

GROUP

14

HERBICIDE

AUTHORITY 480 HERBICIDE

HERBICIDE

COMMERCIAL

(Agricultural)

**Suspension Concentrate
Flowable**

For Use on Chickpeas, Field Pea, Flax, Sunflower, Soybeans, Tame Mustard, Asparagus, Fababean, Mint, Strawberry, Horseradish, Brassica, Head and Stem (Crop Group 5-13), Brassica, Leafy Greens (Crop Sub-Group 4-13b), Fruiting Vegetables (Crop Group 8-09) (Transplants only), Tree Nuts (Crop Group 14):, Grapes and Berries (Crop Group 13-07) and Apples

GUARANTEE: Sulfentrazone..... 480 g/L
Contains Petroleum Distillate

Contains o-phenylphenol (present as sodium o-phenylphenol tetrahydrate) at 0.032% as a preservative

REGISTRATION NUMBER 29012
PEST CONTROL PRODUCTS ACT

READ THE LABEL BEFORE USING

CAUTION



POISON

Net Contents: 3.79 Litres to 1000 L

FMC Corporation
2929 Walnut Street
Philadelphia PA
19104
USA
1-800-331- 3148

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GENERAL INFORMATION

SECTION 1: 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.

SECTION 2: PRODUCT INFORMATION

Authority 480 Herbicide is a selective soil applied herbicide for the control of wild buckwheat, kochia, lamb's-quarters, redroot pigweed, cleavers, powell pigweed, Eastern black nightshade, common waterhemp, smooth crabgrass, large crabgrass, yellow woodsorrel, common groundsel and common purslane in chickpeas, field peas, flax, sunflower, soybeans, mustard, asparagus, fababean, mint, strawberry, horseradish, brassica, head and stem (Crop Group 5-13), brassica, leafy greens (Crop Sub-Group 4-13b), fruiting vegetables (Crop Group 8-09) (transplants only), tree nuts (Crop Group 14), grapes and berries (Crop Group 13-07) and apples.

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.

For Information regarding the Use of this Product, visit www.fmccrop.ca

SAFETY AND HANDLING

SECTION 3: 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.

SECTION 4: FIRST AID AND TOXICOLOGICAL INFORMATION

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

TOXICOLOGICAL INFORMATION

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

SECTION 5: PRECAUTIONS, PROTECTIVE CLOTHING AND EQUIPMENT

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 inversion, application equipment and sprayer settings.

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.

SECTION 6: ENVIRONMENTAL HAZARDS AND INFORMATION

Sulfentrazone is persistent and may carryover. It is recommended that any products containing sulfentrazone not be used in areas treated with this product during the previous season.

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. As this product is not registered for the control of pests in aquatic systems, **DO NOT** use to control aquatic pests.

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

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.

SECTION 7: 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 re-dissolve 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.

SECTION 8: 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.

DIRECTIONS FOR USE

SECTION 9: CROPS AND WEEDS

SECTION 9.1: CROPS

AUTHORITY 480 HERBICIDE may be applied to pre-plant or pre-emergent to chickpeas, field peas, flax, sunflower, soybeans, mustard, asparagus, fababean, mint, strawberry, horseradish, brassica, head and stem (Crop Group 5-13), brassica, leafy greens (Crop Sub-Group 4-13b), fruiting vegetables (Crop Group 8-09) (transplants only), tree nuts (Crop Group 14), grapes and berries (Crop Group 13-07) and apples.

Authority 480 Herbicide does not control emerged weeds.

SECTION 9.2: WEEDS CONTROLLED

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

Use rate (L/ha)	Weeds controlled
0.219	Kochia
0.292	Above weeds plus: Redroot pigweed Lamb's-quarters Wild buckwheat Eastern black nightshade Common waterhemp Smooth crabgrass Large crabgrass Yellow woodsorrel Common groundsel Cleavers (suppression) Powell pigweed Common purslane

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.

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 and organic matter greater than 3%.

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.

SECTION 9.3: SPECIFIC CROP INFORMATION

SECTION 9.3.1 FIELD CROPS

CHICKPEAS, FIELD PEAS, FLAX, SUNFLOWER, FABABEAN, SOYBEANS

Make one pre plant or pre emergence application per season. Apply in 100 L of water per ha.

