STATE OF MAINE
DEPARTMENT OF AGRICULTURE, CONSERVATION & FORESTRY
BOARD OF PESTICIDES CONTROL
28 STATE HOUSE STATION
AUGUSTA, MAINE 04333

JANET T. MILLS
GOVERNOR

AMANDA E. BEAL
COMMISSIONER

Memorandum
To: Board of Pesticides Control
From: Julia Vacchiano
Subject: Section 24(c) Registration for Dual Magnum (100-816)
Active Ingredient: S-Metolachlor (83.7%)
May 7, 2026

The University of Maine has requested the re-registration of the SLN (Special Local Need) for Dual Magnum (SLN ME-140002) that was first approved in 2014, reregistered in 2020, and expired in December 2024. This SLN is for weed control, primarily controlling for yellow nutsedge (Cyperus esculentis) and hairy galinsoge (Galinsoga cilita) affecting highbush blueberry, brassica leafy greens, broccoli, brussels sprouts, cane berries (blackberry, red raspberry, black raspberry), cauliflower, cucumber, garlic, lettuce (head and leaf), and melons (cantaloupe, muskmelon, watermelon). Mark Hutton, Vegetable Specialist at the University of Maine Cooperative Extension, requests this Special Local Need permit because there is a lack of effective chemical herbicides for these crops and weed combinations. Dual Magnum controls the pests listed above and is more affordable compared to cultivation and hand weeding.

Special Local Need 24(c) registrations allow for additional uses beyond the EPA approved master labels. Due to potential for crop damage, diminished yield, and possible crop loss when Dual Magnum is applied, listed crops are not available on the Section 3 label and a waiver is required by Syngenta for use. Waivers can be found at https://www.syngenta-us.com/labels/indemnified-label-login

This registration was first presented to the Board in 2014 and was renewed in 2020. The registration was previously for use on asparagus, bell pepper, cabbage, carrots, garden beets, dry bulb onions, green onions, spinach, Swiss chard, and pumpkin. The registration expired in 2024 and is being reintroduced with a new list of crops for use. Currently, this Section 24(c) registration is expired and inactive. If approved by the Board, the SLN will become immediately active, although subject to an EPA rejection for 90 days. The requested SLN, with proper registration renewal and annual payment, will remain active until December 31, 2030.

ALEXANDER PEACOCK, DIRECTOR
90 BLOSSOM LANE, DEERING BUILDING

PHONE: (207) 287-2731
WWW.THINKFIRSTSPRAYLAST.ORG

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Enclosed are supporting documents for your consideration:

- Letter of request from Mark Hutton, Ph.D., Vegetable Specialist, University of Maine Cooperative Extension
- Memo from Doug Van Hoewyk, Ph.D., BPC Toxicologist
- Cover Letter from Pat Dinnen, Regulatory Manager, Syngenta Crop Protection, LLC
- Draft Maine Dual Magnum SLN label
- Dual Magnum Section 3 label
- Dual Magnum Safety Data Sheet

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syngenta

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Section 24(c) Special Local Need Label

S-METOLACHLOR	GROUP 15	HERBICIDE

FOR DISTRIBUTION AND USE ONLY WITHIN THE STATE OF MAINE

DUAL MAGNUM® HERBICIDE
FOR WEED CONTROL IN HIGHBUSH BLUEBERRY, BRASSICA LEAFY GREENS, BROCCOLI, BRUSSSELS SPROUTS, CANEBERRIES (BLACKBERRY, RED RASPBERRY, BLACK RASPBERRY), CAULIFLOWER, CUCUMBER, GARLIC, LETTUCE (HEAD AND LEAF), MELONS (CANTALOUPE, MUSKMELON, WATERMELON),

EPA Reg. No. 100-816
EPA SLN No. ME-xxxxxx

This label expires and must not be distributed or used in accordance with this SLN registration after December 31, 2030

SYNGENTA'S SPECIAL CONDITIONS, RISKS OF USE AND DISCLAIMER FOR USE OF DUAL MAGNUM HERBICIDE ON CROPS ON THIS 24(c) LABEL

IMPORTANT- READ BEFORE USE
THESE CONDITIONS RISKS OF USE AND DISCLAIMER ARE REQUIRED BY SYNGENTA CROP PROTECTION LLC AND NOT SPECIFIED BY U.S. EPA OR THE STATE OF MAINE

TO THE EXTENT CONSISTENT WITH APPLICABLE LAW, SYNGENTA CROP PROTECTION, LLC INTENDS THAT THE PRODUCT THAT IS THE SUBJECT OF THIS SECTION 24(c) LABEL BE PURCHASED ONLY BY END USERS WHO AGREE BY ELECTRONIC SIGNATURE ON SYNGENTA CROP PROTECTION'S INTERNET SITE TO THE TERMS AND CONDITIONS REQUIRED BY SYNGENTA CROP PROTECTION, LLC INCLUDING A WAIVER AND RELEASE FROM ALL LIABILITY AND INDEMNIFICATION BY THE USER AND/OR GROWER OF SYNGENTA AND OTHERS FOR FAILURE TO PERFORM AND FOR CROP INJURY, CROP YIELD REDUCTION, AND/OR CROP LOSS FROM USE OF DUAL MAGNUM HERBICIDE ON CROPS ON THIS SECTION 24(c) LABEL. IF SUCH TERMS AND CONDITIONS ARE UNACCEPTABLE, RETURN THE DUAL MAGNUM HERBICIDE AT ONCE UNOPENED OR USE THE DUAL MAGNUM HERBICIDE FOR A DIFFERENT APPROVED USE IN ACCORDANCE WITH THE LABEL AFFIXED TO THE PRODUCT CONTAINER.

USE OF DUAL MAGNUM HERBICIDE (THE "PRODUCT") ON CROPS LISTED (THE "CROP") FOR THIS SPECIAL LOCAL NEED MAY RESULT IN CROP INJURY, CROP YIELD

REDUCTION AND/OR CROP LOSS AS FURTHER DISCUSSED BELOW. READ AND UNDERSTAND THESE CONDITIONS AND RISKS OF USE FOR SPECIAL LOCAL NEED BEFORE USING THE PRODUCT ON THE CROP. SYNGENTA RECOMMENDS THAT THE USER TEST THIS PRODUCT TO DETERMINE ITS SUITABILITY FOR SUCH INTENDED USE.

Syngenta Crop Protection, LLC makes the Product available for use in the manner described in this Section 24(c) Labeling on the basis that, in the sole opinion of the user, the benefits and utility derived from the use of the Product on the Crop outweigh the potential risk of Crop injury, Crop yield reduction or Crop loss.

The decision to use this Product in the manner described in this Section 24(c) Labeling must be made by each individual user on the basis of anticipated benefits versus (i) the potential risk of Crop injury, Crop yield reduction and Crop loss, (ii) the severity of the target pest infestation, (iii) the cost and availability of alternative pest controls and (iv) any other relevant factors. Syngenta recommends that the user test this Product to determine its suitability for such intended use.

By purchasing the Product for use, or using the Product in the manner described in this Section 24(c) Labeling, you acknowledge and accept that, to the extent consistent with applicable law:

1) you assume all risk of Crop injury, Crop yield reduction and Crop loss;
2) Syngenta Crop Protection, LLC do not make, and do not authorize any agent or representative to make, any representations or recommendations regarding the use of this Product on the Crop other than the statements on this Section 24(c) labeling;
3) Syngenta Crop Protection, LLC do not make, and do not authorize any agent or representative to make, any warranties, express or implied, with respect to the use of the Product on the Crop and disclaim all warranties, expressed or implied, including any implied warranty of merchantability;
4) Syngenta Crop Protection, LLC disclaim all liability for any damages, losses, expenses, claims or causes of actions arising out of or relating to Crop injury, Crop yield reduction and/or Crop loss;
5) these conditions and Risks of Use for Special Local Need supersede any contrary representations or recommendations by Syngenta Crop Protection, LLC or their respective agents or representatives, and any provisions in or on any Product literature or labeling including any provisions on the label affixed to the Product container.

If these Conditions and Risks of Use for Special Local Need are not acceptable, the unopened Product may be returned to the seller for a refund or used for a different labeled use in accordance with the label affixed to the Product container.

FAILURE TO FOLLOW THE DIRECTIONS FOR USE AND PRECAUTIONS ON THIS LABEL MAY RESULT IN POOR WEED CONTROL, CROP INJURY, OR ILLEGAL RESIDUES.

DIRECTIONS FOR USE

- It is a violation of Federal law to use this product in a manner inconsistent with its labeling.
- This label must be in the possession of the user at the time of application.

- Follow all applicable directions, restrictions, Worker Protection Standard requirements, and precautions on the EPA-registered label.
- The risk of crop injury increases when adjuvants (e.g., non-ionic surfactants, crop oils, etc.), nitrogen sources (e.g., AMS, UAN), fertilizers or other pesticides are applied with Dual Magnum Herbicide.

BLUEBERRY (HIGHBUSH)

Apply Dual Magnum as a banded treatment to both sides of the blueberry row at 0.67 - 1.3 pt/A (0.64 - 1.26 lb ai/A) prior to weed emergence. The application should be directed to the soil surface in a 3 foot band on each side of the blueberry row to avoid direct contact with the crop foliage or crop injury may occur. When making the banded treatment, apply proportionally less spray mixture on the area actually treated. Use the lower end of the Dual Magnum rate range for soils that are relatively coarse textured and higher rates on fine textured soils.

Precautions: (1) Dual Magnum will not control emerged weeds. Control emerged weeds with an appropriate registered foliar herbicide or by mechanical or physical means. (2) Not all blueberry cultivars have been tested so injury may occur on some types of blueberry. Growers are encouraged to treat a few plants as a test and evaluate crop injury. (3) The risk of crop injury from Dual Magnum is greater at the higher use rates. (4) Blueberry plants that have been established for less than one year may be more sensitive to applications of Dual Magnum than those plants established for more than one year. For this reason, the lower rates are suggested on newer plantings. (5) Tank mixing Dual Magnum with other products (pesticides, adjuvants, etc.) will increase the risk for foliar crop injury.

Restrictions: (1) Do not make more than one application per crop per season. (2) Do not apply more than 1.33 pt/A (1.27 lb ai/A) of Dual Magnum per year. Do not apply more than 1.27 lb ai/A per year of S-metolachlor-containing products. (3) Do not harvest for 28 days following the Dual Magnum application.

BRASSICA LEAFY GREENS: MUSTARD GREENS, BROCCOLI (RAAB), CHINESE CABBAGE (BOK CHOY), COLLARDS, KALE, MIZUNA, MUSTARD GREENS, MUSTARD SPINACH, AND RAPE GREENS

Soil Applied: Apply a single broadcast treatment of Dual Magnum Herbicide at 0.67-1.33 pt/A (0.64-1.27 lb ai/A) to the soil surface after planting, but before weeds or crop emerge (i.e., pre-emergence). If a pre-plant application is used, do not incorporate the application and minimize the mixing/incorporation of treated soil into the seed furrow through the planting operations, so as to reduce the risk of crop injury. Within the rate range, use lower rates on soils relatively coarse-textured and higher rates on fine-textured soils. Dual Magnum Herbicide will not control emerged weeds. Control emerged weeds with an appropriate registered herbicide or by mechanical or physical means.

Post Applied: Dual Magnum Herbicide may be applied post-emergence to leafy brassica greens for residual control of grasses and small seeded broadleaf weeds. Apply a single broadcast treatment of Dual Magnum Herbicide at 0.67-1.33 pt/A (0.64-1.27 lb ai/A) after leafy

brassica greens have at least 1 true leaf. Dual Magnum Herbicide will not control emerged weeds, therefore, emerged weeds must be controlled by cultural or chemical methods.

Precaution: (1) The risk of crop injury increases when nitrogen sources (e.g. AMS, UAN), fertilizers or other pesticides are applied with Dual Magnum Herbicide.

Restrictions: (1) Do not apply more than 1.33 pt/A (1.27 lb ai/A) of Dual Magnum Herbicide per year. do not apply more than 1.27 lb ai/A per year of S-metolachlor-containing products. (2) Make only one application per crop. (2) Do not harvest within 30 days of application.

BROCCOLI (DIRECT SEEDED AND TRANSPLANTED)

Apply a single broadcast treatment of Dual Magnum Herbicide at 0.5-1.33 pt/A (0.48-1.27 lb ai/A) prior to transplanting or within 72 hours after transplanting, the latter often being less injurious. Apply to direct seeded broccoli only at the four-leaf stage. In that rate range, use lower rates on soils relatively coarse-textured and higher rates on fine-textured soils. Dual Magnum Herbicide will not control emerged weeds. Control emerged weeds with an appropriate registered foliar herbicide or by mechanical or physical means. Weed control may be reduced on muck soils.

Restrictions: (1) Make only one application per year. Do not apply more than 1.27 lb ai/A per year of S-metolachlor-containing products. (2) Do not incorporate Dual Magnum Herbicide. (3) Do not use in combination with Goal®. (4) Crop maturity may be delayed by Dual Magnum Herbicide application. (5) To avoid possible illegal residues, do not harvest broccoli within 60 days following application.

Note: Applications of Dual Magnum Herbicide may cause significant injury to broccoli resulting in reduced yields. This product is available to the end user/grower solely to the extent that the benefit and utility, in the opinion of the end user/grower, outweigh the extent of potential injury associated with the use of this product. Due to the risk of crop damage, all such use is at the end user/grower's risk.

BRUSSELS SPROUT (TRANSPLANTED)

Apply Dual Magnum to Brussels sprouts at a broadcast rate of 0.5 - 1.33 pt/A (0.48-1.27 lb ai/A) preplant non-incorporated prior to transplanting or broadcast postemergence application within 48 hours after transplanting. Use lower rates on course textured soils and higher rates on fine textured and muck soils. Dual Magnum will not control emerged weeds. Control emerged weeds with an appropriate registered foliar herbicide or by mechanical or physical means.

Precautions: (1) In general, the risk of crop injury from the use of Dual Magnum is less with post-transplant applications than from pre-transplant applications, and the risk of crop injury is less with post-directed than from post over-the-top post-transplanting applications. (2) The application of Dual Magnum prior to bed formation may result in crop injury due to the incorporation and/or concentration of Dual Magnum near the transplanted crop's root system. (3) Muck soils require the higher use rates; however, weed control may be reduced on muck soil. (4) The addition of another registered

herbicide, especially the herbicide Goal, will increase the risk of crop injury from postemergence applications.

Restrictions: (1) Make only one application of Dual Magnum per year. (2) Do not apply more than 1.33 pt/A (1.27 lb ai/A) of Dual Magnum per year. Do not apply more than 1.27 lb ai/A per year of S-metolachlor-containing products. (3) Do not mechanically incorporate Dual Magnum before transplanting. (4) Do not harvest these crops within 60 days of the Dual Magnum application.

CANEBERRIES: BLACKBERRY, RED RASPBERRY, AND BLACK RASPBERRY

Apply Dual Magnum in the early spring as a banded application only to both sides of the plant row at 1.0 - 2.0 pt/A (0.67 - 1.3 lb ai/A) prior to weed emergence. The application should be directed to the soil surface to avoid direct contact with the crop foliage or crop injury may occur. Use the lower end of the Dual Magnum rate range for soils that are relatively coarse textured and the higher rates on fine textured soils. Dual Magnum will not control emerged weeds. For banded applications, using row and band width measurements in inches, calculate the amount to be applied per acre as follows:

$$\frac{\text{Band width in inches}}{\text{Row width in inches}} \times \text{Dual Magnum Rate per acre for a broadcast treatment} = \text{Amount of Dual Magnum needed per acre for a banded treatment}$$

Precautions: (1) Dual Magnum will not control emerged weeds. Control emerged weeds with an appropriate registered foliar herbicide or by mechanical or physical means. (2) Not all caneberry types, cultivars or hybrids have been tested so injury from Dual Magnum may occur on some crops. (3) The risk of crop injury from Dual Magnum is greater at the higher use rates. (4) Application of Dual Magnum to crop foliage may result in crop injury and illegal residues. (5) Caneberry plants that have been established for less than one year may be more sensitive to applications of Dual Magnum than those plants established for more than one year. For this reason, the lower rates are suggested on newer plantings.

Restrictions: (1) Do not make more than one application of Dual Magnum per crop per year. (2) Do not apply more than 2.0 pt/A (1.3 lb ai/A) of Dual Magnum per crop per year. Do not apply ore than 1.3 lb ai/A per year of S-metolachlor-containing products. (3) Do not harvest for 28 days following the Dual Magnum application.

CAULIFLOWER (TRANSPLANTED)

Apply Dual Magnum Herbicide to cauliflower at a broadcast rate of 0.5-1.33 pt/A (0.48-1.27 lb ai/A) preplant non-incorporated prior to transplanting or broadcast postemergence application within 48 hours after transplanting. Use lower rates on course textured soils and higher rates on fine textured and muck soils. Dual Magnum Herbicide will not control emerged weeds. Control emerged weeds with an appropriate registered foliar herbicide or by mechanical or physical means.

Precautions: (1) In general, the risk of crop injury from the use of Dual Magnum Herbicide is less with post-transplant applications than from pre-transplant applications, and the risk of crop

injury is less with post-directed than from post over-the-top post-transplanting applications. (2) The application of Dual Magnum Herbicide prior to bed formation may result in crop injury due to the incorporation and/or concentration of Dual Magnum Herbicide near the transplanted crop's root system. (3) Muck soils require the higher use rates; however, weed control may be reduced on muck soil. (4) The addition of another registered herbicide, especially the herbicide Goal, will increase the risk of crop injury from postemergence applications.

Restrictions: (1) Make only one application of Dual Magnum Herbicide per season. (2) Do not apply more than 1.33 pt/A (1.27 lb ai/A) of Dual Magnum Herbicide per year. Do not apply more than 1.27 lb ai/A per year of S-metolachlor-containing products. (3) Do not mechanically incorporate Dual Magnum Herbicide before transplanting. (4) Do not harvest these crops within 60 days of the Dual Magnum Herbicide application.

CUCUMBER

Soil Applied: Apply a single broadcast treatment of Dual Magnum at 0.67 - 1.33 pt/A (0.64 - 1.27 lb ai/A) to the soil surface after planting, but before weeds or crop emerge (i.e., pre-emergence). If a pre-plant application is used, do not incorporate the application and minimize the mixing/incorporation of treated soil into the seed furrow through the planting operations, so as to reduce the risk of crop injury. Within the rate range, use lower rates on soils relatively coarse-textured and higher rates on fine-textured soils. Dual Magnum will not control emerged weeds. Control emerged weeds with an appropriate registered herbicide or by mechanical or physical means.

Post Applied: Dual Magnum may be applied post-emergence to cucumber for residual control of grasses and small seeded broadleaf weeds. Apply a single broadcast treatment of Dual Magnum at 0.67 - 1.33 pt/A (0.64 - 1.27 lb ai/A) on cucumbers at the 1-2 true leaf stage. Within the rate range, use lower rates on soils relatively coarse-textured and higher rates on fine-textured soils. Dual Magnum will not control emerged weeds, therefore, emerged weeds must be controlled by cultural or chemical methods.

Precaution: The risk of crop injury increases when nitrogen sources (e.g. AMS, UAN), fertilizers or other pesticides are applied with Dual Magnum.

Restrictions: (1) Do not apply more than 1.33 pt/A (1.27 lb ai/A) of Dual Magnum per crop per year. Do not apply more than 1.27 lb ai/A per year of S-metolachlor-containing products. (2) Make only one application per crop. (2) Do not harvest within 30 days of application.

GARLIC

Apply a broadcast application of Dual Magnum at 0.67 - 1.33 pt/A (0.64-1.27 lb ai/A) postemergence at the two true-leaf stage of the garlic. In that rate range, use lower rates on soils relatively coarse-textured and higher rates on fine-textured soils. Dual Magnum can be applied as a band application applying proportionally less spray mixture on the area actually treated. Dual Magnum will not control emerged weeds. Control emerged weeds with an appropriate registered foliar herbicide or by mechanical or physical means.

Precautions: (1) There is risk of crop injury from the use of Dual Magnum on garlic. In general, the risk of crop injury is greater on lighter textured soils and with higher application rates. (2) The addition of another registered herbicide as a tank mixture with Dual Magnum will increase the risk of crop injury.

Restrictions: (1) Make only one application per year. Do not apply more than 1.27 lb ai/A per year of S-metolachlor-containing products. (2) Do not harvest within 60 days of application or illegal residues may result.

Note: Applications of Dual Magnum may cause significant injury to garlic resulting in reduced yields. This product is available to the end user/grower solely to the extent that the benefit and utility, in the opinion of the end user/grower, outweigh the extent of potential injury associated with the use of this product. Due to the risk of crop damage, all such use is at the end user/grower's risk.

LETTUCE (HEAD AND LEAF)

Dual Magnum Herbicide may be applied to direct seeded or transplanted lettuce for residual control or suppression of annual grasses, yellow nutsedge and small seeded broadleaf weeds. Dual Magnum Herbicide will not control emerged weeds so use an appropriate registered foliar herbicide or mechanical or physical methods to control emerged weeds.

Dual Magnum Herbicide Directions for Use in Lettuce

<table>
<tr><th>Application Timing</th><th>Crop Growth Stage</th><th>Rate (pt/A)[1]</th></tr>
<tr><td>Preplant[2]</td><td>Before planting</td><td rowspan="2">0.67-1.0
(0.64-0.95 lb ai/A)</td></tr>
<tr><td>Pre-emergence</td><td>Before emergence or transplanting</td></tr>
<tr><td>Post-emergence</td><td rowspan="2">After emergence or transplanting</td><td rowspan="2">0.67
(0.64 lb ai/A)</td></tr>
<tr><td>Post-emergence row middles</td></tr>
</table>

[1]Use lower rates on coarse-textured soils and higher rates on fine-textured soils
[2]No more than 14 days prior to planting

Dual Magnum Herbicide can be applied as part of a sequential weed control program. If Dual Magnum Herbicide was applied preplant, pre-emergence or pre-transplant, a second treatment of Dual Magnum Herbicide can be applied postemergence provided the total per crop does not exceed 1.33 pt/A (1.27 lb ai/A). Do not apply more than 1.27 lb ai/A per year of S-metolachlor-containing products.

Precautions for leaf and head lettuce: (1) If a pre-plant application is used, soil incorporation is not recommended. Minimize the mixing of herbicide treated soil into the seed furrow through the planting operations, so as to reduce the risk of crop injury. (2) The risk of post-emergence crop injury increases when adjuvants (e.g. non-ionic surfactants, crop oils, etc.), nitrogen

sources (e.g. AMS, UAN), fertilizers or other pesticides are applied with Dual Magnum Herbicide.

Restrictions: leaf lettuce: (1) Do not apply more than 1.0 pt/A (0.95 lb ai/A) of Dual Magnum Herbicide before crop emergence. (2) Do not apply more than 0.67 pt/A (0.64 lb ai/A) of Dual Magnum Herbicide after crop emergence. (3) Do not apply more than 1.33 pt/A (1.27 lb ai/A) of Dual Magnum Herbicide total per crop. (4) Do not harvest for 25 days after the application of Dual Magnum Herbicide.

Restrictions for head lettuce: (1) Do not apply more than 2.0 pt/A (1.9 lb ai/A) of Dual Magnum Herbicide per crop. (2) Do not harvest for 20 days after the application of Dual Magnum Herbicide.

MELONS: CANTALOUPE, MUSKMELON AND WATERMELON

Melons grown on plastic mulch:

Apply Dual Magnum as a row middle application (between the crop rows) at 0.67 - 1.27 pt/A (0.64 - 1.21 lb ai/A) before crop emergence or transplanting, before weed emergence, but after the laying of the plastic mulch. For row middle applications, using row and band width measurements in inches, calculate the amount to be applied per acre as follows:

Band width in inches / Row width in inches	x	Dual Magnum Rate per acre for a broadcast treatment	=	Amount of Dual Magnum needed per acre for a row middle treatment

Melons grown without plastic mulch:

Apply Dual Magnum as a broadcast, pre-emergence treatment at 0.67 - 1.27 pt/A (0.64 - 1.21 lb ai/A) before crop emergence or before transplanting and before weed emergence. Use the lower end of the Dual Magnum rate range for soils that are relatively coarse textured and the higher rates on fine textured soils.

Dual Magnum may also be applied as a banded application (between the crop row) at 0.67 - 1.27 pt/A (0.64 - 1.21 lb ai/A) before crop emergence or before transplanting and before weed emergence. For band applications, using row and band width measurements in inches, calculate the amount to be applied per acre as follows:

Band width in inches / Row width in inches	x	Dual Magnum Rate per acre for a broadcast treatment	=	Amount of Dual Magnum needed per acre for a banded treatment

Precautions: (1) Dual Magnum will not control emerged weeds. Control emerged weeds with an appropriate registered foliar herbicide or by mechanical or physical means. (2) If an activating rainfall (0.5”) does not occur within 7-10 days following

application, weed control may be reduced. (3) Irrigation water can be applied following the treatment of Dual Magnum to activate the herbicide and improve weed control. (4) The risk of injury to melons is greater with a broadcast pre-emergence application than with a row middle application. (5) In general, the risk of crop injury will be less with transplanted melons than with direct seeded melons. (6) Direct application of Dual Magnum to emerged melon foliage (from seed or transplant) may result in crop injury and illegal residues. (7) It is recommended not to mechanically incorporate Dual Magnum into the soil as this will increase the risk for crop injury. (8) Muck soils require the higher use rates; however, weed control may still be reduced on muck soil.

Restrictions: (1) Do not make more than one application of Dual Magnum per crop per year. (2) Do not apply more than 1.27 pt/A (1.21 lb ai/A) of Dual Magnum per crop per year. Do not apply more than 1.21 lb ai/A per year of S-metolachlor-containing products. (3) Harvest at normal maturity but no closer than 60 days following application.

24(c) Registrant:
Syngenta Crop Protection, LLC
P. O. Box 18300
Greensboro, NC 27419-8300

Label Code:

Sale, use, and distribution of this product in Nassau and Suffolk Counties in the State of New York is prohibited.

