

5905-590

2/21/2013

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**U.S. ENVIRONMENTAL PROTECTION
AGENCY**

**Office of Pesticide Programs
Registration Division (7505P)
Ariel Rios Building
1200 Pennsylvania Ave., NW
Washington, D.C. 20460**

EPA Reg.

Number:

5905-590

Date of Issuance:

FEB 21 2013

NOTICE OF PESTICIDE:

☒ Registration
☐ Reregistration
(under FIFRA, as amended)

Term of Issuance: **Unconditional**

Name of Pesticide Product:

HM-1144

**Bill Washburn
Helena Chemical Company
225 Schilling Boulevard, Suite 300
Collierville, TN 38017**

Note: Changes in labeling differing in substance from that accepted in connection with this registration must be submitted to and accepted by the Registration Division prior to use of the label in commerce. In any correspondence on this product always refer to the above EPA registration number.

On the basis of information furnished by the registrant, the above named pesticide is hereby registered/reregistered under the Federal Insecticide, Fungicide and Rodenticide Act. Registration is in no way to be construed as an endorsement or recommendation of this product by the Agency. In order to protect health and the environment, the Administrator, on his motion, may at any time suspend or cancel the registration of a pesticide in accordance with the Act. The acceptance of any name in connection with the registration of a product under this Act is not to be construed as giving the registrant a right to exclusive use of the name or to its use if it has been covered by others.

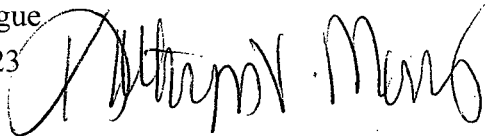
This product is unconditionally registered in accordance with FIFRA sec. 3(c)(5) provided that you:

1. Submit the "Enforcement Analytical Method Validation" within 60 days of the date on this letter.
2. Data requirements for both storage stability (830.6317) and corrosion characteristics (830.6320) have not been satisfied. It is recommended that the observation be made at 0,3,6,9 and 12 month intervals. This data must be submitted within eighteen months of the date of this letter. The results must be submitted to the Agency in electronic and hard copy format.
3. Revise the EPA Reg. No. to 5905-590
4. Remove superscript 1 after "Inerts Ingredients" on page 1
5. In the First Aid Statement "If Swallowed" section, replace "Do not give any liquid to the person" with "Have person sip a glass of water if able to swallow."
6. P 7 Remove the "." between Spray and Drift Management
7. P. 8 Change the second sentence on the page to read as follows "Where states have more stringent regulations, they **must** be observed."
8. P 9. Change "Tank Mixing Precautions" into two different sections. "Tank Mixing Precautions" and "Tank Mixing Restrictions" and separate the bullets accordingly.
9. P10. In the last paragraph, remove the word "Recommended" from the first sentence.
10. Assure that the establishment number and net content are added to the label.
11. Submit and/or cite all data required for registration/reregistration review of your product when the Agency requires all registrants of similar products to submit data.

A stamped copy of the label is enclosed for your records. Submit one (1) copy of the final printed label before you release the product for shipment.

If you have any questions regarding this notice, please contact Grant Rowland at (703) 347-0254 or at rowland.grant@epa.gov.

Kathryn V. Montague
Product Manager 23
Herbicide Branch
Registration Division (7505P)
Office of Pesticide Programs



Date:



FEB 21 2013

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HM-1144
Herbicide
Miscible Concentrate

For control of annual and perennial broadleaf weeds in wheat, barley, and oats not underseeded with a legume and grasses grown for seed.

ACTIVE INGREDIENTS:

MCPA: 2-Methyl-4-Chlorophenoxyacetic Acid*..... 25.94%
Fluroxypyr 1-methylheptyl ester ((4-amino-3,5-dichloro-6-fluoro-2-pyridinyl)oxy)
acetic acid, 1-methylheptyl ester** 10.02%
Clopyralid: 3,6-dichloro-2-pyridinecarboxylic acid*** 6.00%
INERT INGREDIENTS¹ 58.04%
TOTAL 100.00%

Acid Equivalents

* - Isomer Specific AOAC Method, Equivalent to: *2-Methyl-4-Chlorophenoxyacetic Acid - 25.94%, 2.48 lbs/gal.

** - Fluroxypyr: ((4-amino-3,5-dichloro-6-fluoro-2-pyridinyl)oxy)acetic acid - 6.95% (0.66 lb/gal)

*** - Clopyralid: 3,6-dichloro-2-pyridinecarboxylic acid - 6.0% (0.57 lb/gal)

KEEP OUT OF REACH OF CHILDREN

WARNING / AVISO

*Si usted no entiende la etiqueta, busque a alguien para que se la explique a usted en detalle.
(If you do not understand the label, find someone to explain it to you in detail.)*

See Attached Booklet for Precautionary Statements and Use Directions

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 swallowed:	Immediately call a poison control center or doctor. Do not induce vomiting unless told to do so by a poison control center or doctor. Do not give any liquid to the person. Do not give anything by mouth to an unconscious person.
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.
HOT LINE NUMBER	
NOTE TO PHYSICIAN: Have the product container or label with you when calling a poison control center or doctor, or going for treatment. FOR A MEDICAL EMERGENCY INVOLVING THIS PRODUCT CALL: 1-800-424-9300 .	

EPA REG. NO. 5905-LON
AD xxxxxx

EPA EST. NO. _____
NET CONTENTS ____ GAL.

