

2006-4414
16-MAY-2008

GROUP

14

HERBICIDE

AUTHORITY 480 HERBICIDE

HERBICIDE

COMMERCIAL

(Agricultural)

Solution

For Use on Chickpeas in Saskatchewan Only

GUARANTEE: Sulfentrazone 480 g/L
Contains Petroleum Distillate

Contains sodium o-phenylphenate (present as tetrahydrate) at 0.036% as a preservative.

REGISTRATION NUMBER 29012
PEST CONTROL PRODUCTS ACT

READ THE LABEL BEFORE USING



CAUTION

POISON

Net Contents: 10 Litres

FMC Corporation
1735 Market Street
Philadelphia PA
19103
USA

Nufarm Agriculture Inc.
5507 1st Street SE
Calgary, Alberta T2H 1H9
1-800-868-5444

GENERAL INFORMATION

Authority 480 Herbicide is a selective soil applied herbicide for the control of wild buckwheat, kochia, lamb's quarters, and redroot pigweed in chickpeas.

Authority 480 Herbicide is formulated as a flowable (suspension concentrate) containing 480 grams of the active ingredient, sulfentrazone, per litre, intended for dilution with water for application.

Authority 480 Herbicide is taken up by the plant roots and shoots.

Observe all instructions, mixing directions, application precautions and other label information of Authority 480 Herbicide.

PROPER HANDLING INSTRUCTIONS:

Authority 480 Herbicide may not be mixed or loaded within 15 meters of any wells (including abandoned wells and drainage wells), sink holes, perennial or intermittent streams or rivers, and natural or impounded lakes and reservoirs. This setback does not apply to properly capped or plugged abandoned wells and does not apply to impervious pads or properly diked mixing/loading areas.

Operations that involve mixing, loading, rinsing or washing of this product into or from pesticide handling or application equipment or containers within 15 metres of any well, are prohibited unless conducted on an impervious pad constructed to withstand the weight of the heaviest load that may be positioned on or moved across the pad. Such a pad shall be designed and maintained to contain any product spills or equipment leaks, container or equipment rinse or wash water, and rainwater that may fall on the pad. Surface water shall not be allowed to either flow over or from the pad, which means the pad must be self-contained. The pad shall be sloped to facilitate material removal. An unroofed pad shall be of sufficient capacity to contain at a minimum 110% of the capacity of the largest pesticide container or application equipment on the pad. A pad that is covered by a roof of sufficient size to completely exclude precipitation from contact with the pad shall have a minimum containment capacity of 100% of the capacity of the largest pesticide container or application equipment on the pad. Containment capacities as described above shall be maintained at all times. The above specific minimum containment capacities do not apply to vehicles when delivering pesticide shipments to the mixing/loading site. Provinces may have in effect additional requirements regarding wellhead setbacks and operational containment.

Authority 480 Herbicide must be used in a manner which will prevent back siphoning in wells, spills or improper disposal of excess pesticide, spray mixtures or rinsates.

FIRST AID

If inhaled: Move person to fresh air. If person is not breathing, call 911 or an ambulance, then give artificial respiration, preferably by mouth-to-mouth, if possible. Call a poison control centre or doctor for further treatment advice.

If on skin or clothing: Take off contaminated clothing. Rinse skin immediately with plenty of water for 15-20 minutes. Call a poison control centre or doctor for treatment advice.

If in eyes: Hold eye open and rinse slowly and gently with water for 15-20 minutes. Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye. Call a poison control centre or doctor for treatment advice.

If swallowed: Call a poison control centre or doctor immediately for treatment advice. Do not induce vomiting unless told to do so by the poison control centre or doctor. Do not give **any** liquid to the person. Do not give anything by mouth to an unconscious person.

Take container, label or product name and the Pest Control Product Registration Number with you when seeking medical attention.

You may also contact **1-800-331-3148** for emergency medical treatment information.

For Information regarding the Use of this Product call **1-800-321-1FMC (1362)**.

TOXICOLOGICAL INFORMATION

Treat Symptomatically. Contains petroleum distillate – vomiting may cause aspiration pneumonia.

PRECAUTIONS

KEEP OUT OF REACH OF CHILDREN

Hazards to Humans and Domestic Animals

CAUTION

Harmful if inhaled, swallowed, or absorbed through skin. Avoid breathing vapor or spray mist. Avoid contact with skin, eyes or clothing.

Apply only when the potential for drift to areas of human habitation or areas of human activity, such as houses, cottages, schools and recreational areas is minimal. Take into consideration wind speed, wind direction, temperature, application equipment and sprayer settings.

If this pest control product is to be used on a commodity that may be exported to the U.S. and you require information on acceptable residue levels in the U.S., visit CropLife Canada's web site at: www.croplife.ca.

Environmental Hazards

Sulfentrazone is persistent and may carryover.

Authority 480 Herbicide used according to the label directions is known to leach through soil into groundwater particularly in areas where soils are permeable (e.g. sandy soil) and/or the depth to the water table is shallow. Do not use on coarse soils classified as sand which have less than 1% organic matter.

To reduce runoff from treated areas into aquatic habitats avoid application to areas with a moderate to steep slope, compacted soil, or clay.

Avoid application when heavy rain is forecast.

Contamination of aquatic areas as a result of runoff may be reduced by including a vegetative strip between the treated area and the edge of the water body.

Toxic to small wild mammals.

This product contains an active ingredient and aromatic petroleum distillates which are toxic to aquatic organisms.

Toxic to non-target terrestrial plants. Observe buffer zones specified under DIRECTIONS FOR USE.

PERSONAL PROTECTIVE EQUIPMENT (PPE)

Wear a long-sleeved shirt, long pants and chemical resistant gloves made of waterproof material such as polyethylene or polyvinyl chloride and shoes plus socks during mixing, loading, clean up and repair. Wear a long-sleeved shirt, long pants and shoes plus socks during application.

Discard clothing and other absorbent materials that have been drenched or heavily contaminated with this product. Do not reuse them. Follow manufacturer's instructions for cleaning and maintaining PPE. If no such instructions for washables, use detergent and hot water. Keep and wash PPE separately from other laundry.

