.**

#### **USE PRECAUTIONS FOR CHEMIGATION – (Fruit, Nut, and Vine Crops)**

- Distributing treated water in an uneven manner can result in crop injury, lack of effectiveness, or over-tolerance pesticide residues in the crop. Therefore, to ensure that the mixture is applied evenly at the labeled rate, use sufficient water, apply the mixture for the proper length of time and ensure sprinkler produces a uniform water pattern.
- Continuous agitation in the mix tank is needed to keep the product from settling. If settling does occur, thoroughly re-agitate the tank mixture before using.

## **USE RESTRICTIONS FOR CHEMIGATION – (Fruit, Nut, and Vine Crops)**

- Do not connect an irrigation system used for Grapple Herbicide application to a public water system.
- Do not permit run-off during chemigation.

## **POTATOES**

### **APPLICATION INFORMATION**

#### **PREEMERGENCE APPLICATIONS**

For best results, apply Grapple Herbicide at 1 to 1-1/2 ounces of product per acre immediately after hilling, drag-off, or reservoir tillage (dam/dike operation) to a clean, newly prepared seedbed.

To activate Grapple Herbicide in the soil, supply moisture by a single rainfall event or apply sprinkler irrigation of 1/3 to 1 inch (sandy soils apply at least 1/3 inch, sandy loams apply at least 1/2 inch, silt soils apply at least 3/4 inch, clay soils apply at least 1 inch), within 5 days after application to move Grapple Herbicide 3 inches deep into the soil profile. Activating sprinkler irrigation is required regardless of the soil moisture level at planting or the cumulative precipitation that occurs over the next 5 days (unless rainfall occurs in a single event and equals the activation moisture requirement). If rainfall or sprinkler activation cannot be managed, waiting for weeds to emerge and applying Grapple Herbicide postemergence would result in better weed control.

If a clean, newly prepared seedbed free of emerged or germinating weeds does not occur, and weeds are present at the application, add a spray adjuvant to the spray mix. Control may not be adequate for weeds that have an established root system before activation of Grapple Herbicide.

#### **RESTRICTIONS – POTATOES**

- Do not apply Grapple Herbicide within 30 days of potato harvest.
- Do not apply more than 2.5 ounces per acre (0.625 oz ai rimsulfuron) on a broadcast application basis per year.
- Do not make more than 5 applications per year.

#### **TANK MIXTURES – PREEMERGENCE APPLICATIONS**

Grapple Herbicide may be tank mixed with herbicides labeled for use on potatoes (such as EPTC, pendimethalin, linuron, s-metolachlor, or glyphosate) products registered for potatoes) in accordance with the most restrictive of label limitations and precautions. When tank mixing Grapple Herbicide with another potato herbicide(s), read and follow all use directions, restrictions, and precautions of both Grapple Herbicide and the tank mix partner(s).

Grapple Herbicide may also be used in three-way tank mix combinations with the above herbicide(s). If these instructions conflict with this Grapple Herbicide label, do not use as a tank mix with Grapple Herbicide.

#### **Grapple Herbicide plus Metribuzin**

Apply a tank mix combination of Grapple Herbicide at 1 to 1-1/2 oz per acre and metribuzin for better control of such weeds as kochia, Russian thistle, and common lambsquarters. For best results apply after hilling or drag-off to a clean, newly prepared seedbed before potatoes emerge and weeds germinate. Read and follow the metribuzin label for your area.

#### **Grapple Herbicide plus EPTC**

Apply a tank mix of Grapple Herbicide at 1 to 1-1/2 oz per acre and EPTC at label rates for better control of weeds such as hairy nightshade and crabgrass. For best results apply after hilling or drag-off to a clean, newly prepared seedbed before potatoes emerge and weeds germinate. Since the rates and incorporation methods of EPTC vary by region, follow the instructions for your region. The procedure is to incorporate a tank mix of EPTC + Grapple Herbicide using irrigation, and not equipment, to prevent poor weed control from deep incorporation of the Grapple Herbicide. If your area does not allow incorporation using irrigation, then apply EPTC and Grapple Herbicide in a split application. Read and follow both product labels for your area.

#### **Grapple Herbicide plus pendimethalin**

Apply as a tank mix combination of Grapple Herbicide at 1 to 1-1/2 oz per acre and pendimethalin at label rates for better control of such weeds as kochia, crabgrass, and common lambsquarters. For best results apply after hilling or drag-off to a clean, newly prepared seedbed before potatoes emerge and weeds germinate. Read and follow the pendimethalin label for your area.

#### **Grapple Herbicide plus Linuron**

Apply a tank mix combination of Grapple Herbicide at 1 to 1-1/2 oz per acre and linuron for better control of such weeds as common lambsquarter and common ragweed. For best results apply after hilling or drag-off to a clean, newly prepared seedbed, before potatoes emerge and weeds germinate. Read and follow the linuron label for your area.

#### **Grapple Herbicide plus S-Metolachlor**

Apply a tank mix combination of Grapple Herbicide at 1 to 1-1/2 oz per acre and S-Metolachlor for better control of such weeds as yellow nutsedge and black nightshade. For best results apply after hilling or drag-off to a clean, newly prepared seedbed before potatoes emerge and weeds germinate. Read and follow both product labels for your area.

#### **POSTEMERGENCE APPLICATIONS – POTATOES**

For postemergence applications, apply Grapple Herbicide at 1 to 1-1/2 oz per acre to young, actively growing weeds after crop emergence. Typically, small weeds (less than 1 inch in height or diameter) that are actively growing at application are most easily controlled.

Under growing conditions that promote crop stress (such as drought, frost, cold temperatures, high temperatures, or extreme temperature variations), temporary chlorosis (lime green color) may occur after application of Grapple Herbicide. Symptoms usually disappear within 5 to 15 days.

For best results with Grapple Herbicide postemergence, rainfall or sprinkler irrigation of 1/3 to 1 inch (sandy soils apply at least 1/3 inch, sandy loams apply at least 1/2 inch, silt soils apply at least 3/4 inch, clay soils apply at least 1 inch), no sooner than 4 hours, but not more than 5 days after application, will activate Grapple Herbicide in the soil and help provide control of subsequent flushes of annual weeds.

#### **TANK MIXTURES (POTATOES) – POSTEMERGENCE APPLICATIONS**

Grapple Herbicide may be tank mixed with pesticide products labeled for use on potatoes (such as EPTC and metribuzin) in accordance with the most restrictive of label limitations and precautions. When tank mixing Grapple Herbicide with another potato pesticide(s), read and follow all use directions, restrictions, and precautions of both Grapple Herbicide and the tank mix partner(s).

Grapple Herbicide may also be used in three-way tank mix combinations with the above pesticide(s). If these instructions conflict with this Grapple Herbicide label, do not use as a tank mix with Grapple Herbicide.

#### **Grapple Herbicide plus Foliar Fungicides**

Grapple Herbicide may be tank mixed with other suitable registered fungicides on potatoes (such as mancozeb or chlorothalonil).

Read and follow all manufacturers' label instructions for the companion fungicide. If these instructions conflict with this Grapple Herbicide label, do not use as a tank mix with Grapple Herbicide.

#### **Grapple Herbicide plus Metribuzin**

Apply a tank mix combination of Grapple Herbicide at 1 to 1-1/2 oz per acre and metribuzin for improved weed control of such weeds as Russian thistle, common lambsquarters and triazine-resistant weeds. Use a nonionic surfactant (NIS) at 0.125% v/v (1 pints/100 gal. of water). The addition of adjuvants to postemergence metribuzin applications may reduce crop tolerance. Adjuvants should be used with caution.

When possible, avoid postemergence applications on metribuzin-sensitive varieties or if the crop is under stress. Read and follow both product labels for your area. Note: Crop oil concentrate (COC) or methylated seed oil (MSO) must not be used for tank mix combinations with Grapple Herbicide plus metribuzin.

#### **Grapple Herbicide plus EPTC**

Apply Grapple Herbicide at 1 to 1.5 ounce per acre in tank mix with EPTC herbicide. Include 1% volume/volume (1 gal. per 100 gal. spray solution) of either a modified seed oil adjuvant (MSO) or 0.5% volume/volume (0.5 gal. per 100 gal. spray solution) of an organo-silicon/modified seed oil blend (OS/MSO – such as Dyne-Amic<sup>®</sup>, Rivet<sup>™</sup>, or Phase<sup>®</sup>). Include a 2 lb/acre of a spray-grade ammonium sulfate (AMS).

For best results, rainfall or sprinkler irrigation of 1/3 to 1 inch (sandy soils apply at least 1/3 inch, sandy loams apply at least 1/2 inch, silt soils apply at least 3/4 inch, clay soils apply at least 1 inch), no sooner than 4 hours after application, but not more than 1 day after application.