Manufactured for
Helena Chemical Company
225 Schilling Boulevard, Suite 300
Collierville, TN 38017

ACCEPTED
with COMMENTS
EPA Letter Dated:
FEB 21 2013

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

5905-590

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PRECAUTIONARY STATEMENTS

HAZARDS TO HUMANS AND DOMESTIC ANIMALS

WARNING

Causes substantial but temporary eye injury. Harmful if swallowed. Do not get in eyes or on clothing. Wear protective eyewear (goggles, face shield, or safety glasses). 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. Wear: Long-sleeved shirt and long pants, Socks, Shoes, and chemical-resistant gloves (such as Barrier Lamine, Butyl Rubber, Nitrile Rubber, Barrier Lamine, Viton, Selection Category F, G). Prolonged or frequently repeated skin contact may cause allergic reactions in some individuals.

Personal Protective Equipment (PPE):

Some materials that are chemical-resistant to this product are listed below. If you want more options, follow the instructions for category F, G on an EPA chemical resistance category selection chart.

Applicators and other handlers must wear:

- *long-sleeved shirt and long pants,*
- *socks,*
- *chemical-resistant footwear*
- *chemical resistant gloves (such as Barrier Lamine, Butyl Rubber, Nitrile Rubber, Viton, Selection category F, G)*
- *wear goggles, face shield or safety glasses*

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

Engineering Controls Statements: *When handlers use closed systems, enclosed cabs, or aircraft in a manner that meets the requirements listed in the Worker Protection Standard (WPS) for agricultural pesticides [40 CFR 170.240(d)(4-6)], the handler PPE requirements may be reduced or modified as specified in the WPS.*

USER SAFETY RECOMMENDATIONS

Users should: Wash hands before eating, drinking, chewing gum, using tobacco or using the toilet. Remove clothing/PPE immediately if pesticide gets inside. Then wash thoroughly and put on clean clothing.

ENVIRONMENTAL HAZARDS

Drift or run-off may adversely affect nontarget plants. Do not apply directly to water, or to areas where surface water is present or to intertidal areas below the mean high water mark. Do not contaminate water when disposing of equipment washwaters or rinsate nor pour washwaters on the ground; spray or drain over a large area away from wells and other water sources. Do not apply this product through any type of irrigation system.

Do not contaminate domestic or irrigation waters. Spray equipment used in applying this product should be thoroughly cleaned before using for any other purpose. Use repeated flushing with soap and warm water or suitable chemical cleaner. It is best to use a separate sprayer for application of insecticides and fungicides. This product will kill or seriously injure many desirable forms of vegetation. Do not apply directly to flowers, fruits, grapes, tomatoes, ornamentals, cotton or other desirable plants. Vapors from this product may injure susceptible plants in the immediate vicinity. Do not apply when weather conditions favor drift from target area. Avoid use of small diameter nozzles. (Coarse sprays are less likely to drift.) Excessive amounts of this product in the soil may temporarily inhibit seed germination and plant growth.

Most cases of groundwater contamination involving phenoxy herbicides such as MCPA have been associated with mixing/loading and disposal sites. Caution should be exercised when handling MCPA pesticides at such sites to prevent contamination of groundwater supplies. Use of closed systems for mixing and transferring this pesticide will reduce the probability of spills. Placement of the mixing/loading equipment on an impervious pad to contain spills will help prevent groundwater contamination. Clopyralid is a chemical which can travel (seep or leach) through soil and under certain conditions contaminate groundwater which may be used for irrigation or drinking purposes. Users are advised not to apply clopyralid where soils have a rapid to very rapid permeability throughout the profile (such as loamy sand to sand) and the water table of an underlying aquifer is shallow, or to soils containing sinkholes over limestone bedrock, severely fractured surfaces, and substrates which would allow direct introduction into an aquifer. Your local agricultural agencies can provide further information on the type of soil in your area and the location of groundwater.

DIRECTIONS FOR USE

It is a violation of Federal law to use this product in a manner inconsistent with its labeling. Read entire label before using 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.

AGRICULTURAL USE REQUIREMENTS

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

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

PPE required for early entry to treated areas that is permitted under the Worker Protection Standard and that involves contact with anything that has been treated, such as plants, soil, or water, is: Long-sleeved shirt and long pants; socks, chemical resistant footwear and chemical resistant gloves such as Barrier Laminate, Butyl Rubber, Nitrile Rubber, Viton, wear goggles, face shield or safety glasses. Wear chemical-resistant headgear for overhead exposure.

STORAGE AND DISPOSAL

PESTICIDE STORAGE: *Always store pesticides in a secured warehouse or storage building. Containers should be opened in well ventilated areas. Keep container tightly sealed when not in use. Do not stack cardboard cases more than two pallets high. Do not store near open containers of fertilizer, seed or other pesticides. Do not contaminate water, food or feed by storage or disposal.*

PESTICIDE DISPOSAL: *Wastes resulting from the use of this product may be disposed of on site or at an approved waste disposal facility. If container is damaged or if pesticide has leaked, contain all spillage. Absorb and clean up all spilled material with granules or sand. Place in a closed labeled container for proper disposal.*

CONTAINER DISPOSAL: Nonrefillable container: *Do not reuse this container to hold materials other than pesticides or dilute pesticides (rinsate). After emptying and cleaning, it may be allowable to temporarily hold rinsate or other pesticide-related materials in the container. Contact your state regulatory agency to determine allowable practices in your state. Once cleaned, some agricultural plastic pesticide containers can be taken to a container collection site or picked up for recycling. To find the nearest site,*

contact your chemical dealer or manufacturer, or contact The Agricultural Container Recycling Council (ACRC) at www.acrecycle.org. Triple rinse or pressure rinse container (or equivalent) promptly after emptying.