Remove clothing immediately if pesticide gets inside. Then bathe thoroughly and put on clean clothing.

RESTRICTED ENTRY INTERVAL

Do not enter or allow worker entry into treated areas during the restricted entry interval (REI) of 12 hours.

IMPORTANT

- 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 area, consult the provincial agency responsible for pesticide regulation.
- Do not apply more than the allowed amount per hectare per twelve-month period. The twelve-month period is considered to begin upon the initial application.

STORAGE

STORE ABOVE 5°C TO KEEP PRODUCT FROM FREEZING. If frozen, thaw before use. If solid crystals are observed, warm material to above 15 °C by placing container in warm location. Shake or roll container periodically to redissolve solids.

Do not use or store near heat or open flame.

Store in original containers only. Store containers in a dry location. Carefully open containers. After partial use, replace lids and close tightly. Do not put concentrate or dilute material into food or drink containers. Do not contaminate other pesticides, fertilizers, water, food, or feed by storage or disposal.

To prevent contamination store this product away from food or feed.

DISPOSAL

Do not reuse this container for any purpose. This is a recyclable container, and is to be disposed of at a container collection site. Contact your local distributor/dealer or municipality for the location of the nearest collection site. Before taking the container to the collection site:

1. Triple-rinse or pressure-rinse the empty container. Add the rinsings to the spray mixture in the tank.
2. Make the empty, rinsed container unsuitable for further use. If there is no container collection site in your area, dispose of the container in accordance with provincial requirements.

For information on disposal of unused, unwanted product, contact the manufacturer or the provincial regulatory agency. Contact the manufacturer and the provincial regulatory agency in case of a spill, and for clean up of spills.

NOTICE TO USER

This pest control product is to be used only in accordance with the directions on the label. It is an offence under the *Pest Control Products Act* to use this product in a way that is inconsistent with the directions on the label. The user assumes the risk to persons or property that arises from any such use of this product.

APPLICATION INFORMATION

DO NOT APPLY BY AIR.

Authority 480 Herbicide can be applied with conventional ground spraying equipment.

Ground Application

Utilize a boom and nozzle sprayer equipped with the appropriate nozzles, spray tips and screens and adjusted to provide optimum spray distribution and coverage at the appropriate operating pressures. Utilize nozzles that produce minimal amounts of fine spray droplets to avoid spray drift or inadequate foliar and soil coverage. Apply a minimum of 100 litres of finished spray per hectare by ground. Be aware that spray pattern overlaps and slower ground speeds while starting, stopping or turning while spraying may result in excessive application and subsequent crop response.

Spray Drift Management

Minimizing spray drift at the application site is the responsibility of the applicator and the grower. The interaction of many equipment and weather-related factors determine the potential for spray drift. The applicator and the grower are responsible for considering all these factors when making decisions.

Apply only when the potential for drift to areas of human habitation or areas of human activity, such as houses, cottages, schools and recreational areas is minimal. Take into consideration wind speed, wind direction, temperature, application equipment and sprayer settings.

One of the most effective ways to reduce drift potential is to apply large droplets. The best drift management strategy is to apply the largest droplets that provide sufficient coverage for pesticide performance. Applying larger droplets reduces drift potential but will not reduce drift if applications are made improperly or under unfavorable environmental conditions.

Controlling Spray Droplet Size

Volume: Use high flow rate nozzles to apply the greatest practical spray volume. Nozzles with higher rated flow generally produce larger droplets.

Pressure: When higher flow rates are needed, use higher flow rate nozzles rather than increasing spray pressure. Do not exceed the nozzle manufacturer's recommended pressures. Lower pressure produces larger droplets in many types of nozzles.

Nozzle Type: Use a nozzle type that is designed for the intended application. With most nozzle types, narrower spray angles produce larger droplets. Consider using low-drift nozzles for both ground and aerial applications. Solid stream nozzles oriented straight back usually produce the largest droplets and the lowest drift potential in aerial applications.

GENERAL APPLICATION INSTRUCTIONS

Authority 480 Herbicide may be applied to the soil as a preplant incorporated treatment or as a pre-emergence (to weed and crop) surface application. Do not make fall applications to any crops. See DIRECTIONS FOR USE for the proper rates of application according to soil texture, organic matter content and pH.

Preplant incorporated treatments require a uniform surface application followed by thorough incorporation to a depth no greater than 5 centimetres. Care must be taken not to create overlaps in treated zones due to soil movement which will result in excessive Authority 480 Herbicide rates that could result in adverse crop response. Additional care must be exercised to prevent deep incorporation of Authority 480 Herbicide which may result in poor weed control performance on shallow germinating weeds.

All soil applications of Authority 480 Herbicide require adequate rainfall for herbicidal activation. The ultimate amount of moisture, whether supplied by rainfall or irrigation, is dependent on several factors. These factors include but are not limited to existing soil moisture at application, soil type, organic matter and pH. In crop situations, dependent on rainfall, Authority 480 Herbicide can await activating moisture for extended periods (10 to 14 days or longer) depending on the soil parameters described above. Once activated, Authority 480 Herbicide will provide activity on existing weeds. Where irrigation is not available and rainfall has not provided activation, particularly for surface applications of Authority 480 Herbicide, a shallow incorporation is recommended to initiate the process of activation with existing soil moisture. In circumstances where prolonged periods without rainfall or irrigation are not possible, alternative or additional weed management practices (cultivation or post-applied herbicides) may be required.

When activating moisture is received after dry conditions, Authority 480 Herbicide may provide a reduced level of control of susceptible germinating weeds. Soil applications of Authority 480 Herbicide must be made before crop seed germination to prevent injury to the emerging crop seedlings. When applications after planting are delayed, injury may occur if seeds are germinating or if they are located near the soil surface.

Extreme care must be exercised and the DIRECTIONS FOR USE must be followed exactly when utilizing Authority 480 Herbicide.