Additional EPTC can be added during the water in process if desired (read and follow all use directions, restrictions, and precautions on the EPTC label before use. If these instructions conflict with this Grapple Herbicide label, do not use as a tank mix with Grapple Herbicide).

**Precautions:** Crop injury can occur (leaf burn and temporary yellowing) when applications are made under high temperatures. Addition of fungicides may increase the level of crop injury. In warm, moist conditions, the expression of herbicide symptoms is accelerated; in cold, dry conditions, expression of herbicide symptoms is delayed and may be more variable in weed control.

#### **SEQUENTIAL APPLICATIONS – POTATOES**

Depending upon rainfall or other environmental conditions, and the density of the top growth of the potato variety (those with poor top growth such as Norkotah), the annual weeds may have a second flush of germinating seedlings, and treated perennials may produce new growth from underground roots or stems. To maximize control of such weeds, it may be necessary to apply Grapple Herbicide a second time 14 to 28 days after the first application (typically, make applications to small weeds that are less than 1 inch in height or diameter that are actively growing). The combined rate of the applications cannot exceed 2.5 oz Grapple Herbicide per acre per year.

#### **POTATOES GROWN FOR SEED**

Grapple Herbicide may be used on potatoes grown for seed that use field-grown tubers as the planted seed piece and are at least the progeny of the first field planting. (First field planting utilizes laboratory-tested stocks, which may be tissue-cultured plantlets, greenhouse- produced microtubers, minitubers, stem cuttings, or line selections.)

Apply Grapple Herbicide by any of the following methods:

- Preemergence at 1.5 oz per acre
- Postemergence at 1.0 to 1.5 oz per acre
- In a sequential application preemergence at 1.0-1.5 oz per acre, followed by postemergence at 1.0 oz per acre
- Postemergence at 1.0 oz per acre followed by postemergence at 1.0 oz per acre.

To activate Grapple Herbicide preemergence, supply moisture by a single rainfall event, or apply sprinkler irrigation of 1/3 to 1 inch (sandy soils apply at least 1/3 inch, sandy loams apply at least 1/2 inch, silt soils apply at least 3/4 inch, clay soils apply at least 1 inch) within 5 days after application to move Grapple Herbicide 2 to 3 inches deep into the soil profile.

## USE RESTRICTIONS

- Do not apply to plants suffering stress from lack of moisture, cold, herbicide injury, and insect or disease injury.
- Do not use on potatoes grown for seed if these are grown from microtubers or transplants. Depending on geography, these may be referred to as Generation 1, Nuclear, Elite 1, or Pre-Elite.
- The rotational crop interval for Spring Barley is extended to 18 months due to the generally shorter growing seasons and different cultural practices in seed production in the states of California, Idaho, Oregon, Montana, South Dakota, Washington, Colorado, and parts of North Dakota (all counties in North Dakota except Pembina, Towner, Walsh, Grand Forks, Trail, and Cass).
- Do not exceed 2.5 oz per acre of Grapple Herbicide per year.

## USE PRECAUTIONS

- The rotational crop interval listed in the Grapple Herbicide label may need to be extended to 18 months if seed potato production practices decrease water and/or time for Grapple Herbicide breakdown. Practices that may shorten the breakdown are late planting or less frequent irrigations as compared to commercial production practices. Potatoes can be planted at anytime.
- Consider informing your state seed certification agency or inspector that Grapple Herbicide has been applied. Under growing conditions that promote crop stress (such as drought, frost, cold temperatures, high temperatures, or extreme temperature variations), temporary chlorosis (lime green color) may occur after application. These symptoms may appear similar to virus-like symptoms (such as chlorosis, leaf crinkling, pinching of terminal leaflet) but will usually disappear within 5 to 15 days of application.

## WEEDS IN POTATOES - CONTROLLED OR PARTIALLY CONTROLLED

Preemergence Control	
Grass weeds	Broadleaf weeds
Barnyardgrass	Chamomile, false
Foxtail (giant, green, yellow)	Filaree, redstem
Wheat, volunteer	Henbit
	Kochia
	Mustard (birdsrape, black)
	Pigweed (prostate, redroot, smooth)
	Purslane, Common

Preemergence Partial Control*	
Grass weeds	Broadleaf weeds
Crabgrass	Cocklebur
Wild Oats	Lambsquarters, common
	Nightshade (black**, hairy)
	Pigweed, Prostrate
	Ragweed, Common
	Velvetleaf

\* Weed partial control is a reduction in weed competition (reduced population and/or vigor) as visually compared to an untreated area.

\*\* Eastern Black Nightshade (*Solanum ptycanthum*) is not controlled or suppressed

Postemergence Control	
Grass weeds	Broadleaf weeds
Barley, Volunteer	Chamomile, false
Barnyardgrass	Chickweed, common
Bluegrass, Annual	Henbit
Crabgrass	Kochia
Foxtail (bristly, giant, green, yellow)	Mustard (birdsrape, black, wild)
Panicum, fall	Pigweed (redroot, smooth)
Wheat, Volunteer	Purslane, common
	Shepherd's purse
	Wild radish



### Postemergence Partial Control\*

Grass weeds	Broadleaf weeds
Johnsongrass, seedling	Cocklebur
Millet, wild-proso	Lambsquarters, common
Oat, wild	Morningglory, ivyleaf
Stinkgrass	Nightshade, hairy
Yellow nutsedge	Nightshade, black <sup>1, 2</sup>
	Pigweed, prostrate
	Quackgrass <sup>2</sup>
	Ragweed, common
	Smartweed, Pennsylvania
	Thistle, Canada <sup>2</sup>
	Velvetleaf
	Volunteer, alfalfa <sup>3</sup>

\* Weed partial control is a reduction in weed competition (reduced population and/or vigor) as visually compared to an untreated area. The degree of partial control varies with the rate used, the size of weeds, and the environmental conditions following treatment.

<sup>1</sup> - Eastern black nightshade (*Solanum ptycanthum*) is not controlled or suppressed.

<sup>2</sup> - See Specific Weed Problems

<sup>3</sup> - Not for use in California

### RESTRICTIONS - AERIAL APPLICATION

#### (See also SPRAY DRIFT)

- Use nozzle types and arrangements that will provide optimum spray distribution and maximum coverage at a minimum of 5 GPA. In California use a minimum of 10 GPA.
- Do not apply during a temperature inversion, when winds are gusty or when conditions favor poor coverage and/or off-target spray movement.
- Do not apply by air in the state of California, except in Modoc or Siskiyou counties. Do not apply by air in the state of New York.

### CHEMIGATION – POTATOES

Grapple Herbicide can be applied using center-pivot, lateral-move, solid-set, or hand-move irrigation systems in potatoes. Do not apply Grapple Herbicide using any other type of irrigation system. Check irrigation systems to ensure uniform application of water to all areas. Failure to apply Grapple Herbicide uniformly may result in crop injury and/or poor weed control.

For best results, use the highest labeled rate and apply preemergence to early postemergence to the weeds (weeds less than 1 inch tall). If weeds are present at application, add a nonionic surfactant containing at least 80% active ingredient to the spray mix at 1 to 2 pints/acre.

Grapple Herbicide may be mixed in a supply tank with water, fertilizer, or other appropriate agricultural chemicals. Maintain continuous agitation in the injection nurse tanks during application.

For solid set and hand move irrigation systems, apply Grapple Herbicide at the beginning of the set and then apply 1/3 to 1 inch of water for activation (sandy soils apply at least 1/3 inch, sandy loams apply at least 1/2 inch, silt soils apply at least 3/4 inch, and clay soils apply at least 1 inch).

If you have questions about calibrating chemigation equipment, contact State Extension Service specialists, equipment manufacturers, or other experts. If the chemigation equipment needs adjustment, only the custodian responsible for its operation or someone under the supervision of that custodian should make the necessary adjustments.

### IRRIGATION SYSTEM REQUIREMENTS

The irrigation system must contain the following:

- a functional check valve
- vacuum relief valve
- a low-pressure drain (to prevent water source contamination from backflow; should be located on the irrigation pipeline)
- functional interlocking controls (to automatically shut off the pesticide injection pump when the water pump motor stops)
- a metering pump, such as 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.

The pesticide injection pipeline must contain the following:

- a functional, automatic, quick-closing check valve (to prevent the flow of fluid back toward the injection pump)
- a functional, solenoid-operated valve (normally closed) located on the intake side of the injection pump (should be connected to the system interlock to prevent fluid from being withdrawn from the supply tank when the irrigation system is shut down either automatically or manually)

The irrigation line or water pump must include a functional pressure switch that will stop the water pump motor when pesticide distribution is adversely affected by a decrease in water pressure.

**CHEMIGATION PRECAUTIONS**

Distributing treated water in an uneven manner can result in crop injury, lack of effectiveness, and pesticide residues in the crop that may be above tolerance limits. Therefore, to ensure that the mixture is applied evenly at the labeled rate, use sufficient water and apply the mixture for the proper length of time.