PULL HERE TO OPEN

S-METOLACHLOR | GROUP 15 HERBICIDE

Dual Magnum®

Herbicide

syngenta®

For weed control in corn; cotton; grasses grown for seed; horseradish; legume vegetables; peanuts; potatoes; pumpkin; rhubarb; safflowers; sorghum (forage, grain and sweet); soybean; sugar beets; sugarcane; sunflowers; and tomatoes

Active Ingredient:	
S-metolachlor:*	83.7%
Other Ingredients:	16.3%
Total:	100.0%

*CAS No. 87392-12-9

Dual Magnum Herbicide is formulated as an Emulsifiable Concentrate (EC) and contains the equivalent of 83.7% or 7.62 lb of active ingredient per gallon.

KEEP OUT OF REACH OF CHILDREN

CAUTION

See additional precautionary statements and directions for use inside booklet.

EPA Reg. No. 100-816

EPA Est. 070989-IA-001^{OMH}, EPA Est. 100-NE-001^{MHA}

(Superscript is first three letters of batch code on container)

SCP 816A-L1Z 1222
4175484

2.5 gallons
Net Contents

®

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continued...

DIRECTIONS FOR USE ***(continued)***

1.0 FIRST AID

FIRST AID	
If in eyes	• Hold eye open and rinse slowly and gently with water for 15-20 minutes. • Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye. • Call a poison control center or doctor for treatment advice.
If on skin or clothing	• Take off contaminated clothing. • Rinse skin immediately with plenty of water for 15-20 minutes. • Call a poison control center or doctor for treatment advice.
If swallowed	• Call a poison control center or doctor immediately for treatment advice. • Have person sip a glass of water if able to swallow. • Do not induce vomiting unless told to by a poison control center or doctor. • Do not give anything by mouth to an unconscious person.
If inhaled	• Move person to fresh air. • If person is not breathing, call 911 or an ambulance, then give artificial respiration, preferably mouth-to-mouth, if possible. • Call a poison control center or doctor for further treatment advice.
Have the product container or label with you when calling a poison control center or doctor, or going for treatment.	
SYNGENTA HOTLINE NUMBER For 24-Hour Medical Emergency Assistance (Human or Animal) Or Chemical Emergency Assistance (Spill, Leak, Fire or Accident) Call **1-800-888-8372**	

PRECAUTIONARY STATEMENTS

2.0 PRECAUTIONARY STATEMENTS

2.1 Hazards to Humans and Domestic Animals

CAUTION

Causes moderate eye irritation. Harmful if swallowed or absorbed through skin. Avoid contact with eyes, skin, or clothing. Wash thoroughly with soap and water after handling and before eating, drinking, chewing gum, using tobacco, or using the toilet. Remove and wash contaminated clothing before reuse. Prolonged or frequently repeated skin contact may cause allergic reactions in some individuals.

2.2 Personal Protective Equipment (PPE)

All applicators and other handlers must wear:

- Long-sleeved shirt and long pants
- Chemical-resistant gloves made of barrier laminate or Viton™ ≥ 14 mils
- Shoes plus socks

2.3 User Safety Requirements

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

2.4 Engineering Controls

Mixers and loaders supporting aerial applications are required to use closed systems. The closed system must be used in a manner that meets the requirements listed in the Worker Protection Standard (WPS) for agricultural pesticides. When using the closed system, the mixers' and loaders' PPE requirements may be reduced or modified as specified in the WPS.

When handlers use closed systems, enclosed cabs, or aircraft in a manner that meets the requirements listed in the Worker Protection Standard (WPS) for agricultural pesticides (40 CFR 170.607(d-f)), the handler PPE requirements may be reduced or modified as specified in the WPS.

2.5 User Safety Recommendations

User Safety Recommendations

Users should:

- Remove clothing/PPE immediately if pesticide gets inside. Then wash thoroughly and put on clean clothing.
- Remove PPE immediately after handling this product. Wash the outside of gloves before removing. As soon as possible, wash thoroughly and change into clean clothing.

2.6 Environmental Hazards

Do not apply directly to water, to areas where surface water is present, or to intertidal areas below the mean high water mark. Do not contaminate water when disposing of equipment washwater or rinsate.

2.6.1 GROUNDWATER ADVISORY

S-metolachlor is known to leach through soil into groundwater under certain conditions as a result of label use. This chemical may leach into groundwater if used in areas where soils are permeable, particularly where the water table is shallow.

2.6.2 SURFACE WATER ADVISORY

This product may impact surface water quality due to runoff of rain water or through ground spray drift. This is especially true for poorly draining soils and soils with shallow groundwater. This product is classified as having high potential for reaching surface water via runoff for several weeks or months after application. A level, well-maintained vegetative buffer strip between areas to which this product is applied and surface water features such as ponds, streams, and springs will reduce the potential loading of *S*-metolachlor from runoff water and sediment. Runoff of this product will be reduced by avoiding applications when rainfall or irrigation is expected to occur within 48 hours.

2.6.3 NON-TARGET ORGANISM ADVISORY

This product is toxic to plants and may adversely impact the forage and habitat of non-target organisms, including pollinators, in areas adjacent to the treated site. Protect the forage and habitat of non-target organisms by following label directions intended to minimize spray drift.

2.6.4 REPORTING ECOLOGICAL INCIDENTS

To report ecological incidents, including mortality, injury, or harm to plants and animals, call 1-800-888-8372.

2.6.5 MIXING/LOADING/APPLICATION INSTRUCTIONS

Care must be taken when using this product to prevent back-siphoning into wells, spills, or improper disposal of excess pesticide, spray mixtures, or rinsates. Check-valves or anti-siphoning devices must be used on all mixing and/or irrigation equipment.

- This product must not be mixed or loaded within 50 ft of perennial or intermittent streams and rivers, natural or impounded lakes and reservoirs.
- This product must not be mixed/loaded or used within 50 ft of all wells, including abandoned wells, drainage wells, and sink holes.
- Operations that involve mixing, loading, rinsing, or washing of this product into or from pesticide handling or application equipment or containers within 50 ft 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 washwater, and rain water 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.

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- 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-specified minimum containment capacities do not apply to vehicles when delivering pesticide shipments to the mixing/loading site.

DIRECTIONS FOR USE

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

Dual Magnum Herbicide must be used only in accordance with directions on this label or in separately published EPA accepted supplemental labeling for this product.

Do not apply this product in a way that will contact workers or other persons, either directly or through drift. Only protected handlers may be in the area during application. For any requirements specific to your State or Tribe, consult the agency responsible for pesticide regulation.

Endangered Species Protection Requirements

It is a Federal offense to use any pesticide in a manner that results in an unauthorized "take" (e.g., kill or otherwise harm) of an endangered species and certain threatened species, under the Endangered Species Act section 9. When using this product, you must follow the measures contained in the Endangered Species Protection Bulletin for the area in which you are applying the product. You must obtain a Bulletin no earlier than six months before using this product. To obtain Bulletins, consult http://www.epa.gov/espp/, call 1-844-447-3813, or email ESPP@epa.gov. You must use the Bulletin valid for the month in which you will apply the product.

AGRICULTURAL USE REQUIREMENTS

Use this product only in accordance with its labeling and with the Worker Protection Standard, 40 CFR Part 170. This Standard contains requirements for the protection of agricultural workers on farms, forests, nurseries, and greenhouses, and handlers of agricultural pesticides. It contains requirements for training, decontamination, notification, and emergency assistance. It also contains specific instructions and exceptions pertaining to the statements on this label about personal protective equipment (PPE) and restricted-entry interval. The requirements in this box only apply to uses of this product that are covered by the Worker Protection Standard (WPS).

Do not enter or allow worker entry into treated areas during the restricted-entry interval (REI) of 24 hours.

Exception: If the product is soil-injected or soil incorporated, the Worker Protection Standard, under certain circumstances, allows workers to enter the treated area if there will be no contact with anything that has been treated.

PPE required for early entry to treated areas that is permitted under the Worker Protection Standard and that involves contact with anything that has been treated, such as plants, soil, or water, is:

- Coveralls
- Chemical-resistant gloves made of barrier laminate or Viton ≥ 14 mils
- Shoes plus socks

3.0 PRODUCT INFORMATION

Dual Magnum Herbicide is a selective herbicide that can be applied for control of most annual grasses and certain broadleaf weeds in corn (all types); cotton; grasses grown for seed; horseradish; legume vegetables; peanuts; potatoes; pumpkin; rhubarb; safflowers; sorghum (forage, grain and sweet); soybean; sugar beets; sugarcane; sunflowers; and tomatoes.

Dual Magnum Herbicide is taken up by the shoots and/or roots of emerging weeds. This uptake results in the inhibition of shoot and root tissue growth soon after weed germination. Because of this, Dual Magnum Herbicide will not control emerged weeds. Control weeds that are present by another means, e.g., mechanical means or by another herbicide.

3.1 Weed Resistance Management

S-METOLACHLOR	GROUP	15	HERBICIDE

S-metolachlor, the active ingredient in this product, is a Group 15 herbicide based on the mode of action classification system of the Weed Science Society of America. Any weed population may contain plants naturally resistant to Group 15 herbicides.

Such resistant weed plants may not be effectively managed using Group 15 herbicides but may be effectively managed utilizing another herbicide alone or in mixtures from a different group and/or by using cultural or mechanical practices. However, an herbicide mode of action classification by itself may not adequately address specific weeds that are resistant to specific herbicides. Consult your local company representative, state cooperative extension service, professional consultants, or other qualified authorities to determine appropriate actions for treating specific resistant weeds.

3.1.1 PRINCIPLES OF HERBICIDE RESISTANT WEED MANAGEMENT

Scout and know your field

- Know weed species present in the field to be treated through scouting and field history. An understanding of weed biology is useful in designing a resistance management strategy. Ensure the weed management program will control all weeds present.
- Fields should be scouted prior to application to determine species present and growth stage. Always apply this herbicide at the full labeled rate and correct timing for the weeds present in the field.

Utilize non-herbicidal practices to add diversity

- Use diversified management tactics such as cover crops, mechanical weed control, harvest weed seed control, and crop rotation as appropriate.

Use good agronomic practices, start clean and stay clean

- Use good agronomic practices that enhance crop competitiveness.
- Plant into weed-free fields utilizing tillage or an effective burndown herbicide for control of emerged weeds.
- Sanitize farm equipment to avoid spreading seed or vegetative propagules prior to leaving fields.

Difficult to control weeds

- Fields with difficult to control weeds should be planted in rotation with crops that allow the use of herbicides with an alternative mode of action or different management practices.
- Difficult to control weeds may require sequential applications, such as a broad spectrum preemergence herbicide followed by one or more postemergence herbicide applications. Utilize herbicides containing different modes of action effective on the target weeds in sequential applications.

Do not overuse the technology

- Do not use this or any other herbicide with the same mode of action in a single growing season unless mixed with an herbicide with a different mode of action which provides overlapping spectrum for difficult to control weeds.

Scout and inspect fields following application

- Prevent an influx of weeds into the field by controlling weeds in field borders.
- Scout fields after application to verify that the treatment was effective.
- Suspected- herbicide resistant weeds may be identified by these indicators
    - Failure to control a weed species normally controlled by the herbicide at the dose applied, especially if control is achieved on adjacent weeds;
    - A spreading patch of non-controlled plants of a particular weed species; and
    - Surviving plants mixed with controlled individuals of the same species.
- Report non-performance of this product to your Syngenta retailer, Syngenta representative, or call 1-866-Syngent(a) (866-796-4368). If resistance is suspected ensure weed escapes are controlled using an herbicide with an effective mode of action and/or use non-chemical means to prevent further seed production.

Prevent weed escapes before, during, and after harvest

- Do not allow weed escapes to produce seed or vegetative structures such as tubers or stolons which contribute to spread and survival. Consider harvest weed seed management and control weeds postharvest to prevent seed production.

Resistant Weeds

- Contact your local Syngenta representative, retailer, crop advisor, or extension agent to determine if weeds resistant to this mode of action are present in your area. If resistant biotypes have been reported, use the full labeled rate of this product, apply at the labeled timing, and tank-mix with a different mode of action product so there are multiple effective modes of application for each suspected resistant weed.

4.0 APPLICATION DIRECTIONS

4.1 Methods of Application

Applications with Dual Magnum Herbicide alone or in tank mixtures are permitted by ground, by air and via chemigation. Preplant surface, preplant incorporated, preemergence and postemergence or lay-by applications are allowed as specified in **Section 9.0**. For band-application refer to **Section 4.1.1**. Refer to **Section 4.6** for details of application by chemigation.

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

4.1.1 BAND APPLICATION

Calculate the amount of herbicide and water volume needed for band treatment by the following formula:

$$\frac{\textit{Band width in inches}}{\textit{Row width in inches}} \times \frac{\textit{Broadcast rate}}{\textit{Acre}} = \textit{Amount needed per Acre of Field}$$

4.2 Application Equipment

- Spray equipment configuration should be arranged to provide accurate and uniform coverage of the target area and minimize potential for spray drift.
- To ensure accuracy, calibrate sprayer before each use.
- For information on spray equipment and calibration, consult spray equipment manufacturers and/or state recommendations.
- All ground, aerial, and chemigation application equipment must be properly maintained and calibrated using appropriate carriers.
- For aerial applications, use low-drift nozzles.
- For ground applications, use sprayers that provide accurate and uniform application.
- For preplant incorporated application, use an implement capable of providing uniform incorporation.

4.3 Application Volume and Spray Coverage

- For ground application, apply alone or in tank mixtures in a minimum of 10 gal/A of spray mixture unless otherwise specified.
- For aerial application, apply alone or in tank mixtures in a minimum total volume of 2 gal/A of spray mixture.

4.4 Mixing Directions

1. Thoroughly clean spray equipment before using this product. Dispose of the cleaning solution in a responsible manner.
2. Prepare no more spray mixture than is needed for the immediate operation.
3. Keep product container tightly closed when not in use.
4. Do not let the spray mixture stand overnight in the spray tank.
5. Flush the spray equipment thoroughly following each use and apply the rinsate to a previously treated area.

4.4.1 DUAL MAGNUM HERBICIDE ALONE

1. Fill the spray tank 1/2-3/4 full with water or fluid fertilizer.
2. Add the proper amount of Dual Magnum Herbicide.
3. Add the rest of the water or fluid fertilizer.
4. Provide sufficient agitation during mixing and application to maintain a uniform emulsion.

4.4.2 TANK-MIX PRECAUTIONS

- It is the pesticide user's responsibility to ensure that all products are registered for the intended use. Read and follow the applicable restrictions, limitations, and directions for use on all product labels involved in tank mixing. User must follow the most restrictive directions for use and precautionary statements of each product in the tank mixture.
- For tank mixtures with wettable powder or dry flowable formulations, use screens and strainers no finer than 50-mesh.
- Check compatibility (**Section 4.4.3**) with other pesticides and/or liquid fertilizers before mixing in spray tank.

NOTE: Nitrogen solutions or complete fluid fertilizers may replace all or part of the water in the spray for applications prior to crop emergence. Because liquid fertilizers vary, even within the same analysis, **always check compatibility with pesticide(s) before use**. Incompatibility of tank mixtures is more common with suspensions of fertilizer and pesticides.

4.4.3 TANK-MIX COMPATIBILITY

- Conduct a jar test using a 1 pt to 1 qt container with lid by adding water or other intended carrier such as liquid fertilizer to the jar.
- Next, add the appropriate amount of pesticides(s) or tank-mix partner(s) in their relative proportions based on recommended label rates. Add tank-mix components separately in the order described in the tank-mixing section, **Section 4.4.4**. After each addition, shake or stir gently to thoroughly mix.
- After all ingredients have been added, put the lid on the jar, tighten and invert the jar 10 times to mix.
- After mixing, let the mixture stand 15–30 minutes and then examine for signs of incompatibility such as obvious separation, large flakes, precipitates, gels, or heavy oily film on the jar.
- If the mixture remains mixed or can be remixed readily, it is physically compatible and can be used.
- If the mixture is incompatible, repeat the test using a compatibility agent at the recommended rate. Or, if applicable, slurry dry formulations in water before adding to the jar. If incompatibility is still observed after following these procedures, do not use the mixture.
- After compatibility testing is complete, dispose of any pesticide wastes in accordance with the storage and disposal section, **Section 10.0**, of this label.

4.4.4 DUAL MAGNUM HERBICIDE IN TANK MIXTURES

1. Fill the spray tank 1/4 full with water and start the agitation.
2. Check the tank mix partner label for any specific instructions pertaining to the tank-mix partner.
3. Add the tank mix partner and allow it to become dispersed.
4. Add Dual Magnum Herbicide.
5. Add glyphosate or paraquat product if one is being used.
6. Add the remainder of the water and maintain agitation during mixing and application to maintain a uniform suspension.
7. Fluid fertilizers may replace all or part of the water as carrier for applications prior to crop emergence unless otherwise specified.

4.5 Dry Bulk Granular Fertilizers

Many dry bulk granular fertilizers may be impregnated or coated with Dual Magnum Herbicide alone or selected Dual Magnum Herbicide tank mixtures which are registered for preplant incorporated or preplant surface applications which are used to control weeds in crops on the Dual Magnum Herbicide label and are not prohibited from use on dry bulk granular fertilizers.

When applying Dual Magnum Herbicide or Dual Magnum Herbicide mixtures with dry bulk granular fertilizers, follow all directions for use, restrictions, and precautions on the respective product labels, regarding target crops, rates per acre, soil texture, application methods (including timing of application), and rotational crops.

All individual state regulations relating to dry bulk granular fertilizer blending, registration, labeling, and application are the responsibility of the individual and/or company selling the herbicide/fertilizer mixture.

4.5.1 PREPARATION OF HERBICIDE/FERTILIZER MIXTURES

- Use any closed drum, belt, ribbon, or other commonly used dry bulk fertilizer blender.
- Place the nozzles used to spray Dual Magnum Herbicide and Dual Magnum Herbicide mixtures onto the fertilizer in such a way as to provide uniform spray coverage.
- Use care to aim the spray directly onto the fertilizer only and to avoid spraying the walls of the blender.
- If the herbicide/fertilizer mixture is too wet, add a highly absorptive material or similar granular clay or diatomaceous earth materials, to obtain a dry, free-flowing mixture.
- Add absorptive materials only after the herbicide has been thoroughly blended into the fertilizer mixture.
- Best application results will be obtained by using a granule of 6/30 particle size or of a size similar to that of the fertilizer material being used.
- Generally, less than 2% by weight of absorptive material will be needed.
- Avoid using more than 5% absorptive material by weight.
- Calculate amounts of Dual Magnum Herbicide by the following formula:

$$\frac{2000}{\text{lb of fertilizer per Acre}} \times \frac{\text{pt of liquid or flowable product}}{\text{Acre}} = \frac{\text{pt of liquid or flowable product}}{\text{ton of fertilizer}}$$

4.5.2 PNEUMATIC (COMPRESSED AIR) APPLICATION

- High humidity, high urea concentrations, low fertilizer use rates, and dusty fertilizer may cause fertilizer mixture to build up or plug the distributor head, air tubes, or nozzle deflector plates.
- To minimize buildup, premix Dual Magnum Herbicide with Exxon Aromatic 200 at a rate of 1.0-4.0 pt/gal of Dual Magnum Herbicide.
- Aromatic 200 is a noncombustible/nonflammable petroleum product.
- Aromatic 200 may be used in either a fertilizer blender or through direct injection systems.
- Avoid drying agents when using Aromatic 200.

4.5.3 PRECAUTIONS

- Use mixtures of Dual Magnum Herbicide and Aromatic 200 on dry fertilizer only. Poor results or crop injury may result if these mixtures are used in water or liquid fertilizer solutions for spraying applications.
  - When impregnating Dual Magnum Herbicide in a blender before application, a drier mixture can be attained by substituting a drying agent for Aromatic 200.
  - Agsorb® FG or drying agents of 6/30 particle size will provide best results.
- When possible, avoid drying agents when using on-board impregnation equipment.
- **TO AVOID POTENTIAL FOR EXPLOSION:**
  1. Do not impregnate Dual Magnum Herbicide or Dual Magnum Herbicide mixtures on ammonium nitrate, potassium nitrate, or sodium nitrate, either alone or in blends with other fertilizers.
  2. Do not use Dual Magnum Herbicide or Dual Magnum Herbicide mixtures on straight limestone, since absorption will not be achieved. Fertilizer blends containing limestone can be impregnated.

4.5.4 APPLICATION INSTRUCTIONS

- Apply 200-700 lb of the herbicide/fertilizer mixture per acre.
- For best results, apply the mixture uniformly to the soil with properly calibrated equipment immediately after blending.
- Uniform application of the herbicide/fertilizer mixture is essential to prevent possible crop injury.
- Non-uniform application may also result in unsatisfactory weed control. In areas where conventional tillage is practiced, a shallow incorporation of the mixture into the soil may improve weed control.
- On fine or medium textured soils in areas where soil incorporation is not planned, i.e., reduced tillage situations or in some conventional till situations, make applications approximately 30 days before planting to allow moisture to move the herbicide/fertilizer mixture into the soil.
- On coarse textured soils, make applications approximately 14 days prior to planting.
- **Precaution:** To avoid crop injury, do not use the herbicide/fertilizer mixture on crops where bedding occurs.

4.6 Application through Irrigation Systems (Chemigation)

4.6.1 CHEMIGATION RESTRICTIONS

- **ONLY APPLY THIS PRODUCT THROUGH CENTER-PIVOT IRRIGATION SYSTEMS.**
- If you have questions about calibration, you should contact State Extension specialists, equipment manufacturers, or other experts.
- Do not connect an irrigation system (including greenhouse systems) used for pesticide application to a public water system, unless the pesticide label-prescribed safety devices for public water systems are in place.
- A person knowledgeable of the chemigation system and responsible for its operation, or under the supervision of the responsible person, shall shut the system down and make necessary adjustments when needed.

4.6.2 OPERATING INSTRUCTIONS FOR CHEMIGATION

1. The system must contain a functional check-valve, vacuum relief valve, and low pressure drain appropriately located on the irrigation pipeline to prevent water-source contamination from backflow.
2. The pesticide injection pipeline must contain a functional, automatic, quick-closing check-valve to prevent the flow of fluid back toward the injection pump.
3. The pesticide injection pipeline must also contain a functional, normally closed, solenoid-operated valve located on the intake side of the injection pump and connected to the system interlock to prevent fluid from being withdrawn from the supply tank when the irrigation system is either automatically or manually shut down.

4. The system must contain functional interlocking controls to automatically shut off the pesticide injection pump when the water pump motor stops.
5. The irrigation line or water pump must include a functional pressure switch which will stop the water pump motor when the water pressure decreases to the point where pesticide distribution is adversely affected.
6. Systems must use a metering pump, such as a positive displacement injection pump (e.g., diaphragm pump or piston pump), effectively designed and constructed of materials that are compatible with pesticides and capable of being fitted with a system interlock.
7. Do not apply when wind speed favors drift beyond the area intended for treatment.

4.6.3 SPECIFIC INSTRUCTIONS FOR PUBLIC WATER SYSTEMS

1. Public water system means a system for the provision to the public of piped water for human consumption if such system has at least 15 service connections or regularly serves an average of at least 25 individuals daily at least 60 days out of the year.
2. Chemigation systems connected to public water systems must contain a functional, reduced-pressure zone (RPZ), back-flow preventer or the functional equivalent in the water supply line upstream from the point of pesticide introduction. As an option to the RPZ, the water from the public water system should be discharged into a reservoir tank prior to pesticide introduction. There shall be a complete physical break (air gap) between the outlet end of the fill pipe and the top or overflow rim of the reservoir tank of at least twice the inside diameter of the fill pipe.
3. The pesticide injection pipeline must contain a functional, automatic, quick-closing check valve to prevent the flow of fluid back toward the injection pump.
4. The pesticide injection pipeline must contain a functional, normally closed, solenoid-operated valve located on the intake side of the injection pump and connected to the system interlock to prevent fluid from being withdrawn from the supply tank when the irrigation system is either automatically or manually shut down.
5. The system must contain functional interlocking controls to automatically shut off the pesticide injection pump when the water pump motor stops, or in cases where there is no water pump, when the water pressure decreases to the point where pesticide distribution is adversely affected.
6. Systems must use a metering pump, such as a positive displacement injection pump (e.g., diaphragm pump) effectively designed and constructed of materials that are compatible with pesticides and capable of being fitted with a system interlock.
7. Do not apply when wind speed favors drift beyond the area intended for treatment.

4.6.4 APPLICATION DIRECTIONS FOR IRRIGATION SYSTEMS

1. Prepare a mixture with a minimum of 1 part water to 1 part herbicide(s) and inject this mixture into the center pivot system. Injecting a larger volume of a more dilute mixture per hour will usually provide more accurate calibration of equipment.
2. Maintain sufficient agitation to keep the herbicide in suspension.
3. Meter into irrigation water during entire period of water application.
4. Apply in 1/2-1 inch of water. Use the lower water volume (1/2 inch) on *coarser soils* and the higher volume (1 inch) on *fine textured soils*. More than 1 inch of water at application may reduce weed control by moving the herbicide below the effective zone in the soil.

4.6.5 CENTER PIVOT IRRIGATION APPLICATION

- Dual Magnum Herbicide alone or in tank mixture with other herbicides on this label, which are registered for center pivot application, may be applied in irrigation water preemergence (after planting, but before weeds or crop emerge) at rates listed on this label.
- Dual Magnum Herbicide also may be applied postemergence to the crop and preemergence to weeds in crops where postemergence applications are allowed on this label.
- Follow all restrictions (height, timing, rate, etc.) to avoid illegal residues.
- Apply this product only through a center pivot irrigation system.
- Crop injury, lack of effectiveness, or illegal pesticide residues in the crop can result from non-uniform distribution of treated water.

Where sprinkler distribution patterns do not overlap sufficiently, unacceptable weed control may result. Where sprinkler distribution patterns overlap excessively, crop injury may result.

4.7 Sprayer Cleanout

Thoroughly clean sprayer or other application device before using. Dispose of cleaning solution in a responsible manner. Do not use a sprayer or applicator contaminated with any other materials, or crop damage or clogging of the application device may result.

5.0 REPLANT AND ROTATIONAL CROPS

5.1 Replant and Rotational Crops

- If a crop treated with Dual Magnum Herbicide is lost, any crop on this label, or on a supplemental Dual Magnum Herbicide label, may be replanted or rotated at any interval provided that the rate of Dual Magnum Herbicide applied to the previous crop was not greater than the labeled rate for the crop to be replanted.
- Dual Magnum Herbicide may be applied again following crop replanting provided the total annual maximum rate for that crop is not exceeded.

The crops listed in the table below and in **Section 5.2** may be planted at the specified interval following application of Dual Magnum Herbicide.