Mode of Action

Sulfentrazone, the active ingredient in Authority 480 Herbicide, is a potent inhibitor of the enzyme Protoporphyrinogen Oxidase IX (Protox) required for the formation of chlorophyll. Inhibition of the PPO IX enzyme results in the liberation of singlet oxygen (O) that, in turn, disrupts cellular membranes and causes cellular leakage. The ultimate manifestation of the process is cellular death leading to plant death. The selective herbicidal activity of sulfentrazone is based on its greater affinity for the PPO IX enzyme in weed species versus crop plants.

Mechanism of Action

Following the application of Authority 480 Herbicide to soil, germinating seeds and seedlings take up sulfentrazone from the soil solution. The amount of sulfentrazone in soil solution, and available for weed uptake, is determined primarily by soil type, organic matter and soil pH. Sulfentrazone adsorbs to the clay and organic matter fractions of soils effectively limiting the amount of active ingredient immediately available to control

weeds. Soils typically increase in clay content through the series from coarse to fine as noted in the following Soil Classification Chart.

Soil Classification Chart

Coarse*	Medium	Fine
Sand	Sandy clay loam	Silty clay loam
Loamy sand	Sandy clay	Silty clay
Sandy loam	Loam	Clay loam
	Silt loam	Clay
	Silt	

* Authority 480 Herbicide is to be applied in chickpeas grown in medium and fine soils only.

Influence of Soil Type, Organic Matter and pH on Authority 480 Herbicide Use Rates and Crop Response

Soil organic matter content can vary widely and independently of soil type and requires an accurate analysis of representative soil samples to determine its content. Soil pH also exerts a dramatic affect on sulfentrazone availability in the soil solution. As soil pH increases, sulfentrazone availability increases. Determining soil pH requires an accurate analysis of representative soil samples. Do not apply to soils classified as sand containing less than 1% organic matter.

The total amount of sulfentrazone available in solution, in any given soil, is determined by the interaction of soil type (primarily clay content), % organic matter and pH. The application timing (relative to the emergence of the crop and weeds) and amount of rainfall and/or irrigation received will ultimately determine, in conjunction with the soil parameters and pH, the amount of sulfentrazone in soil solution. It is important to note that Authority 480 Herbicide can await activating moisture. However, diminished weed control may result due to the successive increase in weed growth versus timing of activation.

It is important to note that irrigation with highly alkaline water (high pH) following an Authority 480 Herbicide soil application can also significantly increase the amount of sulfentrazone available, in the soil solution. Irrigation with water having a pH greater than 7.5 could result in adverse crop response. This response will ultimately depend on initial Authority 480 Herbicide application rate, timing, amount and pH of irrigation water and sensitivity of the crop and its growth stage when irrigated. The risk of adverse crop response will lessen with the advances in growth stages among most crops.

APPLICATION INFORMATION

Utilize a boom and nozzle sprayer or boomless ground sprayer equipped with the appropriate nozzles, spray tips and screens and adjusted to provide optimum spray distribution and coverage at the appropriate operating pressures. Utilize boom and nozzle and boomless sprayer configurations which produce minimal amounts of fine spray droplets. Do not exceed 175 kPa spray pressure unless otherwise required by the manufacturer of drift reducing nozzles or boomless application systems. Apply a minimum of 100 L/ha of finished spray.

Water must be used as the carrier for Authority 480 Herbicide.

Do not allow spray mixtures to sit overnight due to potential settling of product and difficulty in resuspending may occur.

Avoid spray drift to adjacent plants as injury to other plants may occur.

MIXING and LOADING

Spray Tank Preparation

It is important that spray equipment is clean and free of existing pesticide deposits before using this product. Follow the spray tank clean out procedures specified on the label of product previously applied before adding Authority 480 Herbicide to the tank.

Mixing and Loading Instructions

Authority 480 Herbicide is a suspension concentrate intended for dilution with water. For best results, fill spray tank with one half of the volume of clean water needed for the area to be treated. Start the agitation system. Prepare a slurry of Authority 480 Herbicide in a clean container using clean water. Slowly add the Authority 480 Herbicide/water slurry to the spray tank. Carefully rinse the slurry container, adding the rinsate to the spray tank. Complete filling the spray tank to the desired level. Continuous spray tank agitation is required at all times to maintain a uniform spray solution. Make sure Authority 480 Herbicide is thoroughly mixed before application.

Use the Authority 480 Herbicide mixture immediately after mixing.

Do not store the sprayer overnight or for any extended period of time with the sulfentrazone spray mixture remaining in the tank.

Premixing Authority 480 Herbicide spray solutions in nurse tanks is not recommended.

ROTATIONAL CROP GUIDELINES

The following table shows the minimum interval in months from the time of the last Authority 480 Herbicide application until Authority 480 Herbicide treated soil can be replanted to the crops listed as follows.

Accepted rotational crops and replant intervals for Authority 480 Herbicide.

Rotational Crop	Replant Interval (Months)
Alfalfa	12
Canola	24
Corn, field	10
Corn, sweet	24
Sorghum	24
Soybeans	Anytime
Sunflowers	Anytime
Spring Wheat	12
Winter wheat	16

For crops listed in the rotational crop table, the minimum replant interval listed in the table must be observed. For crops not listed in the rotational crop table, A MINIMUM ROTATIONAL CROP INTERVAL OF 36 MONTHS must be observed and a representative bioassay of the field must be conducted with the rotational crop and adequate soil moisture to evaluate potential crop sensitivity.

If there is a lack of adequate or normal soil moisture due to drought conditions following an application of Authority 480 Herbicide, the minimum rotational crop interval listed in the table must be extended for one additional year and a representative bioassay of the field must be conducted with the potential rotational crop and adequate soil moisture to determine the crop sensitivity to Authority 480 Herbicide.

REPLANTING INSTRUCTIONS

If initial planting of labeled crops fails to produce a stand, only labeled crops for Authority 480 Herbicide, may be planted. **Do not retreat field with Authority 480 Herbicide.** Do not plant treated fields with any crop at intervals that are inconsistent with the Rotational Crop Guidelines on this label. When replanting use minimum soil tillage to preserve the herbicide barrier and achieve maximum weed control.