**CHEMIGATION RESTRICTIONS**

- Do not permit run-off during chemigation.
- Do not apply when wind speed favors drift beyond the area intended for treatment.
- Do not connect an irrigation system (including greenhouse systems) used for Grapple Herbicide application to a public water system.

**GRAPPLE HERBICIDE ROTATIONAL CROP GUIDELINES – POTATO**

For crops listed below, planting prior to the interval shown may result in crop injury when using this product. Rotation intervals may need to be extended to 18 months if drought conditions prevail after application and before the rotational crop is planted unless supplemental sprinkler irrigation has been applied and totals greater than 15” during the growing season. For tank mixtures, follow the most restrictive rotational crop guideline.

Rotation Crop	Interval (months)
Alfalfa**	4
Barley, Spring*	9
Beans, Dry	10
Carrots (Kern County, CA)**	4
Carrots**	10
Corn, Field	Anytime
Corn, Popcorn	10
Corn, Sweet	10
Cotton	10
Cover Crops (erosion control)	4
Cucumber	10

(continued)

Rotation Crop	Interval (months)
Garlic	6
Grass, pasture, hay, seed**	4
Mint**	4
Oats, Spring	9
Onions**	10
Peas**	8
Potatoes	Anytime
Sunflowers	10
Soybeans	4
Tomatoes	Anytime
Wheat, Spring	9
Wheat, Winter	4
Crops Not Listed	18

\* Idaho – 18 months for Teton County, Caribou County, Madison County East of Hwy. 20, and Fremont County East of Hwy. 20. Colorado – Alamosa, Conejos, Costilla, Rio Grande and Saguache Counties: 1.5 oz or less Grapple Herbicide per acre per year – 9 months; greater than 1.5 oz of Grapple Herbicide per acre per year – 18 months.

\*\* Potatoes grown in the counties listed below in OR and WA under sprinkler irrigation with a minimum of 18 inches of water per season. All other areas may be rotated to alfalfa at 18 months after application. This rotation interval is for sand, loamy sand, and sandy loam soils having not more than 1.5% organic matter where a minimum of 18 inches of sprinkler irrigation is used on the previous potato crop. Injury to the rotated crop may occur if less than 18 inches of irrigation is used on the previous potato crop. For tank mixtures, follow the most restrictive rotational crop guideline.

**\*\* Specific Rotation for Crops marked “\*\*\*”:**

**For Rotation to Alfalfa:** Grapple Herbicide in potatoes not to exceed 1 ounce per year in Adams, Grant, Douglas and Lincoln Counties of Washington, and Grapple Herbicide in potatoes not to exceed 1.5 ounces per acre per year in Benton, Franklin, Klickitat, Walla Walla, and Yakima Counties in Washington and Morrow and Umatilla Counties in Oregon.

(continued)

**For Rotation to Onions and Carrots:** Grapple Herbicide in potatoes not to exceed 1.5 ounces per acre per year in Adams, Grant, Douglas and Lincoln Counties of Washington, and Grapple Herbicide in potatoes not to exceed 2.5 ounces per acre per year in Benton, Franklin, Klickitat, Walla Walla, and Yakima Counties in Washington and Morrow and Umatilla Counties in Oregon.

**For Rotation to Grass Crops Grown for Seed, Hay or Pasture:** Grapple Herbicide in potatoes not to exceed 1.5 ounces per acre per year in Adams, Grant, Douglas, and Lincoln Counties of Washington, and Grapple Herbicide in potatoes not to exceed 2.5 ounces per acre per year in Benton, Franklin, Klickitat, Walla Walla and Yakima counties in Washington and Morrow and Umatilla Counties in Oregon.

**For Rotation to Peas and Mints:** Grapple Herbicide in potatoes not to exceed 1.5 ounces per acre per year in all areas.

**NOTE:** Grapple Herbicide must not be used in a tank mix or sequential application program with other soil residual ALS-inhibiting herbicides on potatoes as the combined effects of these herbicides on the planting of subsequent crops have not been thoroughly investigated and crop injury may occur.

#### USE RESTRICTIONS FOR POTATOES

- Do not apply Grapple Herbicide on potatoes within 30 days of harvest.
- Do not apply more than 2.5 ounces per acre (0.625 oz ai rimsulfuron) on a broadcast application basis per year.
- Do not make more than 5 applications per year.
- Do not apply to sweet potatoes or yams.
- Do not use Grapple Herbicide on potatoes grown for seed, except as directed on this labeling or supplemental labeling.
- Do not apply to potatoes growing in greenhouses, cold frames, pot cultures, etc. Apply only to potatoes growing in fields.

### TOMATOES (DIRECT-SEEDED AND TRANSPLANT)

#### PREEMERGENCE APPLICATIONS

For preemergence applications to the crop, apply Grapple Herbicide after seeding at 2.0 to 4.0 ounces product per acre.

To activate Grapple Herbicide in the soil, supply moisture by a single rainfall event, or apply sprinkler irrigation of 1/2 to 1 inch (sandy soils apply at least 1/2-inch, sandy loams apply at least 1/2 inch, silt soils apply at least 3/4 inch, clay soils apply at least 1 inch) within 5 days after application to move Grapple Herbicide 2 to 3 inches deep into the soil profile. Activating sprinkler irrigation is required regardless of the soil moisture level at planting or the cumulative precipitation that occurs over the next 5 days (unless rainfall occurs in a single event and

equals the activation moisture requirement). If rainfall or sprinkler activation cannot be managed, waiting for weeds to emerge and applying Grapple Herbicide postemergence may result in better weed control.

If a clean, newly prepared seedbed, free of emerged or germinating weeds does not occur and weeds are present at application, the addition of a spray adjuvant may improve weed control (see the SPRAY ADJUVANT section of this label for additional information). Control may not be adequate for weeds that are greater than 1 inch in height or diameter or weeds that have an established root system before activation of Grapple Herbicide.

#### POSTEMERGENCE APPLICATIONS

For postemergence applications, apply Grapple Herbicide at 1.0 to 2.0 ounces product per acre (use 2.0 ounces per acre for longer residual) to young, actively growing weeds after the crop has reached the cotyledon stage. Optimum performance is obtained when weeds are less than 1 inch in height or diameter and are actively growing.

Use a surfactant at a minimum rate of 0.25% V/V (2 pints/100 gallons of water). The use of crop oil concentrate, methylated seed oils, nitrogen fertilizer solution, or nonionic surfactant rates above 0.25% V/V may result in temporary crop chlorosis (yellowish color). Symptoms usually disappear within 5 to 15 days.

Under growing conditions that promote crop stress (such as drought, frost, cold temperatures, high temperatures, extreme temperature variations, or saturated or water-logged soils), temporary crop chlorosis (yellowish color) may occur after application with Grapple Herbicide. Symptoms usually disappear within 5 to 15 days.

For best results with Grapple Herbicide postemergence, rainfall or sprinkler irrigation of 1/2 to 1 inch (sandy soils apply at least 1/2, sandy loams apply at least 1/2, silt soils apply at least 3/4 inch, clay soils apply at least 1 inch), no sooner than 4 hours but not more than 5 days after application, will activate Grapple Herbicide in the soil and help provide control of subsequent flushes of annual weeds.

Postemergence applications of Grapple Herbicide should be made after the tomatoes reach the cotyledon stage.

#### SEQUENTIAL APPLICATIONS TOMATOES

Annual weeds at times may have multiple flushes of seedlings, or treated weeds may sometimes regrow from underground stems or roots, depending upon rainfall and other environmental conditions. To maximize control of such weeds, it may be necessary to use sequential applications of Grapple Herbicide.

#### PREEMERGENCE FOLLOWED BY POSTEMERGENCE

Applications of Grapple Herbicide may be applied preemergence followed by a single or multiple applications postemergence.

**Note:** For sequential applications the total amount of Grapple Herbicide cannot exceed 4.0 oz product per acre per year on a broadcast basis.

## POSTEMERGENCE FOLLOWED BY POSTEMERGENCE

Multiple applications of Grapple Herbicide may be applied postemergence, optimum control is seen when the first application is made to small actively growing weeds, followed by a second application 7 to 14 days later.

**Note:** For sequential applications the total amount of Grapple Herbicide cannot exceed 4.0 oz product per acre per year on a broadcast basis.

### BAND APPLICATIONS – TOMATOES

Grapple Herbicide can be applied preemergence and postemergence as a banded application. Use proportionally less spray mixture based on the soil area actually sprayed. See the “Preemergence Applications” and “Postemergence Applications” sections of this label for additional details on the use of Grapple Herbicide.

### TANK MIXTURES – TOMATOES

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. Users must follow the most restrictive directions for use and precautionary statements of each product in the tank mixture.