For packages up to 5 gallons. 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. Pressure rinse as follows: Empty the remaining contents into application equipment or a mix tank and continue to drain for 10 seconds after the flow begins to drip. Hold container upside down over application equipment or mix tank or collect rinsate for later use or disposal. Insert pressure rinsing nozzle in the side of the container, and rinse at about 40 PSI for at least 30 seconds. Drain for 10 seconds after the flow begins to drip.

For packages greater than 5 gallons and less than 56 gallons: 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. Empty the rinsate into application equipment or a mix tank or store rinsate for later use or disposal. Repeat this procedure two more times. Pressure rinse as follows: Empty the remaining contents into application equipment or a mix tank and continue to drain for 10 seconds after the flow begins to drip. Hold container upside down over application equipment or mix tank or collect rinsate for later use or disposal. Insert pressure rinsing nozzle in the side of the container, and rinse at about 40 PSI for at least 30 seconds. Drain for 10 seconds after the flow begins to drip.

For packages greater than 56 gallons: To clean the container before final disposal, empty the remaining contents from this container into application equipment or mix tank. Fill the container about 10 percent full with water. Agitate vigorously or recirculate water with the pump for 2 minutes. Pour or pump rinsate into application equipment or rinsate collection system. Repeat this rinsing procedure two more times.

For refillable containers: 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 refiller. To clean the container before final disposal, empty the remaining contents from this container into application equipment or mix tank. Fill the container about 10 percent full with water. Agitate vigorously or recirculate water with the pump for 2 minutes. Pour or pump rinsate into application equipment or rinsate collection system. Repeat this rinsing procedure two more times.

For help with any spill, leak, fire or exposure involving this material, call day or night CHEMTREC - 1-800-424-9300

Application Precautions

- Avoid application where proximity of susceptible crops or other desirable plants is likely to result in exposure to spray or spray drift.
- Field Bioassay Instructions: In fields previously treated with this product, plant short test rows of the intended rotational crop across the original direction of application in a manner to sample variability in field conditions such as soil texture, soil organic matter, soil pH, or drainage. The field bioassay can be initiated at any time between harvest of the treated crop and the planting of the intended rotational crop. Observe the test crop for herbicidal activity, such as poor stand (effect on seed germination) chlorosis (yellowing), and necrosis (dead leaves or shoots), or stunting (reduced growth). If herbicidal symptoms do not occur, the test crop can be grown. If there is apparent herbicidal activity, do not plant the field to the test rotational crop; plant only a labeled crop or crop listed in the table below for which the rotational interval has clearly been met.

Application Restrictions

- Do not apply HM-1144 directly to, or allow spray drift to come in contact with broadleaf crops or other susceptible broadleaf plants, including, but not limited to, alfalfa, canola, beans, cotton, flowers, grapes, lettuce, lentils, mustard, peas, potatoes, radishes, soybeans, sugar beets, sunflowers, tobacco, tomatoes, vegetables, or other desirable broadleaf crops or ornamental plants or soil where sensitive crops will be planted the same season.
- Do not contaminate irrigation ditches or water used for domestic purposes.
- Chemigation: Do not apply this product through any type of irrigation system.
- Do not transfer livestock from treated grazing areas (or feeding of treated hay) to sensitive broadleaf crop areas without first allowing 7 days of grazing on an untreated pasture (or feeding of treated hay). If livestock are transferred within less than 7 days of grazing untreated pasture or eating untreated hay, urine and manure may contain enough clopyralid to cause injury to sensitive broadleaf plants.

Crop Rotation Intervals

Residues of HM-1144 in treated plant tissues, including the treated crop or weeds, which have not completely decayed may affect succeeding susceptible crops.

Plantback Restrictions: Wheat, barley, oats, rye, flax and peas treated with MCPA may be replanted with any crop specified on an MCPA label or any crop for which a residue tolerance exists for MCPA. For crops not listed on an MCPA label, or on crops for which no residue tolerances for MCPA have been established, a 1-year plantback interval must be observed.

Crop Rotation Intervals for All States except California, Idaho, Nevada, Oregon, Utah and Washington

Note: Numbers in parenthesis and [†] refer to footnotes following tables.

Rotation Crops (1)	Rotation Interval [†] (Soils greater than 2% organic matter AND rainfall more than 15 inches during 12 months following application)	Rotation Interval [†] (Soils less than 2% organic matter AND rainfall less than 15 inches during 12 months following application)
barley, grasses, field com, oats, sweet com, wheat	Anytime	Anytime
flax	120 days	120 days
canola (rapeseed), cole crops (Brassica species), garden beet, popcorn, spinach, sugarbeet, turnip	12 months	12 months
alfalfa	10.5 months	10.5 months
asparagus, grain sorghum, mint, onions, safflower, strawberries	12 months	12 months
dry beans, soybeans, sunflowers	12 months	18 months
lentils, peas, potatoes (including potatoes grown for seed), and broadleaf crops grown for seed (excluding Brassica species)	18 months (2)	18 months (2,3)

- A field bioassay is recommended prior to planting any broadleaf crops that are not listed. Do not rotate to unlisted crops prior to 12 months following application.
- For rotation to field peas in 10.5 months, precipitation must be greater than 7.0 inches during the 10.5 months following application of HM-1144 and greater than 5.5 inches during the June 1 to August 31 time period following application. Otherwise rotation to field peas is recommended 18 months following application.
- A field bioassay is also recommended prior to planting these sensitive crops. See instructions above.