SPRAYER EQUIPMENT CLEAN-OUT

After spraying Authority 480 Herbicide and before using sprayer equipment for any other applications, the sprayer must be thoroughly cleaned using the following procedure:

1. Drain sprayer tank, hoses, and spray boom. Use a high-pressure detergent wash to remove physical sediment and residues from the inside of the sprayer tank and thoroughly rinse. Then thoroughly flush all sprayer hoses, booms, and nozzles with clean water.
2. Prepare a sprayer cleaning solution by adding three litres of ammonia (containing at least 3% active) per 100 litres of clean water. Prepare sufficient cleaning solution to allow the operation of the spray system for a minimum of 15 minutes to thoroughly flush hoses, spray boom and spray nozzles.
3. Convenient and thorough cleaning of the sprayer can be achieved if the ammonia solution or fresh water is left in the spray tank, hoses, spray booms and spray nozzles overnight or during storage.
4. Drain the sprayer system. Rinse the tank with clean water and flush through the hoses, boom, and nozzles. Remove and clean spray tips and all strainers and screens separately in an ammonia solution.
5. Properly dispose of all cleaning solution and rinsate in accordance with provincial guidelines and regulations.

Do not drain or flush equipment on or near desirable trees or plants.

Do not contaminate any body of water including irrigation water that may be used on other plants or crops.

DIRECTIONS FOR USE (CHICKPEAS IN SASKATCHEWAN ONLY)

When used as directed, Authority 480 Herbicide will provide control of the listed weeds in chickpeas.

Control
Kochia
Lamb's quarters
Redroot pigweed
Wild buckwheat

Authority 480 Herbicide may be applied preemergence or preplant incorporated **AS A SINGLE GROUND APPLICATION**. Authority 480 Herbicide can be applied prior to planting or up to 3 days after planting, but before seed germination. When applications after planting are delayed greater than 3 days, injury may occur if seeds are germinating. For preplant incorporated applications, incorporation must be uniform and no deeper than 5 centimetres. Improper soil incorporation may result in erratic weed control and/or crop

injury. Authority 480 Herbicide applied near or after crop emergence may cause severe injury to the crop.

Sulfentrazone is persistent and will last in the soils (carryover) for one to two years. DO NOT APPLY AUTHORITY 480 HERBICIDE TO FIELDS PREVIOUSLY TREATED WITH AUTHORITY 480 HERBICIDE WITHIN THE PAST THREE (3) YEARS (36 MONTHS). In case of drought in any of those years, a subsequent application of Authority 480 Herbicide should be further delayed by the equivalent number of years in which drought occurred. Authority 480 Herbicide requires one (1) to two (2) cm of rain or irrigation water to be effective. If adequate moisture from rainfall or irrigation is not received within 7 to 10 days of application, a shallow incorporation no deeper than 5 cm may be needed to obtain adequate weed control.

Buffer zones:

The buffer zones specified in the table below are required between the point of direct application and the closest downwind edge of sensitive terrestrial habitats (such as grasslands, forested areas, shelter belts, woodlots, hedgerows, riparian areas and shrublands) and sensitive freshwater habitats (such as lakes, rivers, sloughs, ponds, prairie potholes, creeks, marshes, streams, reservoirs and wetlands).

Method of application	Crop	Buffer Zones (metres) Required for the Protection of:		
		Freshwater Habitat of Depths:		Terrestrial Habitat
		Less than 1 m	Greater than 1 m	
Field sprayer*	Chickpea	1	0	10

*For field sprayer application, buffer zones can be reduced with the use of drift reducing spray shields. When using a spray boom fitted with a full shield (shroud, curtain) that extends to the crop canopy, the labeled buffer zone can be reduced by 70%. When using a spray boom where individual nozzles are fitted with cone-shaped shields that are no more than 30 cm above the crop canopy, the labeled buffer zone can be reduced by 30%.

Rates of Application

Authority 480 Herbicide needs to be applied at the following rates of application (milliliters of product) according to soil texture, organic matter content and pH. **Authority 480 Herbicide should not be used in chickpeas that are grown in coarse-textured soils.**

Rates of Application for Authority 480 Herbicide

Percent (%) Organic Matter	Application by Soil Type (mL of Authority 480 Herbicide per hectare)	
	Medium	Fine

< 1.5	219 -292*	--
1.5 - 3.0	219 -292	219 -292
> 3.0	219 -292	219 -292

*** Use the higher rates within the rate range for soils with pH less than 7.0**

Do not apply to soils classified as coarse-textured soils.

Do not apply in fine textured soils with less than 1.5% organic matter.

Do not apply in any type of soils with an organic matter content greater than 6%.

Do not use on soils with a pH of 7.8 or greater.

Authority 480 Herbicide can be applied to CHICKPEAS IN SASKATCHEWAN ONLY.

DO NOT apply this product directly to freshwater habitats (such as lakes, rivers, sloughs, ponds, prairie potholes, creeks, marshes, streams, reservoirs and wetlands), estuarine/ marine habitats.

DO NOT contaminate irrigation or drinking water supplies or aquatic habitats by cleaning of equipment or disposal of wastes.

Field sprayer application: **DO NOT** apply during periods of dead calm. Avoid application of this product when winds are gusty. **DO NOT** apply with spray droplets smaller than the American Society of Agricultural Engineers (ASAE) medium classification. Boom height must be 60 cm or less above the crop or ground.

DO NOT apply by air.

RESISTANCE MANAGEMENT

For resistance management, Authority 480 Herbicide is a Group 14 herbicide. Any weed population may contain or develop plants naturally resistant to Authority 480 Herbicide and other Group 14 herbicides. The resistant biotypes may dominate the weed population of these herbicides are used repeatedly in the same field. Other resistance mechanisms that are not lined to site of action, but specific for individual chemicals, such as enhanced metabolism, may also exist. Appropriate resistance-management strategies should be followed.

To delay herbicide resistance:

- Where possible, rotate the use of Authority 480 Herbicide or other Group 14 herbicides with different groups that control the same weeds in a field.
- Use tank mixtures with herbicides from a different group when such use is permitted.
- Herbicide use should be based on an IPM program that includes scouting, historical information related to herbicide use and crop rotation, and considers tillage (or other mechanical), cultural, biological and other chemical control practices.
- Monitor treated weed populations for resistance developments.