MINT

Dormant Applications

Apply AUTHORITY 480 Herbicide to established stands of dormant mint after spring land cultivation has been completed and before emergence of new mint growth.

Apply AUTHORITY 480 Herbicide in tank-mixtures with a registered burndown herbicide to control emerged weeds at the time of application.

AUTHORITY 480 Herbicide may also be applied in tank mixtures with other products registered for use in mint.

New Planting Applications

AUTHORITY 480 Herbicide may be applied to new mint plantings preemergence to the weeds and mint. The rate of application should be reduced approximately twenty five percent of the rate listed for established plantings for particular soil characteristics. Refer to AUTHORITY 480 Herbicide Use Rate Table for the appropriate use rate for the soil type and organic matter content.

Level of weed control will be reduced with the application of Authority 480 Herbicide at the reduced rate in new mint plantings.

Precautions

Applications made to mint that has emerged will result in severe injury to exposed plant tissue.

Apply only to healthy mint fields. Applications to mint under stress from disease, pests and cultural or environmental conditions may result in crop injury.

Moisture in the form of rainfall or overhead irrigation is required after application to activate the herbicide

Restrictions

Apply AUTHORITY 480 Herbicide only to dormant mint or new mint plantings before new growth emerges.

SECTION 9.3.2 FRUITS AND VEGETABLES

ASPARAGUS

Applications

Apply Authority 480 Herbicide as a broadcast treatment to crowns established for one or more years. Apply in the spring before the crop and weeds emerge. Authority 480 Herbicide should be applied in 100 to 400 litres of finished spray per hectare.

Restrictions

Do not apply within 14 days prior to harvest.

STRAWBERRY

Applications

Authority 480 Herbicide may be applied as a broadcast or banded dormancy treatment to strawberry. Applications should be made with ground sprayers at 200 – 400 L/ha. A single application may be made using no more than 0.292 L/ha of Authority 480 Herbicide per hectare.

Spring applications may be made during dormancy to established plantings only.

Precautions

Applications to strawberry plants with emerged growth are not recommended due to leaf burning and possible stand loss.

Restrictions

Do not apply within 70 days of harvest.

Do not use flood irrigation to activate this product.

Do not apply to saturated soils.

If soils are wet, do not apply if heavy rainfall is predicted within 24 hours.

Do not apply to frozen soils.

BRASSICA, HEAD AND STEM (Crop Group 5-13)

(Broccoli, Brussels sprouts, Chinese (napa) cabbage, Cabbage, Cauliflower)

Early Preplant (Spring Application)

AUTHORITY 480 Herbicide may be applied in the spring preceding the growing season as a broadcast or banded treatment up to 72 hours prior to transplanting head and stem brassica. AUTHORITY 480 Herbicide should be applied to the harvested crop stubble or soil surface without incorporation. Moisture will move and activate the product into the soil. Do not mechanically incorporate after application as this may destroy the herbicide barrier and weed escapes can occur. Do not apply to frozen soils to prevent AUTHORITY 480 Herbicide runoff from rain that may occur following application. AUTHORITY 480 Herbicide may be tank mixed with other burndown herbicides to control emerged weeds or with residual soil herbicides that are labeled for use on head and stem brassica. Use the listed rates of burndown herbicides in combination with AUTHORITY 480 Herbicide, or split applications as needed. Observe all precautions, instructions, and rotational cropping guidelines of each product's label when tank mixing, including all references to potential carryover and crop injury warnings or restrictions.