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Crop Rotation Intervals for California, Idaho, Nevada, Oregon, Utah and Washington Only

Rotation Crops (1)	Rotation Interval [†] (Areas receiving greater than 18 inches of rainfall – not including irrigation)	Rotation Interval [†] (Areas receiving less than 18 inches of rainfall – not including irrigation)
barley, grasses, field com, oats, sweet com, wheat	Anytime	Anytime
flax	120 days	120 days
canola (rapeseed), cole crops (includes Brassica species grown for seed), garden beet, popcorn, spinach, sugarbeet, turnip	12 months	12 months
asparagus, grain sorghum, mint, onions, safflower, strawberries	12 months	12 months
Alfalfa, dry beans, soybeans, sunflower	12 months	18 months (2,3)
broadleaf crops grown for seed (excluding Brassica species), carrots (2), celery (2), cotton (2), lentils, lettuce (2), melons (2), peas, potatoes (including potatoes grown for seed), safflower, and tomatoes (2)	18 months (2)	18 months (2,3)

1. A field bioassay is recommended prior to planting any broadleaf crops that are not listed. Do not rotate to unlisted crops prior to 12 months following application.
2. An 18-month crop rotation is recommended due to the potential for crop injury. Note: For these crops, a minimum 12 month rotation interval must be observed to avoid illegal residues in the harvested crop.
3. Crop injury and/or yield loss may occur up to 4 years after application. A field bioassay is also recommended prior to planting these sensitive crops. See instructions above.

[†] **Note:** The above intervals are based on average annual precipitation, regardless of irrigation practices. Observance of recommended crop rotation intervals should result in adequate safety to rotational crops. However, HM-1144 is dissipated in the soil by microbial activity and the rate of microbial activity is dependent on several interrelating factors including soil moisture, temperature and organic matter. Therefore, accurate prediction of rotational crop safety is not possible. In areas of low organic matter «2.0%) and less than 15 inches average annual precipitation, potential for crop injury may be reduced by burning or removal of plant residues, supplemental fall irrigation and deep moldboard plowing prior to planting the sensitive crop.

Avoiding Injury to Non-Target Plants: This product can affect susceptible broadleaf plants directly through foliage and indirectly by root uptake from treated soil. Do not apply HM-1144 herbicide directly to, or allow spray drift to come in contact with broad leaf crops, including, but not limited to alfalfa, canola, beans, cotton, flowers, grapes, lettuce, lentils, mustard, peas, potatoes, radishes, soybeans, sugar beets, sunflowers, tobacco, tomatoes, vegetables, or other desirable broadleaf crops or ornamental plants or soil where sensitive crops will be planted the same season. (See guidance in section entitled "Crop Rotation Intervals".)

Residues in Plants or Manure: Do not use plant residues, including hay or straw from treated areas, or manure or bedding straw from animals that have grazed or consumed forage from treated areas, for composting or mulching, where susceptible plants may be grown the following season. Do not spread

manure from animals that have grazed or consumed forage or hay from treated areas on land used for growing susceptible broadleaf crops. To promote herbicidal decomposition, plant residues should be evenly incorporated or burned. Breakdown of clopyralid in crop residues or manure is more rapid under warm, moist soil conditions and may be enhanced by supplemental irrigation.

Avoid Movement of Treated Soil: Avoid conditions under which soil from treated areas may be moved or blown to areas containing susceptible plants. Wind-blown dust containing clopyralid may produce visible symptoms, such as epinasty (downward curving or twisting of leaf petioles or stems) when deposited on susceptible plants; however, serious injury is unlikely. To minimize potential movement of clopyralid on wind-blown dust, avoid treatment of powdery dry or light sandy soils until soil has been settled by rainfall or irrigation or irrigate shortly after application.

Precautions for Avoiding Spray Drift: Spray drift, even very small quantities of the spray that may not be visible, may severely injure susceptible crops whether dormant or actively growing. When applying HM-1144, use low-pressure equipment capable of producing sprays of uniform droplet size with a minimum of fine spray droplets. Under adverse weather conditions, fine spray droplets that do not settle rapidly onto target vegetation may be carried a considerable distance from the treatment area. A drift control or spray thickening agent may be used with this product to improve spray deposition and minimize the potential for spray drift. If used, follow all use recommendations and precautions on the product label.

Ground Applications: To minimize spray drift, apply HM-1144 in a total spray volume of 8 or more gallons per acre using spray equipment designed to produce large-droplet, low pressure sprays. Refer to the spray equipment manufacturer's recommendations for detailed information on nozzle types, arrangement, spacing and operating height and pressure. Spot treatments should be applied only with a calibrated boom to prevent over application. Operate equipment at spray pressures no greater than is necessary to produce a uniform spray pattern. Operate the spray boom no higher than is necessary to produce a uniformly overlapping pattern between spray nozzles. Do not apply with hollow cone-type insecticide nozzles or other nozzles that produce a fine-droplet spray.

Aerial Application: To minimize spray drift, apply HM-1144 in a total spray volume of 3 or more gallons per acre. Drift potential is lowest between wind speeds of 2 to 10 mph. However, many factors, including droplet size and equipment type, determine drift potential at any given speed. Application should be avoided below 2 mph due to variable wind direction and high potential for temperature inversion. Spray drift from aerial application can be minimized by applying a coarse spray at spray boom pressure no greater than 30 psi; by using straight-stream nozzles directed straight back; and by using a spray boom no longer than 3/4 the rotor or wing span of the aircraft. Spray pattern and droplet size distribution can be evaluated by applying sprays containing a water soluble dye marker or appropriate drift control agents over a paper tape (adding machine tape). Mechanical flagging devices may also be used.