- Prevent movement of resistant weed seeds to other fields by cleaning harvesting and tillage equipment and planting clean seed.
- Contact your local extension specialist or certified crop advisors for any additional pesticide resistance-management and/or integrated weed-management recommendations for specific crops and weed biotypes.
- For further information or to report suspected resistance contact Nufarm Agriculture Inc. at 1-800-868-5444.

**EMERGENCY USE LABEL:
Expires August 31st, 2009**

GROUP

14

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COMMERCIAL

(Agricultural)

Solution

For Use on the Following Non-Irrigated Crop:

Chickpea in the Province of Alberta Only

GUARANTEE: Sulfentrazone 480 g/L
Contains Petroleum Distillate

Contains sodium o-phenylphenate (present as tetrahydrate) at 0.036% as a preservative.

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PEST CONTROL PRODUCTS ACT

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POISON

Net Contents: 10 Litres

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Philadelphia PA
19103
USA

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5507 1st Street SE
Calgary, Alberta T2H 1H9
1-800-868-5444

GENERAL INFORMATION

Authority 480 Herbicide is a selective soil applied herbicide for the control of kochia in chickpeas.

Authority 480 Herbicide is formulated as a flowable (suspension concentrate) containing 480 grams of the active ingredient, sulfentrazone, per litre, intended for dilution with water for application.

Authority 480 Herbicide is taken up by the plant roots and shoots.

Observe all instructions, mixing directions, application precautions and other label information of Authority 480 Herbicide.

PROPER HANDLING INSTRUCTIONS:

Authority 480 Herbicide may not be mixed or loaded within 15 meters of any wells (including abandoned wells and drainage wells), sink holes, perennial or intermittent streams or rivers, and natural or impounded lakes and reservoirs. This setback does not apply to properly capped or plugged abandoned wells and does not apply to impervious pads or properly diked mixing/loading areas.

Operations that involve mixing, loading, rinsing or washing of this product into or from pesticide handling or application equipment or containers within 15 metres of any well, are prohibited unless conducted on an impervious pad constructed to withstand the weight of the heaviest load that may be positioned on or moved across the pad. Such a pad shall be designed and maintained to contain any product spills or equipment leaks, container or equipment rinse or wash water, and rainwater that may fall on the pad. Surface water shall not be allowed to either flow over or from the pad, which means the pad must be self-contained. The pad shall be sloped to facilitate material removal. An unroofed pad shall be of sufficient capacity to contain at a minimum 110% of the capacity of the largest pesticide container or application equipment on the pad. A pad that is covered by a roof of sufficient size to completely exclude precipitation from contact with the pad shall have a minimum containment capacity of 100% of the capacity of the largest pesticide container or application equipment on the pad. Containment capacities as described above shall be maintained at all times. The above specific minimum containment capacities do not apply to vehicles when delivering pesticide shipments to the mixing/loading site. Provinces may have in effect additional requirements regarding wellhead setbacks and operational containment.

Authority 480 Herbicide must be used in a manner which will prevent back siphoning in wells, spills or improper disposal of excess pesticide, spray mixtures or rinsates.

FIRST AID

If inhaled: Move person to fresh air. If person is not breathing, call 911 or an ambulance, then give artificial respiration, preferably by mouth-to-mouth, if possible. Call a poison control centre or doctor for further treatment advice.

If on skin or clothing: Take off contaminated clothing. Rinse skin immediately with plenty of water for 15-20 minutes. Call a poison control centre or doctor for treatment advice.

If in eyes: Hold eye open and rinse slowly and gently with water for 15-20 minutes. Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye. Call a poison control centre or doctor for treatment advice.

If swallowed: Call a poison control centre or doctor immediately for treatment advice. Do not induce vomiting unless told to do so by the poison control centre or doctor. Do not give **any** liquid to the person. Do not give anything by mouth to an unconscious person.

Take container, label or product name and the Pest Control Product Registration Number with you when seeking medical attention.

You may also contact **1-800-331-3148** for emergency medical treatment information.

For Information regarding the Use of this Product call **1-800-321-1FMC (1362)**.

TOXICOLOGICAL INFORMATION

Treat Symptomatically. Contains petroleum distillate – vomiting may cause aspiration pneumonia.

PRECAUTIONS

KEEP OUT OF REACH OF CHILDREN

Hazards to Humans and Domestic Animals

CAUTION

Harmful if inhaled, swallowed, or absorbed through skin. Avoid breathing vapor or spray mist. Avoid contact with skin, eyes or clothing.

Apply only when the potential for drift to areas of human habitation or areas of human activity, such as houses, cottages, schools and recreational areas is minimal. Take into consideration wind speed, wind direction, temperature, application equipment and sprayer settings.

If this pest control product is to be used on a commodity that may be exported to the U.S. and you require information on acceptable residue levels in the U.S., visit CropLife Canada's web site at: www.croplife.ca.

Environmental Hazards

Sulfentrazone is persistent and may carryover.

Authority 480 Herbicide used according to the label directions is known to leach through soil into groundwater particularly in areas where soils are permeable (e.g. sandy soil)

and/or the depth to the water table is shallow. Do not use on coarse soils classified as sand which have less than 1% organic matter.

To reduce runoff from treated areas into aquatic habitats avoid application to areas with a moderate to steep slope, compacted soil, or clay.

Avoid application when heavy rain is forecast.

Contamination of aquatic areas as a result of runoff may be reduced by including a vegetative strip between the treated area and the edge of the water body.

Toxic to small wild mammals.

This product contains an active ingredient and aromatic petroleum distillates which are toxic to aquatic organisms.

Toxic to non-target terrestrial plants. Observe buffer zones specified under DIRECTIONS FOR USE.

PERSONAL PROTECTIVE EQUIPMENT (PPE)

Wear a long-sleeved shirt, long pants and chemical resistant gloves made of waterproof material such as polyethylene or polyvinyl chloride and shoes plus socks during mixing, loading, clean up and repair. Wear a long-sleeved shirt, long pants and shoes plus socks during application.