BRASSICA, LEAFY GREENS (Crop Sub-group 4-13B)

Broccoli raab, Chinese (bok choy) cabbage, collards, kale, mizuna, mustard greens, mustard spinach, rape greens Arugula, Chinese Broccoli

Early Preplant and Preemergence (Spring Application)

AUTHORITY 480 Herbicide may be applied in the spring preceding the growing season up to 72 hours prior to planting leafy brassica. AUTHORITY 480 Herbicide should be applied to the harvested crop stubble or soil surface without incorporation. Moisture will move and activate the product into the soil. Do not mechanically incorporate after application as this may destroy the herbicide barrier and weed escapes can occur. Do not apply to frozen soils to prevent AUTHORITY 480 Herbicide runoff from rain that may occur following application. AUTHORITY 480 Herbicide may be tank mixed with other burndown herbicides to control emerged weeds in the spring or with residual soil herbicides that are labeled for use on cabbage. Use the listed rates of burndown herbicides in combination with AUTHORITY 480 Herbicide, or split applications as needed. Observe all precautions, instructions, and rotational cropping guidelines of each product's label when tank mixing, including all references to potential carryover and crop injury warnings or restrictions.

FRUITING VEGETABLES (Crop Group 8-09) (Transplants only)

African eggplant; currant tomato; eggplant; garden huckleberry; goji berry; groundcherry; pea eggplant; pepino; pepper, bell; pepper, nonbell; scarlet eggplant; sunberry; tomatillo; tomato; cultivars, varieties, and/or hybrids of these

Preplant Applications

AUTHORITY 480 Herbicide may be applied preemergence as a broadcast or banded treatment on transplanted fruiting vegetables. Applications must be made prior to transplant. AUTHORITY 480 Herbicide can be tankmixed with other burndown or soil-applied herbicides labeled for use on tomatoes. Use the listed rates of burndown herbicides or split applications as needed. Observe all precautions, instructions and

rotational cropping guidelines of each product's label when tank mixing including all references to potential carryover and crop injury warnings or restrictions.

Early crop injury may be observed, but the final yield should not be affected.

The Preharvest Interval of 19 days is required for transplants of Fruiting Vegetables CG 8-09.

HORSERADISH

AUTHORITY 480 Herbicide may be applied as a preplant or preemergent treatment by ground in a minimum of 150 L per ha of finished spray.

Early Preplant (Spring Application)

AUTHORITY 480 Herbicide may be applied in the spring preceding the growing season to control or suppress weeds prior to or up to the planting of horseradish.

AUTHORITY 480 Herbicide should be applied to the harvested crop stubble or soil surface without incorporation. Moisture will move and activate the product into the soil. Do not mechanically incorporate after application as this may destroy the herbicide barrier and weed escapes may occur. Do not apply to frozen soils to prevent AUTHORITY 480 Herbicide runoff from rain that may occur following application.

AUTHORITY 480 Herbicide may be tankmixed with other burndown herbicides to control emerged weeds or with residual soil herbicides that are labeled for use on horseradish. Use listed rates of burndown herbicides in combination with AUTHORITY 480 Herbicide, or split applications as needed. Observe all precautions, instructions, and rotational cropping guidelines of each product label when tank mixing, including all references to potential carryover and crop injury warnings or restrictions.

Pre-Emergence (PRE)

AUTHORITY 480 Herbicide may be applied pre-emergence as a broadcast or banded treatment on horseradish. Applications should be made broadcast prior to planting, broadcast soon after planting but at least 5 days before crop emergence. AUTHORITY 480 Herbicide may be applied as a banded treatment into the row middles after crop emergence. AUTHORITY 480 Herbicide may be applied with other pesticides registered for use on horseradish.

Restrictions

Do not apply directly on the crop after the crop emerges or if the seedling sprouts are close to the soil surface.

Do not use on soils classified as sand, which have less than 1% organic matter.

