



HM-0452

For control of a wide-spectrum of annual, biennial, and perennial broadleaf weeds and brush in Pastures, Rangelands and Grass (Hay, Silage); Conservation Reserve Program land; General Farmstead Areas; Post-Harvest, Fallow, Crop Stubble and Set Aside Acres; Forest Management; Sorghum; Wheat; Roadsides, Rights-of-way, Industrial Sites and similar Non-crop areas.

ACTIVE INGREDIENT(S):

3,6-dichloro-*o*-methoxybenzoic acid* 10.80%
(2,4-dichlorophenoxy) acetic acid** 24.16%

OTHER INGREDIENTS: 65.04%

TOTAL 100.00%

Equivalent to:

*Dicamba Acid, 1.0 lbs./gal (CAS # 1918-00-9)

**2,4-D Acid, 2.3 lbs./gal (CAS # 94-75-7) Isomer specific by AOAC Method 6.D01-5 (12th Ed.)

KEEP OUT OF REACH OF CHILDREN DANGER/PELIGRO

**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 you in detail.)**

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 first 5 minutes, then continue rinsing eye. Call a poison control center or doctor for treatment advice.
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.
IF SWALLOWED:	Call a poison control center or doctor immediately for treatment advice. Have a person sip a glass of water if able to swallow. Do not induce vomiting unless told to do so by a poison control center or doctor. Do not give anything by mouth to an unconscious or convulsing 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 further treatment advice.

HOT LINE NUMBER – Have the product container or label with you when calling a poison control center or doctor or going for treatment. You may also contact 1-800-424-9300 for emergency medical treatment information.

NOTE TO PHYSICIAN: Probable mucosal damage may contraindicate the use of gastric lavage.

SEE INSIDE BOOKLET FOR ADDITIONAL PRECAUTIONS AND DIRECTIONS FOR USE.

AD 042414

EPA Reg. No. 42750-144-5905

EPA Est. No. 42750-MO-001

Manufactured For

HELENA CHEMICAL COMPANY

225 SCHILLING BOULEVARD, SUITE 300 • COLLIERVILLE, TENNESSEE 38017

PRECAUTIONARY STATEMENTS

HAZARDS TO HUMANS AND DOMESTIC ANIMALS

DANGER

Corrosive. Causes irreversible eye damage. Harmful if inhaled. Harmful if swallowed. Do not get in eyes or on clothing. Avoid contact with skin. Avoid breathing spray mist.

PERSONAL PROTECTIVE EQUIPMENT (PPE)

Some materials that are chemical-resistant to this product are butyl rubber, natural rubber, neoprene rubber or nitrile rubber. If you want more options, follow the instructions for Category A on an EPA chemical-resistance category selection chart.

All mixers, loaders, applicators, flaggers and other handlers must wear:

- Long-sleeved shirt and long pants,
- Chemical-resistant gloves
- Chemical-resistant apron when mixing, or loading, cleaning up spills or equipment, or otherwise exposed to the concentrate.
- Shoes plus socks, and
- Protective eyewear (goggles, faceshield, or safety glasses).

See engineering controls for additional 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.

If this container contains 5 gallons or more in capacity, do not open pour. A mechanical system (such as a probe and pump or spigot) must be used for transferring the contents of this container. If the contents of a non-refillable pesticide container are emptied, the probe must be rinsed before removal. If the mechanical system is used in a manner that meets the requirements listed in the Worker Protection Standard (WPS) for agricultural pesticides [40 CFR 170.240(d)(4)], the handler PPE requirements may be reduced or modified as specified in the WPS.

ENGINEERING CONTROL STATEMENTS

When handlers use 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.

Pilots must use cockpits in a manner that meets the requirements, listed in the Worker Protection Standard (WPS) for agricultural pesticides (40 CFR 170.240(d)(4-6).

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 change into clean clothing. If pesticide gets on skin, wash immediately with soap and water.
- 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.

ENVIRONMENTAL HAZARDS

This pesticide is toxic to fish and aquatic invertebrates. Do not apply directly to water, to areas where surface water is present, or to intertidal areas below the mean high water mark. Drift and runoff may be hazardous to aquatic organisms in water adjacent to treated areas. Do not contaminate water when disposing of equipment wash water or rinsate.