Discard clothing and other absorbent materials that have been drenched or heavily contaminated with this product. Do not reuse them. Follow manufacturer's instructions for cleaning and maintaining PPE. If no such instructions for washables, use detergent and hot water. Keep and wash PPE separately from other laundry.

Remove clothing immediately if pesticide gets inside. Then bathe thoroughly and put on clean clothing.

RESTRICTED ENTRY INTERVAL

Do not enter or allow worker entry into treated areas during the restricted entry interval (REI) of 12 hours.

IMPORTANT

- 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 area, consult the provincial agency responsible for pesticide regulation.
- Do not apply more than the allowed amount per hectare per twelve-month period. The twelve-month period is considered to begin upon the initial application.

STORAGE

STORE ABOVE 5°C TO KEEP PRODUCT FROM FREEZING. If frozen, thaw before use. If solid crystals are observed, warm material to above 15 °C by placing container in warm location. Shake or roll container periodically to redissolve solids.

Do not use or store near heat or open flame.

Store in original containers only. Store containers in a dry location. Carefully open containers. After partial use, replace lids and close tightly. Do not put concentrate or dilute material into food or drink containers. Do not contaminate other pesticides, fertilizers, water, food, or feed by storage or disposal.

To prevent contamination store this product away from food or feed.

DISPOSAL

Do not reuse this container for any purpose. This is a recyclable container, and is to be disposed of at a container collection site. Contact your local distributor/dealer or municipality for the location of the nearest collection site. Before taking the container to the collection site:

1. Triple-rinse or pressure-rinse the empty container. Add the rinsings to the spray mixture in the tank.
2. Make the empty, rinsed container unsuitable for further use. If there is no container collection site in your area, dispose of the container in accordance with provincial requirements.

For information on disposal of unused, unwanted product, contact the manufacturer or the provincial regulatory agency. Contact the manufacturer and the provincial regulatory agency in case of a spill, and for clean up of spills.

NOTICE TO USER

This pest control product is to be used only in accordance with the directions on the label. It is an offence under the *Pest Control Products Act* to use this product in a way that is inconsistent with the directions on the label. The user assumes the risk to persons or property that arises from any such use of this product.

APPLICATION INFORMATION

DO NOT APPLY BY AIR.

Authority 480 Herbicide can be applied with conventional ground spraying equipment.

Ground Application

Utilize a boom and nozzle sprayer equipped with the appropriate nozzles, spray tips and screens and adjusted to provide optimum spray distribution and coverage at the appropriate operating pressures. Utilize nozzles that produce minimal amounts of fine spray droplets to avoid spray drift or inadequate foliar and soil coverage. Apply a minimum of 100 litres of finished spray per hectare by ground. Be aware that spray pattern overlaps and slower ground speeds while starting, stopping or turning while spraying may result in excessive application and subsequent crop response.

Spray Drift Management

Minimizing spray drift at the application site is the responsibility of the applicator and the grower. The interaction of many equipment and weather-related factors determine the potential for spray drift. The applicator and the grower are responsible for considering all these factors when making decisions.

Apply only when the potential for drift to areas of human habitation or areas of human activity, such as houses, cottages, schools and recreational areas is minimal. Take into consideration wind speed, wind direction, temperature, application equipment and sprayer settings.

One of the most effective ways to reduce drift potential is to apply large droplets. The best drift management strategy is to apply the largest droplets that provide sufficient coverage for pesticide performance. Applying larger droplets reduces drift potential but will not reduce drift if applications are made improperly or under unfavorable environmental conditions.

Controlling Spray Droplet Size

Volume: Use high flow rate nozzles to apply the greatest practical spray volume. Nozzles with higher rated flow generally produce larger droplets.

Pressure: When higher flow rates are needed, use higher flow rate nozzles rather than increasing spray pressure. Do not exceed the nozzle manufacturer's recommended pressures. Lower pressure produces larger droplets in many types of nozzles.

Nozzle Type: Use a nozzle type that is designed for the intended application. With most nozzle types, narrower spray angles produce larger droplets. Consider using low-drift nozzles for both ground and aerial applications. Solid stream nozzles oriented straight back usually produce the largest droplets and the lowest drift potential in aerial applications.

GENERAL APPLICATION INSTRUCTIONS

Authority 480 Herbicide may be applied to the soil as a preplant incorporated treatment or as a pre-emergence (to weed and crop) surface application. Do not make fall

applications to any crops. See DIRECTIONS FOR USE for the proper rates of application according to soil texture, organic matter content and pH.

Preplant incorporated treatments require a uniform surface application followed by thorough incorporation to a depth no greater than 5 centimetres. Care must be taken not to create overlaps in treated zones due to soil movement which will result in excessive Authority 480 Herbicide rates that could result in adverse crop response. Additional care must be exercised to prevent deep incorporation of Authority 480 Herbicide which may result in poor weed control performance on shallow germinating weeds.

All soil applications of Authority 480 Herbicide require adequate rainfall for herbicidal activation. The ultimate amount of moisture, supplied by rainfall, is dependent on several factors. These factors include but are not limited to existing soil moisture at application, soil type, organic matter and pH. In crop situations, dependent on rainfall, Authority 480 Herbicide can await activating moisture for extended periods (10 to 14 days or longer) depending on the soil parameters described above. Once activated, Authority 480 Herbicide will provide activity on existing weeds. Where rainfall has not provided activation, particularly for surface applications of Authority 480 Herbicide, a shallow incorporation is recommended to initiate the process of activation with existing soil moisture. In circumstances where prolonged periods without rainfall are not possible, alternative or additional weed management practices (cultivation or post-applied herbicides) may be required.

When activating moisture is received after dry conditions, Authority 480 Herbicide may provide a reduced level of control of susceptible germinating weeds. Soil applications of Authority 480 Herbicide must be made before crop seed germination to prevent injury to the emerging crop seedlings. When applications after planting are delayed, injury may occur if seeds are germinating or if they are located near the soil surface.

Extreme care must be exercised and the DIRECTIONS FOR USE must be followed exactly when utilizing Authority 480 Herbicide.