Grapple Herbicide may be tank mixed with pesticide products labeled for use on tomatoes in accordance with the most restrictive of label limitations and precautions. Grapple Herbicide may also be used in three-way tank mix combinations with the above pesticide(s). If these instructions conflict with this Grapple Herbicide label, do not use as a tank mix with Grapple Herbicide. Tank mixtures with products that lower the spray solution pH may reduce weed control (such as LI700 surfactant).

### Grapple Herbicide plus Foliar Fungicides

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. Users must follow the most restrictive directions for use and precautionary statements of each product in the tank mixture.

Grapple Herbicide may be tank mixed with suitable registered fungicides (such as mancozeb or chlorothalonil) on tomatoes. Tank mixtures with copper-containing fungicides may reduce weed control.

### RESTRICTIONS – TOMATO

- Do not apply more than 4 ounces per acre (1.0 oz ai rimsulfuron) on a broadcast application basis per year.
- Do not make more than 8 applications per year.

## TOMATOES: CALIFORNIA

### PREEMERGENCE APPLICATIONS

For preemergence applications to the crop, apply Grapple Herbicide after seeding at 2.0 to 4.0 oz product per acre. To activate Grapple Herbicide in the soil, supply moisture by a single rainfall event, or apply sprinkler irrigation of 1/2 to 1 inch (sandy soils apply at least 1/2 inch, sandy loams apply at least 1/2 inch, silt soils apply at least 3/4 inch, clay soils apply at least 1 inch) within 5 days after application to move Grapple Herbicide 2 to 3 inches deep into the soil profile. Activating sprinkler irrigation is required regardless of the soil moisture level at planting, or the cumulative precipitation that occurs over the next 5 days (unless rainfall occurs in a single event and equals the activation moisture requirement). If rainfall or sprinkler activation cannot be managed, waiting for weeds to emerge and applying Grapple Herbicide postemergence may result in better weed control.

If a clean, newly prepared seedbed, free of emerged or germinating weeds does not occur and weeds are present at application, the addition of spray adjuvant may improve weed control (see the SPRAY ADJUVANT section of this label for additional information). Control may not be adequate for weeds that are greater than 1 inch in height or diameter or weeds that have an established root system before activation of Grapple Herbicide.

### POSTEMERGENCE APPLICATIONS

For postemergence applications, apply Grapple Herbicide at 2.0 oz product per acre to young, actively growing weeds after the crop has reached the cotyledon stage. Optimum performance is obtained when weeds are less than 1 inch in height or diameter and are actively growing.

Use a surfactant at a minimum rate of 0.25% V/V (2 pints/100 gallons of water). The use of crop oil concentrate, methylated seed oils, nitrogen fertilizer solution or nonionic surfactant rates above 0.25% V/V may result in temporary crop chlorosis (yellowish color). Symptoms usually disappear within 5 to 15 days.

Under growing conditions that promote crop stress (such as drought, frost, cold temperatures, high temperatures, extreme temperature variations, or saturated or water-logged soils), temporary crop chlorosis (yellowish color) may occur after application of Grapple Herbicide. Symptoms usually disappear within 5 to 15 days.

For best results with Grapple Herbicide postemergence, rainfall or sprinkler irrigation of 1/2 to 1 inch (sandy soils apply at least 1/2 inch, sandy loams apply at least 1/2 inch, silt soils apply at least 3/4 inch, clay soils apply at least 1 inch) no sooner than 4 hours but not more than 5 days after application will activate Grapple Herbicide in the soil and help provide control of subsequent flushes of annual weeds.

Postemergence applications of Grapple Herbicide should be made after the tomatoes reach the cotyledon stage.

### SEQUENTIAL APPLICATIONS

Annual weeds at times may have multiple flushes of seedlings, or treated weeds may sometimes regrow from underground stems or roots, depending upon rainfall and other environmental conditions. To maximize control of such weeds, it may be necessary to use sequential applications of Grapple Herbicide.

### PREEMERGENCE FOLLOWED BY POSTEMERGENCE

Applications of Grapple Herbicide may be applied Preemergence followed by single or multiple applications of Postemergence.

**Note:** For sequential applications the total amount of Grapple Herbicide cannot exceed 4.0 oz product per acre year on a broadcast basis.

### POSTEMERGENCE FOLLOWED BY POSTEMERGENCE

Multiple applications of Grapple Herbicide may be applied postemergence; optimum control is seen when the first application is made to small actively growing weeds followed by a second application 7 to 14 days later.

**Note:** For sequential applications the total amount of Grapple Herbicide cannot exceed 4.0 oz product per acre per year on a broadcast basis.

### BAND APPLICATIONS – TOMATOES

Grapple Herbicide can be applied in a preemergence band at 2.0 to 4.0 oz product per acre (For example, 0.5 to 1.0 oz of product per conventional broadcast acre assuming 25% banding) followed by two separate postemergence band applications applied at 2 oz product per acre (For example, 0.5 oz of product per conventional broadcast acre assuming 25% banding) over the same sprayed area.

Restriction - Do not make any more than three band applications of Grapple Herbicide per year.

### WEEDS IN TOMATOES - CONTROLLED OR PARTIALLY CONTROLLED

Preemergence Control	
Grass weeds	Broadleaf weeds
Barnyardgrass	Filaree, redstem
Foxtail (giant, green, yellow)	Henbit
Wheat, volunteer	Kochia
	Mustard, black
	Pigweed (redroot, smooth)
	Purslane, Common

### Preemergence Partial Control\*

Grass weeds	Broadleaf weeds
Crabgrass	Cocklebur
Wild Oats	Lambsquarters, common
	Nightshade (black <sup>1,2</sup> , hairy)
	Pigweed, Prostrate
	Ragweed, Common
	Velvetleaf

\* Weed partial control is a reduction in weed competition (reduced population and/or vigor) as visually compared to an untreated area.

<sup>1</sup> - Eastern black nightshade (*Solanum ptycanthum*) is not controlled or suppressed.

<sup>2</sup> - See Specific Weed Problems

### Postemergence Control

Grass weeds	Broadleaf weeds
Barley, Volunteer	Chamomile, false
Barnyardgrass	Chickweed, common
Bluegrass, Annual	Henbit
Crabgrass	Kochia
Foxtail (bristly, giant, green, yellow)	Mustard (birdsrape, black, wild)
Panicum, fall	Pigweed (redroot, smooth)
Wheat, Volunteer	Purslane, common
	Shepherd's purse
	Wild radish

Postemergence Partial Control*	
Grass weeds	Broadleaf weeds
Johnsongrass, seedling	Cocklebur
Millet, wild-proso	Lambsquarters, common
Oat, wild	Morningglory, ivyleaf
Quackgrass <sup>2</sup>	Nightshade, hairy
Stinkgrass	Nightshade, black <sup>1</sup> · <sup>2</sup> (cotyledon stage only)
Yellow nutsedge	Pigweed, prostrate
	Quackgrass <sup>2</sup>
	Ragweed, common
	Smartweed, Pennsylvania
	Thistle, Canada <sup>2</sup>
	Velvetleaf
	Volunteer, alfalfa <sup>3</sup>

\* Weed partial control is a reduction in weed competition (reduced population and/or vigor) as visually compared to an untreated area. The degree of partial control varies with the rate used, the size of weeds, and the environmental conditions following treatment.

<sup>1</sup> - Eastern black nightshade (*Solanum ptycanthum*) is not controlled or suppressed. Black nightshade partial control is only for use in Tomatoes in California.

<sup>2</sup> - See Specific Weed Problems

<sup>3</sup> - Not for use in California

#### GRAPPLE HERBICIDE ROTATIONAL CROP GUIDELINES – TOMATO

For crops listed below, planting prior to the interval shown may result in crop injury when using Grapple Herbicide. Rotation intervals may need to be extended to 18 months if drought conditions prevail after application and before the rotational crop is planted, unless supplemental sprinkler irrigation has been applied and totals greater than 15 inches during the growing season. For tank mixtures, follow the most restrictive rotational crop guideline.

Rotation Crop	Interval (months)
Beans, Dry	10
Beans, Snap	10
Corn, Field	Anytime
Corn, Sweet	10
Cotton	10
Cucumber	10
Garlic	6
Potatoes	Anytime
Soybeans	10
Tomatoes	Anytime
Wheat, Winter	4
Crops Not Listed	12

**NOTE:** Where drip-irrigated tomatoes are grown, rotate only to tomato, potato, or field corn as crop injury may result.

Rotational crops may be planted at indicated intervals provided the fields are deep disked or plowed and thorough soil mixing is achieved prior to planting the rotational crop.