This chemical has properties and characteristics associated with chemicals detected in groundwater. The use of this chemical in areas where soils are permeable, particularly where the water table is shallow, may result in groundwater contamination. Application around a cistern or well may result in contamination of drinking water or groundwater.

Groundwater Contamination: Most cases of groundwater contamination involving phenoxy herbicides such as 2,4-D have been associated with mixing/loading and disposal sites. Caution should be exercised when handling 2,4-D pesticides at such sites to prevent contamination of groundwater supplies. Use of closed systems for mixing or 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.

Endangered Species Concerns:

The use of any pesticide in a manner that may kill or otherwise harm an endangered species or adversely modify their habitat is a violation of federal law.

DIRECTIONS FOR USE

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

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. This labeling must be in the user's possession during application.

Use of this product in certain portions of California, Oregon and Washington is subject to the January 22, 2004 Order for injunctive relief in Washington Toxics Coalition, et al. v. EPA, C01-0132C, (W.D. WA). For further information, please refer to EPA Web Site: <http://www.epa.gov/espp>.

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 48 hours.

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

- Coveralls worn over short-sleeved shirt and short pants.
- Chemical-resistant gloves made of any waterproof material
- Chemical-resistant footwear plus socks
- Chemical-resistant headgear for overhead exposure
- Protective eyewear

NON-AGRICULTURAL USE REQUIREMENTS

The requirements in this box apply to uses of this product that are NOT within the scope of the Worker Protection Standard for agricultural pesticides (40 CFR Part 170). The WPS applies when this product is used to produce agricultural plants on farms, forests, nurseries, or greenhouses.

Do not enter or allow people (or pets) to enter the treated area until sprays have dried.

(continued)

NON-AGRICULTURAL USE REQUIREMENTS (cont.)

USE REQUIREMENTS FOR PASTURES, PERENNIAL GRASSLANDS, RANGELAND, FALLOW LAND AND NON-CROP AREAS: Do not enter treated areas until spray has dried. For early entry to treated areas, wear eye protection, chemical-resistant gloves, long-sleeved shirt, long pants, shoes and socks.

TURF USE REQUIREMENTS: Do not allow persons (other than applicator) or pets on treated area during application. Do not enter treated areas until spray has dried.

NOTE: For application to turf being grown for sale or other commercial use as sod, or for commercial seed production, or for research purposes, follow AGRICULTURAL USE REQUIREMENTS on this label.

STORAGE AND DISPOSAL

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

PESTICIDE STORAGE: Do not store below temperature of 32°F or above 100°F. Store in original container in a well-ventilated area separately from fertilizer, feed, and foodstuffs. Keep container tightly closed when not in use. Reduce stacking height where local conditions can affect package strength. Do not store under conditions that might adversely affect the container or its ability to function properly.

PESTICIDE DISPOSAL: Pesticide wastes are toxic. Wastes resulting from the use of this product must be disposed of on site or at an approved waste disposal facility. Improper disposal of excess pesticide, spray mixture, or rinsate is a violation of Federal law and may contaminate groundwater. If these wastes cannot be disposed of by use according to label instructions, contact your State Pesticide or Environmental Control Agency, or the Hazardous Waste representative at the nearest EPA Regional Office for guidance.

CONTAINER DISPOSAL: Non-refillable containers (non-refillable ≤5 gallons): Do not reuse or refill this container. Offer for recycling, if available. Triple rinse or pressure rinse container (or equivalent) promptly after emptying.

(non-refillable ≤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. Then offer for recycling if available or puncture and dispose of in a sanitary landfill or by incineration, or, if allowed by state and local authorities, by burning. If burned, stay out of smoke.

(non-refillable >5 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. 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, if allowed by state and local authorities, by burning. If burned, stay out of smoke.

Pressure rinse as follows (all sizes): 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 for disposal. Insert pressure rinsing nozzle inside of the container, and rinse at about 40 PSI for at least 30 seconds. Drain for 10 seconds after the flow begins to drip.

Refillable container (250 gallon & bulk): 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 the 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 process two more times. Then offer for recycling if available or puncture and dispose of in a sanitary landfill or by incineration, or, if allowed by state and local authorities, by burning. If burned, stay out of smoke.