Crop	**Plant-Back Interval**
Alfalfa	4 months
Barley Oats Rye Wheat	4 1/2 months
Clover (seeded)	9 months
Buckwheat Rice Tobacco	Next spring following treatment
All other crops not listed above or in **Section 5.2**.	12 months
Precaution: • Refer to **Section 5.3** for rotational crop instructions when water or irrigation is limited.	
ROTATIONAL CROPS USE RESTRICTION	
1. **DO NOT** rotate to alfalfa or clover for 12 months if more than 1.9 lb active ingredient per acre (2.0 pt of Dual Magnum Herbicide) was applied in the previous crop.	

5.2 Additional Rotational Crop Options

This is a listing of rotational crop options that are made possible through *S*-metolachlor tolerances which were established by the EPA as crop groupings.

For the crop groups and crop subgroups below, not all crops within each group are specifically listed. Where a crop group or crop subgroup is listed, the plant-back interval applies to all the respective crops in that specific EPA crop group or EPA crop subgroup.

Crop Group or Crop Subgroup		Maximum Rate Previously Applied to the Field (pt/A)	Plant-Back Interval
Cilantro Spinach		1.0	60 days
Subgroup 1B: Vegetable root (except sugar beet, except carrot) Beet, garden Burdock, edible Celeriac Chervil, turnip-rooted Chicory Ginseng Horseradish Parsley, turnip-rooted	Parsnip Radish Radish, oriental Rutabaga Salsify Salsify, black Salsify, Spanish Skirret Turnip	1.33	60 days
Subgroup 3-07B: Onion, green Chive Chive, Chinese Leek, lady's Leek Leek, wild	Onion, Beltsville bunching Onion, fresh Onion, green Onion, Welsh Shallot		
Subgroup 4-16B: Brassica, leafy greens Bok choy Broccoli, Chinese Broccoli, Cavolo Cabbage, Chinese (napa) Collards	Kale Greens, mustard Greens, turnip		
Crop Group 9: Vegetable, cucurbit Cantaloupe Citron Melon Cucumber Gourd Muskmelon Pumpkin	Squash, Summer Squash, Winter Watermelon		
Carrot Leaf Lettuce Sesame	Strawberry Swiss Chard	1.33	60 days

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Crop Group or Crop Subgroup	Maximum Rate Previously Applied to the Field (pt/A)	Plant-Back Interval
Group 8-10: Vegetable fruiting (except tabasco pepper) Eggplant Groundcherry (Physalis spp.) Okra Pepino Pepper, bell Pepper, chili Pepper, cooking Pepper, pimento Pepper, sweet Tomatillo Tomato	1.67	60 days
Subgroup 1C: Tuberous and Corm Vegetables Arracacha Arrowroot Artichoke, Chinese Artichoke, Jerusalem Canna, edible Cassava, bitter Cassava, sweet Chayote (root) Chufa Dasheen (taro) Ginger Leren Potato Potato, sweet Tanier Turmeric Yam bean Yam, true	2.0	60 days
Subgroup 3-07A: Onion, bulb Garlic, bulb Garlic, great headed Onion, dry bulb Shallot		
Subgroup 22A: Stalk and stem vegetable (except Kohlrabi) Agave Asparagus Celtuce Fennel, Florence Fern, edible Kale, sea		
Subgroup 22B: Leaf petiole vegetable Cardoon Celery, Chinese Celery Rhubarb		
Subgroup 5-16: Vegetable, *Brassica*, head and stem Broccoli Brussel sprouts Cabbage Cabbage, Chinese Cauliflower		
Kohlrabi Lettuce, head		
Precaution: • Refer to **Section 5.3** for rotational crop instructions when water or irrigation is limited.		

ADDITIONAL ROTATIONAL CROP USE RESTRICTIONS
1. **DO NOT** make a second application of an *S*-metolachlor-containing product to these rotational crops within 60 days of the original application. 2. If the rate of Dual Magnum Herbicide applied in the previous crop was greater than the rate listed in the table, these crops cannot be planted until the following spring.

5.3 Limited Water or Irrigation Conditions

When planting rotational crops, special attention must be given to the amount of rainfall and type of irrigation used. Rotational crops listed on this label are safe for planting after a Dual Magnum Herbicide application provided the rotational interval is followed and the preceding crop received natural rainfall or overhead irrigation.

When non-overhead watering methods (e.g. drip tape, furrow irrigation, etc.) are used, the areas of the field not receiving water (e.g. furrows when drip irrigated or bed tops when furrow irrigated) will have a higher Dual Magnum Herbicide residue remaining in the soil resulting in a significant increase in the rotational crop injury risk.

To reduce the risk of rotational crop injury, thoroughly incorporate the Dual Magnum Herbicide treated field to a depth of 3-4 inches before planting the rotational crop. For more thorough incorporation, till the soil in 2 different directions (cross-till). Even with thorough tillage, injury to rotational crops is still possible following non-overhead watering methods or limited moisture conditions.

6.0 COVER CROPS

A cover crop can be an important tool for the overall farm cropping system. Cover crops are planted for conservation purposes, soil erosion control, soil health improvement, water quality improvement, and weed management. A cover crop can be a single crop or a combination of crops, including grasses and/or broadleaf crops.

After harvest of a Dual Magnum Herbicide treated crop, planting of a cover crop is allowed provided the cover crop is not grazed or fed to livestock nor harvested for food. Terminate the cover crop through natural causes such as frost or intentional termination by herbicide application, crimping, rolling, tillage, or cutting.

All possible cover crops or cover crop combinations have not been tested for tolerance to this product. Before planting the cover crop, determine the level of tolerance for the intended cover crops by conducting a field bioassay. Refer to **Section 6.1** for instructions on how to conduct a field bioassay.

6.1 Field Bioassay for Cover Crops

A field bioassay is a method of determining if herbicide residues are present in the soil at concentrations high enough to adversely affect crop growth.

Conduct the field bioassay by planting several strips of the desired cover crop across the field which has been previously treated with Dual Magnum Herbicide. Plant the cover crop strips perpendicular to the direction of the product application. The strips should be located so that all the different field conditions are encountered, including differences in field terrain, soil texture, organic matter, pH, and drainage.

If the cover crop does not show adverse effects such as crop injury and/or stand reduction, the field can be planted to this cover crop. If injury and/or stand reduction are visible, wait two to four weeks for further herbicide degradation to occur and repeat the bioassay. Alternatively, select a different cover crop and repeat the bioassay. Only plant cover crops that show acceptable tolerance in the field bioassay.

7.0 RESTRICTIONS AND PRECAUTIONS

7.1 Use Restrictions

- **DO NOT** sell, use, or distribute this product in Nassau and Suffolk Counties in the State of New York.
- **DO NOT** use in nurseries, turf, or landscape plantings.
- **DO NOT** apply this product through any type of irrigation system except center pivot systems.

7.2 Use Precautions

- Avoid making applications under conditions which favor runoff or wind erosion of soil containing this product to non-target areas.
- To prevent off-site movement due to runoff or wind erosion:
  - o Avoid treating powdery dry or light sand soils when conditions are favorable for wind erosion. Under these conditions, settle the soil surface first by rainfall or irrigation.
  - o Avoid applications to impervious substrates, such as paved or highly compacted surfaces.
  - o Avoid use of tailwater from the first flood or furrow irrigation of treated fields to treat non-target crops, unless at least 1/2 inch of rainfall has occurred between application and the first irrigation.
- Avoid using a sprayer or applicator contaminated with any other materials, or crop damage or clogging of the application device may result.
- Avoid spray overlap, as crop injury may result.
- Injury may occur following the use of Dual Magnum Herbicide under abnormally high soil moisture conditions during early development of the crop.
- Dry weather following application of Dual Magnum Herbicide may reduce weed control. Cultivate if weeds develop.
- To avoid crop injury, avoid the use of a herbicide/fertilizer mixture on crops where bedding occurs.
- Avoid application to humans or animals. Flagmen and loaders must avoid inhalation of spray mist and prolonged contact with skin.

7.3 Mandatory Spray Drift Management

Aerial Applications:

- Do not release spray at a height greater than 10 ft above the ground or vegetative canopy, unless a greater application height is necessary for pilot safety.
- Applicators are required to select the nozzle and pressure that deliver medium or coarser droplets (ASABE S641).
- If the wind speed is 10 miles per hour or less, applicators must use 1/2 swath displacement upwind at the downwind edge of the field. When the wind speed is between 11-15 miles per hour, applicators must use 3/4 swath displacement upwind at the downwind edge of the field.
- Do not apply when wind speeds exceed 15 mph at the application site. If the wind speed is greater than 10 mph, the boom length must be 65% or less of the wingspan for fixed wing aircraft and 75% or less of the rotor diameter for helicopters. Otherwise, the boom length must be 75% or less of the wingspan for fixed-wing aircraft and 90% or less of the rotor diameter for helicopters.
- Do not apply during temperature inversions.

Ground Boom Applications:

- User must only apply with the release height recommended by the manufacturer, but no more than 4 feet above the ground or crop canopy.
- Applicators are required to select the nozzles and pressure that deliver medium or coarser droplets (ASABE S572).
- Do not apply when wind speeds exceed 15 miles per hour at the application site.
- Do not apply during temperature inversions.

Boomless Ground Applications:

- Applicators are required to select the nozzle and pressure that deliver medium or coarser droplet size (ASABE S572.3) for all applications.
- Do not apply when wind speeds exceed 15 miles per hour at the application site.
- Do not apply during temperature inversions.

7.4 SPRAY DRIFT ADVISORIES

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

7.4.1 IMPORTANCE OF DROPLET SIZE

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

7.4.2 CONTROLLING DROPLET SIZE – GROUND BOOM

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

7.4.3 CONTROLLING DROPLET SIZE – AIRCRAFT

- Adjust Nozzles – Follow nozzle manufacturers' recommendations for setting up nozzles generally, to reduce fine droplets, nozzles should be oriented parallel with the airflow in flight.

7.4.4 RELEASE HEIGHT - AIRCRAFT

- Higher release heights increase the potential for spray drift.

7.4.5 BOOM HEIGHT - GROUND BOOM

- For ground equipment, the boom should remain level with the crop and have minimal bounce.

7.4.6 BOOMLESS GROUND APPLICATIONS

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

7.4.7 SHIELDED SPRAYERS

- Shielding the boom or individual nozzles can reduce spray drift. Consider using shielded sprayers. Verify that the shields are not interfering with the uniform deposition of the spray on the target area.

7.4.8 TEMPERATURE AND HUMIDITY

- When making applications in hot and dry conditions, use larger droplets to compensate for evaporation.

7.4.9 TEMPERATURE INVERSIONS

- Drift potential is high during a temperature Inversion.
- Temperature inversions are characterized by increasing temperatures with altitude and are common on nights with limited cloud cover and light to no wind.
- They begin to form as the sun sets and often continue into the morning.
- The presence of an inversion can be indicated by ground fog or by the movement of smoke from a ground source or an aircraft smoke generator.
- Smoke that layers and moves laterally in a concentrated cloud (under low wind conditions) indicates an inversion, while smoke that moves upward and rapidly dissipates indicates good vertical air mixing.
- Avoid applications during temperature inversions.

7.4.10 WIND

- Drift potential generally increases with wind speed.
- AVOID APPLICATIONS DURING GUSTY WIND CONDITIONS.
- Applicators need to be familiar with local wind patterns and terrain that could affect spray drift.

7.4.11 WINDBLOWN SOIL PARTICLES

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

7.4.12 SENSITIVE AREAS

- This pesticide may only be applied when the potential for drift to adjacent sensitive areas (e.g., residential areas, bodies of water, non-target plants) is minimal (i.e., when the wind is blowing away from the sensitive area).
- To assure that spray will not adversely affect adjacent sensitive nontarget plants, apply Dual Magnum Herbicide by aircraft at a minimum upwind distance of 400 ft from sensitive plants.

8.0 WEEDS CONTROLLED OR PARTIALLY CONTROLLED BY DUAL MAGNUM HERBICIDE APPLIED PRIOR TO WEED EMERGENCE

PARTIAL WEED CONTROL

Where reference is made to weeds partially controlled, partial control can either mean erratic control from good to poor, or consistent control at a level below that generally considered acceptable for commercial weed control. Control of these weeds can be erratic, due partially to variable weather conditions.

Common Name	Scientific Name	Weed Type	Control (C) or Partial Control (PC)
Barnyardgrass	*Echinochloa crus-galli*	Grass	C
Crabgrass, large	*Digitaria ischaemum*	Grass	C
Crabgrass, smooth	*Digitaria sanguinalis*	Grass	C
Crowfootgrass	*Dactyloctenium aegyptium*	Grass	C
Cupgrass, Prairie	*Eriochloa contracta*	Grass	C
Cupgrass, Southwestern	*Eriochloa acuminata*	Grass	C
Cupgrass, woolly	*Eriochloa villosa*	Grass	PC
Foxtail, bristly	*Setaria verticillata*	Grass	C
Foxtail, giant	*Setaria faberi*	Grass	C
Foxtail, green	*Setaria viridis*	Grass	C
Foxtail, millet	*Setaria italica*	Grass	C
Foxtail, yellow	*Setaria pumila*	Grass	C
Goosegrass	*Eleusine indica*	Grass	C
Johnsongrass (seedling)	*Sorghum halepense*	Grass	PC
Millet, wild-proso	*Panicum miliaceum*	Grass	PC
Panicum, fall	*Panicum dichotomiflorum*	Grass	C
Panicum, Texas	*Panicum texanum*	Grass	PC
Rice, red	*Oryza sativa*	Grass	C

Common Name	Scientific Name	Weed Type	Control (C) or Partial Control (PC)
Ryegrass, Italian	*Lolium multiflorum*	Grass	C
Sandbur, field	*Cenchrus spinifex*	Grass	PC
Sandbur, Southern	*Cenchrus echinatus*	Grass	PC
Shattercane	*Sorghum bicolor*	Grass	PC
Signalgrass, broadleaf	*Urochloa platyphylla*	Grass	C
Sorghum (volunteer)	*Sorghum bicolor*	Grass	PC
Witchgrass	*Panicum capillare*	Grass	C
Amaranth, Palmer	*Amaranthus palmeri*	Broadleaf	C
Amaranth, Powell	*Amaranthus powellii*	Broadleaf	C
Beggarweed, Florida	*Desmodium tortuosum*	Broadleaf	PC
Carpetweed	*Mollugo verticillata*	Broadleaf	C
Eclipta	*Eclipta prostrata*	Broadleaf	PC
Galinsoga, hairy	*Galinsoga quadriradiata*	Broadleaf	C
Galinsoga, smallflower	*Galinsoga parviflora*	Broadleaf	C
Nightshade, Eastern black	*Solanum ptychanthum*	Broadleaf	C
Nightshade, hairy	*Solanum physalifolium*	Broadleaf	PC
Pigweed, prostrate	*Amaranthus blitoides*	Broadleaf	C
Pigweed, redroot	*Amaranthus retroflexus*	Broadleaf	C
Pigweed, smooth	*Amaranthus hybridus*	Broadleaf	C
Pigweed, tumble	*Amaranthus albus*	Broadleaf	C
Purslane, common	*Portulaca oleracea*	Broadleaf	PC
Pusley, Florida	*Richardia scabra*	Broadleaf	C
Spiderwort, tropical	*Commelina benghalensis*	Broadleaf	C
Waterhemp,	*Amaranthus tuberculatus*	Broadleaf	C
Nutsedge, yellow	*Cyperus esculentus*	Sedge	C

Procedures that might improve control of weeds listed above:

- Thoroughly till soil to destroy germinating and emerged weeds prior to preemergence or preplant applications.
- If Dual Magnum Herbicide is to be used preemergence, apply at planting or immediately after planting.
- If available, sprinkler irrigate within 2 days after application. Apply 1/2-1 inch of water. Use lower water volume (1/2 inch) on coarse textured soils and higher volume (1 inch) on fine textured soils.
- If irrigation is not possible and rain does not occur within 2 days after planting and application, weed control may be decreased. Under these conditions, make a uniform, shallow cultivation as soon as weeds emerge or apply an appropriately labeled herbicide to control emerged weeds.

9.0 CROP USE DIRECTIONS

SOIL TEXTURES

Where rates are based on coarse, medium, or fine textured soils, it is understood that soil textural classes are generally categorized as follows:

Coarse	Medium	Fine
Sand Loamy Sand Sandy Loam	Sandy Clay Sandy Clay Loam Loam Silt Loam Silt	Clay Clay Loam Silty Clay Silty Clay Loam

9.1 Corn

9.1.1 FALL, PREPLANT SURFACE, PREPLANT INCORPORATED, PREEMERGENCE, OR POSTEMERGENCE APPLICATIONS

Crops (including cultivars, varieties, and/or hybrid of these)		
Field Corn Popcorn Seed Corn Sweet Corn		
Application Timing	**Rate (pt/A)**	**Use Directions**
Fall Application for Spring Weed Control **For use in the following states:** **Iowa** **Illinois** **Minnesota** **Nebraska** **North Dakota** **South Dakota** **Wisconsin**	For minimum-till or no-tillage systems on soils with ≥ 2.5% organic matter, apply rate based on soil texture: *Medium Soils:* Apply 1.67-2.0 pt/A *Fine Soils:* Apply 2.0 pt/A	Apply after harvest when the sustained soil temperature at a 4-inch depth is less than 55° F and falling. Apply to ground that will be planted to corn the following spring. **Apply after September 30** in ND, SD, MN, WI, and north of Route 30 in IA. **Apply after October 15** North of Route 91 in NE and south of Route 30 in IA. **Apply after October 31** North of Route 136 in IL. When a fall and/or a spring tillage follows application, do not exceed an incorporation depth of 2-3 inches. Minimize furrow and ridge formation in the tillage operations.
Fall Application for Residual Control of Glyphosate Resistant Italian Ryegrass (*Lolium multiflorum*)	1.33 - 1.67 pt/A Use the lower rate for *coarse textured soils* and the higher rate for *fine textured soils*.	Apply from September 1 – December 1 after harvest of the previous crop and prior to Italian ryegrass emergence. If tillage follows application, do not incorporate to a depth greater than 2-3 inches. If glyphosate resistant Italian ryegrass is emerged at the time of application, a paraquat brand herbicide can be tank-mixed with Dual Magnum Herbicide to control emerged ryegrass. Other registered herbicides may be tank mixed with Dual Magnum Herbicide for control or improved control of other weeds present at the time of application.

Application Timing	Rate (pt/A)	Use Directions
Fall Application for Residual Control or Suppression of Yellow Nutsedge (*Cyperus esculentus*) the Following Spring in ID, OR, and WA	1.33 pt/A	Apply in the fall after the harvest of the previous crop but before freeze-up. Application can be surface-applied or incorporated. If tillage follows application, do not incorporate to a depth greater than 2-3 inches.
Early Preplant Surface Application	1.33 pt/A on coarse soils 1.67 pt/A on medium soils 2.0 pt/A on fine soils For extended residual or control of heavy weed infestations, up to 2.6 pt/A is allowed.	Apply up to 14 days prior to planting on coarse soils. Apply up to 30 days before planting, on medium and fine textured soils.
Preplant Incorporated	For all applications use the rate for the specific soil texture and organic matter (OM) as follows: *Coarse Soils:* 1.0-1.33 pt/A; <3% OM 1.33 pt/A; ≥ 3% OM *Medium Soils:* 1.33-1.67 pt/A *Fine Soils:* 1.33-1.67 pt/A; <3% OM 1.67-2.0 pt/A; ≥ 3% OM For extended residual or control of heavy weed infestations, up to 2.6 pt/A is allowed.	Apply within 14 days of planting. Apply to the soil and incorporate into the top 2 inches of soil. Use a preplant incorporated application if furrow irrigation is used or when a period of dry weather after application is expected. If crop will be planted on beds, apply and incorporate after bed formation, unless specified otherwise. **For California Only:** Broadcast Dual Magnum Herbicide alone or with tank mix partners to the soil and thoroughly incorporate with a disk or similar implement set to till 4-6 inches deep. For more thorough incorporation, till the soil in 2 different directions (cross-till). Corn may be planted on flat surface or on beds. Use caution when forming the beds to ensure that only soil from the treated zone is used (i.e., do not bring untreated soil to soil surface). If application is made to preformed beds, incorporate with a tillage implement set to till 2-4 inches deep. Use care during tilling to keep the treated, tilled soil on the beds.
Preemergence	For all applications use the rate for the specific soil texture and organic matter (OM) as follows: *Coarse Soils:* 1.0-1.33 pt/A; <3% OM 1.33 pt/A; ≥ 3% OM *Medium Soils:* 1.33-1.67 pt/A *Fine Soils:* 1.33-1.67 pt/A; <3% OM 1.67-2.0 pt/A; ≥ 3% OM For extended residual or control of heavy weed infestations, up to 2.6 pt/A is allowed.	Apply after planting but before crop emerges. **For California Only:** Apply after planting. Water with sprinkler or flood irrigation within 7-10 days.

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9.1.1 FALL, PREPLANT SURFACE, PREPLANT INCORPORATED, PREEMERGENCE OR POSTEMERGENCE APPLICATIONS *(continued)*

Application Timing	Rate (pt/A)	Use Directions
Postemergence or Lay-By	1.0 - 2.0 pt/A	Apply after corn emergence up until corn reaches 40 inches in height. Apply to extend the duration of weed control in corn following any preplant surface-applied, preplant incorporated, or preemergence herbicide application, including Dual Magnum Herbicide. For best results, make applications prior to weed emergence and directed toward the base of corn plants in excess of 5 inches tall.

For Weed Control:
- Refer to **Section 8.0** for list of weeds controlled or partially controlled.

Tank Mix or Sequential Application Options:
- Refer to **Section 9.1.2** for tank-mix options.

Resistance Management:
- Refer to **Section 3.1**.

Precautions:
- For preplant surface application, to the extent possible, avoid moving treated soil out of the row or moving untreated soil to the surface during planting or weed control will be diminished.
- Use on peat or muck soils will result in reduced weed control.

USE RESTRICTIONS

1) Refer to **Section 7.1** for additional product use restrictions.
2) **Maximum Single Application Rate:** 2.6 pt/A
   a. **DO NOT** apply more than 2.6 pt/A in a single preemergence application - (2.48 lb ai/A of *S*-metolachlor).
   b. **DO NOT** apply more than 2.0 pt/A in a single postemergence application - (1.91 lb ai/A of *S*-metolachlor).
3) **Minimum Application Interval:** Not Applicable
4) **Maximum Annual Rate:** 3.9 pt/A/year - (3.71 lb ai/A/year of *S*-metolachlor)
   a. **DO NOT** exceed 3.71 lb ai/A/year of *S*-metolachlor-containing products.
5) The combined total amount of Dual Magnum Herbicide from all applications in the fall plus spring must not exceed the maximum allowed annual rate.
6) **DO NOT** make more than 1 fall application per crop.
7) **DO NOT** apply to frozen ground.
8) **DO NOT** graze or feed forage for 30 days following application.
9) **Preharvest Interval (PHI):**
   a. Sweet corn ears: 30 days

9.1.2 TANK-MIX COMBINATIONS FOR CORN

Application	Tank-Mix Brands	Use Directions
Burndown Weed Control	2,4-D AAtrex® brands Banvel® Gramoxone® brands Solo glyphosate brands Princep® brands	Apply before, during or after planting, but before corn emerges. Apply solo glyphosate brands in water or fluid fertilizer with ground equipment. Gramoxone brands will not control weeds taller than 6 inches. Apply AAtrex tank mixture before weeds exceed 3 inches in height. Add non-ionic surfactant (NIS) at 1.0-2.0 qt/100 gal of diluted spray, or another appropriate surfactant at its labeled rate, or add crop oil concentrate plus 28% liquid nitrogen (or equivalent).
Preplant Surface **Preplant Incorporated** **Preemergence**	AAtrex brands Balance® Flexx Princep brands	These tank mixes may be used to broaden the weed control spectrum in corn beyond that of Dual Magnum Herbicide alone. Use the Balance Flexx mixture on **field corn only**.
Postemergence	AAtrex brands Status®	Apply before grass and broadleaf weeds pass the 2-leaf state and before corn exceeds 12 inches in height. Application to weeds larger than the 2-leaf stage will generally result in unsatisfactory control. Occasionally, some corn leaf burn may result, but this will likely not affect later growth or yield. Do not apply the postemergence tank mixes in fluid fertilizer, or severe crop injury may occur.
Postemergence Application to Glufosinate Resistant Corn	Liberty®	This tank mix provides postemergence control of a broad spectrum of grass and broadleaf weeds on the Liberty label and residual control of weeds on the Dual Magnum Herbicide label. Refer to the solo Dual Magnum Herbicide label and the Liberty label for rates recommended for weed populations and soil texture. Apply only to corn that is resistant to glufosinate.
Postemergence Application to Glyphosate Resistant Corn	Solo glyphosate brands	These tank mixes provide postemergence control of weeds on the glyphosate brand label and residual control of weeds on the Dual Magnum Herbicide label. Application may be made from corn emergence until 30 inches tall or the V8 stage (8 leaves with collars), whichever comes first. Refer to the solo Dual Magnum Herbicide label and the glyphosate brands label for rates recommended for weed populations and soil texture. Apply only to corn that is resistant to glyphosate.
See **Appendix 12.1** for the EPA Registration Number and Active Ingredient(s) in each listed brand.		
Precautions: • Dual Magnum Herbicide in any tank mixture for corn may be applied in water or fluid fertilizer before corn emerges. **After corn emergence**, use only water as a carrier when Dual Magnum Herbicide is applied. • Do not apply combinations containing paraquat brands in suspension-type liquid fertilizers, because the activity of paraquat will be reduced.		

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9.1.2 TANK-MIX COMBINATIONS FOR CORN *(continued)*

TANK-MIX USE RESTRICTIONS
1) All application rates, precautions, and use restrictions cited in **Section 9.1.1** for Dual Magnum Herbicide solo apply to tank-mixes with Dual Magnum Herbicide. 2) It is the pesticide user's responsibility to ensure that all products are registered for the intended use. Read and follow the applicable restrictions and limitations and directions for use on all product labels involved in tank mixing. Users must follow the most restrictive directions for use and precautionary statements of each product in the tank mixture. 3) **IMPORTANT: FOR TANK MIXTURES WITH AATREX (OR OTHER BRANDS OF ATRAZINE)** a. If applying Dual Magnum Herbicide in tank mixture with AAtrex, all the restrictions and rate limitations on the AAtrex label must be followed. b. Certain states may have established rate limitations for atrazine within specific geographical areas. Consult your state lead pesticide control agency for additional information. It is a violation of this label to deviate from state use regulations. c. **DO NOT** exceed a total of 2.5 lb ai/A/year of atrazine-containing products.