#### RESTRICTIONS – TOMATO

- Do not apply Grapple Herbicide within 45 days of tomato harvest.
- Do not apply Grapple Herbicide by air on tomatoes.
- Do not apply using assisted (Airblast) field crops sprayers on tomatoes.
- Do not apply more than 4 ounces per acre (1.0 oz ai rimsulfuron) on a broadcast application basis per year.
- Do not make more than 8 applications per year.
- Do not apply to tomatoes growing in greenhouses, cold frames, pot cultures, etc. Apply only to tomatoes growing in fields.
- Do not apply through any type of irrigation system.

## CULTIVATION

A timely cultivation may be necessary to control suppressed weeds, weeds that were beyond the maximum size at application, or weeds that emerge after an application of Grapple Herbicide.

- Cultivation up to 7 days before the postemergence application of Grapple Herbicide may decrease weed control by pruning weed roots, placing the weeds under stress or covering the weeds with soil and preventing coverage by Grapple Herbicide.
- To allow Grapple Herbicide to fully control treated weeds, do not cultivate for 7 days after application.
- Optimizing timing for cultivation is 7 to 14 days after a postemergence application of Grapple Herbicide.

## SPECIFIC WEED PROBLEMS

**QUACKGRASS:** For best results, apply Grapple Herbicide postemergence to quackgrass that is 4 to 8 inches tall. Quackgrass not emerged at the time of application will not be controlled or suppressed and would require a second postemergence application for acceptable control.

**BLACK NIGHTSHADE (TOMATOES):** For best results, apply Grapple Herbicide preemergence (prior to weed germination) at 2 to 4 oz per acre followed by a postemergence application at 1 to 2 oz per acre to small actively growing weeds.

**CANADA THISTLE:** For best results, apply Grapple Herbicide postemergence to small actively growing Canada thistle. Canada thistle not emerged at the time of application will not be controlled or suppressed and would require a second postemergence application for acceptable control.

## SPRAY ADJUVANTS

Include a spray adjuvant with applications of Grapple Herbicide when applied by itself and postemergence to the weeds. Consult your Ag dealer or applicator prior to using an adjuvant system. If another herbicide is tank mixed with Grapple Herbicide, select adjuvants authorized for use with both products. Products must contain only EPA-exempt ingredients (40 CFR 910 or 40 CFR 920).

### Nonionic Surfactant (NIS)

- Apply 0.125 to 0.25% v/v (1 to 2 pints/100 gal. of water). The 0.25% v/v rate is preferred under arid or drought conditions.
- Surfactant products must contain at least 80% nonionic surfactant with a hydrophilic/lipophilic balance (HLB) greater than 12.

### Petroleum Crop Oil Concentrate (COC) or Modified Seed Oil (MSO)

Apply at 1% volume/volume (1 gal. per 100 gal. spray solution) or 2% under arid conditions.

- Oil adjuvants must contain at least 80% high-quality, petroleum (mineral) or modified vegetable seed oil with at least 15% surfactant emulsifiers.
- Blended products that contain both MSO and silicone are acceptable at labeled rates.

## Ammonium Nitrogen Fertilizer

- Use 2 quart/acre of a high-quality urea ammonium nitrate (UAN), such as 28%N or 32%N, or 2 lb/acre of a spray-grade ammonium sulfate (AMS). Use 4 quart/acre UAN or 4 lb/acre AMS under arid conditions.
- Do not use liquid nitrogen fertilizer as the total carrier solution.

## Special Adjuvant Types

- Combination adjuvant products may be used at doses that provide the required amount of NIS and ammonium nitrogen fertilizer. Consult product literature for use rates and restrictions.
- Do not use any other adjuvant rates or mixtures with Grapple Herbicide unless instructed to do so by Nufarm representative.

## Precautions:

- The use of silicone polymer-type surfactants is not suggested as reduced weed control may result.
- Avoid using crop oil concentrate (COC) or methylated seed oil (MSO) when tomatoes are under heat stress (>85 degrees F) as multiple stresses may cause crop injury.

## EQUIPMENT-SPRAY VOLUMES

Agitate the spray tank continuously to keep the material in suspension.

Do not use equipment and/or spray volumes that will cause damage from spray by drift onto nontarget sites. Do not make applications when weather conditions are likely to cause spray to drift onto nontarget sites (see the SPRAY DRIFT ADVISORY section of this label for additional information).

## GROUND APPLICATION – POTATOES AND TOMATOES

To ensure optimum spray distribution and thorough coverage, apply Grapple Herbicide with a properly calibrated, low-pressure (20 to 40 psi) boom sprayer equipped with flat fan, “Twinjet”, underleaf banding nozzles or flood jet nozzles. Nozzle screens should be no finer than 50 mesh. When using flood nozzles, the spray pattern should overlap 100% for optimum product performance. For banded applications even-flow flat fan or twin jet spray nozzles may provide a more uniform spray distribution.

For maximum preemergence activity, prior to application, the bed or soil surface should be smooth and relatively free of crop and weed trash (dead weeds, decaying leaves, clippings, etc.). Leaves and trash may be removed by blowing the area to be treated or by thoroughly mixing the trash into the soil through cultivation prior to herbicide application. Cultural practices that result in redistribution or disturbance of the soil surface after treatment will decrease the herbicidal effectiveness of Grapple Herbicide. Cutting water furrows or cultivations that mix untreated soil into the treated areas will also reduce the effectiveness of the herbicide treatment.

For best weed management, apply Grapple Herbicide with another suitable residual herbicide registered for that crop on all soil types, but especially on coarse-textured soils under standard sprinklers or micro-sprinklers.

More than one banded application of Grapple Herbicide may be needed to provide extended weed control.

## USE PRECAUTIONS

- Potato and tomato varieties may differ in their response to various herbicides. Nufarm recommends that you first consult your state experiment station, university, or extension agent as to sensitivity to any herbicide. If no information is available, limit the initial use to a small area.
- Preemergence use on soils containing more than 6% organic matter may not provide adequate soil-residual weed control and may result in reduced weed control.
- Preemergence and postemergence use on rill-irrigated potatoes and tomatoes (furrow or gravity) may not provide adequate weed control in the absence of rainfall.
- If sprinklers are used for frost protection, delay the application of Grapple Herbicide until stress from environmental conditions has passed.
- Avoid spray drift to any adjacent crops or desirable plants as injury may occur.
- Crop injury may occur following an application of Grapple Herbicide if there is a prolonged period of cold weather and/or cold weather in conjunction with wet soils caused by poor drainage or excessive use of sprinkler irrigation for frost protection.
- Draining or flushing equipment on or near desirable trees or other plants, or in areas where their roots may extend, or in locations where the chemical may be washed or moved into contact with their roots may injure these plants. Trees or other desirable plants whose roots extend into a treated crop use area may be injured.
- For best results, maintain spray tank solution at pH 5 to 7.
- Crop injury may occur from applications made to poorly drained soils.
- If the selected companion herbicide has a ground or surface water advisory, consider the advisory when using the companion herbicide.
- Tank mixing Grapple Herbicide with organophosphate insecticides in tomatoes may result in crop injury.

## USE RESTRICTIONS

- Do not apply to frozen or snow-covered soil.

## BLUEBERRIES, RASPBERRIES AND BLACKBERRIES

### Not for use in California

#### BLUEBERRY (High Bush)

For broadcast applications, make a single application of Grapple Herbicide preemergence or early postemergence to actively growing weeds at 4 ounces per acre per year. Use a directed spray application adjusted to provide complete coverage of the weeds while minimizing the amount of spray coming into contact with the blueberry plants. When applied as a banded treatment (50% treated band or less), Grapple Herbicide may be applied twice per year.

Applications made after bud break may cause temporary chlorosis and/or stunting of leaves contacted by the spray.

Use Grapple Herbicide on high bush blueberries that have gone through at least one growing season and are in good health and vigor.

Grapple Herbicide may be applied in tank mixture with other herbicides registered for use in high bush blueberries.

#### USE RESTRICTIONS – HIGH BUSH BLUEBERRY

- Do not apply by air.
- Do not use on soils classified as sand.
- Do not apply within 21 days of first harvest (21 day PHI).
- Do not apply more than 4 ounces per acre (1.0 oz ai rimsulfuron) on a broadcast application basis per year.
- Do not make more than 8 applications per year.
- Allow a minimum of 30 days between applications.
- Not for use in California.

#### BLUEBERRY (Low Bush)

All applications of Grapple Herbicide are to be applied in the vegetative year growth stage of low bush blueberries. Make a single broadcast application of Grapple Herbicide preemergence or early postemergence to actively growing weeds at 4 ounces per acre per year. When applied as a banded treatment (50% treated band or less), Grapple Herbicide may be applied twice per year.

For broadcast treatments, make the application prior to bud break of the blueberries. After bud break, use a directed spray application adjusted to provide complete coverage of the weeds while minimizing spray contact with the blueberry plants.

Applications made after bud break may cause temporary chlorosis and/or stunting of leaves contacted by the spray.

Use Grapple Herbicide on low bush blueberries that have gone through at least one growing season and are in good health and vigor.