In Case of Spill: In case of large-scale spillage regarding this product, call ChemTrec 800-424-9300.

Steps to be taken in case material is released or spilled:

Dike and contain the spill with inert material (sand, earth, etc.) and transfer liquid and solid diking material to separate containers for disposal. Remove contaminated clothing, and wash affected skin areas with soap and water. Wash clothing before re-use. Keep the spill out of all sewers and open bodies of water.

I. PRODUCT INFORMATION

HM-0452 is a postemergence herbicide for controlling a wide spectrum of annual, biennial, and perennial broadleaf weeds and brush in pastures, rangeland, and grass (hay, silage); sorghum; wheat; conservation reserve program land; postharvest, fallow, crop stubble, set-aside acres; general farmstead areas; certain noncrop areas; and for forest management.

Mode of Action

HM-0452 contains two active ingredients uniquely formulated to be used alone or tank mixed with other listed products as well as liquid fertilizer solutions. **HM-0452** is readily absorbed by plants through shoot and root uptake, translocates throughout the plant's system, and accumulates in areas of active growth. **HM-0452** interferes with the plant's growth hormones (auxins) resulting in death of many broadleaf weeds.

For best results, thoroughly clean sprayer equipment (tank, lines and nozzles) immediately after use by flushing system with water and heavy duty detergent or other suitable tank cleaner.

II. APPLICATION INSTRUCTIONS

Apply **HM-0452** at the rates and growth stages listed in Tables 1 and 2 as follows unless instructed differently by section on "Food/Feed Crop Specific Information" or "Non-Food/Feed Use (Land not Harvested, Grazed or Foraged)–Specific Information." **HM-0452** may be applied using water or sprayable fluid fertilizer as a carrier. Sprayable fluid fertilizer may be used as the carrier in preplant or pre-emergence use for all crops listed on this label. Postemergence uses with sprayable fluid fertilizer may be made on pasture, hayland, or wheat crops only. The most effective application rate and timing varies based on the target weed species (refer to Table I). In mixed populations of weeds the correct rate is determined by the weed species requiring the highest rate. Delaying application permits weeds to exceed the maximum size and will prevent adequate control. For certain specified applications liquid fertilizer or oil may replace part or all of the water as diluent. If dry flowable (DF), wettable powder (WP) or flowable (F) tank mix products are to be used, these should generally be added to the spray tank first. Follow the mixing directions on the labels of the tank mix products.

Apply product only when active weed growth is evident.

CHEMIGATION PROHIBITION

Restrictions:

- Do not apply this product through any type of irrigation system.
- 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.

Spray Coverage:

Weeds must be thoroughly covered with spray. Dense leaf canopies shelter smaller weeds and prevent adequate spray coverage. Do not apply more than 2 applications per year.

Sensitive Crop Precautions:

HM-0452 may cause injury to desirable trees and plants, particularly beans, cotton, flowers, fruit trees, grapes, ornamentals, peas, potatoes, soybeans, sunflowers, tobacco, tomatoes and other broadleaf plants when contacting their roots, stems or foliage. At high temperatures (about 85 degrees or higher), vapors from this product may cause injury to the aforementioned susceptible crops. These plants are most sensitive to **HM-0452** during their development or growing stage. Do not treat areas where either possible downward movement into the soil or surface washing may cause contact of **HM-0452** with the roots of desirable trees and shrubs.

Drift Reduction Information:

The following information may be helpful in reducing possible spray drift from ground or aerial applications. Avoid making applications when spray particle may be carried by air currents to areas where sensitive crops and plants are growing. Do not spray near sensitive plants if the wind is gusty or in excess of 5 mph and moving in the direction of nearby sensitive crops or if a temperature inversion exists. Always determine the direction and distance of possible spray drift prior to application. Leave an adequate buffer zone between area to be treated and sensitive plants. Coarse sprays are less likely to drift out of the target area than fine sprays. Properly maintain and calibrate all spray equipment. The use of agriculturally accepted drift retardants are acceptable and advised. Avoid applications within the vicinity of susceptible plants when at all possible. Do not apply in greenhouses.

AERIAL APPLICATION METHODS AND EQUIPMENT

Water Volume: Use 3–10 gallons of water per acre. Use the higher spray volume when treating dense or tall vegetation.