SECTION 9.3.3 PERMANENT CROPS

TREE NUTS, GRAPES and BERRIES

Grapes: Wine, Raisin, Table and Juice, Amur river grape

Preharvest Interval: 3 days

Berries (Crop Group 13-07): aronia berry; bayberry; bearberry; bilberry; blackberry (including Andean blackberry, arctic blackberry, bingleberry, black satin berry, boysenberry, brombeere, California blackberry, Chesterberry, Cherokee blackberry, Cheyenne blackberry, common blackberry, coryberry, darrowberry, dewberry, Dirksen thornless berry, evergreen blackberry, Himalayaberry, hullberry, lavacaberry, loganberry, lowberry, Lucretiaberry, mammoth blackberry, marionberry, mora, mures deronce, nectarberry, Northern dewberry, olallieberry, Orgeon evergreen berry, phenomenalberry, rangeberry, ravenberry, rossberry, Shawnee blackberry, Southern dewberry, tayberry, youngberry, zarzamora, and cultivars, varieties and/or hybrids of these); blueberry, highbush; blueberry, lowbush; buffalo currant; buffaloberry; Chilean guava; chokecherry; cloudberry; cranberry; currant, black; currant, red; elderberry; European barberry; gooseberry; honeysuckle, edible; huckleberry; jostaberry; Juneberry (Saskatoon berry); kiwifruit, fuzzy; kiwifruit, hardy; lingonberry; maypop; mountain pepper berries; mulberry; muntries; native currant; partridgeberry; pincherry; raspberry, black and red; schisandra berry; sea buckthorn; serviceberry; wild raspberry; cultivars, varieties, and/or hybrids of these

Preharvest interval: 3 days

Tree Nuts (Crop Group 14): Almond, Beech Nut, Brazil Nut, Butternut, Cashew, Chestnut, Chinquapin, Filbert (Hazelnut), Hickory Nut, Macadamia Nut (Bush Nut), Pecan, Pistachio and Walnut (Black and English),

Preharvest Interval: 3 days

Apples:

Preharvest Interval: 14 days

APPLICATION INFORMATION

AUTHORITY 480 Herbicide should be applied as a uniform broadcast soil application to orchard and vineyard floors and to berry beds and furrows or as a uniform band application directed to the base of the trunk in trees and vines and to the base of the berry and beds in berries to provide preemergence control of weeds.

For best control, AUTHORITY 480 Herbicide should be applied when there are no weeds present or a postemergence herbicide is tank mixed to eliminate emerged weeds.

For broadcast applications, a single application of AUTHORITY 480 Herbicide should be made per season. The twelve-month period is considered to begin when the initial application of AUTHORITY 480 Herbicide is applied.

For improved weed management, AUTHORITY 480 Herbicide can be applied in a tank mixture with other preemergence and postemergence burndown herbicides. Refer to the tank mix partner's labels for additional restrictions, including minimum spray volumes and crops in which they are labeled. Do not tank mix with Chateau[®] herbicides (flumioxazin) or with other products containing sulfentrazone.

When applied as a banded treatment (50% band or less), refer to formula in chart for rate and volume in Section 10.1, General Application Information. AUTHORITY 480 Herbicide may be applied once per year.

A minimum of 100 L of spray solution per ha should be used to ensure uniform spray coverage. Nozzle selection should meet manufacturer's spray volume and pressure recommendations for preemergence and postemergence herbicide applications. The spray solution should have a pH between 5.0 and 9.0.

AUTHORITY 480 Herbicide should only be applied to crops that have been established for one full growing season and are in good health and vigor. Avoid contact of the spray solution on the green bark of trunks of young vines and trees by wrapping the trunk with a nonporous wrap, grow tubes, or wax containers which will keep the spray solution from coming in direct contact with the green tissue. Avoid direct or indirect spray contact with crop foliage and fruit.

Use ground equipment only. Do not apply using an airblast sprayer or by air. Do not apply using a mechanically pressurized handgun.

Best results are obtained when the soil is moist at the time of application and the application will be followed by at least ½ inch of rainfall or sprinkler irrigation within two weeks after application. Applications should be timed to take advantage of normal rainfall patterns and cool temperatures, especially where drip or micro sprinkler irrigation is used which may not uniformly incorporate the herbicide.

Restrictions

- Use ground equipment only. Do not apply AUTHORITY 480 Herbicide using airblast sprayers or by air. Do not apply using a mechanically pressurized handgun.
- Apply to crops that have been growing for at least one full year and are in good condition.
- Avoid direct or indirect spray contact to foliage and green bark (wrap trunk with non-porous wrap, grow tubes, or wax containers to keep spray solution off of green tissue).
- Do not apply to powdery soils or soils where wind may displace the soil, unless irrigation can be applied immediately after application.
- Follow the most restrictive label of tank mix partners including all references to potential carryover and crop injury warnings and restrictions.