9.2 Cotton

9.2.1 FALL, PREPLANT INCORPORATED, PREEMERGENCE, OR POSTEMERGENCE APPLICATIONS

Crops (including cultivars, varieties, and/or hybrids of these)		
Cotton		
Application Timing	**Rate (pt/A)**	**Use Directions**
Fall Application for Residual Control of Glyphosate Resistant Italian Ryegrass (*Lolium multiflorum*)	1.33 - 1.67 pt/A Use the lower rate for *coarse textured soils* and the higher rate for *fine textured soils*.	Apply from September 1 – December 1 after harvest of the previous crop and prior to Italian ryegrass emergence. If tillage follows application, do not incorporate to a depth greater than 2-3 inches. If glyphosate resistant Italian ryegrass is emerged at the time of application, a paraquat brand herbicide can be tank-mixed with Dual Magnum Herbicide to control emerged ryegrass.
Preplant Incorporated (NM, OK, and TX Only)	Use the following rates for the specific soil type: *Sandy Loam Soils:* 1.0 pt/A *Medium Soils:* 1.0-1.33 pt/A *Fine Soils:* 1.33 pt/A	Apply to the soil and incorporate into the top inch of soil. Use a rolling cultivator or similar implement to uniformly incorporate not more than 1 inch deep. Use a preplant incorporated application if furrow irrigation is used or when a period of dry weather after application is expected. Where furrow irrigation is used, wet the top of the bed for best results. If the crop is to be planted on beds, apply and incorporate after bed formation. Plant cotton below the zone of incorporation; i.e., at least 1 inch on *fine soils* and 1.5 inches on *coarse* and *medium soils*. If incorporated prior to planting, use a planter that will result in a minimum of soil disturbance.

Application Timing	Rate (pt/A)	Use Directions
Preemergence (AR, KS, LA, MS, TN, and Bootheel of MO Only)	Use the following rates for the specific soil type in AR, KS, LA, MS, TN, and Bootheel of MO only: *Sandy Loam Soils:* 0.5 - 1.0 pt/A *Medium Soils:* 0.66 -1.33 pt/A *Fine Soils:* 1.0 - 1.33 pt/A	Apply at planting or after planting, but before crop emerges. If the crop is to be planted on beds, apply after bed formation.
Preemergence (NM, OK, and TX Only)	Use the following rates for the specific soil type in NM, OK and TX only: *Sandy Loam Soils:* 1.0 pt/A *Medium Soils:* 1.0 - 1.33 pt/A *Fine Soils:* 1.33 pt/A	Apply at planting or after planting, but before crop emerges. If the crop is to be planted on beds, apply after bed formation.
Postemergence	Use the postemergence rates below based upon the following geographical areas: **VA, NC, SC, GA, FL, and AL:** Apply at 1.0 – 1.33 pt/A **TN, AR, KS, MS, MO, and LA:** Apply at 0.5 – 1.33 pt/A **TX, OK, NM, AZ, CA, and Clay Soils in AR:** Apply at 1.0 – 1.33 pt/A	Apply broadcast over-the-top or directed to the soil surface. In sprinkler-irrigated areas, sprinkler irrigate after application with 1/2 - 1 inch of water (1/2 inch on *coarse textured soils* to 1 inch on *fine textured soils*) to incorporate Dual Magnum Herbicide. In furrow-irrigated areas, apply Dual Magnum Herbicide, incorporate with a rolling cultivator or similar implement that provides uniform shallow incorporation (2 inches or less), and then irrigate. In non-irrigated areas, if at least 1/2 inch of rainfall does not occur within 10 days after application, cultivate with a rolling cultivator or similar implement that provides uniform shallow incorporation of Dual Magnum Herbicide.
For Weed Control: • Refer to **Section 8.0** for list of weeds controlled or partially controlled.		
Tank Mix Options: • Refer to **Section 9.2.2** for tank-mix options.		
Resistance Management: • Refer to **Section 3.1.**		

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9.2.1 FALL, PREPLANT INCORPORATED, PREEMERGENCE OR POSTEMERGENCE APPLICATIONS *(continued)*

Precautions:

- For best control of yellow nutsedge and suppression of seedling Johnsongrass, apply preplant incorporated, preemergence, or postemergence to cotton and preemergence to weeds at the maximum rate for the soil texture, whether applied alone or in combinations.
- To avoid concentration in the seed furrow, do not make broadcast applications to cotton planted in furrows more than 2 inches deep. When making band applications to cotton planted in furrows deeper than 2 inches, ensure that band width does not exceed the width of the bottom of the furrow.
- Applying over-the-top in fluid fertilizer or any other adjuvant, surfactant, oil, or other pesticide not listed in the cotton section of this label may result in crop injury.
- In furrow-planted cotton, to avoid concentration in the furrow and potential injury, do not apply postemergence until after first "knifing" or cultivation to level soil surface.
- Dual Magnum Herbicide will not control emerged weeds. Control emerged weeds with an appropriate registered foliar herbicide or by mechanical means.

USE RESTRICTIONS

1) Refer to **Section 7.1** for additional product use restrictions.
2) **Maximum Single Application Rate:** 1.67 pt/A - (1.59 lb ai/A of *S*-metolachlor)
3) **Minimum Application Interval:** Not Applicable
4) **Maximum Annual Rate:** 2.6 pt/A/year - (2.48 lb ai/A/year of *S*-metolachlor)
   a. **DO NOT** exceed 2.48 lb ai/A/year of *S*-metolachlor-containing products.
5) **DO NOT** apply on sand or loamy sand soils, or in areas where water is likely to "pond" over the bed.
6) **DO NOT** apply on Taloka silt loam.
7) **DO NOT** use in Gaines County, TX.
8) **DO NOT** apply to frozen ground.
9) The combined total amount of Dual Magnum Herbicide from all applications in the fall plus spring must not exceed the maximum allowed annual rate.
10) **Preharvest Interval (PHI):**
    a. 80 days after directed-postemergence application
    b. 100 days after postemergence over-the-top application

9.2.2 TANK-MIX COMBINATIONS FOR COTTON

Application	Tank-Mix Brands	Use Directions
Burndown	Cotoran® 4L Gramoxone brands Solo glyphosate brands	Use in applications where cotton is planted directly into a cover crop, stale seedbed, or previous crop residues. Apply before, during or after planting, but before the cotton emerges. Apply in a minimum of 15 gallons of water or fluid fertilizer per acre with ground equipment.
Preplant Incorporated Preemergence	Caparol® 4L	Apply as a mixture in water or liquid fertilizer. For preplant incorporated applications, plant cotton below the zone of incorporation. If incorporated before planting, use a planter that will result in a minimum of soil disturbance.
Preemergence	Cotoran 4L	Apply to the soil surface at planting or after planting, but before weeds or crop emerge.

Application	Tank-Mix Brands	Use Directions
Postemergence-Directed	Caparol 4L	Tank mix in water only for postemergence-directed application in **AR, AZ, CA, LA, MS, NM, OK, TN, TX, and MO**. Apply the tank mix in a minimum of 15 gallons of spray volume per acre. Only use water as a carrier for postemergence applications.
Postemergence-Directed Semi-Directed Over-the-Top Spray	Cotoran 4L	Do not use fluid fertilizer as a carrier for postemergence applications. Tank mix may be applied postemergence to cotton but preemergence to weeds or postemergence to both cotton and weeds for control of weeds on the Cotoran 4L label.
Postemergence Application to Glyphosate Resistant Cotton	Solo glyphosate brands	Apply as a tank mixture in water for control of emerged weeds on the glyphosate labels and for residual preemergence control of weeds listed on the Dual Magnum Herbicide label. Adding additional spray adjuvants, surfactants, fertilizer additives, or other pesticides to a tank mixture of Dual Magnum Herbicide + solo glyphosate brands applied postemergence can result in unacceptable crop injury. Apply only to cotton that is resistant to glyphosate.
Postemergence Application to Glufosinate Resistant Cotton	Liberty	Apply as a tank mixture in water for control of emerged weeds on the Liberty label and for residual preemergence control of weeds listed on the Dual Magnum Herbicide label. Apply only to cotton that is resistant to glufosinate.
See **Appendix 12.1** for the EPA Registration Number and Active Ingredient(s) in each listed brand.		
Tank Mix Instructions: • Refer to **Section 4.4** for tank-mix instructions.		
Precautions: • To avoid concentration in the seed furrow, do not make broadcast applications of Dual Magnum Herbicide + Caparol 4L or Dual Magnum Herbicide + Cotoran DF to cotton planted in furrows more than 2 inches deep. When making band applications to cotton planted in furrows deeper than 2 inches, ensure that the band width does not exceed the width of the bottom of the furrow. • Do not apply Dual Magnum Herbicide + Caparol 4L postemergence over-the-top of cotton, or injury may occur. • For tank mixtures of Dual Magnum Herbicide or Dual Magnum Herbicide + Cotoran, if heavy rain occurs soon after application, crop injury may result, especially in poorly drained areas where water stands for several days, or where the seeding slit has not been properly closed. • Do not apply combinations containing Gramoxone brands in suspension-type liquid fertilizers, as the activity of paraquat will be reduced.		
TANK-MIX USE RESTRICTIONS		
1) All use restrictions cited in **Section 9.2.1** for Dual Magnum Herbicide solo apply to tank-mixes with Dual Magnum Herbicide. 2) It is the pesticide user's responsibility to ensure that all products are registered for the intended use. Read and follow the applicable restrictions and limitations and directions for use on all product labels involved in tank mixing. Users must follow the most restrictive directions for use and precautionary statements of each product in the tank mixture.		

9.3 Grasses Grown for Seed

Crops (including cultivars, varieties, and/or hybrids of these)		
Bentgrass Fine fescue	Kentucky bluegrass Orchardgrass	Perennial ryegrass Tall fescue
Application Timing	**Rate (pt/A)**	**Use Directions**
Established Grasses Grown for Seed Crops in Idaho, Oregon, and Washington	Use the following rates for the specific grass type: *Fine fescue and perennial ryegrass:* Apply 1.0 pt/A *Bentgrass, Kentucky bluegrass, orchardgrass, and tall fescue:* Apply 1.0 – 1.33 pt/A	Apply just before, during, or immediately following the first fall rains or just before or during a late summer or early fall irrigation, but before target grasses emerge. Evenly spread, remove, or burn the postharvest residue (straw) before applying Dual Magnum Herbicide. In addition to controlling the weeds listed in **Section 8.0**, Dual Magnum Herbicide will provide preemergence control/suppression of volunteer seedlings of Bentgrass, fine fescue spp., Kentucky bluegrass, orchardgrass, perennial ryegrass, and tall fescue. Dual Magnum Herbicide will also suppress or control annual bluegrass, California brome, doughstalk bluegrass, downy brome, Italian ryegrass, and rattail fescue. Apply by ground equipment in a minimum of 10 gallons of water per acre at the recommended rate.

For Weed Control:
- Refer to **Section 8.0** for list of weeds controlled or partially controlled.

Resistance Management:
- Refer to **Section 3.1.**

Precautions:
- Avoid application after the 15th of November or poor control may result.
- Tank mixtures with other pesticides, or the addition of an adjuvant, can increase the risk of crop injury.
- Application to perennial ryegrass and fine fescue stands under stress may cause crop injury.
- If weed escapes occur following a Dual Magnum Herbicide application, an application of a postemergence herbicide may be necessary to control escapes.
- Control may be decreased if excessive straw from the previous harvest is present at application and/or insufficient rainfall/irrigation occurs.
- Dual Magnum Herbicide will not control emerged weeds. Control emerged weeds with an appropriate registered foliar herbicide or by mechanical means.

USE RESTRICTIONS

1) Refer to **Section 7.1** for additional product use restrictions.
2) The grass grown for seed crop must have at least one seed harvest or been established at least one year prior to application.
3) **Maximum Single Application Rate:** 1.33 pt/A - (1.27 lb ai/A of *S*-metolachlor)
4) **Minimum Application Interval:** Not Applicable
5) **Maximum Annual Rate:** 1.33 pt/A/year - (1.27 lb ai/A of *S*-metolachlor)
   a. **DO NOT** exceed 1.27 lb ai/A/year of *S*-metolachlor-containing products.
6) **DO NOT** apply Dual Magnum Herbicide more than once per crop year.
7) **DO NOT** graze forage regrowth for 60 days following application west of the Cascades.
8) **DO NOT** graze forage regrowth for 150 days following application in areas east of the Cascades.
9) **Preharvest Interval (PHI):**
   a. Hay: harvest anytime between seed harvest and the next application of *S*-metolachlor.

9.4 Horseradish

Crops (including cultivars, varieties, and/or hybrids)		
Horseradish		
Application Timing	**Rate (pt/A)**	**Use Directions**
Preemergence	1.0 – 1.33 pt/A Use lower rates on soils relatively coarse textured and higher rates on fine textured soils.	Apply a single broadcast application of Dual Magnum Herbicide to the soil surface after planting but before the crop emerges.
For Weed Control: • Refer to **Section 8.0** for list of weeds controlled or partially controlled.		
Resistance Management: • Refer to **Section 3.1.**		
Precaution: • Dual Magnum Herbicide will not control emerged weeds. Control emerged weeds with an appropriate registered foliar herbicide or by mechanical means.		
USE RESTRICTIONS		
1) Refer to **Section 7.1** for additional product use restrictions. 2) **Maximum Single Application Rate:** 1.33 pt/A -(1.27 lb ai/A of *S*-metolachlor) 3) **Minimum Application Interval:** Not Applicable 4) **Maximum Annual Rate:** 1.33 pt/A/year - (1.27 lb ai/A of *S*-metolachlor) a. **DO NOT** exceed 1.27 lb ai/A/year of *S*-metolachlor-containing products. 5) **DO NOT** apply Dual Magnum Herbicide more than once per crop year. 6) **Preharvest Interval (PHI):** normal timing for horseradish		

9.5 Legume Vegetables (Succulent or Dried), Crop Group 6, except Soybean (NOT FOR POSTEMERGENCE AND OR CHEMIGATION (CENTER PIVOT ONLY) USE IN CALIFORNIA)

9.5.1 FALL, PREPLANT INCORPORATED, PREEMERGENCE, POSTEMERGENCE, AND/OR CHEMIGATION (CENTER PIVOT ONLY) APPLICATIONS

Crops (including cultivars, varieties, and/or hybrids of these)

Edible Podded (only):
Jackbean
Sword bean
Soybean, (immature seed)

Edible Podded, Succulent Shelled or Dried Shelled:
Pigeon pea

Bean (*Phaseolus* spp.)
Field bean
Great Northern
Kidney bean
Lima bean
Navy bean
Pinto bean
Runner bean
Snap bean

Edible Podded, Succulent Shelled or Dried Shelled:

Bean (*Phaseolus* spp.) *(continued)*
Tepary Bean
Wax Bean

Pea (*Pisum* spp.)
Dwarf pea
Edible-pod pea
English pea
Field pea
Garden pea
Green pea
Snow pea
Sugar snap pea

Edible Podded, Succulent Shelled or Dried Shelled: *(continued)*

Bean (*Vigna* spp.)
Adzuki bean
Asparagus bean
Blackeyed pea
Catjang
Chinese longbean
Cowpea
Crowder pea
Moth bean
Mung bean
Rice bean
Southern pea
Urd bean
Yardlong bean

Succulent Shelled or Dried Shelled:
Broad bean (fava bean)

Dried Shelled Only:
Chickpea (garbanzo bean)
Guar
Lablab bean (hyacinth bean)
Grain lupin
Sweet lupin
White lupin
White sweet lupin
Lentils

continued...

9.5.1 FALL, PREPLANT INCORPORATED OR PREEMERGENCE APPLICATIONS *(continued)*

Application Timing	Rate (pt/A)	Use Directions
Fall Application for Spring Weed Control **For use in the following states:** **Iowa** **Illinois** **Minnesota** **Nebraska** **North Dakota** **South Dakota** **Wisconsin**	For minimum-till or no-tillage systems on soils with ≥ 2.5% organic matter, apply rate based on soil texture: *Medium Soils:* Apply 1.67-2.0 pt/A *Fine Soils:* Apply 2.0 pt/A	Apply after harvest when the sustained soil temperature at a 4-inch depth is less than 55° F and falling. **Apply after September 30** in ND, SD, MN, WI, and north of Route 30 in IA. **Apply after October 15** North of Route 91 in NE and south of Route 30 in IA. **Apply after October 31** North of Route 136 in IL. When a fall and/or a spring tillage follows application, do not exceed an incorporation depth of 2-3 inches. Minimize furrow and ridge formation in the tillage operations.
Preplant Incorporated	For all applications use the rate for the specific soil texture and organic matter (OM) as follows: *Coarse Soils:* 1.0-1.33 pt/A; <3% OM 1.33 pt/A; ≥ 3% OM *Medium Soils:* 1.33-1.67 pt/A *Fine Soils:* 1.33-1.67 pt/A; <3% OM 1.67-2.0 pt/A; ≥ 3% OM	Apply to the soil and incorporate in the top 2 inches within 14 days before planting using an implement capable of providing uniform incorporation. Use a preplant incorporated application if furrow irrigation is used or when a period of dry weather after application is expected. If a crop will be planted on beds, apply and incorporate after bed formation, unless specified otherwise. **For California Only for Beans, Peas, and Lentils:** For preplant incorporation, broadcast alone or with tank mix partners to the soil and thoroughly incorporate with a disk or similar implement set to till 4-6 inches deep. For more thorough incorporation, till the soil in 2 different directions (cross-till). Crops may be planted on flat surface or on beds. Use caution when forming the beds to ensure that only soil from the treated zone is used (i.e., do not bring untreated soil to soil surface). If application is made to preformed beds, incorporate with a tillage implement set to till 2-4 inches deep. Use care during tilling to keep the treated, tilled soil on the beds.
Preemergence	For all applications use the rate for the specific soil texture and organic matter (OM) as follows: *Coarse Soils:* 1.0-1.33 pt/A; <3% OM 1.33 pt/A; ≥ 3% OM *Medium Soils:* 1.33-1.67 pt/A *Fine Soils:* 1.33-1.67 pt/A; <3% OM 1.67-2.0 pt/A; ≥ 3% OM	Make preemergence applications after planting, but before crop emerges. **For California Only for Beans, Peas, and Lentils:** Apply after planting. Water with sprinkler or flood irrigation within 7-10 days.

Application Timing	Rate (pt/A)	Use Directions
Postemergence and/or Chemigation *(Center Pivot Only)*	For all applications use the rate for the specific soil texture and organic matter (OM) as follows: *Coarse Soils:* 1.0-1.33 pt/A; <3% OM 1.33 pt/A; > 3% OM *Medium Soils:* 1.33-1.67 pt/A *Fine Soils:* 1.33-1.67 pt/A; <3% OM 1.67-2.0 pt/A; > 3% OM	Apply Dual Magnum Herbicide postemergence or chemigation only after the first trifoliate stage of plant growth. Application to plants with less than one trifoliate can result in unacceptable crop injury. When applied broadcast over-the-top, crop injury in the form of leaf spotting and speckling may be observed, especially with rates greater than 1 pt/A. **DO NOT** graze or harvest forage or hay following postemergence applications. **Refer to Section 4.6 for chemigation restrictions and directions.**

For Weed Control:
- Refer to **Section 8.0** for list of weeds controlled or partially controlled.

Tank Mix Application Options:
- Refer to **Section 9.5.2** for preplant incorporated tank-mix options.

Resistance Management:
- Refer to **Section 3.1.**

Precautions:
- All cultivars have not been tested for tolerance, especially postemergence or postemergence chemigation applications. Experiment on a limited basis until on-farm confidence in these use patterns and rates are obtained.
- On English peas, spring preemergence or pre-plant applications where soils are cold and wet during pea germination and emergence, the use of Dual Magnum Herbicide may delay maturity and/or reduce yields.
- Dual Magnum Herbicide will not control emerged weeds. Control emerged weeds with an appropriate registered postemergence herbicide(s) or by mechanical means.
- The risk of crop injury is greater on lighter textured soils and with higher use rates, especially when coupled with heavy rains or when excessive multiple irrigations occur within 5 days of application.
- Postemergence or postemergence-chemigation applications to wet plants or when conditions are extremely hot or humid may result in increased risk of crop injury.
- Postemergence or postemergence-chemigation applications should only be applied in a water-carrier. The addition of fertilizers, adjuvants, or other postemergence herbicides will increase the risk of crop injury.

USE RESTRICTIONS

1) Refer to **Section 7.1** for additional product use restrictions.
2) Refer to **Section 4.6** for chemigation restrictions and directions.
3) **Maximum Single Application Rate:** 2.0 pt/A - (1.91 lb ai/A of *S*-metolachlor)
4) **Minimum Application Interval:** 2 weeks
5) **Maximum Annual Rate:** 2.0 pt/A/year - (1.91 lb ai/A of *S*-metolachlor)
   a. **DO NOT** exceed 1.91 lb ai/A/year of *S*-metolachlor-containing products.
6) The combined total amount of Dual Magnum Herbicide from fall, preplant incorporated, preemergence, postemergence or chemigation applications must not exceed the maximum allowed annual rate.
7) **DO NOT** apply to frozen ground.
8) **DO NOT** make “Fall Applications for Spring Weed Control” or “Postemergence and/or Chemigation” applications to English peas.
9) **DO NOT** graze or harvest forage or hay following postemergence applications.
10) **Preharvest Interval (PHI):**
    a. **Preemergence**
       i. Forage: 60 days
       ii. Hay: 120 days
    b. Postemergence Preharvest Interval (PHI):
       i. **DO NOT** GRAZE OR HARVEST FORAGE OR HAY.
       ii. Seed: 50 days

9.5.2 TANK-MIX COMBINATIONS FOR LEGUME VEGETABLES

Application	Tank-Mix Brands	Use Directions
Preplant Incorporated	Treflan®	For use with **Dry Beans** (Kidney, Navy, Pinto, etc.; Lima; and Snap). Apply up to 14 days prior to planting. Incorporate to a uniform 2-inch depth using appropriate equipment. Choose the rate specified on the respective labels for each product used alone, for the specific soil texture/organic matter classification and weed species expected.
See **Appendix 12.1** for the EPA Registration Number and Active Ingredient(s) in each listed brand.		
TANK-MIX USE RESTRICTIONS		
1) All use restrictions cited in **Section 9.5.1** for Dual Magnum Herbicide solo apply to tank-mixes with Dual Magnum Herbicide. 2) It is the pesticide user's responsibility to ensure that all products are registered for the intended use. Read and follow the applicable restrictions and limitations and directions for use on all product labels involved in tank mixing. Users must follow the most restrictive directions for use and precautionary statements of each product in the tank mixture.		

9.6 Peanut

9.6.1 PREPLANT INCORPORATED, POSTPLANT INCORPORATED, PREEMERGENCE, OR LAY-BY APPLICATION

Crops (including cultivars, varieties, and/or hybrids)		
Peanut		
Application Timing	**Rate (pt/A)**	**Use Directions**
Preplant Incorporated **Postplant Incorporated**	Use the following rates for the specific geography: *Southeast:* Apply 1.0 - 1.33 pt/A *NM, OK, and TX:* Apply 0.8 - 1.33 pt/A Within the rate range, use lower rates on soils relatively coarse textured and higher rates on fine textured soils.	**For Preplant Incorporation:** Apply within 14 days before planting. Apply to the soil and incorporate into the top 2 inches of soil before planting using an implement capable of providing uniform incorporation. Use preplant incorporated application if furrow irrigation is used or when a period of dry weather after application is expected. If peanuts will be planted on beds, apply and incorporate after bed formation. **For Postplant Incorporation:** Apply and shallowly incorporate into the soil after planting but before peanut germination. Incorporation depth and incorporating implements must be kept above the seed, or seed will be damaged.

Application Timing	Rate (pt/A)	Use Directions
Preemergence **Lay-By**	Use the following rates for the specific geography: *Southeast:* Apply 1.0 - 1.33 pt/A Apply 1.33 - 2.0 pt/A preemergence for partial control of Florida beggarweed. *NM, OK, and TX:* Apply 0.8 - 1.33 pt/A Within the rate range, use lower rates on soils relatively coarse textured and higher rates on fine textured soils.	**Preemergence Application:** Apply after planting but before crop emergence. If applying at planting, apply behind the planter. **Lay-By Application:** Apply to the soil immediately after the last cultivation.
For Weed Control: • Refer to **Section 8.0** for list of weeds controlled or partially controlled.		
Tank Mix Options: • Refer to **Section 9.6.2** for tank mix application options.		
Resistance Management: • Refer to **Section 3.1.**		
Precaution: • Dual Magnum Herbicide will not control emerged weeds. Control emerged weeds with an appropriate registered foliar herbicide or by mechanical means.		
USE RESTRICTIONS		
1) Refer to **Section 7.1** for additional product use restrictions. 2) **Maximum Single Application Rate:** 2.0 pt/A - (1.91 lb ai/A of *S*-metolachlor) 3) **Minimum Application Interval:** Not Applicable 4) **Maximum Annual Rate:** 2.0 pt/A/year - (1.91 lb ai/A of *S*-metolachlor) a. **DO NOT** exceed 2.67 lb ai/A/year of *S*-metolachlor-containing products. 5) **DO NOT** graze or feed peanut forage or fodder to livestock for 30 days following application. 6) **Preharvest Interval (PHI):** 90 days		

9.6.2 TANK-MIX COMBINATIONS FOR PEANUT

Application Timing	Tank-Mix Brands	Use Directions
Preplant Incorporated	Prowl® Pursuit® Sonalan®	Apply the tank mixture within 14 days before planting. Apply to the soil and incorporate into the top 2 inches of soil before planting using an implement capable of providing uniform incorporation. Use preplant incorporated application if furrow irrigation is used or when a period of dry weather after application is expected. If peanuts will be planted on beds, apply and incorporate after bed formation.
Preemergence	Pursuit	Apply after planting but before peanut cracking.
Ground Cracking	Basagran® Butyrac® 200 Gramoxone Brands Pursuit	Apply tank mixtures at ground cracking. Apply **Gramoxone brands** as a tank mixture with Dual Magnum Herbicide at ground cracking to control or suppress small (1-6 inch) emerged annual grass and broadleaf weeds and provide residual control of weeds listed in **Section 8.0**. Apply in a minimum spray volume of 20 gal/A with ground equipment.
Ground Cracking to Postemergence	Basagran Pursuit Storm®	Apply **Basagran** as a tank mixture with Dual Magnum Herbicide from ground cracking to postemergence. Apply **Storm** as a tank mixture with Dual Magnum Herbicide postemergence (after peanut emergence) through 2 expanded trifoliate leaves. Apply **Pursuit** as a tank mixture with Dual Magnum Herbicide at ground cracking and after peanut emergence.
See **Appendix 12.1** for the EPA Registration Number and Active Ingredient(s) in each listed brand.		
TANK-MIX USE RESTRICTIONS		
1) All use restrictions cited in **Section 9.6.1** for Dual Magnum Herbicide solo apply to tank-mixes with Dual Magnum Herbicide. 2) It is the pesticide user's responsibility to ensure that all products are registered for the intended use. Read and follow the applicable restrictions and limitations and directions for use on all product labels involved in tank mixing. Users must follow the most restrictive directions for use and precautionary statements of each product in the tank mixture. 3) **DO NOT** apply more than the equivalent of 2.67 lb ai/A/year of Dual Magnum Herbicide.		