Application Equipment: Select nozzles designed to produce minimal amounts of fine spray particles. Make applications at the lowest stage height to reduce the exposure of spray droplets to evaporation and wind. The applicator must follow the most restrictive use cautions to avoid drift hazards, including those found in the this labeling as well as applicable state and local regulations and ordinances.

SPRAY DRIFT MANAGEMENT

AVOIDING SPRAY DRIFT AT THE APPLICATION SITE IS THE RESPONSIBILITY OF THE APPLICATOR.

A variety of factors including weather conditions (e.g., wind direction, wind speed, temperature, relative humidity) and method of application (e.g., ground, aerial, airblast) can influence pesticide drift. The applicator must evaluate all factors and make appropriate adjustments when applying this product.

Droplet Size

When applying sprays that contain 2,4-D as the sole active ingredient, or when applying sprays that contain 2,4-D mixed with active ingredients that require a Coarse or coarser spray, apply only as a Coarse or coarser spray (ASAE standard 572) or a volume mean diameter of 385 microns or greater for spinning atomizer nozzles.

When applying sprays that contain 2,4-D mixed with other active ingredients that require a Medium or more fine spray, apply only as a Medium or coarser spray (ASAE standard 572) or a volume mean diameter of 300 microns or greater for spinning atomizer nozzles.

Wind Speed

Do not apply at wind speeds greater than 15 mph. Only apply this product if the wind direction favors on-target deposition and there are not sensitive areas (including, but not limited to, residential areas, bodies of water, known habitat for nontarget species, nontarget crops) within 250 feet downwind. If applying a Medium spray, leave one swath unsprayed at the downwind edge of the treated field.

Temperature Inversions

If applying at wind speeds less than 3 mph, the applicator must determine if: (a) conditions of temperature inversion exist, or (b) stable atmospheric conditions exist at or below nozzle height. Do not make applications into areas of temperature inversions or stable atmospheric conditions.

Susceptible Plants

Do not apply under circumstances where spray drift may occur to food, forage, or other plantings that might be damaged or crops thereof rendered unfit for sale, use or consumption. Susceptible crops include, but are not limited to, cotton, okra, flowers, grapes (in growing stage), fruit trees (foliage), soybeans (vegetable stage), ornamentals, sunflowers, tomatoes, beans and other vegetables, or tobacco. Small amounts of spray drift that might not be visible may injure susceptible broadleaf plants.

Other State and Local Requirements

Applicators must follow all state and local pesticide drift requirements regarding application of 2,4-D herbicides. Where states have more stringent regulations, they must be observed.

Equipment

All aerial and ground application equipment must be properly maintained and calibrated using appropriate carriers or surrogates. The boom length must not exceed 75% of the wingspan or 90% of the rotor blade diameter.

Release spray at the lowest height consistent with efficacy and flight safety. Do not release spray at a height greater than 10 feet above the crop canopy unless a greater height is required for aircraft safety. This requirement does not apply to forestry or rights-of-way applications.

Do not apply with a nozzle height greater than 4 feet above the crop canopy.

Do not apply during conditions of low humidity and high temperatures.

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).

Table 1. Application Rate and Timing – Annual Weeds

(For use in non-food/feed crops only: the addition of liquid fertilizer (28-0-0, 32-0-0) solutions at 1/2 the GPA spray solution has shown to give increased efficacy.)