Mode of Action

Sulfentrazone, the active ingredient in Authority 480 Herbicide, is a potent inhibitor of the enzyme Protoporphyrinogen Oxidase IX (Protox) required for the formation of chlorophyll. Inhibition of the PPO IX enzyme results in the liberation of singlet oxygen (O) that, in turn, disrupts cellular membranes and causes cellular leakage. The ultimate manifestation of the process is cellular death leading to plant death. The selective herbicidal activity of sulfentrazone is based on its greater affinity for the PPO IX enzyme in weed species versus crop plants.

Mechanism of Action

Following the application of Authority 480 Herbicide to soil, germinating seeds and seedlings take up sulfentrazone from the soil solution. The amount of sulfentrazone in soil solution, and available for weed uptake, is determined primarily by soil type, organic matter and soil pH. Sulfentrazone adsorbs to the clay and organic matter fractions of

soils effectively limiting the amount of active ingredient immediately available to control weeds. Soils typically increase in clay content through the series from coarse to fine as noted in the following Soil Classification Chart.

Soil Classification Chart

Coarse*	Medium	Fine
Sand	Sandy clay loam	Silty clay loam
Loamy sand	Sandy clay	Silty clay
Sandy loam	Loam	Clay loam
	Silt loam	Clay
	Silt	

* Authority 480 Herbicide is to be applied in chickpeas, grown in medium and fine soils only.

Influence of Soil Type, Organic Matter and pH on Authority 480 Herbicide Use Rates and Crop Response

Soil organic matter content can vary widely and independently of soil type and requires an accurate analysis of representative soil samples to determine its content. Soil pH also exerts a dramatic affect on sulfentrazone availability in the soil solution. As soil pH increases, sulfentrazone availability increases. Determining soil pH requires an accurate analysis of representative soil samples. Do not apply to soils classified as sand containing less than 1% organic matter.

The total amount of sulfentrazone available in solution, in any given soil, is determined by the interaction of soil type (primarily clay content), % organic matter and pH. The application timing (relative to the emergence of the crop and weeds) and amount of rainfall received will ultimately determine, in conjunction with the soil parameters and pH, the amount of sulfentrazone in soil solution. It is important to note that Authority 480 Herbicide can await activating moisture. However, diminished weed control may result due to the successive increase in weed growth versus timing of activation.

APPLICATION INFORMATION

Utilize a boom and nozzle sprayer or boomless ground sprayer equipped with the appropriate nozzles, spray tips and screens and adjusted to provide optimum spray distribution and coverage at the appropriate operating pressures. Utilize boom and nozzle and boomless sprayer configurations which produce minimal amounts of fine spray droplets. Do not exceed 175 kPa spray pressure unless otherwise required by the manufacturer of drift reducing nozzles or boomless application systems. Apply a minimum of 100 L/ha of finished spray.

Water must be used as the carrier for Authority 480 Herbicide.

Do not allow spray mixtures to sit overnight due to potential settling of product and difficulty in resuspending may occur.

Avoid spray drift to adjacent plants as injury to other plants may occur.

MIXING and LOADING

Spray Tank Preparation

It is important that spray equipment is clean and free of existing pesticide deposits before using this product. Follow the spray tank clean out procedures specified on the label of product previously applied before adding Authority 480 Herbicide to the tank.

Mixing and Loading Instructions

Authority 480 Herbicide is a suspension concentrate intended for dilution with water. For best results, fill spray tank with one half of the volume of clean water needed for the area to be treated. Start the agitation system. Prepare a slurry of Authority 480 Herbicide in a clean container using clean water. Slowly add the Authority 480 Herbicide/water slurry to the spray tank. Carefully rinse the slurry container, adding the rinsate to the spray tank. Complete filling the spray tank to the desired level. Continuous spray tank agitation is required at all times to maintain a uniform spray solution. Make sure Authority 480 Herbicide is thoroughly mixed before application.

Use the Authority 480 Herbicide mixture immediately after mixing.

Do not store the sprayer overnight or for any extended period of time with the sulfentrazone spray mixture remaining in the tank.

Premixing Authority 480 Herbicide spray solutions in nurse tanks is not recommended.

ROTATIONAL CROP GUIDELINES

The following table shows the minimum interval in months from the time of the last Authority 480 Herbicide application until Authority 480 Herbicide treated soil can be replanted to the crops listed as follows.

Accepted rotational crops and replant intervals for Authority 480 Herbicide.

Rotational Crop	Replant Interval (Months)
Alfalfa	12
Canola	24
Corn, field	10
Corn, sweet	24
Sorghum	24
Soybeans	Anytime
Sunflowers	Anytime
Spring Wheat	12
Winter wheat	16

For crops listed in the rotational crop table, the minimum replant interval listed in the table must be observed. For crops not listed in the rotational crop table, A MINIMUM ROTATIONAL CROP INTERVAL OF 36 MONTHS must be observed and a representative bioassay of the field must be conducted with the rotational crop and adequate soil moisture to evaluate potential crop sensitivity.

If there is a lack of adequate or normal soil moisture due to drought conditions following an application of Authority 480 Herbicide, the minimum rotational crop interval listed in the table must be extended for one additional year and a representative bioassay of the field must be conducted with the potential rotational crop and adequate soil moisture to determine the crop sensitivity to Authority 480 Herbicide.

REPLANTING INSTRUCTIONS

If initial planting of labeled crops fails to produce a stand, only labeled crops for Authority 480 Herbicide, may be planted. **Do not retreat field with Authority 480 Herbicide.** Do not plant treated fields with any crop at intervals that are inconsistent with the Rotational Crop Guidelines on this label. When replanting use minimum soil tillage to preserve the herbicide barrier and achieve maximum weed control.