9.7 Potato

9.7.1 INCORPORATED, PREEMERGENCE, POSTEMERGENCE, AND LAY-BY APPLICATION

Crops (including cultivars, varieties, and/or hybrids)		
Potato		
Application Timing	**Rate (pt/A)**	**Use Directions**
Incorporated	1.0-2.0 pt/A Within the rate range, use the lower rate on soils relatively coarse textured or low in organic matter; use the higher rate on soils relatively fine textured or high in organic matter.	**Preplant Incorporated** Apply and incorporate into the top 3 inches before planting using an implement capable of providing uniform incorporation. During planting and cultural practices later in the growing season, avoid bringing untreated soil to the surface or weed control will be reduced where untreated soil has been exposed. **Postplant Incorporated** Applications may be made any time after planting to drag-off, but before potato emergence. Use an implement that evenly distributes Dual Magnum Herbicide in the top 2 inches of soil. Do not damage potato seed pieces or sprouts with incorporation equipment.
Preemergence	1.0-2.0 pt/A Within the rate range, use the lower rate on soils relatively coarse textured or low in organic matter; use the higher rate on soils relatively fine textured or high in organic matter. For extended residual or control of heavy weed infestations, up to 2.6 pt/A is allowed.	Apply either after planting as a preemergence, delayed preemergence, after drag-off or hilling treatment. Effectiveness will be reduced if later cultural practices expose untreated soil.
Postemergence After-Hilling/ Lay-By	1.67 pt/A	Apply to potatoes after hilling or at lay-by for control of Dual Magnum Herbicide labeled weeds for remainder of the growing season.
For Weed Control: • Refer to **Section 8.0** for list of weeds controlled or partially controlled.		
Tank Mix Options: • Refer to **Section 9.7.2** for tank mix application options.		
Resistance Management: • Refer to **Section 3.1**.		
Precautions: • If cool, wet soil conditions occur after application, Dual Magnum Herbicide may delay maturity and/or reduce yield of Superior and other early maturing potato varieties. • Dual Magnum Herbicide will not control emerged weeds. Control emerged weeds with an appropriate registered foliar herbicide or by mechanical means.		

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9.7.1 INCORPORATED, PREEMERGENCE, AND POSTEMERGENCE AND LAY-BY APPLICATION *(continued)*

USE RESTRICTIONS
1) Refer to **Section 7.1** for additional product use restrictions. 2) **Maximum Single Application Rate:** 2.6 pt/A - (2.48 lb ai/A of *S*-metolachlor) 3) **Maximum Application Interval:** Not Applicable 4) **Maximum Annual Rate:** 3.6 pt/A/year - (3.43 lb ai/A of *S*-metolachlor) a. **DO NOT** exceed 3.43 lb ai/A/year of *S*-metolachlor-containing products. 5) **DO NOT** use on muck or peat soils. 6) **DO NOT** apply both as a preemergence and an incorporated treatment. 7) **DO NOT** apply to sweet potatoes or yams. 8) **Preharvest Interval (PHI):** a. 40 days after a lay-by application b. 60 days after at-planting to drag-off application

9.7.2 TANK-MIX COMBINATIONS FOR POTATO

Application	Tank-Mix Brands	Use Directions
Preemergence (East of the Rocky Mountains)	Linex® Lorox®	Apply this tank mix mixture preemergence broadcast application. Apply to the soil surface after planting and before emergence of the crop or after final drag-off.
Preemergence Incorporated **Preemergence** **Early Postemergence**	Prowl	For **preemergence incorporated** use, apply this tank mixture after planting but before potato emerges. Keep incorporation depth above the seed pieces and elongated sprouts, or the crop will be damaged. For **preemergence** use, apply this tank mixture after planting but before potato emerges. For **early postemergence** use, apply this tank mixture after potato emerges.
Preemergence Postemergence	Tricor®	Apply this tank mixture preemergence or postemergence to potatoes. For **postemergence** use, apply this tank mixture as a directed or semi-directed spray to avoid chlorosis, minor necrosis, or leaf distortion.
See **Appendix 12.1** for the EPA Registration Number and Active Ingredient(s) in each listed brand.		
Precaution: • These use directions do not apply to sweet potatoes or yams.		
TANK-MIX USE RESTRICTIONS		
1) All use restrictions cited in **Section 9.7.1** for Dual Magnum Herbicide solo apply to tank-mixes with Dual Magnum Herbicide. 2) It is the pesticide user's responsibility to ensure that all products are registered for the intended use. Read and follow the applicable restrictions and limitations and directions for use on all product labels involved in tank mixing. Users must follow the most restrictive directions for use and precautionary statements of each product in the tank mixture.		

9.8 Pumpkin

Crops (including cultivars, varieties, and/or hybrids)		
Pumpkin		
Application Timing	**Rate (pt/A)**	**Use Directions**
Preemergence (Inter-Row or Inter-Hill)	1.0 - 1.33 pt/A Use the lower rate on soils light in texture (loamy sand or lighter) and low in soil organic matter (less than 3%).	Apply as an inter-row or inter-hill application. Leave 1 foot of untreated area over the row, or 6 inches to each side of the planted hill and/or any emerged pumpkin foliage (inter-row or inter-hill means not directly over the planted seed or young pumpkin plants).
For Weed Control: • Refer to **Section 8.0** for list of weeds controlled or partially controlled.		
Resistance Management: • Refer to **Section 3.1**.		
Precautions: • Dual Magnum Herbicide applied as a broadcast spray over the planted row or hill, or applications made directly to crop foliage will increase the risk of injury to the pumpkin crop such as stand loss, delayed maturity, and loss of yield. • Dual Magnum Herbicide will not control emerged weeds. Control emerged weeds with an appropriate registered foliar herbicide or by mechanical means.		
USE RESTRICTIONS		
1) Refer to **Section 7.1** for additional product use restrictions. 2) **Maximum Single Application Rate:** 1.33 pt/A - (1.27 lb ai/A of *S*-metolachlor) 3) **Minimum Application Interval:** Not Applicable 4) **Maximum Annual Rate:** 1.33 pt/A/year - (1.27 lb ai/A of *S*-metolachlor) a. **DO NOT** exceed 1.27 lb ai/A/year of *S*-metolachlor-containing products. 5) **Preharvest Interval (PHI):** 30 days		

9.9 Rhubarb

Crops (including cultivars, varieties, and/or hybrids)		
Rhubarb		
Application Timing	**Rate (pt/A)**	**Use Directions**
Preemergence	0.67 – 1.33 pt/A Use lower rates on soils relatively coarse textured and higher rates on fine textured soils.	Apply as a broadcast spray to the soil surface. Apply in early spring, prior to crop emergence.
For Weed Control: • Refer to **Section 8.0** for list of weeds controlled or partially controlled.		
Resistance Management: • Refer to **Section 3.1**.		
Precaution: • Dual Magnum Herbicide will not control emerged weeds. Control emerged weeds with an appropriate registered foliar herbicide or by mechanical means.		

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9.9 Rhubarb *(continued)*

USE RESTRICTIONS
1) Refer to **Section 7.1** for additional product use restrictions. 2) **Maximum Single Application Rate:** 1.33 pt/A - (1.27 lb ai/A of *S*-metolachlor) 3) **Minimum Application Interval:** Not Applicable 4) **Maximum Annual Rate:** 1.33 pt/A/year - (1.27 lb ai/A of *S*-metolachlor) a. **DO NOT** exceed 1.27 lb ai/A/year of *S*-metolachlor-containing products. 5) **DO NOT** make more than one application of Dual Magnum Herbicide per crop. 6) **Preharvest Interval (PHI):** 62 days

9.10 Safflowers

Crops (including cultivars, varieties, and/or hybrids)		
Safflowers		
Application Timing	**Rate (pt/A)**	**Use Directions**
Preplant Incorporated	For all applications use the rate for the specific soil texture and organic matter (OM) as follows: *Coarse Soils:* 1.0-1.33 pt/A; <3% OM 1.33 pt/A; ≥ 3% OM *Medium Soils:* 1.33-1.67 pt/A *Fine Soils:* 1.33-1.67 pt/A; <3% OM 1.67-2.0 pt/A; ≥ 3% OM	Apply within 14 days of planting. Apply to the soil and incorporate into the top 2 inches of soil using an implement capable of providing uniform incorporation. Use a preplant incorporated application if furrow irrigation is used or when a period of dry weather after application is expected. If crop will be planted on beds, apply and incorporate after bed formation, unless specified otherwise. **For California Only:** Broadcast alone or with tank mix partners to the soil and thoroughly incorporate with a disk or similar implement set to till 4-6 inches deep. For more thorough incorporation, till the soil in 2 different directions (cross-till). Safflowers may be planted on flat surface or on beds. Use caution when forming the beds to ensure that only soil from the treated zone is used (i.e., do not bring untreated soil to soil surface). If application is made to preformed beds, incorporate with a tillage implement set to till 2-4 inches deep. Use care during tilling to keep the treated, tilled soil on the beds.
Preemergence	For all applications use the rate for the specific soil texture and organic matter (OM) as follows: *Coarse Soils:* 1.0-1.33 pt/A; <3% OM 1.33 pt/A; ≥ 3% OM *Medium Soils:* 1.33-1.67 pt/A *Fine Soils:* 1.33-1.67 pt/A; <3% OM 1.67-2.0 pt/A; ≥ 3% OM	Apply during planting (behind the planter) or after planting. **For California Only:** Apply after planting. Water with sprinkler or flood irrigation within 7-10 days.

For Weed Control: • Refer to **Section 8.0** for list of weeds controlled or partially controlled.
Resistance Management: • Refer to **Section 3.1**.
Precaution: • Dual Magnum Herbicide will not control emerged weeds. Control emerged weeds with an appropriate registered foliar herbicide or by mechanical means.
USE RESTRICTIONS
1) Refer to **Section 7.1** for additional product use restrictions. 2) **Maximum Single Application Rate:** 2.0 pt/A - (1.91 lb ai/A of *S*-metolachlor) 3) **Minimum Application Interval:** Not Applicable 4) **Maximum Annual Rate:** 2.0 pt/A/year - (1.91 lb ai/A of *S*-metolachlor) a. **DO NOT** exceed 1.91 lb ai/A/year of *S*-metolachlor-containing products. 5) **Preharvest Interval (PHI):** Not Applicable

9.11 Sorghum (Concep III Treated Only)

9.11.1 GRAIN OR FORAGE SORGHUM, FALL, PREPLANT SURFACE, PREPLANT INCORPORATED, PREEMERGENCE, OR POSTEMERGENCE APPLICATIONS

Crops (including cultivars, varieties, and/or hybrids of these)		
Sorghum grain (seed-treated with Concep® III only)		Forage sorghum (seed-treated with Concep III only)
Application Timing	**Rate (pt/A)**	**Use Directions**
Fall Application for Residual Control of Glyphosate Resistant Italian Ryegrass	1.33-1.67 pt/A Use the lower rate for *coarse textured soils* and the higher rate for *fine textured soils*.	Apply from September 1 to December 1 after harvest of the previous crop and prior to Italian ryegrass emergence. If tillage follows application, avoid incorporating to a depth greater than 2-3 inches. After emergence of glyphosate resistant Italian ryegrass, a paraquat brand herbicide can be tank-mixed with Dual Magnum Herbicide to control emerged ryegrass.
Preplant Surface Application in CO, IA, IL, KS, MO, NE, and SD	Apply the rate for the specific soil texture as follows: *Coarse Soils:* 1.33 pt/A *Medium Soils:* 1.5 pt/A *Fine Soils:* 1.67 pt/A	Apply up to 45 days before planting. On coarse soils apply no more than 2 weeks prior to planting. Under dry conditions, irrigate after application to activate Dual Magnum Herbicide and improve weed control.
Preplant Incorporated **Preemergence**	Apply the rate for the specific soil texture as follows: *Coarse Soils:* 1.0 - 1.33 pt/A *Medium Soils:* 1.33 - 1.5 pt/A *Fine Soils:* 1.33 -1.67 pt/A	**Preplant Incorporated Application:** Apply within 14 days of planting. Apply to the soil and incorporate into the top 2 inches of soil using an implement capable of providing uniform incorporation. Use a preplant incorporated application if furrow irrigation is used or when a period of dry weather after application is expected. **Preemergence Application:** Apply after planting but before crop emerges.

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9.11.1 GRAIN OR FORAGE SORGHUM, FALL, PREPLANT SURFACE, PREPLANT INCORPORATED, PREEMERGENCE, OR POSTEMERGENCE APPLICATIONS *(continued)*

Application Timing	Rate (pt/A)	Use Directions
Postemergence	Apply the rate for the specific soil texture as follows: *Coarse Soils:* 1.0 - 1.33 pt/A *Medium Soils:* 1.33 - 1.5 pt/A *Fine Soils:* 1.33 -1.67 pt/A	Apply as a broadcast spray. When applied alone, Dual Magnum Herbicide will be safe to emerged sorghum. The risk of sorghum injury increases when adjuvants (e.g., non-ionic, crop oil), nitrogen sources (e.g., AMS, UAN) or fertilizers are applied with Dual Magnum Herbicide.
For Weed Control: • Refer to **Section 8.0** for list of weeds controlled or partially controlled.		
Tank Mix Application Options: • Refer to **Section 9.11.2** for tank-mix options.		
Resistance Management: • Refer to **Section 3.1.**		
Precautions: • If sorghum seed is not properly treated with Concep III seed treatment, applications prior to sorghum emergence will result in severe injury or crop death. • Under high soil moisture conditions prior to sorghum emergence, injury may occur following preplant and preemergence application. The crop will normally outgrow this effect. • Avoid use of Dual Magnum Herbicide on sorghum grown under dry mulch tillage, or injury may occur. • Dual Magnum Herbicide will not control emerged weeds. Control emerged weeds with an appropriate registered foliar herbicide or by mechanical means.		
USE RESTRICTIONS		
1) Refer to **Section 7.1** for additional product use restrictions. 2) **Maximum Single Application Rate:** 1.67 pt/A - (1.59 lb ai/A of *S*-metolachlor) 3) **Minimum Application Interval:** Not Applicable 4) **Maximum Annual Rate:** 1.67 pt/A/year - (1.59 lb ai/A of *S*-metolachlor) a. **DO NOT** exceed 1.68 lb ai/A/year of *S*-metolachlor-containing products. 5) If a spring application is made following a fall application, the total rate of the fall plus spring applications must not exceed the maximum total rate allowed for *S*-metolachlor. 6) More than 1 application per year is allowed but the total must not exceed 1.67 pt/A/year. 7) **DO NOT** apply to frozen ground. 8) **Preharvest Interval (PHI):** 75 days		

9.11.2 TANK-MIX COMBINATIONS FOR SORGHUM (CONCEP III TREATED ONLY)

Application	Tank-Mix Brands	Use Directions
Burndown Weed Control	Gramoxone brands Landmaster® BW Solo glyphosate brands	For use where sorghum (seed treated with Concep III) is planted directly into a cover crop, stale seedbed, established sod, or previous crop residues. Apply before, during or after planting, but before sorghum emerges. The herbicides identified as tank-mix partners may be tank mixed with Dual Magnum Herbicide or Dual Magnum Herbicide + AAtrex.

Application	Tank-Mix Brands	Use Directions
Preplant Surface **Preplant Incorporated** **Preemergence**	AAtrex	Tank mixtures with AAtrex may be applied in water or fluid fertilizer.

See **Appendix 12.1** for the EPA Registration Number and Active Ingredient(s) in each listed brand.

Precautions:

- If sorghum seed is not properly treated with Concep III seed treatment, applications prior to sorghum emergence will result in crop death.
- Applications of Dual Magnum Herbicide + AAtrex on highly alkaline soils or on eroded areas where calcareous subsoils are exposed may cause sorghum injury.
- Burndown, preplant or preemergence applications of Dual Magnum Herbicide to sorghum not treated with Concep III seed treatment will result in severe injury or kill the crop.
- Under high soil moisture conditions prior to sorghum emergence, injury may occur following the use of preplant and preemergence applications of Dual Magnum Herbicide + AAtrex. The crop will normally outgrow this effect.
- Avoid use of Dual Magnum Herbicide + AAtrex on sorghum grown under dry mulch tillage, or injury may occur.

TANK-MIX USE RESTRICTIONS

1) All use restrictions cited in **Section 9.11.1** for Dual Magnum Herbicide solo apply to tank-mixes with Dual Magnum Herbicide.
2) It is the pesticide user's responsibility to ensure that all products are registered for the intended use. Read and follow the applicable restrictions and limitations and directions for use on all product labels involved in tank mixing. Users must follow the most restrictive directions for use and precautionary statements of each product in the tank mixture.
3) **IMPORTANT: FOR TANK MIXTURES WITH AATREX (OR OTHER BRANDS OF ATRAZINE)**
   a. If applying Dual Magnum Herbicide in tank mixture with AAtrex, all the restrictions and rate limitations on the AAtrex label must be followed.
   b. **DO NOT** apply Dual Magnum Herbicide + AAtrex tank mixture on *coarse soils* or *medium soils* with less than 1.5% organic matter.
   c. **DO NOT** apply Dual Magnum Herbicide + AAtrex tank mixture as a preplant incorporated or preemergence treatment in NM, OK, or TX, except in northeast OK and the TX Gulf Coast and Blacklands areas.
   d. **DO NOT** apply Dual Magnum Herbicide + AAtrex tank mixture as a preplant incorporated treatment in AZ or the Imperial Valley of CA.

9.12 Sorghum, Sweet (Concep III Treated Only)

Crops (including cultivars, varieties, and/or hybrids of these)		
Sweet sorghum (seed treated with Concep III only)		
Application Timing	**Rate (pt/A)**	**Use Directions**
Preplant Surface Application	Apply the rate for the specific soil texture as follows: *Coarse Soils:* 1.33 pt/A *Medium Soils:* 1.5 pt/A *Fine Soils:* 1.67 pt/A	On medium and fine soils, apply up to 30 days before planting. On coarse soils apply no more than 14 days prior to planting. To the extent possible, do not move treated soil out of the row or move untreated soil to the surface during planting, or weed control will be diminished. Under dry conditions, irrigate after application to activate Dual Magnum Herbicide and improve weed control.
Preplant Incorporated Preemergence	Apply Dual Magnum Herbicide at the rates below for the soil texture: *Coarse Soils:* 1.0 - 1.33 pt/A *Medium Soils:* 1.33-1.5 pt/A *Fine Soils:* 1.33-1.67 pt/A	**Preplant Incorporated Application:** Make applications within 14 days of planting. Apply to the soil and incorporate into the top 2 inches of soil using an implement capable of providing uniform incorporation. Use a preplant incorporated application if furrow irrigation is used or when a period of dry weather after application is expected. If crop will be planted on beds, apply and incorporate after bed formation, unless specified otherwise. **Preemergence Application:** Apply after planting but before crop emerges. Under dry conditions, irrigate after application to activate Dual Magnum Herbicide and improve weed control.
Postemergence	Apply Dual Magnum Herbicide at the rates below for the soil texture: *Coarse Soils:* 1.0 - 1.33 pt/A *Medium Soils:* 1.33 pt/A *Fine Soils:* 1.33 pt/A	Apply up to a crop height of 5 inches. When applied alone, Dual Magnum Herbicide will be safe to emerged sweet sorghum. Use of adjuvants is prohibited on sweet sorghum.
For Weed Control: • Refer to **Section 8.0** for list of weeds controlled or partially controlled.		
Resistance Management: • Refer to **Section 3.1.**		

Precautions:

- If sweet sorghum seed is not properly treated with Concep III seed treatment, Dual Magnum Herbicide applications prior to sorghum emergence will result in crop death.
- Under high soil moisture conditions prior to sweet sorghum emergence, injury may occur following soil applications. The crop will normally outgrow this effect.
- Avoid use of Dual Magnum Herbicide on sweet sorghum grown under dry mulch tillage, or injury may occur.
- Weed control will be reduced under dry conditions, irrigate after application to activate the Dual Magnum Herbicide.
- Dual Magnum Herbicide will not control emerged weeds. Control emerged weeds with an appropriate registered foliar herbicide or by mechanical means.

USE RESTRICTIONS

1) Refer to **Section 7.1** for additional product use restrictions.
2) **Maximum Single Application Rate:** 1.67 pt/A - (1.59 lb ai/A of *S*-metolachlor)
3) **Minimum Application Interval:** Not Applicable
4) **Maximum Annual Rate:** 1.67 pt/A/year - (1.59 lb ai/A of *S*-metolachlor)
   a. **DO NOT** exceed 1.59 lb ai/A/year of *S*-metolachlor-containing products.
5) **DO NOT** make more than 1 application per year.
6) **Preharvest Interval (PHI):** 90 days

9.13 Soybeans (NOT FOR POSTEMERGENCE USE IN CALIFORNIA)

9.13.1 FALL, PREPLANT SURFACE, PREPLANT INCORPORATED, PREEMERGENCE, OR POSTEMERGENCE APPLICATIONS

Crops (including cultivars, varieties, and/or hybrids of these)		
Soybeans		
Application Timing	**Rate (pt/A)**	**Use Directions**
Fall Application for Spring Weed Control **For use in the following states:** **Iowa** **Illinois** **Minnesota** **Nebraska** **North Dakota** **South Dakota** **Wisconsin**	For minimum-till or no-tillage systems on soils with ≥ 2.5% organic matter, apply rate based on soil texture: *Medium Soils:* Apply 1.67-2.0 pt/A *Fine Soils:* Apply 2.0 pt/A	Apply after harvest when the sustained soil temperature at a 4-inch depth is less than 55° F and falling. Apply to ground that will be planted to soybeans the next spring and time application according to the following geographic schedule: **Apply after September 30** in ND, SD, MN, WI, and north of Route 30 in IA. **Apply after October 15** North of Route 91 in NE and south of Route 30 in IA. **Apply after October 31** North of Route 136 in IL. When fall and/or a spring tillage follows application, avoid incorporating to a depth greater than 2-3 inches. Minimize furrow and ridge formation in the tillage operations.

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9.13.1 FALL, PREPLANT SURFACE, PREPLANT INCORPORATED, PREEMERGENCE, OR POSTEMERGENCE APPLICATIONS *(continued)*

Application Timing	Rate (pt/A)	Use Directions
Fall Application for Residual Control of Glyphosate Resistant Italian Ryegrass	1.33 – 1.67 pt/A Use the lower rate for *coarse textured soils* and the higher rate for *fine textured soils*.	Apply from September 1 – December 1 after harvest of the previous crop and prior to Italian ryegrass emergence. If tillage follows application, avoid incorporating to a depth greater than 2-3 inches. After emergence of glyphosate resistant Italian ryegrass, a Gramoxone brand herbicide can be tank-mixed with Dual Magnum Herbicide to control emerged ryegrass.
Preplant Surface Application	Apply Dual Magnum Herbicide at rates below for the soil texture: *Coarse Soils:* 1.33 pt/A *Medium Soils:* 1.67 pt/A *Fine Soils:* 2.0 pt/A For extended residual or control of heavy weed infestations, up to 2.6 pt/A is allowed.	Apply up to 14 days prior to planting on coarse soils. Apply up to 30 days before planting on medium or fine soils.
Preplant Incorporated Preemergence	For all applications use the rate for the specific soil texture and organic matter (OM) as follows: *Coarse Soils:* 1.0-1.33 pt/A; <3% OM 1.33 pt/A; ≥ 3% OM *Medium Soils:* 1.33-1.67 pt/A *Fine Soils:* 1.33-1.67 pt/A; <3% OM 1.67-2.0 pt/A; ≥ 3% OM For extended residual or control of heavy weed infestations, up to 2.6 pt/A is allowed.	**Preplant Incorporation Application:** Apply within 14 days of planting. Apply to the soil and incorporate into the top 2 inches of soil using an implement capable of providing uniform incorporation. Use a preplant incorporated application if furrow irrigation is used or when a period of dry weather after application is expected. If crop will be planted on beds, apply and incorporate after bed formation, unless specified otherwise. **Preemergence Application:** Apply during planting or after planting but before crop emerges.
Postemergence	1.0 – 2.0 pt/A Use the lower rate for *coarse textured soils* and the higher rate for *fine textured soils*.	Apply to extend the duration of weed control in soybean.
For Weed Control: • Refer to **Section 8.0** for list of weeds controlled or partially controlled.		
Tank Mix Application Options: • Refer to **Section 9.13.2** for tank-mix options.		
Resistance Management: • Refer to **Section 3.1.**		

Precautions:

- For preplant surface application, to the extent possible, avoid moving treated soil out of the row or moving untreated soil to the surface during planting or weed control will be diminished.
- Dual Magnum Herbicide will not control emerged weeds. Control emerged weeds with an appropriate registered foliar herbicide or by mechanical means.