Do not apply under conditions of a low level air temperature inversion. A temperature inversion is characterized by little or no wind and lower air temperature near the ground than at higher levels. The behavior of smoke generated by an aircraft mounted device or continuous smoke column released at or near site of application will indicate the direction and velocity of air movement. A temperature inversion is indicated by layering of smoke at some level above the ground and little or no lateral movement.

Spray. Drift Management: Avoiding spray drift at the application site is the responsibility of the applicator. The interaction of many equipment-and-weather-related factors determines the potential for spray drift. The applicator and the grower are responsible for considering all these factors when making decisions. The following drift management requirements must be followed to avoid off-target drift movement from aerial applications to agricultural field crops. These requirements do not apply to forestry applications, public health uses or to applications using dry formulations.

1. The distance of the outer most nozzles on the boom must not exceed 75% the length of the wingspan or 90% of rotor width.

2. Nozzles must always point backward parallel with the air stream and never be pointed downwards more than 45 degrees.

Where states have more stringent regulations, they should be observed.

The applicator should be familiar with and take into account the information covered in the following **Aerial Drift Reduction Advisory Information:**

Importance of Droplet Size: The most effective way to reduce drift potential is to apply large droplets. The best drift management strategy is to apply the largest droplets that provide sufficient coverage and control. Applying larger droplets reduces drift potential, but will not prevent drift if applications are made improperly, or under unfavorable environmental conditions (see Wind, Temperature and Humidity, and Temperature Inversion section of this label).

Controlling Droplet Size

Volume - Use high flow rate nozzles to apply the highest practical spray volume. Nozzles with higher rated flows produce larger droplets.

Pressure - Use the lower spray pressures recommended for the nozzle. Higher pressure reduces droplet size and does not improve canopy penetration. When higher flow rates are needed, use higher flow rate nozzles instead of increasing pressure.

Number of nozzles - Use the minimum number of nozzles that provide uniform coverage.

Nozzle Orientation - Orienting nozzles so that the spray is released backwards, parallel to the airstream will produce larger droplets than other orientations. Significant deflection from the horizontal will reduce droplet size and increase drift potential.

Nozzle Type - Use a nozzle type that is designed for the intended application. With most nozzle types, narrower spray angles produce larger droplets. Consider using low-drift nozzles. Solid stream nozzles oriented straight back produce larger droplets than other nozzle types.

Boom Length - For some use patterns, reducing the effective boom length to less than 75% of the wingspan or 90% of rotor width may further reduce drift without reducing swath width.

Application: Applications should not be made at a height greater than 10 feet above the top of the largest plants unless a greater height is required for aircraft safety. Making applications at the lowest height that is safe reduces exposure of droplets to evaporation and wind.

Swath Adjustment: When applications are made with a crosswind, the swath will be displaced downwind. Therefore, on the up and downwind edges of the field, the applicator must compensate for this displacement by adjusting the path of the aircraft upwind. Swath adjustment distance should increase, with increasing drift potential (higher wind, smaller drops, etc.).

Wind: Drift potential is lowest between wind speeds of 2-10 mph. However, many factors, including droplet size and equipment type determine drift potential at any given speed. Application should be avoided below 2 mph due to variable wind direction and high inversion potential. Note: Local terrain can influence wind patterns. Every applicator should be familiar with local wind patterns and how they affect drift.

Temperature and Humidity: When making applications in low relative humidity, set up equipment to produce larger droplets to compensate for evaporation. Droplet evaporation is most severe when conditions are both hot and dry.

Temperature Inversions: Applications should not occur during a temperature inversion, because drift potential is high. Temperature inversions restrict vertical air mixing, which causes small-suspended droplets to remain in a concentrated cloud. This cloud can move in unpredictable directions due to the light variable winds common during inversions. A temperature inversion is characterized by increasing temperature with altitude and commonly develops at night when there is limited cloud cover and calm conditions. They begin to form as the sun sets and often continue into the morning. Presence of a

temperature inversion is indicated by ground fog; however, if ground fog is not present, a temperature inversion can also be indicated by movement of smoke from a ground or an aircraft smoke generator. Smoke that forms a layer and moves laterally in a connected cloud (under low wind conditions) is an indication of inversion conditions, while smoke that moves upward and dissipates rapidly is an indication of good vertical air mixing.

Sensitive Areas: The pesticide should only be applied when the potential for drift to adjacent sensitive areas (e.g., residential areas, bodies of water, known habitat for threatened or endangered species, non-target crops) is minimal (e.g., when wind is blowing away from the sensitive areas).

Sprayer Clean-Out: To avoid injury to desirable plants, equipment used to apply HM-1144 should be thoroughly cleaned before re-using to apply any other chemicals.

1. Rinse and flush application equipment thoroughly at least 3 times with water after use. Dispose of rinse water by application to treatment area or in non-cropland area away from water supplies.
2. During the second rinse, add 1 qt of household ammonia for every 25 gallons of water. Circulate the solution through the entire system so that all internal surfaces are contacted (15-20 minutes). Let the solution stand for several hours, preferably overnight.
3. Flush the solution out of the spray tank through the boom.
4. Rinse the system twice with clean water, recirculating and draining each time.
5. Remove nozzles and screens and clean separately.