SPRAYER EQUIPMENT CLEAN-OUT

After spraying Authority 480 Herbicide and before using sprayer equipment for any other applications, the sprayer must be thoroughly cleaned using the following procedure:

1. Drain sprayer tank, hoses, and spray boom. Use a high-pressure detergent wash to remove physical sediment and residues from the inside of the sprayer tank and thoroughly rinse. Then thoroughly flush all sprayer hoses, booms, and nozzles with clean water.
2. Prepare a sprayer cleaning solution by adding three litres of ammonia (containing at least 3% active) per 100 litres of clean water. Prepare sufficient cleaning solution to allow the operation of the spray system for a minimum of 15 minutes to thoroughly flush hoses, spray boom and spray nozzles.
3. Convenient and thorough cleaning of the sprayer can be achieved if the ammonia solution or fresh water is left in the spray tank, hoses, spray booms and spray nozzles overnight or during storage.
4. Drain the sprayer system. Rinse the tank with clean water and flush through the hoses, boom, and nozzles. Remove and clean spray tips and all strainers and screens separately in an ammonia solution.
5. Properly dispose of all cleaning solution and rinsate in accordance with provincial guidelines and regulations.

Do not drain or flush equipment on or near desirable trees or plants.

Do not contaminate any body of water including irrigation water that may be used on other plants or crops.

DIRECTIONS FOR USE

CHICKPEA ONLY IN THE PROVINCE OF ALBERTA

When used as directed, Authority 480 Herbicide will provide control of kochia in Chickpea

Control
Kochia

Authority 480 Herbicide may be applied preemergence or preplant incorporated **AS A SINGLE GROUND APPLICATION**. Authority 480 Herbicide can be applied prior to planting or up to 3 days after planting, but before seed germination. When applications after planting are delayed greater than 3 days, injury may occur if seeds are germinating. For preplant incorporated applications, incorporation must be uniform and no deeper than 5 centimetres. Improper soil incorporation may result in erratic weed control and/or crop

injury. Authority 480 Herbicide applied near or after crop emergence may cause severe injury to the crop.

Sulfentrazone is persistent and will last in the soils (carryover) for one to two years. DO NOT APPLY AUTHORITY 480 HERBICIDE TO FIELDS PREVIOUSLY TREATED WITH AUTHORITY 480 HERBICIDE WITHIN THE PAST THREE (3) YEARS (36 MONTHS). In case of drought in any of those years, a subsequent application of Authority 480 Herbicide should be further delayed by the equivalent number of years in which drought occurred. Authority 480 Herbicide requires one (1) to two (2) cm of rain water to be effective. If adequate moisture from rainfall is not received within 7 to 10 days of application, a shallow incorporation no deeper than 5 cm may be needed to obtain adequate weed control.

Buffer zones:

The buffer zones specified in the table below are required between the point of direct application and the closest downwind edge of sensitive terrestrial habitats (such as grasslands, forested areas, shelter belts, woodlots, hedgerows, riparian areas and shrublands) and sensitive freshwater habitats (such as lakes, rivers, sloughs, ponds, prairie potholes, creeks, marshes, streams, reservoirs and wetlands).

Method of application	Crop	Buffer Zones (metres) Required for the Protection of:		
		Freshwater Habitat of Depths:		Terrestrial Habitat
		Less than 1 m	Greater than 1 m	
Field sprayer*	Chickpea	1	0	10

*For field sprayer application, buffer zones can be reduced with the use of drift reducing spray shields. When using a spray boom fitted with a full shield (shroud, curtain) that extends to the crop canopy, the labeled buffer zone can be reduced by 70%. When using a spray boom where individual nozzles are fitted with cone-shaped shields that are no more than 30 cm above the crop canopy, the labeled buffer zone can be reduced by 30%.

Rates of Application

Authority 480 Herbicide needs to be applied at the following rates of application (milliliters of product) according to soil texture, organic matter content and pH.

Authority 480 Herbicide should not be used in chickpeas, that are grown in coarse-textured soils.

Rates of Application for Authority 480 Herbicide

Percent (%) Organic Matter	Application by Soil Type (mL of Authority 480 Herbicide per hectare)	
	Medium	Fine
< 1.5	219 -292*	--
1.5 - 3.0	219 -292	219 -292
> 3.0	219 -292	219 -292

* Use the higher rates within the rate range for soils with pH less than 7.0

Do not apply to soils classified as coarse-textured soils.

Do not apply in fine textured soils with less than 1.5% organic matter.

Do not apply in any type of soils with an organic matter content greater than 6%.

Do not use on soils with a pH of 7.8 or greater.

Authority 480 Herbicide can be applied to

CHICKPEA IN ALBERTA ONLY.

DO NOT apply this product to crops that are irrigated.

DO NOT apply this product directly to freshwater habitats (such as lakes, rivers, sloughs, ponds, prairie potholes, creeks, marshes, streams, reservoirs and wetlands), estuarine/marine habitats.

DO NOT contaminate irrigation or drinking water supplies or aquatic habitats by cleaning of equipment or disposal of wastes.

Field sprayer application: **DO NOT** apply during periods of dead calm. Avoid application of this product when winds are gusty. **DO NOT** apply with spray droplets smaller than the American Society of Agricultural Engineers (ASAE) medium classification. Boom height must be 60 cm or less above the crop or ground.

DO NOT apply by air.

RESISTANCE MANAGEMENT

For resistance management, Authority 480 Herbicide is a Group 14 herbicide. Any weed population may contain or develop plants naturally resistant to Authority 480 Herbicide and other Group 14 herbicides. The resistant biotypes may dominate the weed population of these herbicides are used repeatedly in the same field. Other resistance mechanisms that are not lined to site of action, but specific for individual chemicals, such as enhanced metabolism, may also exist. Appropriate resistance-management strategies should be followed.

To delay herbicide resistance:

- Where possible, rotate the use of Authority 480 Herbicide or other Group 14 herbicides with different groups that control the same weeds in a field.
- Use tank mixtures with herbicides from a different group when such use is permitted.
- Herbicide use should be based on an IPM program that includes scouting, historical information related to herbicide use and crop rotation, and considers tillage (or other mechanical), cultural, biological and other chemical control practices.
- Monitor treated weed populations for resistance developments.
- Prevent movement of resistant weed seeds to other fields by cleaning harvesting and tillage equipment and planting clean seed.
- Contact your local extension specialist or certified crop advisors for any additional pesticide resistance-management and/or integrated weed-management recommendations for specific crops and weed biotypes.
- For further information or to report suspected resistance contact Nufarm Agriculture Inc. at 1-800-868-5444.

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