USE RESTRICTIONS

1) Refer to **Section 7.1** for additional product use restrictions.
2) **Maximum Single Application Rate:**
   a. **DO NOT** apply more than 2.6 pt/A in a single preemergence application - (2.48 lb ai/A of *S*-metolachlor).
   b. **DO NOT** apply more than 2.0 pt/A in a single postemergence application - (1.91 lb ai/A of *S*-metolachlor).
3) **Minimum Application Interval:** Not Applicable
4) **Maximum Annual Rate:** 3.9 pt/A/year - (3.71 lb ai/A of *S*-metolachlor)
   a. **DO NOT** exceed 3.71 lb ai/A/year of *S*-metolachlor-containing products.
5) The combined total amount of Dual Magnum Herbicide from all applications in the fall plus spring must not exceed the maximum allowed annual rate.
6) More than one postemergence application may be applied, but the total applied to the crop must not exceed 3.9 pt/A/year.
7) **DO NOT** apply Dual Magnum Herbicide to frozen ground.
8) **DO NOT** graze or feed treated forage, hay, or straw from soybeans to livestock for 30 days following a preplant surface, preplant incorporated or preemergence application.
9) **DO NOT** graze or feed treated forage or hay from soybeans to livestock following a postemergence application.
10) **Preharvest Interval (PHI):** 75 days

9.13.2 TANK-MIX COMBINATIONS FOR SOYBEANS

Application	Tank-Mix Brands	Use Directions
Preplant Surface Preemergence	Gramoxone brands Solo glyphosate brands	Use these tank mixtures for burndown plus residual control in reduced or no-till systems.
	Authority® MTZ TriCor Canopy® Authority® First Authority® Maxx Classic® FirstRate® Sharpen® Sonic® Verdict®	Use these tank mixtures for additional residual control. Do not use this Authority MTZ of Tricor tank mixes on soil with less than 0.5% organic matter or on alkaline soils with a pH over 7.4. If heavy rain occurs soon after application, crop injury may result. Use of Authority MTZ of Tricor is not recommended for soybean varieties known to be metribuzin sensitive.
Postemergence	Classic FirstRate Flexstar® Fusilade® DX Fusion® Prefix® Python® Reflex®	Use these tank mixtures for control of emerged weeds plus residual control of grasses and small-seeded broadleaf weeds. Follow the tank-mix partner label for adjuvant use instructions.

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9.13.2 TANK-MIX COMBINATIONS FOR SOYBEANS *(continued)*

Application	Tank-Mix Brands	Use Directions
Postemergence to Glyphosate Resistant Soybeans	Flexstar® GT Solo glyphosate brands	Use these tank mixtures only on glyphosate resistant soybeans. Use of Dual Magnum Herbicide in these tank mixtures will provide residual control of weeds listed in **Section 8.0**. Follow the tank-mix partner label for adjuvant use instructions. Apply only to soybeans that are resistant to glyphosate.
Postemergence to Glufosinate Resistant Soybeans	Liberty	Use this tank mixture only on soybeans that are resistant to glufosinate (e.g., LibertyLink®). Use of Dual Magnum Herbicide in this tank mixture will provide residual control of weeds listed in **Section 8.0**. Follow the Liberty product label for adjuvant use instructions. Apply only to soybeans that are resistant to glufosinate.
See **Appendix 12.1** for the EPA Registration Number and Active Ingredient(s) in each listed brand.		
Precaution: • The use of COC or UAN with Dual Magnum Herbicide may result in temporary crop injury with postemergence applications.		
TANK-MIX USE RESTRICTIONS		
1) All use restrictions cited in Section **9.13.1** for Dual Magnum Herbicide solo apply to tank mixes with Dual Magnum Herbicide. 2) It is the pesticide user's responsibility to ensure that all products are registered for the intended use. Read and follow the applicable restrictions and limitations and directions for use on all product labels involved in tank mixing. Users must follow the most restrictive directions for use and precautionary statements of each product in the tank mixture.		

9.14 Sugar Beets

9.14.1 POSTEMERGENCE APPLICATION

Crops (including cultivars, varieties, and/or hybrids of these)		
Sugar Beets		
Application Timing	**Rate (pt/A)**	**Use Directions**
Postemergence	Apply Dual Magnum Herbicide at rates below for the soil texture: *Coarse Soils:* 1.0 pt/A *Medium Soils:* 1.33 pt/A *Fine Soils:* 1.67 pt/A	Apply after sugar beets have reached first true leaf stage. More than one postemergence application may be made.
For Weed Control: • Refer to **Section 8.0** for list of weeds controlled or partially controlled.		
Tank Mix Application Options: • Refer to **Section 9.14.2** for tank-mix options.		
Resistance Management: • Refer to **Section 3.1.**		
Precaution: • Dual Magnum Herbicide will not control emerged weeds. Control emerged weeds with an appropriate registered foliar herbicide or by mechanical means.		

USE RESTRICTIONS
1) Refer to **Section 7.1** for additional product use restrictions. 2) **Maximum Single Application Rate:** 1.67 pt/A - (1.59 lb ai/A of *S*-metolachlor) 3) **Minimum Application Interval:** Not Applicable 4) **Maximum Annual Rate:** 2.67 pt/A/year - (2.54 lb ai/A of *S*-metolachlor) a. **DO NOT** exceed 2.54 lb ai/A/year of *S*-metolachlor-containing products. 5) More than one postemergence application may be applied, but the total must not exceed 2.67 pt/A. 6) **Preharvest Interval (PHI):** 60 days

9.14.2 TANK-MIX COMBINATIONS FOR SUGAR BEETS

Application	Tank-Mix Brands	Use Directions
Postemergence	Assure® II Poast® Select® Stinger® Upbeet®	Tank mixtures of these products will increase the risk of crop injury over that of either product applied alone.
See **Appendix 12.1** for the EPA Registration Number and Active Ingredient(s) in each listed brand.		
Precautions: • The addition of a spray adjuvant such as crop oil concentrates (COC's) or methylated seed oils (MSO's) can further increase the risk of crop injury. • Injury risk can be reduced by using the lowest effective rate of the tank mix partner(s) and/or adjuvant and by avoiding applications under adverse growing conditions or high soil or air humidity.		
TANK-MIX USE RESTRICTIONS		
1) All use restrictions cited in **Section 9.14.1** for Dual Magnum Herbicide solo apply to tank-mixes with Dual Magnum Herbicide. 2) It is the pesticide user's responsibility to ensure that all products are registered for the intended use. Read and follow the applicable restrictions and limitations and directions for use on all product labels involved in tank mixing. Users must follow the most restrictive directions for use and precautionary statements of each product in the tank mixture.		

9.15 Sugarcane (NOT FOR USE IN CALIFORNIA)

9.15.1 PREPLANT, PREEMERGENCE, AND POSTEMERGENCE APPLICATIONS

Crops (including cultivars, varieties, and/or hybrids of these)		
Sugarcane		
Application Timing	**Rate (pt/A)**	**Use Directions**
Preplant	1.78 – 2.44 pt/A	See **Section 4.3** for Application Volume and Spray coverage information. Apply by ground or air prior to planting of cane. Application can also be made after harvest of ratoon cane. Apply by ground or air as a broadcast application for the residual control of certain grasses and broadleaf weeds, plus yellow nutsedge. Dual Magnum Herbicide will not control emerged weeds.

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9.15.1 PREPLANT, PREEMERGENCE, AND POSTEMERGENCE APPLICATIONS *(continued)*

Application	Tank-Mix Brands	Use Directions
Preemergence	1.78 – 2.44 pt/A	See **Section 4.3** for Application Volume and Spray coverage information. Apply by ground or air after planting of cane but prior to crop emergence. Application can also be made after harvest of ratoon cane. Apply by ground or air as a broadcast application for the residual control of certain grasses and broadleaf weeds, plus yellow nutsedge. Dual Magnum Herbicide will not control emerged weeds.
Postemergence	1.00 – 1.96 pt/A	See **Section 4.3** for Application Volume and Spray coverage information. Apply by ground or air as a broadcast application for the residual control of certain grasses and broadleaf weeds, plus yellow nutsedge. Dual Magnum Herbicide will not control emerged weeds. If a preplant or preemergence application was made earlier in the season (not to exceed 2.44 pt/A) only 1.0 pt/A maybe applied postemergence. The total amount of Dual Mangum applied preplant, preemergence and postemergence cannot exceed 3.49 pt/A/year- (3.34 lb ai/A/year).

For Weed Control:
- Refer to **Section 8.0** for list of weeds controlled or partially controlled.

Tank Mix Application Options:
- Refer to **Section 9.15.2** for tank-mix options.

Resistance Management:
- Refer to **Section 3.1**.

USE PRECAUTIONS

- Postemergence application rates less than 1.0 pt/A may result in incomplete weed control and loss of residual control.
- The addition of a spray adjuvant such as crop oil concentrates (COC's) or methylated seed oils (MSO's) can increase the risk of crop injury.

USE RESTRICTIONS

1) Refer to **Section 7.1** for additional product use restrictions.
2) **Maximum Single Preplant or Preemergence Application Rate:** 2.44 pt/A - (2.32 lb ai/A of *S*-metolachlor)
3) **Maximum Single Postemergence Application Rate:** 1.96 pt/A - (1.87 lb ai/A of *S*-metolachlor)
4) **Maximum Single Postemergence Application Rate, if a Preplant or Preemergence application was made:** 1.0 pt/A - (0.95 lb ai/A of *S*-metolachlor)
5) **DO NOT** make more than two applications of Dual Magnum Herbicide.
6) **DO NOT** make application to sugarcane greater than 60 inches in height.
7) **Minimum Application Interval:** 2 weeks
8) **Maximum Annual Rate:** 3.49 pt/A/year- (3.32 lb ai/A of *S*-metolachlor)
   a. **DO NOT** exceed 3.34 lb ai/A/year of s-metolachlor-containing products.
9) **Preharvest Interval (PHI):**
   a. **DO NOT** apply within 100 days of harvest.

9.15.2 TANK-MIX COMBINATIONS FOR SUGARCANE

Application	Tank-Mix Brands	Use Directions
Preplant	Solo glyphosate brands Gramoxone brands	These tank-mixtures are for the control of emerged weeds prior to sugarcane emergence. Do not apply solo glyphosate brands or Gramoxone brands postemergence over- the-top to emerged sugarcane. If Dual Magnum Herbicide is tank-mixed with other herbicides follow the label restrictions for the most restrictive tank-mix partner(s).
Preemergence	AAtrex brands or other solo atrazine products Callisto® or Explorer® Callisto Xtra® Envoke® Evik® Prowl, Prowl® H2O or other solo pendimethalin products TriCor or other solo metribuzin products	These tank mixtures are for improved weed control spectrum. If Dual Magnum Herbicide is tank-mixed with other herbicides follow the label restrictions for the most restrictive tank-mix partner(s).
Postemergence	AAtrex brands or other solo atrazine products Callisto or Explorer Callisto Xtra 2,4-D Armezon® or other solo tropramezone products Banvel, Clarity® or other solo dicamba containing products Envoke Evik Permit® or other solo halosulfuron products TriCor or other solo metribuzin products	These tank mixtures are for improved spectrum and improved postemergence weed control. If Dual Magnum Herbicide is tank-mixed with other herbicides follow the label restrictions for the most restrictive tank-mix partner(s).
See **Appendix 12.1** for the EPA Registration Number and Active Ingredient(s) in each listed brand.		
TANK-MIX USE PRECAUTIONS		
Precautions: • The addition of a spray adjuvant such as a crop oil concentrate (COC) or methylated seed oil (MSO) can increase the risk of crop injury. • Injury risk can be reduced by using the lowest effective rate of the tank mix partner(s) and/or adjuvant and by avoiding applications under adverse growing conditions or high soil or air humidity. • Not all tank-mixes have been tested for crop tolerance. Experiment on a limited basis until on-farm confidence in these tank-mixes are obtained.		

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9.15.2 TANK-MIX COMBINATIONS FOR SUGARCANE *(continued)*

TANK-MIX USE RESTRICTIONS
1) All use restrictions cited in **Section 9.15.1** for Dual Magnum Herbicide solo apply to tank mixes with Dual Magnum Herbicide. 2) It is the pesticide user's responsibility to ensure that all products are registered for the intended use. Read and follow the applicable restrictions and limitations and directions for use on all product labels involved in tank mixing. Users must follow the most restrictive directions for use and precautionary statements of each product in the tank mixture.

9.16 Sunflowers

Crops (including cultivars, varieties, and/or hybrids of these)		
Sunflowers		
Application Timing	**Rate (pt/A)**	**Use Directions**
Preplant Incorporated **Preemergence**	For all applications use the rate for the specific soil texture and organic matter (OM) as follows: *Coarse Soils:* 1.0-1.33 pt/A; <3% OM 1.33 pt/A; ≥ 3% OM *Medium Soils:* 1.33-1.67 pt/A *Fine Soils:* 1.33-1.67 pt/A; <3% OM 1.67-2.0 pt/A; ≥ 3% OM Within the rate range, use the higher rate of Dual Magnum Herbicide if heavy weed infestations are expected.	**Preplant Incorporation Application:** Apply within 14 days of planting. Apply to the soil and incorporate into the top 2 inches of soil using an implement capable of providing uniform incorporation. Use a preplant incorporated application if furrow irrigation is used or when a period of dry weather after application is expected. If crop will be planted on beds, apply and incorporate after bed formation, unless specified otherwise. **Preemergence Application:** Apply after planting but before crop emerges.
For Weed Control: • Refer to **Section 8.0** for list of weeds controlled or partially controlled.		
Resistance Management: • Refer to **Section 3.1.**		
Precaution: • Dual Magnum Herbicide will not control emerged weeds. Control emerged weeds with an appropriate registered foliar herbicide or by mechanical means.		
USE RESTRICTIONS		
1) Refer to **Section 7.1** for additional product use restrictions. 2) **Maximum Single Application Rate:** 2.0 pt/A - (1.91 lb ai/A of *S*-metolachlor) 3) **Minimum Application Interval:** Not Applicable 4) **Maximum Annual Rate:** 2.0 pt/A/year - (1.91 lb ai/A of *S*-metolachlor) a. **DO NOT** exceed 1.91 lb ai/A/year of *S*-metolachlor-containing products. 5) **DO NOT** exceed the maximum label rates given above for the soil type. 6) **DO NOT** allow livestock to graze or feed in treated area. 7) **Preharvest Interval (PHI):** Not Applicable		

9.17 Tomato

Crops (including cultivars, varieties, and/or hybrids of these)		
Tomato, seeded		Tomato, transplanted
Application Timing	**Rate (pt/A)**	**Use Directions**
For Transplanted Tomatoes **Preplant Incorporated** **Preplant** **Post-Directed**	For all applications, use the rate for the specific soil texture and organic matter (OM) as follows: *Coarse Soils:* 1.0-1.33 pt/A; <3% OM 1.33 pt/A; ≥ 3% OM *Medium Soils:* 1.33-1.67 pt/A *Fine Soils:* 1.33-1.67 pt/A; <3% OM 1.67-2.0 pt/A; ≥ 3% OM	**Preplant Incorporation Application:** Apply to the soil and incorporate into the soil using an implement capable of providing uniform incorporation. Use a preplant incorporated application if furrow irrigation is used or when a period of dry weather after application is expected. **Preplant Application:** Apply before transplanting and keep soil disturbance to a minimum during the transplanting operation. In bedded transplanted tomatoes, apply Dual Magnum Herbicide preplant non-incorporated to the top of the pressed bed, as the last step prior to laying plastic. Dual Magnum Herbicide may also be used to treat row-middles in bedded tomatoes, as long as the total amount of Dual Magnum Herbicide does not exceed the maximum allowed per crop. **Post-Directed Application:** Apply after the first settling rain or irrigation. Apply in a minimum of 20 gallons of water per acre and minimize contact with tomato plants.
For Seeded Tomatoes **Post-Directed**	For all applications, use the rate for the specific soil texture and organic matter (OM) as follows: *Coarse Soils:* 1.0-1.33 pt/A; <3% OM 1.33 pt/A; ≥ 3% OM *Medium Soils:* 1.33-1.67 pt/A *Fine Soils:* 1.33-1.67 pt/A; <3% OM 1.67-2.0 pt/A; ≥ 3% OM	Apply to when tomato plants are at least 4 inches tall. Apply in a minimum of 20 gallons of water per acre. Minimize spray contact with tomato plants.
For Weed Control: • Refer to **Section 8.0** for list of weeds controlled or partially controlled.		
Resistance Management: • Refer to **Section 3.1.**		

continued...

9.17 Tomato *(continued)*

Precautions:

- Application to varieties or cultivars with unknown tolerance to Dual Magnum Herbicide may result in crop injury.
- Dual Magnum Herbicide may damage transplants that have been weakened by any cause. To prevent damage, plant only healthy transplants and avoid planting when wet, cool, or unfavorable growing conditions exist.
- In transplanted tomatoes, if Dual Magnum Herbicide is applied preplant incorporated, incorporate to a depth less than the depth of transplanting, and use the lower end of the rate range for the given soil type, or damage may occur.
- For row middle applications where tomatoes are grown on sandy soils and where high soil moisture conditions can exist (e.g., low binding and high evaporation conditions), as may be found in the States of Florida, Georgia, Maryland, and Virginia, there is potential for crop injury in the form of leaf epinasty. The risk of this type of injury can be reduced by: a) incorporating the Dual Magnum Herbicide immediately following application, b) applying the Dual Magnum Herbicide seven or more days before transplanting (but only after the beds have been formed), c) minimizing the application of Dual Magnum Herbicide onto the plastic of the bed, or d) any combination of the above.
- Dual Magnum Herbicide will not control emerged weeds. Control emerged weeds with an appropriate registered foliar herbicide or by mechanical means.

USE RESTRICTIONS

1) Refer to **Section 7.1** for additional product use restrictions.
2) **Maximum Single Application Rate:** 2.0 pt/A - (1.91 lb ai/A of *S*-metolachlor)
3) **Minimum Application Interval:** Not Applicable
4) **Maximum Annual Rate:** 2.0 pt/A/year - (1.91 lb ai/A of *S*-metolachlor)
   a. **DO NOT** exceed 1.91 lb ai/A/year of *S*-metolachlor-containing products.
5) Apply only by ground application.
6) When applying at 1.33 pt/A - (1.27 lb ai/A of *S*-metolachlor) per year with a 30 day PHI:
   a. **DO NOT** exceed two applications per growing season and do not use adjuvants.
7) **Preharvest Interval (PHI):**
   a. 30 days, if the total amount of Dual Magnum Herbicide applied does not exceed 1.33 pt/A/year.
   b. 90 days, if the total amount of Dual Magnum Herbicide applied is greater than 1.33 pt/A/year.

10.0 STORAGE AND DISPOSAL

STORAGE AND DISPOSAL

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

Pesticide Storage

This product may be stored at temperatures down to 30 degrees below 0°F.

Pesticide Disposal

Open dumping is prohibited. Wastes resulting from the use of this product are toxic. Improper disposal of unused pesticide, spray mixture, or rinsate is a violation of federal law. Pesticide, spray mixture, or rinsate that cannot be used according to label instructions must be disposed of according to federal, state, or local procedures. For guidance in proper disposal methods, contact your State Pesticide or Environmental Control Agency, or the Hazardous Waste representative at the nearest EPA Regional Office.

Container Handling (less than or equal to 5 gallons)

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

continued…

Container Handling (greater than 5 gallons)

Non-refillable container. Do not reuse or refill this container. Triple rinse container (or equivalent) promptly after emptying. Triple rinse as follows: Empty the remaining contents into application equipment or a mix tank. Fill the container 1/4 full with water. Replace and tighten closures. Tip container on its side and roll it back and forth, ensuring at least one complete revolution, for 30 seconds. Stand the container on its end and tip it back and forth several times. Turn the container over onto its other end and tip it back and forth several times. Empty the rinsate into application equipment or a mix tank or store rinsate for later use or disposal. Repeat this procedure two more times. Then offer for recycling if available or puncture and dispose of in a sanitary landfill, or by incineration, or by other procedures approved by state and local authorities.

Container Handling (greater than 5 gallons)

Refillable container. Refill this container with pesticide only. Do not reuse this container for any other purpose. Cleaning the container before final disposal is the responsibility of the person disposing of the container. Cleaning before refilling is the responsibility of the person refilling. To clean container before final disposal, empty the remaining contents from this container into application equipment or mix tank. Fill the container about 10 percent full with water. Agitate vigorously or recirculate water with the pump for 2 minutes. Pour or pump rinsate into application equipment or rinsate collection system. Repeat this rinsing procedure two more times. Then offer for recycling if available or puncture and dispose of in a sanitary landfill, or by incineration, or by other procedures approved by state and local authorities.

CONTAINER IS NOT SAFE FOR FOOD, FEED, OR DRINKING WATER.

11.0 CONDITIONS OF SALE AND LIMITATION OF WARRANTY AND LIABILITY

NOTICE: Read the entire Directions for Use and Conditions of Sale and Limitation of Warranty and Liability before buying or using this product. If the terms are not acceptable, return the product at once, unopened, and the purchase price will be refunded.

The Directions for Use of this product must be followed carefully. It is impossible to eliminate all risks inherently associated with the use of this product. Crop injury, ineffectiveness or other unintended consequences may result because of such factors as manner of use or application, weather or crop conditions, presence of other materials or other influencing factors in the use of the product, which are beyond the control of SYNGENTA CROP PROTECTION, LLC or Seller. To the extent permitted by applicable law, Buyer and User agree to hold SYNGENTA and Seller harmless for any claims relating to such factors.

SYNGENTA warrants that this product conforms to the chemical description on the label and is reasonably fit for the purposes stated in the Directions for Use, subject to the inherent risks referred to above, when used in accordance with directions under normal use conditions. To the extent permitted by applicable law: (1) this warranty does not extend to the use of the product contrary to label instructions, or under conditions not reasonably foreseeable to or beyond the control of Seller or SYNGENTA, and (2) Buyer and User assume the risk of any such use. TO THE EXTENT PERMITTED BY APPLICABLE LAW, SYNGENTA MAKES NO WARRANTIES OF MERCHANTABILITY OR OF FITNESS FOR A PARTICULAR PURPOSE NOR ANY OTHER EXPRESS OR IMPLIED WARRANTY EXCEPT AS WARRANTED BY THIS LABEL.

To the extent permitted by applicable law, in no event shall SYNGENTA be liable for any incidental, consequential or special damages resulting from the use or handling of this product. **TO THE EXTENT PERMITTED BY APPLICABLE LAW, THE EXCLUSIVE REMEDY OF THE USER OR BUYER, AND THE EXCLUSIVE LIABILITY OF SYNGENTA AND SELLER FOR ANY AND ALL CLAIMS, LOSSES, INJURIES OR DAMAGES (INCLUDING CLAIMS BASED ON BREACH OF WARRANTY, CONTRACT, NEGLIGENCE, TORT, STRICT LIABILITY OR OTHERWISE) RESULTING FROM THE USE OR HANDLING OF THIS PRODUCT, SHALL BE THE RETURN OF THE PURCHASE PRICE OF THE PRODUCT OR, AT THE ELECTION OF SYNGENTA OR SELLER, THE REPLACEMENT OF THE PRODUCT.**

SYNGENTA and Seller offer this product, and Buyer and User accept it, subject to the foregoing Conditions of Sale and Limitation of Warranty and Liability, which may not be modified except by written agreement signed by a duly authorized representative of SYNGENTA.

12.0 APPENDIX

12.1 Tank-Mix Partner Table

Product Name	EPA Registration Number	Active Ingredient(s)
2,4-D	1381-102-(multiple)	2,4-D
AAtrex	100-497 & 100-585	atrazine
Banvel	55947-38	dicamba
Gramoxone	100-1431 & 100-1652	paraquat
Roundup	524-549-(multiple)	Solo glyphosate
Princep	100-526 & 100-603	simazine
Balance Flexx	264-1067	isoxaflutole
Status	7969-242	dicamba + Diflufenzopyr
Liberty	264-829 & 7969-448	glufosinate-Ammonium
Cotoran	66222-181	fluometuron
Caparol	100-620	prometryn
Eptam	10163-281 & 10163-283	EPTC
Treflan	34704-853-(multiple)	trifluralin
Prowl & Prowl H2O	241-337 & 241-418	pendimethalin
Pursuit	241-310	imazethapyr
Sonalan	10163-355 & 10163-356	ethalfluralin
Basagran	7969-112-(multiple)	bentazon
Butyrac	42750-39 & 42750-38	2,4-DB
Storm	7050-59	bentazon + acifluorfen
Linex	61842-21	linuron
Lorox	61842-23	linuron
Tricor	70506-68 & 70506-103	metribuzin
Landmaster BW	42750-62	glyphosate + 2,4-D
Authority MTZ	279-3340	metribuzin + sulfentrazone
Canopy	352-444	metribuzin + chlorimuron
Authority First	279-3246	sulfentrazone + cloransulam
Classic	352-436	chlorimuron
FirstRate	62719-275	cloransulam
Sharpen	7969-278	saflufenacil
Sonic	62719-680	sulfentrazone + cloransulam
Verdict	7969-279	dimethenamid-p + saflufenacil
Flexstar	100-1101	fomesafen
Fusilade DX	100-1070	fluazifop
Fusion	100-1059	fluazifop + fenoxaprop

Product Name	EPA Registration Number	Active Ingredient(s)
Prefix	100-1268	*S*-metolachlor + fomesafen
Python	62719-277	flumetsulam
Reflex	100-933	fomesafen
Flexstar GT	100-1385	fomesafen + glyphosate
Liberty	264-829 & 7969-448	glufosinate
Assure II	352-541 & 5481-646	quizalofop
Select	59639- & 59639-3-1381	clethodim
Poast	7969-58	sethoxydim
Stinger	62719-73	clopyralid
Upbeet	279-9584	triflusulfuron
Callisto Xtra	100-1359	atrazine + mesotrione
Callisto	100-1131	mesotrione
Explorer	100-1131	mesotrione
Envoke	100-1132	trifloxysulfuron-sodium
Evik	100-786	ametryn
Clarity	7996-137	dicamba
Permit	81880-2-10163	halosulfuron
Armezon	7969-262	topramezone

AAtrex®, Callisto®, Callisto Xtra®, Caparol®, Concep III®, Dual Magnum®, Envoke®, Evik®, Explorer®, Flexstar®, Flexstar® GT, Fusilade® DX, Fusion®, Gramoxone®, Prefix®, Princep®, Reflex®, and the ALLANCE Frame and the PURPOSE ICON and the Syngenta logo are Trademarks of a Syngenta Group Company

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Authority® First, Authority® Maxx, Authority® MTC, and Upbeet® are trademarks of FMC Corporation

Cotoran® is a trademark of ADAMA

For non-emergency (e.g., current product information), call
Syngenta Crop Protection at 1-866-796-4368.