Grapple Herbicide may be applied in tank mixture with other herbicides registered for use in low bush blueberries.

#### USE RESTRICTIONS – LOW BUSH BLUEBERRY

- Do not apply by air.
- Do not use on soils classified as sand.
- Do not apply within 21 days of first harvest (21 day PHI).
- Do not apply more than 4 ounces per acre (1.0 oz ai rimsulfuron) on a broadcast application basis per year.
- Do not make more than 8 applications per year.
- Allow a minimum of 30 days between applications.
- Not for use in California.



## **RASPBERRY AND BLACKBERRY (CANEERRIES)**

For broadcast applications, make a single application of Grapple Herbicide preemergence or early postemergence to actively growing weeds at 4 ounces per acre per year. Use a directed spray application adjusted to provide complete coverage of the weeds while minimizing the amount of spray coming into contact with the caneberry plants. When applied as a banded treatment (50% treated band or less), Grapple Herbicide may be applied twice per year.

### **USE RESTRICTIONS – CANEBERRY**

- Do not apply by air.
- Do not use on soils classified as sand.
- Do not apply within 21 days of first harvest (21 day PHI).
- Do not apply more than 4 ounces per acre (1.0 oz ai rimsulfuron) on a broadcast application basis per year.
- Do not make more than 8 applications per year.
- Allow a minimum of 30 days between applications.
- Not for use in California.

### **Crop Age for Application**

Apply Grapple Herbicide to raspberries that have been established for at least one growing season and are in good health and vigor. For blackberries apply after plantings have gone through at least two growing seasons and are in good health and vigor. See USE PRECAUTIONS.

### **Crop Grown Stage**

#### **For Every-year Bearing Crops:**

To reduce the risk of injury to primocanes, apply before primo-canes emerge in the spring, or wait until primocanes are approximately 3 feet tall or taller and make a directed application by adjusting the spray nozzles so that only the lower 12 inches of primocanes are exposed to the herbicide spray pattern. For blackberries that have trailing primocanes, apply before primocane emergence.

#### **Alternate Year Bearing Crops:**

Apply in the dormant period before canes start new growth or wait until new growth canes are several feet tall so that a directed application can be used. To avoid crop injury, do not apply over the top of canes once new growth had started. Once canes are approximately 3 feet tall or taller, a directed application can be used provided the spray nozzles are adjusted so that only lower 12 inches of canes are exposed to the herbicide spray pattern.

Grapple Herbicide may be applied in tank mixture with other herbicides registered for use in caneberries.

## **USE PRECAUTIONS**

If Grapple Herbicide is applied over the top of emerged primocanes, injury to the primocanes may occur in the form of chlorosis and/or stunting of primocane growth and in severe situations, individual primocanes may die. To avoid injury to primocanes, apply before primocane emergence or wait until they are at least 3 feet tall before making a directed spray so that only the bottom 12 inches of primocanes are exposed to the herbicide spray pattern.

Grapple Herbicide may cause damage to plants that are small and/or weak due to weed competition, poor soil conditions, disease, insect damage or other factors that can reduce plant health and vigor.

Grapple Herbicide may cause damage to plants growing in areas that are poorly drained, or areas that are subject to saturated or anaerobic soil conditions for an extended period of time.

## **RANGELAND RESTORATION WEST OF THE MISSISSIPPI RIVER**

### **PRODUCT INFORMATION**

A restoration management program that includes Grapple Herbicide may be used when rangeland has become severely infested with invasive weed species such that the land has deteriorated to a point that it is no longer suitable for grazing or forage production. To reclaim these lands, the invasive weed species must first be controlled to allow native grasses to reestablish or to be replanted with desirable forage grasses. The grasses must be allowed time to reestablish before grazing or forage production is resumed. A typical restoration management program will take one to two years. Grapple Herbicide may be used to control grass and broadleaf weeds listed in this section under Weeds Controlled. The residual activity of Grapple Herbicide will also help prevent the reemergence of many of these weeds while desirable grasses are being reestablished.

At the maximum application rate of 4.0 ounces of Grapple Herbicide per acre per year, desirable rangeland perennial grasses in the treated area may exhibit a temporary chlorosis (yellowing of foliage) following application. The use of an adjuvant with Grapple Herbicide can increase desirable perennial grass injury.

Restriction - Do not graze treated sites or cut for forage or hay for a minimum of 1 year after application in order to allow newly emerged grasses sufficient time to become established.

Where practical, fencing or other measures are to be used to prevent early grazing of re-established sites to help promote active grass restoration.

### **RESTORATION PROGRAM**

An effective restoration program may include one or more of the following steps (1 through 6):

1. Identify and inventory weeds and desired grass densities.
2. Consult and plan the entire program with personnel experienced in herbicide programs and range restoration.

3. Make applications of Grapple Herbicide prior to soil freeze or after spring thaw. Make sure all label precautions are followed.
4. Include a tank mix partner labeled for use on rangeland to broaden the spectrum of weeds controlled.
5. Plant grass seed as needed to improve the site, per the Grass Replant Interval in this section of the label.
  - Plant to obtain the highest possible grass stand establishment.
  - Plant a selected grass mixture to improve the desired stand.
  - Use a properly fitted drill to help ensure correct seed placement and depth.
  - Seed in late fall to best ensure moisture for seed germination. Seeding in the spring has the highest risk of stand failure.
  - Consult with a knowledgeable grass seed supplier to select the best-suited varieties for your area.
6. Treat for second year forbs (if necessary): Treat with chlorsulfuron + bromoxynil to weeds at the early growth stage.

#### GRASS REPLANT INTERVAL

The replant interval is for soils with a pH of less than 7.5. Soils having a pH greater than 7.5 will require a longer interval. The replant interval is for applications made in the spring. Because Grapple Herbicide degradation is slowed by cold, dry, or frozen soils, the replant interval for applications made in the fall should begin the spring following treatment.

Following a treatment with Grapple Herbicide at use rates up to 4.0 ounces of product per acre, the following grasses may be replanted at least 7 months after a spring application. Rainfall or irrigation of at least 1/2 inch following treatment is necessary to replant 7 months after a Grapple Herbicide application. If the treated site does not receive at least 1/2 inch of rainfall or irrigation within 4 weeks after Grapple Herbicide application, then the grass replant interval is 12 months.

Crested wheatgrass	<i>Agropyron cristatum</i>
Intermediate wheatgrass	<i>Thinopyrum intermedium</i>
Blue bunch wheatgrass	<i>Pseudoroegneria spicata</i>
Squirreltail	<i>Elymus elymoides</i>
Beadless (creeping) wild rye	<i>Leymus triticoides</i>
Big bluegrass	<i>Poa ampla</i>
Idaho fescue	<i>Festuca idahoensis</i>
Smooth brome	<i>Bromus inermis</i>

Testing has indicated that there is considerable variation in response among species and types of grasses when seeded into areas treated with Grapple Herbicide. If species other than those listed above are to be planted into areas treated with Grapple Herbicide, a field bioassay should be performed, or previous experience may be used to determine the feasibility of replanting treated areas. To conduct a field bioassay, grow to maturity test strips of the grass species you plan to grow the following year. The test strips should cross the entire field including knolls and low areas. Crop response to the bioassay will indicate whether or not to plant the grass species grown in the test strips.

#### APPLICATION EQUIPMENT

Grapple Herbicide may be applied using ground or aerial spray equipment. Fixed-wing aircraft and helicopters can be used to apply Grapple Herbicide; however, do not make applications by fixed-wing aircraft unless appropriate buffer zones can be maintained to prevent spray drift out of the target area or, when treating open tracts of land, spray drift as a result of fixed-wing aircraft application can be tolerated. Aerial equipment designed to minimize spray drift, such as a helicopter equipped with a Microfoil® boom or raindrop nozzles, must be used and calibrated. Except when applying with a Microfoil® boom, a drift-control agent may be added at the labeled rate.

#### APPLICATION RATES AND TIMING

Apply Grapple Herbicide at 2.0 to 4.0 ounces per acre in the fall or spring, prior to moisture expectation and plant growth. Do not apply when soil is frozen. For residual activity, moisture is required to activate Grapple Herbicide. When applied at lower rates in the spring, Grapple Herbicide provides suppression\* of weeds listed. When applied at higher rates in the fall, weed control is afforded.

\* Weed suppression is a visual reduction in weed competition (reduced population and/or vigor) as compared to an untreated check. The degree of actual control that may occur will vary with the size of the weeds, the degree of weed or desirable grass competition, and environmental conditions.

#### TANK MIXTURES

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. Users must follow the most restrictive directions for use and precautionary statements of each product in the tank mixture.

Grapple Herbicide may be tank mixed with other herbicides registered for rangeland use. Grapple Herbicide may be mixed with chlorsulfuron to broaden the spectrum of broadleaf and grass weed control. Refer to the chlorsulfuron label for additional information on weed species controlled, use rates, and instructions or restrictions.