Mixing Instructions

1. Fill spray tank with water equal to 1/2 to 3/4 of the required spray volume and start agitation.
2. Add the required amount of HM-1144.
3. Add any surfactants, adjuvants or drift control agents according to manufacturer's label.
4. Agitate during final filling of the spray tank and maintain sufficient agitation during application to ensure uniformity of the spray mixture.

Note: Allow time for thorough mixing of each spray ingredient before adding the next. If allowed to stand after mixing, agitate spray mixture before use.

Tank Mixing: This product may be applied in tank mix combination with labeled rates of other products provided (1) the tank mix product is labeled for the timing and method of application for the use site to be treated; and (2) tank mixing with products containing MCPA, fluroxypyr or clopyralid is not prohibited by the label of the tank mix product. When tank mixing, do not exceed recommended application rates and use only in accordance with the most restrictive precautions and limitations on the respective product labels.

Tank Mixing Precautions:

- Read carefully and follow all applicable use directions, precautions, and limitations on the respective product labels.
- Do not exceed listed application rates. Do not tank mix with another pesticide product that contains the same active ingredient as this product unless the label of either tank mix partner specifies the maximum dosages that may be applied.
- For products packaged in water soluble packaging, do not tank mix with products containing boron or mix in equipment previously used to apply a product mixture containing boron unless the tank and spray equipment has been adequately cleaned. (See instructions for Sprayer Clean-Out.)
- Always perform a (jar) test to ensure the compatibility of products to be used in tank mixture.

Tank Mix Compatibility Testing: A jar test is recommended prior to tank mixing to ensure compatibility of HM-1144 and other pesticides. Use a clear glass quart jar with lid and mix the tank mix ingredients in their relative proportions. Invert the jar containing the mixture several times and observe the mixture for

approximately 1/2 hour. If the mixture balls-up, forms flakes, sludges, jells, oily films or layers, or other precipitates, it is not compatible and the tank mix combination should not be used.

Tank Mixing Instructions: Fill spray tank with water to 1/2 to 3/4 of the required spray volume. Start agitation. Add different formulation types in the order indicated, allowing time for complete mixing and dispersion after addition of each.

1. Add dry flowables; wettable powders; aqueous suspensions, flowables or liquids.
2. Maintain agitation and fill spray tank to 3/4 of total spray volume and then add HM-1144 and other emulsifiable concentrates and any solutions.

Finish filling the spray tank. Maintain continuous agitation during mixing, final filling and throughout application. If spraying and agitation must be stopped before the spray tank is empty, the materials may settle to the bottom. Settled materials must be resuspended before spraying is resumed. A sparger agitator is particularly useful for this purpose. Settled material may be more difficult to resuspend than when originally mixed.

Application Directions WHEAT (including Durum), BARLEY, OATS

Application Timing: Apply to actively growing weeds. Extreme growing conditions such as drought or near freezing temperatures prior to, at, or following application may reduce weed control and increase the risk of crop injury at all stages of growth. **Only weeds that have emerged at the time of application will be controlled.** If foliage is wet at the time of application, control may be decreased. Applications of HM-1144 herbicide are rainfast within 6 hours after application. To obtain season-long control of perennial weeds such as Canada thistle, apply when the majority of the basal leaves have emerged from the soil up to bud stage. For suppression of volunteer potatoes, apply before potato plants are 6 inches tall. **Do not apply HM-1144 after the crop has reached the F9 stage. Do not use if cereal crop is underseeded with a legume.**

Effect of Temperature on Herbicidal Activity: Herbicidal activity of HM-1144 is influenced by weather conditions. Optimum activity requires active plant growth. The temperature range for optimum herbicidal activity is 55°F to 75°F. Reduced activity will occur when temperatures are below 45°F or above 85°F. Frost before application (3 days) or shortly after (3 days) may reduce weed control and crop tolerance.

Restrictions:

Do not allow livestock to graze treated areas or harvest treated forage within 7 days of application.

Do not apply more than 1.7 pints per acre of HM-1144 per growing season.

Preharvest Interval: Do not apply closer than 14 days before cutting of hay or 40 days before harvesting of grain and straw.

Application Rates: Generally, application rates at the lower end of the recommended rate range will be satisfactory for young, succulent growth of susceptible weed species. For less sensitive species, perennials, and under conditions where control is more difficult (plant stress conditions such as drought or extreme temperatures, dense weed stands and/or larger weeds), the higher rates within the rate range will be needed. Weeds in fallow land or other areas where competition from crops is not present will generally require higher rates for control or suppression.

Broadcast Application Rates:*(Numbers in parentheses (-) refer to footnotes following table.)*

Weed Size ,or Species (1)	Application Rate (pt/acre)	Maximum MCPA a.e. lbs/acre Based on Application Rate
<i>Susceptible broadleaf weed seedlings less than 4 inches tall (2)</i>	1.0	0.310
<i>Susceptible broadleaf weed seedlings less than 8 inches tall or vining; dicamba tolerant kochia biotypes</i>	1.0 – 1.5	0.46
<i>Volunteer potatoes</i>	1.0 – 1.5	0.46

1. See "Weeds Controlled or Suppressed" section for a complete listing of weeds controlled or suppressed.
2. A rate of 1.0 pints per acre will provide satisfactory control of kochia seedlings less than 4 inches tall (including ALS resistant biotypes). However, when conditions for control are less favorable, such as under drought or cool temperatures, a rate of up to 1.5 pints per acre will provide more consistent control of kochia seedlings 1 to 4 inches tall. Control of small kochia will be more consistent if kochia is at least 1 inch tall. A rate of 1.0 to 1.5 pints per acre should be used for optimal control of dicamba tolerant kochia populations (see "Management of Kochia Biotypes" in the "Broadleaf Weeds Controlled" section above).