WEED CONTROL INFORMATION

AUTHORITY 480 Herbicide is a selective soil-applied herbicide for the control of susceptible broadleaf and grass weeds. Adequate moisture of at least 18 mm is required within 14 days after application for optimal control. If adequate rainfall is not received in a timely fashion, irrigate with a minimum of 18 mm of water. When activating moisture is delayed, a reduced level of weed control may occur. These escaped weeds can be removed using a burndown herbicide.

Tank mix AUTHORITY 480 Herbicide with a burndown herbicide and use an appropriate adjuvant when weeds are present at the time of application. Refer to the tank mix partner's product label for the proper use rates by weed sizes. Use the most restrictive label limitations and precautions of the tank mix product(s).

Residual weed control may be reduced when AUTHORITY 480 Herbicide is applied where heavy crop trash such as leaves and branches and /or weed residues exists. It is best to rake or blow off the leaves and trash when they fall and prior to the AUTHORITY 480 Herbicide application.

Do not apply after petal fall unless using a hooded or shielded sprayer to ensure that the spray solution will not come in contact with the crop or foliage.

NOTE TO BUYER/USER: The DIRECTIONS FOR USE for this product for the use described below were developed by persons other than FMC Corporation and accepted for registration by Health Canada under the User Requested Minor Use Label Expansion program. FMC Corporation itself makes no representation or warranty with respect to performance (efficacy) or crop tolerance (phytotoxicity) claims for this product when used on the crops listed below. Accordingly, the Buyer and User assume all risks related to performance and crop tolerance arising, and agree to hold FMC Corporation harmless from any claims based on efficacy or phytotoxicity in connection with the uses described below.

DIRECTIONS FOR USE IN TAME MUSTARD

Authority 480 Herbicide may be applied preplant or preemergence at a rate of 219 ml/ha to control kochia in tame mustard. 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.

Precautions

Do not apply to soils classified as sand containing less than 1% organic matter.

Do not apply to soils with > pH 7.8.

Crop injury may occur in years with greater than normal rainfall.

Section 9.4: Tank Mixes

FIELD PEAS

For volunteer canola and wild mustard control in field peas, tank-mix Authority 480 Herbicide with Nu-Image Herbicide.

FOR USE IN THE BLACK AND GREY WOODED SOIL ZONE ONLY

Use rates of Authority (L/ha)	Use rates of Nu-Image Herbicides (L/ha)	Weeds controlled
0.219 - 0.292	0.070	Volunteer canola Wild mustard
Follow all label directions on the Nu-Image Herbicide product label including any adjuvants and tank-mix partners.		

APPLICATION INFORMATION

PREEMERGENCE APPLICATION:

- AUTHORITY 480 alone, or in the recommended tank-mixes, may be applied to the soil surface as a broadcast spray after planting of the crop, but prior to weed or crop emergence.
- Preemergence application may be made in all tillage systems (conventional, conservation, minimum, ridge, etc.).
- Rainfall and/or overhead sprinkler irrigation is necessary to move AUTHORITY 480 Herbicide into the upper soil surface where weed seeds germinate.
- If adequate moisture is not received within 7 to 10 days after application and weeds begin to emerge from the soil, a light rotary hoeing or shallow incorporation (no deeper than 1.25 cm deep) will improve performance, minimize crop damage, activate chemical and prevent soil crusting.
- Dry weather conditions as well as excessive rainfall or irrigation following application may reduce weed control.
- Do not apply heavy irrigation immediately after application.

BAND APPLICATION:

- If a band application is desired, the chemical may be applied as described in Section 10.1 by using proportionally less AUTHORITY 480 Herbicide per hectare:
- Weeds between treated bands should be removed by cultivating, as needed, using protective fenders to keep freshly turned soil off treated bands.