## WEEDS CONTROLLED

When applied at 2.0 ounces per acre in the spring, Grapple Herbicide suppresses the following weeds and when applied at 3.0 ounces per acre in the fall, Grapple Herbicide controls the following weeds:

Brome, downy (cheatgrass)	<i>Bromus tectorum</i>
Brome, Japanese	<i>Bromus japonicus</i>
Cheat	<i>Bromus secalinus</i>

When applied at 4.0 ounces per acre, Grapple Herbicide controls the following additional weeds:

Barnyardgrass	<i>Echinochloa crus-galli</i>
Crabgrass, large	<i>Digitaria sanguinalis</i>
Foxtail, giant	<i>Setaria faberi</i>
Foxtail, green	<i>Setaria viridis</i>
Foxtail, yellow	<i>Setaria pumila</i>
Filaree redstem	<i>Erodium cicutarium</i>
Fleabane, hairy	<i>Conyza bonariensis</i>
Mallow, common	<i>Malva neglecta</i>
Horseweed/marestail*	<i>Conyza canadensis</i>
Medusahead	<i>Taeniatherum caput-medusae</i>
Mustard, black	<i>Brassica nigra</i>
Pigweed, redroot	<i>Amaranthus retroflexus</i>
Pigweed, smooth	<i>Amaranthus hybridus</i>
Puncturevine	<i>Tribulus terrestris</i>

\* Naturally occurring resistant biotypes of this weed are known to exist in some areas of the U.S. Grapple Herbicide will not control these biotypes.

## USE PRECAUTIONS

- Treatment of powdery, dry soil or light sandy soil when there is little likelihood of rainfall soon after treatment may result in off-target movement and possible damage to susceptible crops when soil particles are moved by wind or water. Injury to crops may result if treated soil is washed, blown, or moved onto land used to

produce crops. Exposure to Grapple Herbicide may injure or kill most crops. Injury may be more severe when the crops are irrigated. Do not apply Grapple Herbicide when these conditions are identified and where powdery, dry soil or light or sandy soil is known to be prevalent in the area to be treated.

- In order to reduce the potential for off-site movement of Grapple Herbicide from wind or water-related soil erosion, do not burn, disk, or otherwise disturb treated sites between the time of application and reseeding or reestablishment of native grasses.
- Preemergence use on soils containing more than 6% organic matter may result in reduced weed control.
- Minimize spray drift to any adjacent crops or planned crop planting areas or desirable plants since injury may occur.
- Draining or flushing equipment on or near desirable trees or other plants or in areas where their roots may extend or in locations where the chemical may be washed or moved into contact with their roots may injure these plants. Crops (especially crops other than pome fruit, tree nuts, stone fruit, citrus, grapes, potatoes, tomatoes, and field corn) whose roots may extend into a treated area may be injured.

## USE RESTRICTIONS

- Do not contaminate any body of water, including irrigation water that may be used on other crops.
- Do not treat frozen soil. Do not apply in or on irrigation ditches or canals including their outer banks.
- Do not apply through any type of irrigation system. If restoration sites treated with Grapple Herbicide are to be converted to an agricultural use other than rangeland, consult the Grapple Herbicide label for all rotational crop instructions.
- Do not apply more than 4 ounces per acre (1.0 oz ai rimsulfuron) on a broadcast application basis per year.
- Do not make more than 8 applications per year.

## SELECTIVE WEED CONTROL AND INVASIVE SPECIES MANAGEMENT IN NON-CROP SITES

Grapple Herbicide is a water dispersible granule formulation to be mixed with water and sprayed for weed control on private, public, and military lands as follows: non-agricultural areas (including airports, highway, railroad and utility rights-of-way, sewage disposal areas); uncultivated agricultural areas – non-crop producing (including farmyards, fuel storage areas, fence rows, non-irrigation ditchbanks, barrier strips); industrial sites – outdoor (including lumberyards, pipeline and tank farms) and non-cropland wildlife habitats.

## INVASIVE SPECIES MANAGEMENT

Grapple Herbicide may be used on public, private, and tribal lands to treat certain weed species infestations that have been determined to be invasive, consistent with the Federal Interagency Committee for Management of Noxious and Exotic Weeds (FICMNEW) National Early Detection and Rapid Response (EDRR) System for invasive plants.

Effective EDRR systems address invasions by eradicating the invader where possible, and controlling them when the invasive species is too established to be feasibly eradicated. Once an EDRR assessment has been completed and action is recommended, a Rapid Response needs to be taken to quickly contain, deny reproduction, and if possible, eliminate the invader. Consult your appropriate state extension service, forest service, or regional multidisciplinary invasive species management coordination team to determine the appropriate Rapid Response provisions and allowed treatments in your area.

Grapple Herbicide is non-corrosive to spray equipment, non-flammable and non-volatile. Do not use Grapple Herbicide in a spray solution or with spray additives that buffer the pH to below 4.0 or above 8.0 as degradation of Grapple Herbicide may occur.

Grapple Herbicide may be used in weed management programs on non-crop sites to provide residual preemergence and early postemergence control of the following weeds:

Barnyardgrass	<i>Echinochloa crus-galli</i>
Browme, downy	<i>Bromus tectorum</i>
Crabgrass, large	<i>Digitaria sanguinalis</i>
Foxtail, giant	<i>Setaria faberi</i>
Foxtail, green	<i>Setaria viridis</i>
Foxtail, yellow	<i>Setaria pumila</i>
Filaree redstem	<i>Erodium cicutarium</i>
Fleabane, hairy	<i>Conyza bonariensis</i>
Mallow, common	<i>Malva neglecta</i>
Marestail/horseweed*	<i>Conyza canadensis</i>
Medusahead	<i>Taeniatherum caput-medusae</i>
Mustard, black	<i>Brassica nigra</i>
Pigweed, redroot	<i>Amaranthus retroflexus</i>
Pigweed, smooth	<i>Amaranthus hybridus</i>
Puncturevine	<i>Tribulus terrestris</i>
* Naturally occurring resistant biotypes of this weed are known to exist in some areas of the U.S. Grapple Herbicide will not control these biotypes.	

Refer to the rest of the label for other weeds controlled.

To provide a broader spectrum of residual weed control, Grapple Herbicide may be applied in a tank mixture with other registered preemergence herbicides. When weeds are present at application, include a labeled burndown herbicide, such as glyphosate.

For best results, make postemergence applications to young, actively growing weeds and include a spray adjuvant. Refer to the label of the tank mixture partner(s) for any additional use instructions or restrictions. Follow the most restrictive labeling of any of the tank-mix component products.

#### TANK MIXTURES

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. Users must follow the most restrictive directions for use and precautionary statements of each product in the tank mixture.

Grapple Herbicide may be mixed with other herbicides registered for non-crop use. It may also be tank mixed with any adjuvants registered for non-crop use.

#### APPLICATION INFORMATION

Apply Grapple Herbicide at 4.0 ounces broadcast per acre. Do not apply more than 4.0 ounces of Grapple Herbicide per acre per year.

For best preemergence and residual activity, Grapple Herbicide must be activated by rainfall and applied when soil temperatures are cool. Make applications to take advantage of normal rainfall patterns (minimum of 1/2 inch) and cooler temperatures. For best results, moisture for activation should occur within 2 to 3 weeks after application.

To help ensure uniform coverage, use a minimum of 10 gallons of spray solution per acre. Nozzle selection should meet manufacturer's spray volume and pressure recommendations for preemergence or postemergence herbicide applications.

Grapple Herbicide may be applied using ground or aerial spray equipment. Fixed wing aircraft and helicopters can be used to apply Grapple Herbicide; however, do not make applications by fixed wing aircraft unless appropriate buffer zones can be maintained to prevent spray drift out of the target area or, when treating open tracts of land, spray drift as a result of fixed wing aircraft application can be tolerated. Aerial equipment designed to minimize spray drift, such as helicopter equipped with a Microfoil® boom or raindrop nozzles, must be used and calibrated. Except when applying with a Microfoil® boom, a drift control agent may be added at the labeled rate.

## **NON-CROPLAND RESTORATION**

Grapple Herbicide is labeled for the control of downy brome (cheatgrass), medusahead, and certain broadleaf weeds in non-cropland. In order to release desirable, perennial grass species for site restoration, Grapple Herbicide may be applied at 3.0 to 4.0 ounces of product per acre in the fall, within 6 weeks before the expected date when the soil freezes. Use the higher rate for medusahead control.

To provide broader spectrum broadleaf weed control in non-crop land restoration, a tank mixture of Grapple Herbicide and Report Herbicide may be used.