Spray Coverage: Use sufficient spray volume to provide thorough coverage and a uniform spray pattern. Do not broadcast apply in less than 3 gallons of total spray volume per acre. For best results and to minimize spray drift, apply in a spray volume of 10 gallons or more per acre. As vegetative canopy and weed density increase, spray volume should be increased to obtain equivalent weed control. Use only nozzle types and spray equipment designed for herbicide application. To reduce spray drift, follow precautions under "Avoiding Injury to Non-Target Plants."

Adjuvants: Generally, this product does not require the use of an adjuvant to achieve satisfactory weed control. However, the addition of an adjuvant may optimize herbicidal activity when applications are made (a) at lower use rates or lower carrier volumes, (b) under conditions of cool temperature, low relative humidity or drought, or (c) to small, heavily pubescent kochia.

Use with Sprayable Liquid Fertilizer Solutions: HM-1144 is compatible with most non-pressurized liquid fertilizer solutions; however, if liquid fertilizer solutions are to be applied with HM-1144, a compatibility test (jar test) should be made prior to mixing. Jar tests are particularly important when a new batch of fertilizer or pesticide is used, when the water source changes, or when tank mixture ingredients or concentrations are changed. A compatibility test is performed by mixing the spray components (in the desired order and proportions) into a clear glass jar before mixing in the spray tank. Use of a compatibility aid such as Blendex may help obtain and maintain a uniform spray solution during mixing and application. Agitation in the spray tank must be vigorous to compare with jar test agitation. For best results, liquid fertilizer should not exceed 50% of the total spray volume. Premix HM-1144 with water and add to the liquid fertilizer/water mixture while agitating contents of the spray tank. Apply the spray the same day it is prepared while maintaining continuous agitation.

Advisory: Foliar-applied liquid fertilizers, used as a carrier for HM-1144, can cause yellowing or leaf burn of crop foliage.

Broadleaf Weeds Controlled or Suppressed –

Note: Numbers in parentheses (-) refer to footnotes below.

Weeds Controlled			Weeds Suppressed [†]
alfalfa, volunteer (from seed)	flax, volunteer	nightshade, black (5)	alfalfa, volunteer (from perennial plants)
artichoke, Jerusalem (1)	fleabane, hairy	nightshade, cutleaf (5)	buffalobur (5)
beans, volunteer	galinsoga	nightshade, hairy (5)	canola, volunteer
bedstraw (cleavers) (2)	grape species	peas, volunteer	Chinese thornapple
bindweed (seedling)	groundcherry	pennycress, field	devilsclaw
buckwheat, wild (3)	groundsel, common	pigweed	dock, (perennial)
burcucumber	hawksbeard, narrowleaf	pineappleweed	fiddleneck
burdock, common	hawkweed, orange	plantain, buckhorn (seedling)	field horsetail
buttercup	hawkweed, yellow	puncturevine	filaree
canola (volunteer)	hemp dogbane	purslane, common	knapweed, Russian
chamomile, false	horseweed	ragweed, common (1)	knotweed
chamomile, mayweed (dogfennel)	jimsonweed (1)	ragweed, giant (1)	ladysthumb (5)
chickweed	knapweed, diffuse	salsify, meadow (goatsbeard)	malva
clover, black medic	knapweed, spotted	shepherds-purse	marestail
clover, hop	knotweed	sicklepod	oxalis
clover, red	kochia (4)	sorrel, red	plantain, buckhorn (perennial)
clover, sweet	lambsquarters	sowthistle, annual & perennial	potato, volunteer
clover, white	lentils, volunteer	starthistle, yellow	smartweed
cocklebur, common (1)	lettuce, prickly	sunflower (1)	smartweed, ladysthumb (5)
coffeeweed	locoweed, Lambert	teasel, common	spurge, prostrate
cornflower (bachelor button)	locoweed, white	thistle, bull	thistle, Russian
cress, hoary	London rocket	thistle, Canada (6)	wormwood, biennial
croton	mallow, common	thistle, musk	
daisy, oxeeye	mallow, Venice	velvetleaf	
dandelion (perennial & seedling)	marshelder (1)	vetch	
dock, seedling	morningglory	whitebush	
flixweed	mustard species	wild carrot	
	nettle, burning	wild radish	

[†] Suppression is expressed as a reduction in weed competition (reduction population or vigor) as compared to untreated areas. The degree of weed control and duration of effect may vary with weed size, density, application rate, coverage, and growing conditions before, during and after treatment.

1. For best control, apply up to 5 leaf stage of growth.
2. For best control, apply in the 1 - 4 leaf "whorl" stage of growth.
3. For best control, apply in the 1 - 3 leaf stage of growth, before vining.
4. Includes herbicide tolerant or resistant biotypes. Best control is achieved when weeds are at least 1 inch tall.
5. For best control or suppression, apply at the 2 - 4 leaf stage of growth.
6. For best control or suppression, apply from rosette to bud (pre-flower) stage of growth.

Perennial weeds: HM-1144 will control the initial top growth and inhibit regrowth during the season of application (season-long control). At higher use rates shown on this label, HM-1144 may cause a reduction in shoot regrowth in the season following application; however, plant response may be inconsistent due to inherent variability in shoot regrowth from perennial root systems.