These Crop Specific Use directions are based upon the interactive effects of Authority 480 Herbicide (sulfentrazone) and the primary soil and environmental factors, which affect its activity on various weed species and tolerance among crops. The user is required to observe the instructions and guidance presented under General Application Instructions, General Authority 480 Herbicide Product Use Rates, Rotational Crop Guidelines, Replanting Instructions, Weeds Controlled and any other section of this label pertinent to the anticipated crop use. It is important to note that not all varieties or cultivars of a given crop species have been evaluated under treatment with Authority 480 Herbicide. Consult university or extension weed management specialists for additional information on specific local varieties or cultivars and any other pertinent information on Authority 480 Herbicide under specific local conditions.

SECTION 10: APPLICATION INFORMATION

SECTION 10.1: GENERAL APPLICATION INSTRUCTIONS

DO NOT APPLY BY AIR.

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

As this product is not registered for the control of pests in aquatic systems, **DO NOT** use to control aquatic pests.

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

Authority 480 Herbicide may be applied pre-plant or pre-emergence **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. Authority 480 Herbicide applied near or after crop emergence may cause severe injury to the crop. Do not make fall applications to a crop unless it is specifically recommended on this label.

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.

Ground Application

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 nozzles and pressures that produce a medium spray as classified by the American Society of Agricultural Engineers (ASAE) to avoid spray drift or inadequate foliar and soil coverage. Consult with spray nozzle manufacturer's charts to determine the correct

nozzle and pressure combination required to achieve a medium spray. Utilize nozzles that produce minimal amounts of fine spray droplets to avoid spray drift or inadequate foliar and soil coverage. 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 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.

Band Application

When applied as a banded treatment (50% band or less), refer to formula in chart below for rate and volume. AUTHORITY 480 Herbicide may be applied once per year.

For band treatments, apply the broadcast equivalent rate and volume per ha. To determine these:

$$\frac{\text{Band width in centimetres}}{\text{Row width In centimeteres}} \times \text{Broadcast Rate Per hectare} = \text{Band rate per hectare}$$

$$\frac{\text{Band width in centimetres}}{\text{Row width In centimeteres}} \times \text{Broadcast Volume Per hectare} = \text{Band Volume per hectare}$$

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.

DO NOT apply during periods of dead calm. Avoid application of this product when winds are gusty. 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 inversion, application equipment and sprayer settings.

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.

Do not apply with spray droplets smaller than the American Society of Agricultural Engineers (ASAE) medium classification. Consult with spray nozzle manufacturer's charts to determine the correct nozzle and pressure combination required to achieve a medium spray. Boom height must be 60 cm or less above the crop or ground.

Rainfall Requirement

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.

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	

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 coarse 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.

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 IN CONSECUTIVE YEARS (24 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.

SECTION 10.2: 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, Field Pea, Flax, Sunflower, Mustard, Asparagus, Strawberry, Soybean, Mustard, Asparagus, Fababean, Mint, Strawberry, Horseradish, Brassica, Head and Stem (Crop Group 5-13), Brassica, Leafy Greens (Crop Sub-Group 4-13b), Fruiting Vegetables (Crop Group 8-09) (Transplants only), Tree Nuts (Crop Group 14), Grapes and Berries (Crop Group 13-07) and Apples	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%. Boom height must be 60 cm or less above the crop or ground.

SECTION 10.3: 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.

Rotational crops and replant intervals for Authority 480 Herbicide.

Rotational Crop	Replant Interval (Months)
Alfalfa	12
Barley	12
Broccoli	Anytime
Cabbage	Anytime
Canola	12
Cauliflower	Anytime
Chickpea	Anytime
Corn, field	12
Corn, sweet and pop	24
Faba bean	Anytime
Field pea	Anytime
Flax	Anytime
Horse radish	Anytime
Lentils	24
Peppers (Transplants)	Anytime
Sorghum	24
Soybeans	Anytime
Sunflowers	Anytime
Spring and Durum wheat	12
Tame mustard	Anytime (low rate only)
Tomato (transplants)	Anytime
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.

SECTION 11: 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.

SECTION 12: MIXING and LOADING INSTRUCTIONS

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. Slowly add the Authority 480 Herbicide/ 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.

SECTION 13: SPRAYER EQUIPMENT CLEANOUT

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.

SECTION 14: RESISTANCE MANAGEMENT RECOMMENDATIONS

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 FMC at www.fmccrop.ca