Weeds Controlled (including ALS- and triazine-resistant)	Rate Per Acre (according to weed growth stage)					
	1/3 pints	2/3 pints	1 pints	1 1/8 pints	1 2/3 pints	2 pints
Beebalm, Spotted	–	–	–	pre-bloom	post-bloom	–
Broomweed	1–3”	3” branching	–	branching	–	after branching
Buckwheat, Wild	–	1–6”	–	–	–	–
Buffalobur	–	–	–	1–6”	–	Flowering
Burdock	–	pre-flower	–	–	–	–
Buttercup	–	pre-flower	–	early bloom	late bloom	–
Chickweed, Common	–	Seedling	1–3”	–	–	–
Cockle, Cow	–	<3”	–	–	–	–
Cocklebur, Common	–	1–6”	6–12”	12–18”	–	–
Coreopsis, Plains	1–4”	1–6”	–	–	–	–
Croton, Woolly	–	4–12”	12–30”	–	–	–
Dogfennel	–	–	–	10–15”	–	–
Evening Primrose	–	<2”	–	2–6”	–	–
Flax	–	<2”	–	–	–	–
Fleabane, Annual	–	1–4”	4–8”	8”	–	–
Flixweed	–	<3”	–	–	–	–
Henbit	–	–	preflower	–	flower	–
Knotweed spp.	–	<3” runners	–	>3” runners	–	actively growing
Kochia	–	1–6”	6–10”	10–20”	–	actively growing
Lambsquarters, Common	–	1–6”	6–10”	10–20”	–	actively growing
Mallow, Common	–	<3”	–	–	–	–
Morningglory, Ivyleaf	–	pre-flower	–	–	–	–
Morningglory, Tall	–	pre-flower	–	post-flower	–	–
Mustards, Annual	–	rosette	–	early bolt	–	–
Mustards, Tansy	–	<3”	–	–	–	–
Pennycress, Field	–	–	–	rosette	–	–
Pepperweed, Virginia	–	–	1–3”	3–6”	after branching	–
Pigweed, Prostrate	–	<3”	–	–	–	–
Pigweed, Redroot	–	<3”	3–10”	–	–	–
Pigweed, Smooth	–	<3”	–	–	–	–
Pigweed, Tumble	–	<3”	–	mature	–	–
Poorjoe	–	prior to flower	–	–	–	actively growing
Purslane, Common	–	<3”	3–8”	–	–	–

(continued)

Weeds Controlled (including ALS- and triazine-resistant)	Rate Per Acre (according to weed growth stage)					
	1/3 pints	2/3 pints	1 pints	1 1/8 pints	1 2/3 pints	2 pints
Ragweed, Common	–	–	–	> 10"	–	–
Ragweed, Western & Lanceleaf	1–3"	3–6"	6–10"	actively growing	–	–
Sedge ¹	–	–	–	–	–	–
Shepherdspurse	–	rosette	–	–	–	–
Smartweed, Pennsylvania	–	< 4"	–	–	4–12"	–
Sneezeweed, Bitter	–	1–4"	prior to flower	flower	–	–
Sowthistle	–	rosette	–	bolting	–	–
Sunflower	–	1–3"	3–6"	6–24"	–	–
Thistle, Russian	–	–	–	rosette	–	–
Velvetleaf	–	< 6"	6–20"	> 20"	–	–

¹ For use in non-food/feed crop only. Adding crop oil concentrate has shown to improve performance on actively growing annual sedge.

Table 2. Application Rate and Timing – Biennial and Perennial Weeds

(The addition of liquid fertilizer (28-0-0, 32-0-0) at 1/2 the GPA of the spray solution has proven to give increase suppression or control on certain species of weeds.)

Weeds Controlled	Rate Per Acre (according to weed growth stage)					
	1/3 pints	2/3 pints	1 pints	1 1/8 pints	1 2/3 pints	2–3 1/4 pints
Bindweed, Field	–	–	–	–	–	actively growing
Bittercress	–	2–3"	–	–	–	–
Buckeye species	–	–	–	–	full leaf	–
Bullnettle ¹	–	–	–	flower	–	–
Chicory	–	–	–	–	early bolting	–
Clove, Bur	–	–	pre-flower	–	–	–
Dandelion, Common	–	rosette	–	bolting	–	–
Dewberry, Southern	–	–	–	–	–	spring or fall
Dock, Curly	–	–	prior to bolting	–	after bolting	–
Elderberry ¹	–	–	–	–	–	actively growing
Goldenrod, Missouri	–	–	–	3–15"	flower	–
Groundsel, Texas	–	rosette	post-bolting	–	–	–
Honeysuckle, Hairy	–	–	–	–	spring or fall	–
Horsenettle, Carolina	–	–	–	–	–	flower or berry
Ivy, Poison	–	–	–	after bloom	–	–
Knapweed, Black ¹	–	–	–	–	–	actively growing
Knapweed, Russian ¹	–	–	–	–	–	actively growing
Knapweed, Spotted	–	–	–	–	–	actively growing
Marshelder	–	–	–	< 12"	12"/prebloom	–