Management of Kochia Biotypes: Research has suggested that many biotypes of kochia can occur within a single field. While kochia biotypes can vary in their susceptibility to HM-1144, all will be suppressed or controlled by the 1.0 pint per acre labeled rate. Application of HM-1144 at rates below the 1.0 pint per acre rate can result in a shift to more tolerant biotypes within a field.

Best Resistance Management Practices: Extensive populations of dicamba tolerant kochia have been identified in certain small grain production regions (such as Chouteau, Fergus, Liberty, Toole, and

Treasure counties in the state of Montana). For optimal control of dicamba tolerant kochia in these counties, HM-1144 is recommended at a minimum rate of 1.0 pints per acre. In addition, use of HM-1144 should be rotated with products **that do not contain dicamba** to minimize selection pressure. Use of these practices will preserve the utility of HM-1144 for control of dicamba tolerant kochia biotypes.

Spot Treatments: To prevent misapplication, it is recommended that spot treatments be applied only with a calibrated boom or with hand sprayers according to directions provided below.

Hand-Held Sprayers: Hand-held sprayers may be used for spot applications. Care should be taken to apply the spray uniformly and at a rate equivalent to a broadcast application. Application rates in the table are based on an area of 1,000 sq ft. Mix the amount of HM-1144 (fl oz or ml) corresponding to the desired broadcast rate in 10 or more gallons of spray. To calculate the amount of HM-1144 required for larger areas, multiply the table value (fl oz or ml) by the area to be treated in "thousands" of square feet, e.g., if the area to be treated is 3,500 sq ft, multiply the table value by 3.5 (calc. $3,500 \div 1,000 = 3.5$). An area of 1000 sq ft is approximately 10.5 x 10.5 yards (strides) in size.

1 fl oz = 29.6 (30) ml

Amount per gallon of spray to Equal Specified Broadcast Rate	
1.0 pt/acre	1.5 pt/acre
0.43 fl oz (11 ml)	0.56 fl oz (16 ml)

SELECTIVE SPRAYING

NOTE - When using on grains - do not forage or graze dairy and meat animals on treated areas within seven days of slaughter. Also, except for small underseeded grains, use at least 10 gallons of water per acre for ground application and at least 1 to 5 gallons of water per acre for aerial application.

Grasses Grown for Seed - Use 1/2 to 1.0 pints per acre in 1 to 50 gallons of water by air or ground sprayer application. Use higher rate where weed stands are heavy. In established grasses, apply in Spring before head comes into boot stage and on seedling grass after grass has tillered.

Application timing: Apply to established grasses in the spring from the tiller stage prior to early boot stage. New grass seed plantings may be treated from the 2 true leaf stage to just before early boot stage of growth. Applications in the boot stage and beyond can result in increased potential for injury. Do not apply to bentgrass unless injury can be tolerated. Apply when weeds are actively growing, but before weeds are 4 inches tall or vining. For control of late-emerging Canada thistle or kochia, a preharvest treatment may be made after grass seed is fully developed. Treatment of Canada thistle at the bud stage or later, or treatment of kochia greater than 8 inches tall may result in less consistent control. Post-harvest treatments in the fall may be made to actively growing Canada thistle after the majority of basal leaves have emerged.

RESTRICTIONS

Do not apply more than 2 pints per acre per year. Do not apply more than 2 applications per year with a minimum retreatment interval of 21 days.

- **Grazing restrictions:** There are no grazing restrictions for lactating or non-lactating dairy animals.
- **Harvest restrictions:** Do not harvest grass for hay or silage from treated areas within 7 days of application.
- **Slaughter restrictions:** Meat animals must be withdrawn from treated forage at least 2 days before slaughter.

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NOTE: For weed control in grasses, repeat treatment may be needed for less susceptible weeds. White clover and other legumes may be temporarily injured or killed. In some areas, bent, buffalo, carpet, centipede, dichondra and St. Augustine may also be injured by the treatment.

CONDITIONS OF SALE - LIMITED WARRANTY AND LIMITATIONS OF LIABILITY AND REMEDIES

Read the Conditions of Sale - Warranty and Limitations of Liability and Remedies before using this product. If the terms are not acceptable, return the product, unopened, and the full purchase price will be refunded.

The directions on this label are believed to be reliable and should be followed carefully. Insufficient control of pests and/or injury to the crop to which the product is applied may result from the occurrence of extraordinary or unusual weather conditions or the failure to follow the label directions or good application practices, all of which are beyond the control of Helena Chemical Company (the "Company") or seller. In addition, failure to follow label directions may cause injury to crops, animals, man or the environment. The Company warrants that this product conforms to the chemical description on the label and is reasonably fit for the purpose referred to in the directions for use subject to the factors noted above which are beyond the control of the Company. To the extent consistent with applicable law, the Company makes no other warranties or representations of any kind, express or implied, concerning the product, including no implied warranty of merchantability or fitness for any particular purpose, and no such warranty shall be implied by law.

To the extent consistent with applicable law, the exclusive remedy against the Company for any cause of action relating to the handling or use of this product shall be limited to, at Helena Chemical Company's election, one of the following:

- 1. Refund of the purchase price paid by buyer or user for product bought, or*
- 2. Replacement of the product used*

To the extent allowed by law, the Company shall not be liable and any and all claims against the Company are waived for special, indirect, incidental, or consequential damages or expense of any nature, including, but not limited to, loss of profits or income. The Company and the seller offer this product and the buyer and user accept it, subject to the foregoing conditions of sale and limitation of warranty, liability and remedies.

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