Manufactured for:
Syngenta Crop Protection, LLC
P. O. Box 18300
Greensboro, North Carolina 27419-8300

SCP 816A-L1Z 1222
4175484

Sale, use, and distribution of this product in Nassau and Suffolk Counties in the State of New York is prohibited.

S-METOLACHLOR	GROUP 15	HERBICIDE

Dual Magnum® Herbicide

For weed control in corn; cotton; grasses grown for seed; horseradish; legume vegetables; peanuts; potatoes; pumpkin; rhubarb; safflowers; sorghum (forage, grain and sweet); soybean; sugar beets; sugarcane; sunflowers; and tomatoes

Active Ingredient:

S-metolachlor *:	83.7%
Other Ingredients:	16.3%
Total:	100.0%

*CAS No. 87392-12-9

Dual Magnum® Herbicide is formulated as an Emulsifiable Concentrate (EC) and contains the equivalent of 83.7% or 7.62 lb of active ingredient per gallon.

See additional precautionary statements and directions for use inside booklet.

AGRICULTURAL USE REQUIREMENTS

Use this product only in accordance with its labeling and with the Worker Protection Standard, 40 CFR part 170. Refer to supplemental labeling under "Agricultural Use Requirements" in the Directions for Use section for information about this standard.

EPA Reg. No. 100-816

EPA Est. 070989-IA-001^{OMH}

EPA Est. 100-NE-001^{MHA}

(Superscript is first three letters of batch code on container)

Manufactured for:
Syngenta Crop Protection, LLC
P. O. Box 18300
Greensboro, North Carolina 27419-8300

SCP 816A-L1Z 1222
4175484

2.5 gallons

Net Contents

KEEP OUT OF REACH OF CHILDREN

CAUTION

PRECAUTIONARY STATEMENTS

Hazards to Humans and Domestic Animals

Causes moderate eye irritation. Harmful if swallowed or absorbed through skin. Avoid contact with eyes, skin, or clothing. Wash thoroughly with soap and water after handling and before eating, drinking, chewing gum, using tobacco, or using the toilet. Remove and wash contaminated clothing before reuse. Prolonged or frequently repeated skin contact may cause allergic reactions in some individuals.

FIRST AID

If in eyes: Hold eye open and rinse slowly and gently with water for 15-20 minutes. Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye. Call a poison control center or doctor for treatment advice. **If on skin or clothing:** Take off contaminated clothing. Rinse skin immediately with plenty of water for 15-20 minutes. Call a poison control center or doctor for treatment advice. **If swallowed:** Call a poison control center or doctor immediately for treatment advice. Have person sip a glass of water if able to swallow. Do not induce vomiting unless told to by a poison control center or doctor. Do not give anything by mouth to an unconscious person. **If inhaled:** Move person to fresh air. If person is not breathing, call 911 or an ambulance, then give artificial respiration, preferably mouth-to-mouth, if possible. Call a poison control center or doctor for further treatment advice. Have the product container or label with you when calling a poison control center or doctor, or going for treatment. **SYNGENTA HOTLINE NUMBER:** For 24-Hour Medical Emergency Assistance (Human or Animal) Or Chemical Emergency Assistance (Spill, Leak, Fire or Accident), Call **1-800-888-8372.**

Environmental Hazards: Do not apply directly to water, to areas where surface water is present, or to intertidal areas below the mean high water mark. Do not contaminate water when disposing of equipment washwater or rinsate.

Groundwater Advisory: *S*-metolachlor is known to leach through soil into groundwater under certain conditions as a result of label use. This chemical may leach groundwater if used in areas where soils are permeable, particularly where the water table is shallow.

Surface Water Advisory: This product may impact surface water quality due to runoff of rain water or through ground spray drift. This is especially true for poorly draining soils and soils with shallow groundwater. This product is classified as having high potential for reaching surface water via runoff for several weeks or months after application. A level, well-maintained vegetative buffer strip between areas to which this product is applied and surface water features such as ponds, streams, and springs will reduce the potential loading of *S*-metolachlor from runoff water and sediment. Runoff of this product will be reduced by avoiding applications when rainfall or irrigation is expected to occur within 48 hours.

Non-target Organism Advisory: This product is toxic to plants and may adversely impact the forage and habitat of non-target organisms, including pollinators, in areas adjacent to the treated site. Protect the forage and habitat of non-target organisms by following label directions intended to minimize spray drift.

Reporting Ecological Incidents: To report ecological incidents, including mortality, injury, or harm to plants and animals, call 1-800-888-8372.

Mixing/Loading /Application Instructions: Care must be taken when using this product to prevent back-siphoning into wells, spills, or improper disposal of excess pesticide, spray mixtures, or rinsates. Check-valves or anti-siphoning devices must be used on all mixing and/or irrigation equipment.

- This product must not be mixed or loaded within 50 ft of perennial or intermittent streams and rivers, natural or impounded lakes and reservoirs.
- This product must not be mixed/loaded or used within 50 ft of all wells, including abandoned wells, drainage wells, and sink holes.
- Operations that involve mixing, loading, rinsing, or washing of this product into or from pesticide handling or application equipment or containers within 50 ft 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.
  - o Such a pad shall be designed and maintained to contain any product spills or equipment leaks, container or equipment rinse or washwater, and rain water that may fall on the pad.
  - o Surface water shall not be allowed to either flow over or from the pad, which means the pad must be self-contained.
  - o The pad shall be sloped to facilitate material removal.
  - o 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.
  - o 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-specified minimum containment capacities do not apply to vehicles when delivering pesticide shipments to the mixing/loading site.

STORAGE AND DISPOSAL

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

Pesticide Storage: This product may be stored at temperatures down to 30 degrees below 0°F.

Pesticide Disposal: Open dumping is prohibited. Wastes resulting from the use of this product are toxic. Improper disposal of unused pesticide, spray mixture, or rinsate is a violation of federal law. Pesticide, spray mixture, or rinsate that cannot be used according to label instructions must be disposed of according to federal, state, or local procedures. For guidance in proper disposal methods, contact your State Pesticide or Environmental Control Agency, or the Hazardous Waste representative at the nearest EPA Regional Office.

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

CONTAINER IS NOT SAFE FOR FOOD, FEED, OR DRINKING WATER.

syngenta®

(01) 0 07 02941 53275 5

DUAL MAGNUM

Version	Revision Date:	SDS Number:	This version replaces all previous versions.
5.1	05/19/2022	S22054246	

SECTION 1. IDENTIFICATION

Product name : DUAL MAGNUM

Design code. : A9793D

Product Registration number : 100-816

Manufacturer or supplier's details

Company name of supplier : Syngenta Crop Protection, LLC
Address : Post Office Box 18300
Greensboro NC 27419
United States of America (USA)
Telephone : 1 800 334 9481
Telefax : 1 336 632 2192

E-mail address : sds.requests@syngenta.com
Emergency telephone : 1 800 888 8372

Recommended use of the chemical and restrictions on use

Recommended use : Herbicide

Restrictions on use : General Use Pesticide

SECTION 2. HAZARDS IDENTIFICATION

GHS classification in accordance with the OSHA Hazard Communication Standard (29 CFR 1910.1200)

Eye irritation : Category 2A

Skin sensitization : Sub-category 1A

Carcinogenicity : Category 2

GHS label elements

Hazard pictograms :

Signal Word : Warning

Hazard Statements : H317 May cause an allergic skin reaction.
H319 Causes serious eye irritation.
H351 Suspected of causing cancer.

Precautionary Statements :

Prevention:

P201 Obtain special instructions before use.
P202 Do not handle until all safety precautions have been read and understood.

P261 Avoid breathing dust/ fume/ gas/ mist/ vapors/ spray.
P264 Wash skin thoroughly after handling.
P272 Contaminated work clothing must not be allowed out of the workplace.
P280 Wear protective gloves/ protective clothing/ eye protection/ face protection.

Response:

P302 + P352 IF ON SKIN: Wash with plenty of soap and water.
P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P308 + P313 IF exposed or concerned: Get medical advice/ attention.
P333 + P313 If skin irritation or rash occurs: Get medical advice/ attention.
P337 + P313 If eye irritation persists: Get medical advice/ attention.
P363 Wash contaminated clothing before reuse.

Storage:

P405 Store locked up.

Disposal:

P501 Dispose of contents/ container to an approved waste disposal plant.

Other hazards

None known.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance / Mixture : Mixture

Components

Chemical name	CAS-No.	Concentration (% w/w)
S-metolachlor	87392-12-9	83.7145
solvent naphtha (petroleum), heavy arom.	64742-94-5	>= 5 - < 10
Amines, tallow alkyl, ethoxylated, compds. with polyethylene glycol hydrogen sulfate nonylphenyl ether	148373-01-7	>= 5 - < 10
naphthalene	91-20-3	>= 0.1 - < 1

Actual concentration is withheld as a trade secret

SECTION 4. FIRST AID MEASURES

General advice : Have the product container, label or Safety Data Sheet with you when calling the emergency number, a poison control center or physician, or going for treatment.

If inhaled : Take the victim into fresh air.
If breathing is irregular or stopped, administer artificial respiration.
Keep patient warm and at rest.

		Call a physician or poison control center immediately.
In case of skin contact	:	Take off all contaminated clothing immediately. Wash off immediately with plenty of water. If skin irritation persists, call a physician. Wash contaminated clothing before re-use.
In case of eye contact	:	Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Remove contact lenses. Immediate medical attention is required.
If swallowed	:	If swallowed, seek medical advice immediately and show this container or label. Do not induce vomiting: contains petroleum distillates and/or aromatic solvents.
Most important symptoms and effects, both acute and delayed	:	Aspiration may cause pulmonary edema and pneumonitis.
Notes to physician	:	There is no specific antidote available. Treat symptomatically. Do not induce vomiting: contains petroleum distillates and/or aromatic solvents.

SECTION 5. FIRE-FIGHTING MEASURES

Suitable extinguishing media	:	Extinguishing media - small fires Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide. Extinguishing media - large fires Alcohol-resistant foam or Water spray
Unsuitable extinguishing media	:	Do not use a solid water stream as it may scatter and spread fire.
Specific hazards during fire fighting	:	As the product contains combustible organic ingredients, fire will produce dense black smoke containing hazardous products of combustion (see section 10). Exposure to decomposition products may be a hazard to health.
Further information	:	Do not allow run-off from fire fighting to enter drains or water courses. Cool closed containers exposed to fire with water spray.
Special protective equipment for fire-fighters	:	Wear full protective clothing and self-contained breathing apparatus.

SECTION 6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures	:	Refer to protective measures listed in sections 7 and 8.
Environmental precautions	:	Prevent further leakage or spillage if safe to do so. Do not flush into surface water or sanitary sewer system. If the product contaminates rivers and lakes or drains inform respective authorities.
Methods and materials for	:	Contain spillage, and then collect with non-combustible

containment and cleaning up	absorbent material, (e.g. sand, earth, diatomaceous earth, vermiculite) and place in container for disposal according to local / national regulations (see section 13). Clean contaminated surface thoroughly. Clean with detergents. Avoid solvents. Retain and dispose of contaminated wash water.

SECTION 7. HANDLING AND STORAGE

Advice on safe handling	:	No special protective measures against fire required. Avoid contact with skin and eyes. When using do not eat, drink or smoke. For personal protection see section 8.
Conditions for safe storage	:	No special storage conditions required. Keep containers tightly closed in a dry, cool and well-ventilated place. Keep out of the reach of children. Keep away from food, drink and animal feedingstuffs.

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Ingredients with workplace control parameters

Components	CAS-No.	Value type (Form of exposure)	Control parameters / Permissible concentration	Basis
S-metolachlor	87392-12-9	TWA	5 mg/m3	Syngenta
solvent naphtha (petroleum), heavy arom.	64742-94-5	TWA	100 mg/m3	Supplier
		TWA	200 mg/m3 (total hydrocarbon vapor)	ACGIH
naphthalene	91-20-3	TWA	10 ppm	ACGIH
		TWA	10 ppm 50 mg/m3	NIOSH REL
		ST	15 ppm 75 mg/m3	NIOSH REL
		TWA	10 ppm 50 mg/m3	OSHA Z-1
		TWA	10 ppm 50 mg/m3	OSHA P0
		STEL	15 ppm 75 mg/m3	OSHA P0

Engineering measures : THE FOLLOWING RECOMMENDATIONS FOR EXPOSURE CONTROLS/PERSONAL PROTECTION ARE INTENDED FOR THE MANUFACTURE, FORMULATION AND PACKAGING OF THE PRODUCT. FOR COMMERCIAL APPLICATIONS AND/OR ON-FARM APPLICATIONS CONSULT THE PRODUCT LABEL.

Containment and/or segregation is the most reliable technical protection measure if exposure cannot be eliminated.

The extent of these protection measures depends on the actual risks in use.
Maintain air concentrations below occupational exposure standards.
Where necessary, seek additional occupational hygiene advice.

Personal protective equipment

Respiratory protection : No personal respiratory protective equipment normally required.
When workers are facing concentrations above the exposure limit they must use appropriate certified respirators.

Hand protection

Remarks : Wear protective gloves. The choice of an appropriate glove does not only depend on its material but also on other quality features and is different from one producer to the other.
Please observe the instructions regarding permeability and breakthrough time which are provided by the supplier of the gloves. Also take into consideration the specific local conditions under which the product is used, such as the danger of cuts, abrasion, and the contact time. The break through time depends amongst other things from the material, the thickness and the type of glove and therefore has to be measured for each case. Gloves should be discarded and replaced if there is any indication of degradation or chemical breakthrough.

Eye protection : Tightly fitting safety goggles
Always wear eye protection when the potential for inadvertent eye contact with the product cannot be excluded.

Skin and body protection : Choose body protection in relation to its type, to the concentration and amount of dangerous substances, and to the specific work-place.
Remove and wash contaminated clothing before re-use.
Wear as appropriate:
Impervious clothing

Protective measures : The use of technical measures should always have priority over the use of personal protective equipment.
When selecting personal protective equipment, seek appropriate professional advice.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance : liquid

Color : Golden

Odor : No data available

Odor Threshold : No data available

pH : No data available

Melting point/range : No data available

Boiling point/boiling range	:	No data available
Flash point	:	Method: Seta closed cup does not flash
Evaporation rate	:	No data available
Flammability (solid, gas)	:	No data available
Upper explosion limit / Upper flammability limit	:	No data available
Lower explosion limit / Lower flammability limit	:	No data available
Vapor pressure	:	No data available
Relative vapor density	:	No data available
Density	:	909 g/cm3 (68 °F / 20 °C)
Solubility(ies)		
Water solubility	:	No data available
Solubility in other solvents	:	No data available
Partition coefficient: n-octanol/water	:	No data available
Autoignition temperature	:	No data available
Decomposition temperature	:	No data available
Viscosity		
Viscosity, dynamic	:	No data available
Viscosity, kinematic	:	No data available
Explosive properties	:	No data available
Oxidizing properties	:	No data available
Particle size	:	No data available

SECTION 10. STABILITY AND REACTIVITY

Reactivity	:	None reasonably foreseeable.
Chemical stability	:	Stable under normal conditions.
Possibility of hazardous reactions	:	No dangerous reaction known under conditions of normal use.
Conditions to avoid	:	No decomposition if used as directed.
Incompatible materials	:	None known.
Hazardous decomposition products	:	No hazardous decomposition products are known.

SECTION 11. TOXICOLOGICAL INFORMATION

Information on likely routes of exposure

Ingestion
Inhalation
Skin contact
Eye contact

Acute toxicity

Product:

Acute oral toxicity	:	LD50 (Rat, female): 2,515 mg/kg Remarks: Based on data from similar materials
Acute inhalation toxicity	:	LC50 (Rat, male and female): > 2.61 mg/l Exposure time: 4 h Test atmosphere: dust/mist Assessment: The substance or mixture has no acute inhalation toxicity Remarks: Based on data from similar materials
Acute dermal toxicity	:	LD50 (Rabbit, male and female): > 2,000 mg/kg Assessment: The substance or mixture has no acute dermal toxicity Remarks: Based on data from similar materials

Components:

S-metolachlor:

Acute oral toxicity	:	LD50 (Rat, male and female): 2,672 mg/kg
Acute inhalation toxicity	:	LC50 (Rat, male and female): > 2.91 mg/l Exposure time: 4 h Test atmosphere: dust/mist Assessment: The substance or mixture has no acute inhalation toxicity
Acute dermal toxicity	:	LD50 (Rabbit, male and female): > 2,000 mg/kg Assessment: The substance or mixture has no acute dermal toxicity

Amines, tallow alkyl, ethoxylated, compds. with polyethylene glycol hydrogen sulfate nonylphenyl ether :

Acute oral toxicity	:	Assessment: The component/mixture is moderately toxic after single ingestion.

naphthalene:

Acute oral toxicity	:	Assessment: The component/mixture is moderately toxic after single ingestion.

Skin corrosion/irritation

Product:

Species	:	Rabbit
Result	:	No skin irritation
Remarks	:	Based on data from similar materials

Components:

S-metolachlor:

Species	:	Rabbit
Result	:	No skin irritation

Amines, tallow alkyl, ethoxylated, compds. with polyethylene glycol hydrogen sulfate nonylphenyl ether :

Result	:	Skin irritation

Serious eye damage/eye irritation

Product:

Species	:	Rabbit
Result	:	Eye irritation
Remarks	:	Based on data from similar materials

Components:

S-metolachlor:

Species	:	Rabbit
Result	:	No eye irritation

Amines, tallow alkyl, ethoxylated, compds. with polyethylene glycol hydrogen sulfate nonylphenyl ether :

Result	:	Irreversible effects on the eye

Respiratory or skin sensitization

Product:

Species	:	Guinea pig
Result	:	The product is a skin sensitizer, sub-category 1A.
Remarks	:	Based on data from similar materials

Components:

S-metolachlor:

Species	:	Guinea pig
Result	:	The product is a skin sensitizer, sub-category 1B.

Germ cell mutagenicity

Components:

S-metolachlor:

Germ cell mutagenicity - Assessment : Animal testing did not show any mutagenic effects.

Carcinogenicity

Components:

S-metolachlor:

Carcinogenicity - Assessment : Animal testing did not show any carcinogenic effects.

naphthalene:

Carcinogenicity - Assessment : Limited evidence of carcinogenicity in animal studies

IARC	Group 2B: Possibly carcinogenic to humans	
	naphthalene	91-20-3
OSHA	No component of this product present at levels greater than or equal to 0.1% is on OSHA's list of regulated carcinogens.	
NTP	Reasonably anticipated to be a human carcinogen	
	naphthalene	91-20-3

Reproductive toxicity

Components:

S-metolachlor:

Reproductive toxicity - Assessment : Animal testing did not show any effects on fertility.

STOT-repeated exposure

Components:

S-metolachlor:

Assessment : The substance or mixture is not classified as specific target organ toxicant, repeated exposure.

Aspiration toxicity

Components:

solvent naphtha (petroleum), heavy arom.:

May be fatal if swallowed and enters airways.

SECTION 12. ECOLOGICAL INFORMATION

Ecotoxicity

Product:

Toxicity to fish	:	LC50 (Cyprinus carpio (Carp)): 9.3 mg/l Exposure time: 96 h
Toxicity to daphnia and other aquatic invertebrates	:	EC50 (Daphnia magna (Water flea)): 9.3 mg/l Exposure time: 48 h
Toxicity to algae/aquatic plants	:	ErC50 (Raphidocelis subcapitata (freshwater green alga)): 0.1 mg/l Exposure time: 96 h NOEC (Raphidocelis subcapitata (freshwater green alga)): 0.01 mg/l End point: Growth rate Exposure time: 96 h EC10 (Raphidocelis subcapitata (freshwater green alga)): 0.019 mg/l End point: Growth rate Exposure time: 96 h

Components:

S-metolachlor:

Toxicity to fish	:	LC50 (Oncorhynchus mykiss (rainbow trout)): 1.23 mg/l Exposure time: 96 h
Toxicity to daphnia and other aquatic invertebrates	:	EC50 (Americamysis): 1.4 mg/l Exposure time: 96 h
Toxicity to algae/aquatic plants	:	ErC50 (Raphidocelis subcapitata (freshwater green alga)): 0.077 mg/l Exposure time: 96 h NOEC (Raphidocelis subcapitata (freshwater green alga)): 0.016 mg/l End point: Growth rate Exposure time: 96 h EC50 (Lemna gibba (gibbous duckweed)): 0.023 mg/l Exposure time: 14 d NOEC (Lemna gibba (gibbous duckweed)): 0.0076 mg/l Exposure time: 14 d
M-Factor (Acute aquatic toxicity)	:	10
Toxicity to fish (Chronic toxicity)	:	NOEC (Pimephales promelas (fathead minnow)): 0.03 mg/l Exposure time: 35 d

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity)	:	NOEC (Americamysis): 0.13 mg/l Exposure time: 28 d
M-Factor (Chronic aquatic toxicity)	:	10

solvent naphtha (petroleum), heavy arom.:

Ecotoxicology Assessment

Chronic aquatic toxicity	:	Toxic to aquatic life with long lasting effects.

Amines, tallow alkyl, ethoxylated, compds. with polyethylene glycol hydrogen sulfate nonylphenyl ether :

Ecotoxicology Assessment

Chronic aquatic toxicity	:	Toxic to aquatic life with long lasting effects.

naphthalene:

Ecotoxicology Assessment

Acute aquatic toxicity	:	Very toxic to aquatic life.
Chronic aquatic toxicity	:	Very toxic to aquatic life with long lasting effects.

Persistence and degradability

Components:

S-metolachlor:

Biodegradability	:	Result: Not readily biodegradable.
Stability in water	:	Degradation half life: 53 - 147 d Remarks: Product is not persistent.

Bioaccumulative potential

Components:

S-metolachlor:

Bioaccumulation	:	Remarks: Does not bioaccumulate.
Partition coefficient: n-octanol/water	:	log Pow: 3.05 (77 °F / 25 °C)

Mobility in soil

Components:

S-metolachlor:

Distribution among environmental compartments	:	Remarks: Moderately mobile in soils
Stability in soil	:	Dissipation time: 12 - 46 d Percentage dissipation: 50 % (DT50) Remarks: Product is not persistent.

Other adverse effects

Components:

naphthalene:

Results of PBT and vPvB assessment	:	This substance is not considered to be persistent, bioaccumulating and toxic (PBT). This substance is not considered to be very persistent and very bioaccumulating (vPvB).

SECTION 13. DISPOSAL CONSIDERATIONS

Disposal methods

Waste from residues	:	Do not contaminate ponds, waterways or ditches with chemical or used container. Do not dispose of waste into sewer. Where possible recycling is preferred to disposal or incineration. If recycling is not practicable, dispose of in compliance with local regulations.
Contaminated packaging	:	Empty remaining contents. Triple rinse containers. Empty containers should be taken to an approved waste handling site for recycling or disposal. Do not re-use empty containers.

SECTION 14. TRANSPORT INFORMATION

International Regulations

UNRTDG

UN number	:	UN 3082
Proper shipping name	:	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (S-METOLACHLOR AND TALLOW ALKYLAMINE ETHOXYLATE)
Class	:	9
Packing group	:	III
Labels	:	9

IATA-DGR

UN/ID No.	:	UN 3082
Proper shipping name	:	Environmentally hazardous substance, liquid, n.o.s. (S-METOLACHLOR AND TALLOW ALKYLAMINE ETHOXYLATE)
Class	:	9
Packing group	:	III
Labels	:	Miscellaneous
Packing instruction (cargo aircraft)	:	964
Packing instruction (passenger aircraft)	:	964
Environmentally hazardous	:	yes

IMDG-Code

UN number	:	UN 3082
Proper shipping name	:	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (S-METOLACHLOR AND TALLOW ALKYLAMINE ETHOXYLATE)
Class	:	9
Packing group	:	III
Labels	:	9
EmS Code	:	F-A, S-F
Marine pollutant	:	yes

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

Not applicable for product as supplied.

Domestic regulation

49 CFR

UN/ID/NA number	:	NA 3082
Proper shipping name	:	Other regulated substances, liquid, n.o.s. (NAPHTHALENE)
Class	:	9
Packing group	:	III
Labels	:	CLASS 9
ERG Code	:	171
Marine pollutant	:	yes
Remarks	:	Shipment by ground under DOT is non-regulated; however it may be shipped per the applicable hazard classification to facilitate multi-modal transport involving ICAO (IATA) or IMO.

Special precautions for user

Remarks : 49CFR: no dangerous good in non-bulk packaging

The transport classification(s) provided herein are for informational purposes only, and solely based upon the properties of the unpackaged material as it is described within this Safety Data Sheet. Transportation classifications may vary by mode of transportation, package sizes, and variations in regional or country regulations.

SECTION 15. REGULATORY INFORMATION

This chemical is a pesticide product registered by the Environmental Protection Agency and is subject to certain labeling requirements under federal pesticide law. These requirements differ from the classification criteria and hazard information required for safety data sheets, and for workplace labels of non-pesticide chemicals. Following is the hazard information as required on the pesticide label:
Caution
Causes moderate eye irritation.
Harmful if swallowed.
Harmful if absorbed through skin.
Avoid contact with skin, eyes or clothing.
May cause skin sensitization reactions in certain individuals.

CERCLA Reportable Quantity

Components	CAS-No.	Component RQ (lbs)	Calculated product RQ (lbs)
naphthalene	91-20-3	100	13869

SARA 304 Extremely Hazardous Substances Reportable Quantity

This material does not contain any components with a section 304 EHS RQ.

SARA 302 Extremely Hazardous Substances Threshold Planning Quantity

This material does not contain any components with a section 302 EHS TPQ.

SARA 311/312 Hazards : Flammable (gases, aerosols, liquids, or solids)
Respiratory or skin sensitization
Carcinogenicity
Serious eye damage or eye irritation

SARA 313 : The following components are subject to reporting levels established by SARA Title III, Section 313:

naphthalene	91-20-3	>= 0.1 - < 1 %

The ingredients of this product are reported in the following inventories:

TSCA : On or in compliance with the active portion of the TSCA inventory

TSCA list

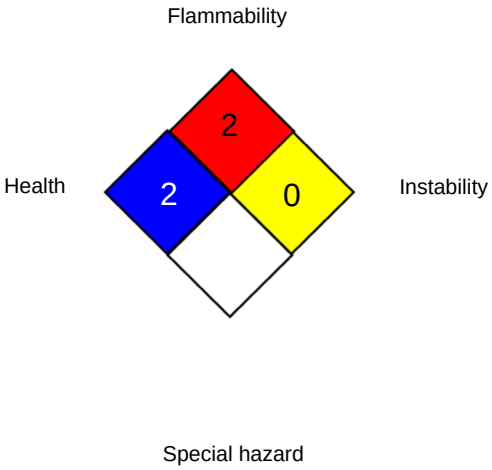
No substances are subject to a Significant New Use Rule.