(continued)

Weeds Controlled	Rate Per Acre (according to weed growth stage)					
	1/3 pints	2/3 pints	1 pints	1 1/8 pints	1 2/3 pints	2-3 1/4 pints
Mesquite ²	-	-	-	-	-	45-90 days after budbreak
Milkweed, Antelopehorn ¹	-	-	-	pre-flower	-	flower
Nightshade, Silverleaf	-	-	-	full flower	-	-
Nightshade, Black	-	-	-	full flower	-	actively growing
Persimmon, Eastern ²	-	-	-	-	-	actively growing
Prickly, Lettuce	-	-	-	rosette	-	actively growing
Rabbitbrush ¹	-	-	-	-	-	-
Ragwort, Tansy	-	-	-	rosette	-	actively growing
Redvine ¹	-	-	-	-	-	actively growing
Sagebrush, Fringed ¹	-	-	-	-	-	actively growing
Smartweed	-	-	-	-	-	-
Sorrel, Red	-	-	rosette	bolting	flower	actively growing
Sowthistle ¹	-	-	-	-	-	actively growing
Spurge, Leafy ¹	-	-	-	-	-	full leaf
Tallow Tree, Chinese ³	-	-	-	-	-	-
Thistle, Bull	-	-	rosette	bolting	-	actively growing
Thistle, Canada ¹	-	-	-	-	-	-
Thistle, Musk	-	-	-	rosette/bolting	-	-
Thistle, Plumeless	-	-	rosette	bolting	-	-
Vetch, Hairy	-	1-4"	4-8"	8" full flower	-	-
Yankeeeweed	-	-	-	10-18"	-	rosette
Yellow Starthistle	-	-	-	-	-	-

¹ Specified rate will provide top growth suppression only.

² For improved root kill or woody species such as mesquite and eastern persimmon spray 2 pints of per acre **HM-0452** each year for 3 consecutive years.

³ Under dense populations, a second application may be needed the following growing season.

For increased control of weeds such as blackberry and dewberry, **HM-0452** may be tank mixed with Ally® herbicide (0.1-0.2 ounces per acre), if labeled for the use site.

Ground Application (Banding)

Do not apply with a nozzle height greater than 4 feet above the crop canopy.

When applying **HM-0452** herbicide by banding, determine the amount of herbicide and water volume needed using the following formula:

$$\frac{\text{Bandwidth in inches}}{\text{Row width in inches}} \times \text{Broadcast rate per acre} = \text{Banding herbicide rate per acre}$$

$$\frac{\text{Bandwidth in inches}}{\text{Row width in inches}} \times \text{Broadcast rate volume per acre} = \text{Banding water volume per acre}$$

Ground Application (Broadcast)

Water volume: Use 10–25 gallons of spray solution per broadcast acre for optimal performance. Use the higher spray volume when treating dense or tall vegetation.

Application Equipment: Select nozzle design to produce minimal amounts of fine spray particles. Spray nozzles as close to the weeds as is practical for good weed coverage.

Spot or Small Area Application

HM-0452 may be applied to individual clumps or small areas of undesirable vegetation using handgun or similar types of application equipment. Apply diluted sprays to allow complete wetting (up to runoff) of foliage and stems. For knapsack or other small capacity sprayers, prepare a solution of **HM-0452** in water according to Table 3 (assuming that the spot treatment rate equates to 40 gallons per acre on the broadcast basis). Adding a surfactant (0.5% by volume) can help improve control.

Do not make spot treatments in addition to broadcast or band treatments.

Application equipment: Select nozzles designed to produce minimal amounts of fine spray particles. Spray with nozzles as close to the weeds as is practical for good weed coverage.

Table 3. Knapsack Sprayer Dilution Instructions

Sprayer Capacity (gallons of water)	Amount of HM-0452 to add to the spray tank
1 gallon	2/3 fluid ounce*
3 gallons	2 fluid ounces
5 gallons	3 fluid ounces

*1 fluid ounce = 2 tablespoons

III. Additives

To improve burndown of emerged weeds, surfactants and/or low use rates of liquid fertilizers (28-0-0; 32-0-0), or crop oil concentrate may be used with **HM-0452** herbicide or **HM-0452** tank mixes applied after the weeds have emerged. Crop oil concentrate is for non-food/feed crop uses only. Do not apply tank mixes that include Ammonium Sulfate or Crop Oil Concentrate to any food/feed crop use listed on this label. For food/feed crop use, do not use liquid fertilizers that contain Ammonium Sulfate (AMS) as a source of nitrogen as tolerances in commodities derived from the crop may contain residues that exceed established tolerances.