### **USE PRECAUTIONS**

- Treatment of powdery, dry soil or light, sandy soil when there is little likelihood of rainfall soon after treatment may result in off-target movement and possible damage to susceptible crops when soil particles are moved by wind or water. Injury to crops may result if treated soil is washed, blown, or moved onto land used to produce crops. Exposure to Grapple Herbicide may injure or kill most crops. Injury may be more severe when the crops are irrigated. Do not apply Grapple Herbicide when these conditions are identified and powdery, dry soil or light or sandy soil is known to be prevalent in the area to be treated.
- Preemergence use on soils containing more than 6% organic matter may result in reduced weed control.
- Avoid spray drift to any adjacent crops or planned crop planting areas or desirable plants since injury may occur.
- Draining or flushing equipment on or near desirable trees or other plants or in areas where their roots may extend or in locations where the chemical may be washed or moved into contact with their roots may injure these plants.
- Crops (especially crops other than pome fruit, tree nuts, stone fruit, citrus, grapes, potatoes, tomatoes, and field corn) whose roots may extend into a treated area may be injured.
- Where food and/or feed crops are grown, or in areas where food and/or feed crops are planned to be grown, care should be taken to prevent any direct spray of Grapple Herbicide onto, or drift to, these crops or planned planting areas since severe crop injury may occur.

### **USE RESTRICTIONS**

- Do not contaminate any body of water, including irrigation water that may be used on other crops.
- Do not apply in or on irrigation ditches or canals including their outer banks.
- Do not apply when the soil is frozen.
- Do not apply more than 4 ounces per acre (1.0 oz ai rimsulfuron) on a broadcast application basis per year.
- Do not make more than 8 applications per year.

If non-crop sites treated with Grapple Herbicide are to be converted to an agriculture use, consult the Grapple Herbicide package label for all rotational crop instructions.

## **ADDITIONAL USE INFORMATION – ALL CROPS AND USES**

### **MIXING INSTRUCTIONS**

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. Users must follow the most restrictive directions for use and precautionary statements of each product in the tank mixture.

Grapple Herbicide must be completely dissolved in clean water before adding to spray tanks that do not have continuous agitation during loading and mixing. (This is common for airplanes with turbine engines).

1. Fill the tank 1/4 to 1/3 full of water.
2. While agitating, add the required amount of Grapple Herbicide.
3. Continue agitation until the Grapple Herbicide is fully dissolved, at least 5 minutes.
4. Once the Grapple Herbicide is fully dissolved, maintain agitation and continue filling tank with water.
5. As the tank is filling, add tank mix partners (if desired) then add the required amount of spray adjuvant (if needed). Always add the spray adjuvant last.
6. Dispersed tank mix partners can settle if the tank mixture is not continually agitated. If settling occurs, thoroughly re-agitate before using.
7. Apply Grapple Herbicide spray mixture within 24 hours of mixing to avoid product degradation.
8. If Grapple Herbicide and a tank mix partner are to be applied in multiple loads, fully dissolve the Grapple Herbicide in clean water prior to adding to the tank.

If the selected companion herbicide has a ground or surface water advisory, consider this advisory when using the companion herbicide.

### **At the End of the Day**

After each day of spraying multiple loads of Grapple Herbicide, the interior of the tank should be rinsed with fresh water and then partially filled and the boom and hoses flushed. This will prevent the buildup of dried pesticide deposits from accumulating in the application equipment.

### **After Spraying Grapple Herbicide and Before Spraying Other Crops**

To avoid subsequent injury to desirable crops, thoroughly clean all mixing and spray equipment immediately following applications of Grapple Herbicide as follows:

1. Empty the tank and drain the sump completely.
2. Spray the tank walls with clean water using a minimum volume of 10% of the tank volume. Circulate the water through the lines, including all by-pass lines, for at least two minutes. Flush the boom well and empty the sprayer. Completely drain the sump.
3. Repeat step 2.

4. Remove the nozzles and screens and clean separately in a bucket containing water.

The rinsate solution may be applied back to the crop(s) listed on this label. Do not exceed the maximum labeled use rate. If cleaners are used, consult the cleaner label for rinsate disposal instructions. If no instructions are given, dispose of the rinsate on site or at an approved waste disposal facility.

**Notes:**

1. Always start with a clean spray tank.
2. Steam-cleaning aerial spray tanks should be done to facilitate the removal of any caked deposits.
3. When Grapple Herbicide is tank mixed with other pesticides, all cleanout procedures for each product should be examined and the most rigorous procedure should be followed.
4. Follow any pre-cleanout guidelines specified on other product labels.

## STORAGE AND DISPOSAL

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

**PESTICIDE STORAGE:** Store product in original container only. Store in a cool, dry place.

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

**CONTAINER HANDLING:**

**Nonrefillable Plastic and Metal Containers (Capacity Equal to or Less Than 50 Pounds):**

Nonrefillable container. Do not reuse or refill this container. Triple rinse container (or equivalent) promptly after emptying. **Triple rinse as follows:** Empty the remaining contents into application equipment or a mix tank. Fill the container 1/4 full with water and recap. Shake for 10 seconds. Pour rinsate into application equipment or a mix tank or store rinsate for later use or disposal. Drain for 10 seconds after the flow begins to drip. Repeat this procedure two more times. Then, for **Plastic Containers**, offer for recycling if available or puncture and dispose of in a sanitary landfill, or by incineration. Do not burn, unless allowed by state and local ordinances. For **Metal Containers**, offer for recycling if available or reconditioning if appropriate, or puncture and dispose of in a sanitary landfill, or by other procedures approved by state and local authorities.

## WARRANTY DISCLAIMER

The directions for use of this product must be followed carefully. TO THE EXTENT CONSISTENT WITH APPLICABLE LAW, (1) THE GOODS DELIVERED TO YOU ARE FURNISHED "AS IS" BY MANUFACTURER OR SELLER AND (2) MANUFACTURER AND SELLER MAKE NO WARRANTIES, GUARANTEES, OR REPRESENTATIONS OF ANY KIND TO BUYER OR USER, EITHER EXPRESS OR IMPLIED, OR BY USAGE OF TRADE, STATUTORY OR OTHERWISE, WITH REGARD TO THE PRODUCT SOLD, INCLUDING, BUT NOT LIMITED TO MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, USE, OR ELIGIBILITY OF THE PRODUCT FOR ANY PARTICULAR TRADE USAGE. UNINTENDED CONSEQUENCES, INCLUDING BUT NOT LIMITED TO INEFFECTIVENESS, MAY RESULT BECAUSE OF SUCH FACTORS AS THE PRESENCE OR ABSENCE OF OTHER MATERIALS USED IN COMBINATION WITH THE GOODS, OR THE MANNER OF USE OR APPLICATION, INCLUDING WEATHER, ALL OF WHICH ARE BEYOND THE CONTROL OF MANUFACTURER OR SELLER AND ASSUMED BY BUYER OR USER. THIS WRITING CONTAINS ALL OF THE REPRESENTATIONS AND AGREEMENTS BETWEEN BUYER, MANUFACTURER AND SELLER, AND NO PERSON OR AGENT OF MANUFACTURER OR SELLER HAS ANY AUTHORITY TO MAKE ANY REPRESENTATION OR WARRANTY OR AGREEMENT RELATING IN ANY WAY TO THESE GOODS.

## LIMITATION OF LIABILITY

TO THE EXTENT CONSISTENT WITH APPLICABLE LAW, IN NO EVENT SHALL MANUFACTURER OR SELLER BE LIABLE FOR SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES, OR FOR DAMAGES IN THEIR NATURE OF PENALTIES RELATING TO THE GOODS SOLD, INCLUDING USE, APPLICATION, HANDLING, AND DISPOSAL. TO THE EXTENT CONSISTENT WITH APPLICABLE LAW, MANUFACTURER OR SELLER SHALL NOT BE LIABLE TO BUYER OR USER BY WAY OF INDEMNIFICATION TO BUYER OR TO CUSTOMERS OF BUYER, IF ANY, OR FOR ANY DAMAGES OR SUMS OF MONEY, CLAIMS OR DEMANDS WHATSOEVER, RESULTING FROM OR BY REASON OF, OR ARISING OUT OF THE MISUSE, OR FAILURE TO FOLLOW LABEL WARNINGS OR INSTRUCTIONS FOR USE, OF THE GOODS SOLD BY MANUFACTURER OR SELLER TO BUYER. ALL SUCH RISKS SHALL BE ASSUMED BY THE BUYER, USER, OR ITS CUSTOMERS. TO THE EXTENT CONSISTENT WITH APPLICABLE LAW, BUYER'S OR USER'S EXCLUSIVE REMEDY, AND MANUFACTURER'S OR SELLER'S TOTAL LIABILITY SHALL BE FOR DAMAGES NOT EXCEEDING THE COST OF THE PRODUCT.

**If you do not agree with or do not accept any of directions for use, the warranty disclaimers, or limitations on liability, do not use the product, and return it unopened to the Seller, and the purchase price will be refunded.**

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