No substances are subject to TSCA 12(b) export notification requirements.

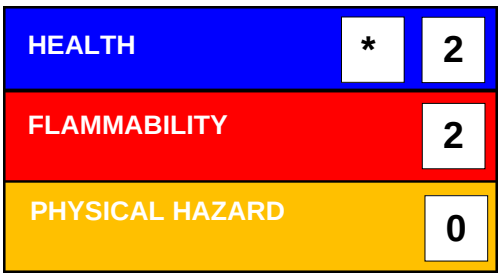
SECTION 16. OTHER INFORMATION

Further information

NFPA 704:



HMIS® IV:



HMIS® ratings are based on a 0-4 rating scale, with 0 representing minimal hazards or risks, and 4 representing significant hazards or risks. The "*" represents a chronic hazard, while the "/" represents the absence of a chronic hazard.

Full text of other abbreviations

ACGIH	:	USA. ACGIH Threshold Limit Values (TLV)
NIOSH REL	:	USA. NIOSH Recommended Exposure Limits
OSHA P0	:	USA. Table Z-1-A Limits for Air Contaminants (1989 vacated values)

OSHA Z-1	:	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
ACGIH / TWA	:	8-hour, time-weighted average
NIOSH REL / TWA	:	Time-weighted average concentration for up to a 10-hour workday during a 40-hour workweek
NIOSH REL / ST	:	STEL - 15-minute TWA exposure that should not be exceeded at any time during a workday
OSHA P0 / TWA	:	8-hour time weighted average
OSHA P0 / STEL	:	Short-term exposure limit
OSHA Z-1 / TWA	:	8-hour time weighted average

AIIC - Australian Inventory of Industrial Chemicals; ASTM - American Society for the Testing of Materials; bw - Body weight; CERCLA - Comprehensive Environmental Response, Compensation, and Liability Act; CMR - Carcinogen, Mutagen or Reproductive Toxicant; DIN - Standard of the German Institute for Standardisation; DOT - Department of Transportation; DSL - Domestic Substances List (Canada); ECx - Concentration associated with x% response; EHS - Extremely Hazardous Substance; ELx - Loading rate associated with x% response; EmS - Emergency Schedule; ENCS - Existing and New Chemical Substances (Japan); ErCx - Concentration associated with x% growth rate response; ERG - Emergency Response Guide; GHS - Globally Harmonized System; GLP - Good Laboratory Practice; HMIS - Hazardous Materials Identification System; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; IBC - International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk; IC50 - Half maximal inhibitory concentration; ICAO - International Civil Aviation Organization; IECSC - Inventory of Existing Chemical Substances in China; IMDG - International Maritime Dangerous Goods; IMO - International Maritime Organization; ISHL - Industrial Safety and Health Law (Japan); ISO - International Organisation for Standardization; KECI - Korea Existing Chemicals Inventory; LC50 - Lethal Concentration to 50 % of a test population; LD50 - Lethal Dose to 50% of a test population (Median Lethal Dose); MARPOL - International Convention for the Prevention of Pollution from Ships; MSHA - Mine Safety and Health Administration; n.o.s. - Not Otherwise Specified; NFPA - National Fire Protection Association; NO(A)EC - No Observed (Adverse) Effect Concentration; NO(A)EL - No Observed (Adverse) Effect Level; NOELR - No Observable Effect Loading Rate; NTP - National Toxicology Program; NZIoC - New Zealand Inventory of Chemicals; OECD - Organization for Economic Co-operation and Development; OPPTS - Office of Chemical Safety and Pollution Prevention; PBT - Persistent, Bioaccumulative and Toxic substance; PICCS - Philippines Inventory of Chemicals and Chemical Substances; (Q)SAR - (Quantitative) Structure Activity Relationship; RCRA - Resource Conservation and Recovery Act; REACH - Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals; RQ - Reportable Quantity; SADT - Self-Accelerating Decomposition Temperature; SARA - Superfund Amendments and Reauthorization Act; SDS - Safety Data Sheet; TCSI - Taiwan Chemical Substance Inventory; TECI - Thailand Existing Chemicals Inventory; TSCA - Toxic Substances Control Act (United States); UN - United Nations; UNRTDG - United Nations Recommendations on the Transport of Dangerous Goods; vPvB - Very Persistent and Very Bioaccumulative

Revision Date : 05/19/2022

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

US / Z8

Patricia (Pat) Dinnen
Regulatory Manager
State Registration/State Affairs

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P.O. Box 18300
Greensboro, NC 27419-8300
www.syngenta.com

Tel. 336 632 2494
Fax: 336 632 2884
pat.dinnen@syngenta.com

March 1, 2026

Ms. Julia Vacchiano
Pesticide Registrar and Water Quality Specialist
Maine Board of Pesticides Control
28 State House Station
Augusta, ME 04333-0028

Subject: Section 24(c) Application
Dual Magnum® Herbicide (EPA Reg. No. 100-816)
Active Ingredient: S-Metolachlor

Dear Ms. Vacchiano:

On behalf of growers in Maine, Syngenta Crop Protection, LLC respectfully requests a new 24(c) for Dual Magnum Herbicide, for control of weeds in Highbush Blueberry, Brassica Leafy Greens, Broccoli, Brussels Sprouts, Caneberries, Cauliflower, Cucumber, Garlic, Lettuce, and Melons. Mark Hutton, Ph.D., Vegetable Specialist of the University of Maine Cooperative Extension, has written a letter of support stating the need for this SLN in Maine.

Enclosed in support of this submission are:

- SLN Label
- EPA SLN Application Form 8570-25
- Support Letter from Dr. Mark Hutton of the University of Maine Cooperative Extension
- Efficacy Data
- Dual Magnum Herbicide Federal Label
- Dual Magnum Herbicide SDS

If you have any questions, please do not hesitate to email at pat.dinnen@syngenta.com or call me at 336-632-2494.

Sincerely,

Pat Dinnen

Pat Dinnen
Regulatory Manager

Enclosures

July 1, 2025

Julia Vacchiano

Pesticide Registrar/Water Quality Specialist

28 State House Station

Augusta, ME 04333-0028

Dear Julie

Based on grower need and requests, I am writing to support a new Dual Magnum (EPA 100-816), 24c registration for highbush blueberry, brassica leafy greens (mustard greens, broccoli raab, Chinese cabbage, bok choy, collards, kale, mizuna, mustard spinach, and rape greens), broccoli (direct seeded and transplanted), brussels sprouts (transplanted), caneberries (blackberry, red raspberry, and black raspberry), cauliflower (transplanted), cucumber, garlic, lettuce (head and leaf), and melons (cantaloupe, muskmelon, and watermelon).

Yellow nutsedge (Cyperus esculentus) and hairy galinsoge (Galinsoga ciliata) are two of the most difficult weeds to control in vegetable crops, particularly in the crops listed above. The lack of effective chemical herbicides for these crop/weed combinations forces growers to rely on expensive cultivation or hand weeding operations. S-Metolachlor, in Dual Magnum, provides excellent control of these species and is very cost effective compared to cultivation and hand weeding.

The product has been working extremely well for Maine for other mixed vegetable growers, and this new label with additional crops matches the options that growers in New York and Massachusetts have available to them.

Sincerely,

Mark Hutton, Ph.D.

Vegetable Specialist

University of Maine Cooperative Extension

Highmoor Farm, P.O. Box 179 Monmouth, ME 04259-0179 mark.hutton@maine.edu

cc. Jaime Cummings, Syngenta Crop Protection

STATE OF MAINE
DEPARTMENT OF AGRICULTURE, CONSERVATION & FORESTRY
BOARD OF PESTICIDES CONTROL
28 STATE HOUSE STATION
AUGUSTA, MAINE 04333

JANET T. MILLS
GOVERNOR

AMANDA E. BEAL
COMMISSIONER

May 8th, 2026

Re: Risk Assessment for Dual Magnum® Herbicide, EPA Reg. No. 100-816
To: Maine Board of Pesticide Control

Dear Members of the Maine Board of Pesticide Control-

I have reviewed the toxicological profile of the product Dual Magnum® Herbicide, which was requested by the Board's Registrar, Julia Vacchiano on April 14th, 2026. This was motivated by a Special Local Need (SLN) to request approval of Dual Magnum® for identified crops, including broccoli. The human health and environmental risk assessment is presented below and is based on the following methodology: *(i)* identification of the active ingredient in Dual Magnum®, (*ii*) hazard assessment of the active ingredient, and *(iii*) analysis of federal and state data on the likely exposure of the active ingredient to humans and aquatic life.

Summary Statement: The product Dual Magnum® contains the active ingredient metolachlor, which presents very low health risk to the general population- including children- if used according to the label. However, metolachlor and its metabolites are moderately persistent in the environment and capable of leaching. An analysis of federal and State of Maine water quality studies reveals that metolachlor is among the most commonly detected pesticides in surface and ground water, and often at the highest concentrations of screened pesticides. Therefore, the use of Dual Magnum® on crops may increase the risk of exposure in Maine, particularly to individuals who rely on well-water. Despite the increased risk of exposure, the overall health risk remains minimal because of (*i*) metolachlor's low toxicity and (*ii*) most detections in groundwater are at low concentrations. However, the five-year high detect level for a metabolite of metolachlor reveals potential risk. Additionally, metolachlor is a dermal irritant, and applicators and sensitive groups with skin disorders or allergies should exercise caution. Risk quotients calculated for aquatic life are far below a level of concern, and therefore aquatic population disturbances are not anticipated. The details of this risk assessment are presented below.

1. Identification and toxicological profile of the active ingredient in Dual Magnum®

The product Dual Magnum® is a pre-emergent herbicide that contains the active ingredient S-metolachlor; it is approved for many agricultural crops. The herbicide contains both the R-and S-stereoisomers of metolachlor; while the latter is more selective and potent to plants, both isomers exhibit similar toxicity and properties (EPA, 2018; EPA, 2019). Therefore, reference to metolachlor in this risk assessment refers to both S-metolachlor and a mixture of both S- and R-metolachlor.

According to the EPA's most recent 2019 review of metolachlor, acute toxicology assays reveal that it is slightly toxic *via* oral, eye, dermal exposures (toxicity category III), and practically non-toxic *via* inhalation (toxicity category IV); it is also classified as a skin sensitizer. There is no evidence of carcinogenicity in lab rats, and in 2005 the EPA's Cancer Assessment Review Committee deemed that it is "not likely to be carcinogenic to humans." Metolachlor exhibits low volatility, but it is moderately persistent in soil and tends to leach into groundwater. Metolachlor is slightly toxic to freshwater invertebrates, and moderately toxic to freshwater vertebrates. The

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metabolites metolachlor-OA and metolachlor-ESA are generally one to three orders of magnitude less toxic to organisms than the parent molecule, but are more soluble in water and more persistent (EPA, 2014). Therefore, these two metabolites are more likely to be mobile in soil solution and contaminate ground and surface waters, as further discussed in Section 2B.

2. Human dietary exposure and risk

A. Exposure *via* food

The potential health risks of metolachlor *via* consumption of crops were examined. The USDA Pesticide Data Program was analyzed to estimate the likelihood of dietary exposure of metolachlor residue; this website contains a data repository on the national pesticide residue monitoring program. From 1994-2024, a total of 236,559 crops/baby foods were analyzed for the presence of metolachlor residue and its metabolites; this testing resulted in 210 detections, or a detection rate of less than 0.1%. Importantly, no residues were detected above the EPA tolerance level. The maximum residue concentration for all crops was 60 ppb (parts per billion) in summer squash, which was still almost 10-fold lower than the EPA tolerance level of 500 ppb. Cilantro had the highest residue detection rate (5%), yet the maximum residue detected was still 300-fold lower than its EPA tolerance level.

Because a SLN (Special Local Need) was requested for use on broccoli, residues in broccoli were specifically analyzed. From 1994-2024, there were only three detections in nearly 4,600 broccoli samples. The maximum detected (2.3 ppb) was still more than 250-fold lower than the EPA tolerance level of 600 ppb. There were no detections in cauliflower or cabbage samples (n>8,000), which are also *Brassica* species.

Lastly, metolachlor residues in crops for which a tolerance has not been established was assessed. A total of 52 detections were observed in crops for which a residue tolerance has not been established; concentrations ranged from 2- 60 ppb, and the geometric mean was less than 4 ppb. In the worst-case scenario, the maximum detection concentration is still below the most stringent metolachlor tolerance level of 100 ppb set for some crops, *e.g.* asparagus, celery, and cherries. In summary, the health risks of metolachlor *via* consumption of broccoli and other foods are very low. This assessment is in line with EPA's calculation that only 10% of dietary exposure of metolachlor is from food, while an estimated 90% of exposure derives from water, as discussed below.

B(*i*). Exposure *via* drinking water- Federal USDA data

Metolachlor and its two major metabolites (*e.g.* metolachlor-ESA and metolachlor-OA) are frequently detected in groundwater, surface waters, and in municipal drinking water systems (Figure 1). Monitoring by the EPA reveals that nearly 40% of private wells (n=1,500) were contaminated with metolachlor-ESA in 45 states from 2007-2013; the detection rate is even greater in raw and untreated municipal water.

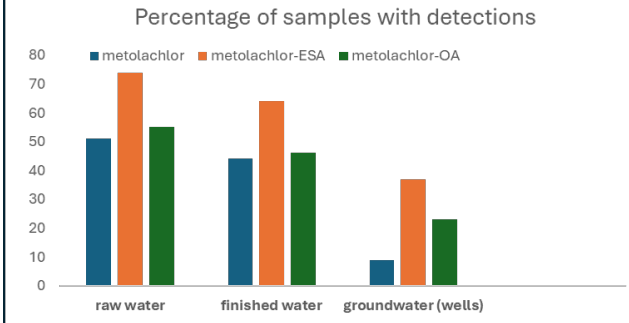

Figure 1. Raw influent water was analyzed for metolachlor at 70 sites in twenty states. Treated effluent was analyzed at 27 sites in five states. Groundwater was analyzed for metolachlor at 1,500 private wells in 45 states from 2007-2013. Data were mined from the USDA.

Next, detections of metolachlor and its metabolites in private drinking wells supplied by groundwater were analyzed; this was prioritized because many residents in Maine's agrarian regions depend upon wells for drinking water. Metolachlor concentrations (mean and range) from wells are reported in Table 1. The EPA has not set a Maximum Contaminant Level (MCL) in drinking water for metolachlor. Instead, the USEPA uses a drinking water concentration of 830 ppb in their chronic dietary risk assessments for metolachlor. In contrast, the states of Minnesota and California set an MCL of 300 ppb and 1,368 ppb, respectively. Margins of exposures (MOE) were calculated in Table 2 by dividing Minnesota's more protective MCL by both the mean and max exposure. MOE values >100 are considered health protective. Although there is practically no risk at mean concentrations, there is a health risk when individuals consume water at the maximum concentrations for metolachlor and metolachlor-OA.

	Minnesota's MCL	geometric mean (ppb)	min. conc (ppb)	max conc. (ppb)	Margin of Exposure (mean/max conc.)
metolachlor	300	0.025	0.002	12.0	12,000/25
metolachlor-ESA	1000	0.027	0.003	4.4	37,000/227
metolachlor-OA	1000	0.049	0.001	18.0	20,000/55

Table 1. Geometric mean and range (part per billion) of metolachlor and its two major metabolites in private wells. Data were mined from the USDA Pesticide Data Program. Margin of exposure was calculated by dividing Minnesota's stringent MCL by maximum concentration detected. Values greater than 100 are considered health protective.

B(*ii*). Exposure *via* drinking water- State of Maine data

The Maine Board of Pesticide Control regularly monitors surface or groundwater for the presence of pesticides. Results of these studies are summarized below, and point to the ubiquity of metolachlor and its metabolites in Maine's waters.

- A 2019 BPC Water Quality study analyzed seven streams that flow into Penobscot Bay and screened for detection of more than 100 pesticides. The metabolite metolachlor-ESA was detected at concentrations of 0.06 and 0.17 ppb in Kenduskeag Stream in two locations in Bangor. It is noteworthy that the maximum detection of metolachlor-ESA was the highest concentration of any pesticide reported in that study.

- A 2020 study noted that metolachlor-ESA had the second-highest detection rate (33%) of all pesticides screened in groundwater from wells and, and the highest detection level (3.2 ppb); this concentration was 10-fold greater than the next highest pesticide, *e.g.* hexazinone.

- A 2021 study reported that metolachlor-ESA had the third-highest detection rate and metolachlor-OA had the highest detection level (12 ppb) of all pesticides; this concentration was 36-fold greater than the pesticide with the second-highest concentration.

- The results of a 2023 study indicated that metolachlor-ESA had the highest detection rate (50%) and the highest maximum concentration (0.4 ppb) of all screened pesticides.

Metolachlor was rarely detected compared to its metabolites. Margins of exposure values were calculated for metolachlor and its metabolites using Minnesota's MCLs (Table 2). All MOE values were >100, expect for the highest concentration that was detected for metolachlor-OA. Collectively, these data illustrate the high likelihood of exposure to metolachlor in drinking water. Although *mean* concentrations of contaminants present practically no risk to Mainers' drinking water, the maximum concentration of detected metolachlor-OA reveals a potential health risk.

	Minnesota's MCL	Geometric mean	max conc. (ppb)	Margin of Exposure (mean/max conc.)
metolachlor	300	-	0.024	-/12,500
metolachlor-ESA	1000	0.09	3.2	11,000/312
metolachlor-OA	1000	0.44	12	2,000/83

Table 2. Geometric mean and range (part per billion) of metolachlor and its two major metabolites in private wells. Data were mined from the Board of Pesticide Control Water Quality studies (2019-2023). Margin of exposure was calculated by dividing Minnesota's stringent MCL by mean and maximum concentration detected. Values greater than 100 are considered health protective.

3. Risk to freshwater aquatic life in Maine

Chronic risk quotients were calculated to determine if metolachlor and its metabolites present a risk to freshwater aquatic life in Maine (Table 2). These values were calculated using the worst-case scenario, *i.e.* EPA benchmark concentration for the most sensitive freshwater aquatic populations divided by the maximum detection of metolachlor and metabolites in any of the water quality studies (2019-2023) performed by the Maine Board of Pesticide Control. According to the EPA, chronic risk quotients <1 are below a level of concern. All calculated risk quotients in Table 3 are far below a level of concern, indicating that metolachlor and its metabolites are not anticipated to threaten aquatic life in Maine.

	Maine BPC Water Quality Studies		Freshwater invertebrates		Freshwater plants (non-vascular)		Freshwater plants (vascular)	
	Maximum detection	Geometic mean	Benchmark Conc.	Risk Quotient	Benchmark Conc.	Risk Quotient	Benchmark Conc.	Risk Quotient
Metolachlor	0.024		30	0.0008	1.5	0.016	4.4	0.00545
Metolachlor-ESA	8	0.09	4,800	0.0017	99,450	8E-05	4,000	0.00200
Metolachlor-OA	12	0.4	9,300	0.0013	29,300	0.00041	95,400	0.00013

Table 3. Summary of Board of Pesticide Control water quality studies (2019, 2021, 2023) that detected metolachlor and its metabolites. All concentrations are reported in parts per billion. Reported are the maximum detection in all three of the studies and the geometric mean. EPA chronic aquatic benchmark values are reported for the three most sensitive groups. Risk Quotients for each group were calculated by dividing the maximum detection by the benchmark concentration. Chronic Risk Quotients less than 1 are below a level of concern and protective for most species. Geometric mean for metolachlor are not reported as most detections were below a level of quantification.

4. Risk of leaching in agricultural-use areas in Maine

The SLN requests usage for several crops in Maine, including broccoli, which is predominantly grown in Aroostook County. To preliminarily gauge the likelihood of leaching, the soil struture and profile was evaluated in the town of Westfield, which is the location of one of the largest broccoli farms. SoilWeb was used to examine the NRCS soil profile on a typical farm field, which revealed a soil profile termed Caribou (Figure 4a). The Caribou soil profile is among the most dominant in Aroostook Country (Fig. 4b). Caribou soil is characterized as deep (> 4 ft to bedrock), which decreases the risk of leaching. Although it is 40% sand, the soil is predominantly silt-loam which further decreases the risk of leaching. However, the soil profile is also characterized as having "pockets of sand" which can increase the mobility and the risk of leaching. NRCS soil maps provide a rough "snapshot" of the soil properties in Aroostook County, and soil structure will certainly vary at different sites. Overall, the Caribou soil profile will not likely maximize the risk of metolachlor leaching into groundwater compared to other soils that are predominantly sandy, course gravel, or shallow to bedrock; however, the risk of leaching cannot be ruled out based on the soil structure.

Figure 4A.

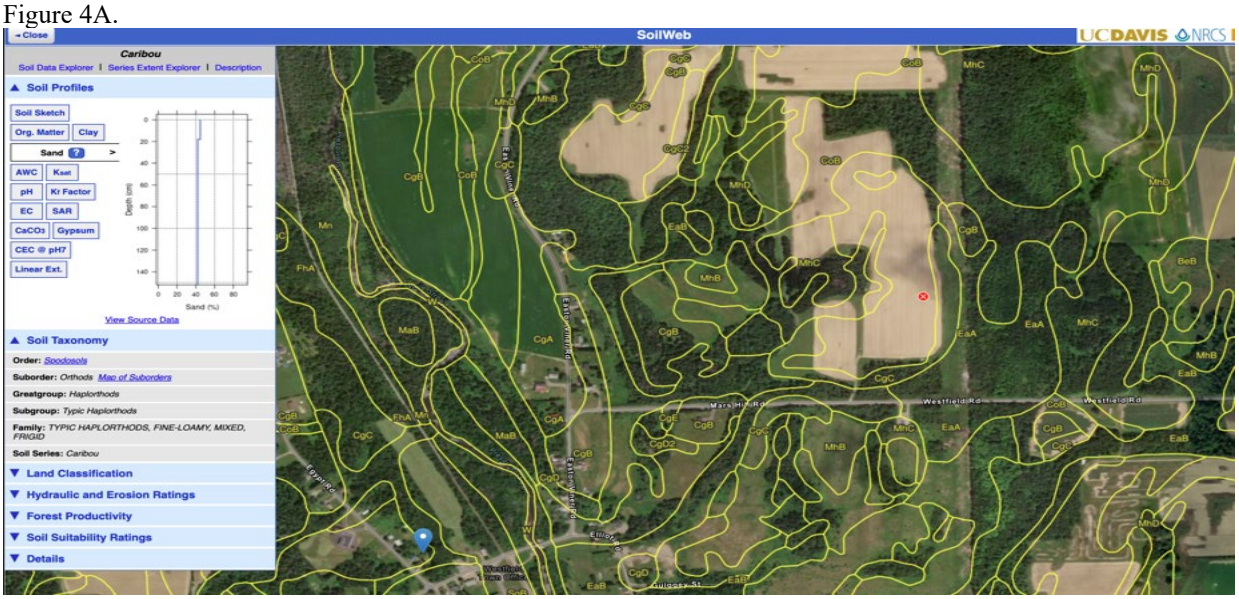

Figure 4B.

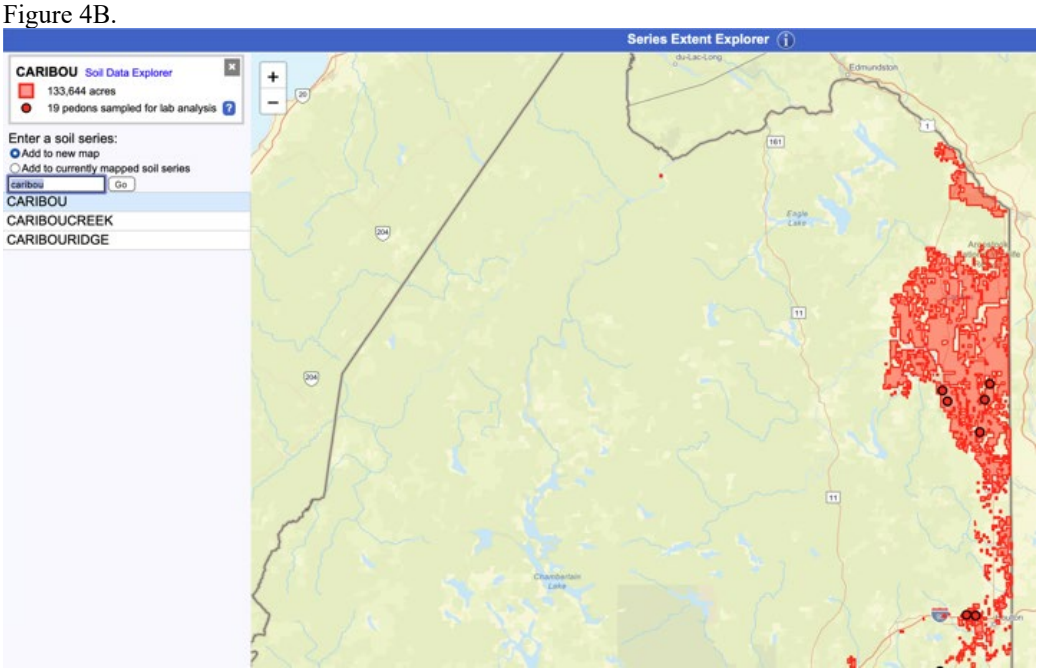

Figure 4. Caribou soil profile of a typical farmland in Westfield, Aroostook County (A). Caribou soil profile dominates southeastern Aroostook County (B).

5. In Summary, approving this SLN request for the use of Dual Magnum® on the specified crops- including broccoli- will may increase the potential for metolachlor to be found in groundwater. If exposures *via* drinking water are at historical mean values in Maine (Table 2), health risks are not anticipated; extremely high concentrations of metolachlor-OA (a five-year high detect level) will increase the risk of adverse health events. Additionally, using EPA's aquatic benchmark values, exposures to aquatic life will likely be far below a level of concern and should not disrupt aquatic populations or ecosystems.

Please let me know if you have any questions related to my risk assessment.

Respectfully,
Doug Van Hoewyk, PhD

Toxicologist
Maine Board of Pesticide Control

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