Oil Concentrate

A crop oil concentrate must contain either a petroleum or vegetable oil base and must meet all of the following criteria:

- be non-phytotoxic
- provide good mixing quality in the jar test, and
- be successful in local experience

The exact composition of suitable products will vary; however, vegetable oil and petroleum oil concentrates should contain emulsifiers to provide good mixing quality. Highly refined vegetable oils have proven more satisfactory than unrefined vegetable oils. For additional information, see "Compatibility Test for Mix Components".

Adjuvants containing crop oil concentrates may be used for preplant, pre-emergence and between cropping applications. Do not use crop oil concentrate for postemergence applications to food/feed crops (i.e. sorghum, grass (hay or silage), pastures, rangeland, and wheat).

Nitrogen Source

Sprayable liquid fertilizers: Use 1/2 GPA of sprayable liquid fertilizers (28-0-0; 32-0-0) per acre. Do not use brass or aluminum nozzles when spraying fertilizers.

Non-ionic Surfactant

The standard label recommendation is 2–4 pints of an 80% active non-ionic spray surfactant per 100 gallons of water. (Rate will vary with the size and condition of weeds to be controlled. Use lowest rate per 100 gallons when weeds are small and actively growing. As weeds increase in size and or become hardened off, the rate of non-ionic surfactant will have to be increased to give optimum coverage and control.)

Table 4. Additive Rate Per Acre

Additive ¹	Rate Additive Per Acre
Non-ionic Surfactant	2–4 pints per 100 gallons ²
Sprayable Liquid Fertilizers (28-0-0; 32-0-0)	1/2 GPA of spray solution
Crop Oil Concentrate	1 quart

¹See manufacturer's label for specific rate recommendations.

²Use lowest rate per 100 gallons when weeds are small and actively growing. As weeds increase in size and or become hardened off, the rate of non-ionic surfactant will have to be increased to give optimum coverage and control.

IV. Tank Mixing Information

Tank Mix Partners/Components

The following products may be tank mixed with **HM-0452** according to the specific tank mixing instructions in this label and respective product labels.

- Aim™ (carfentrazone-ethyl)
- Ally® (metsulfuron-methyl)
- Amber® (triasulfuron)
- Asulox® (asulam)
- Atrazine
- Banvel® (dicamba)*
- Basagran® (bentazon)
- Bronate® (bromoxynil + MCPA)
- Buctril® (bromoxynil)
- Canvas® (thifensulfuron-methyl + tribenuron-methyl + metsulfuron-methyl)
- Clarity® (dicamba)*
- Curtail™ (clopyralid + 2,4-D)
- Cyclone® (paraquat)
- Dakota® (fenoxaprop-p-ethyl + MCPA)
- Dicamba DMA (dicamba)*
- Distinct® (diflufenzopyr + dicamba)*
- Evik® (ametryn)
- Express® (tribenuron-methyl)
- Fallowmaster® (glyphosate + dicamba)*
- Fallow Star™ (glyphosate + dicamba)*
- Finesse® (chlorsulfuron + metsulfuron-methyl)
- Glean® (chlorsulfuron)
- GlyStar® Plus (glyphosate)
- Gramoxone® Extra (paraquat)
- Grazon™ P+D (picloram + 2,4-D)*
- Harmony® Extra (thifensulfuron-methyl + tribenuron-methyl)
- Karmex® (diuron)
- Kerb™ (pronamide)
- Laddok® S-12 (bentazon + atrazine)*
- Landmaster® (glyphosate + 2,4-D)*
- MCPA
- Paramount® (quinclorac)
- Peak® (prosulfuron)
- Permit® (halosulfuron-methyl)
- Rave™ (dicamba + triasulfuron)*
- Roundup® Ultra (glyphosate)
- Sencor® (metribuzin)
- Sinbar® (terbacil)
- Stinger™ (clopyralid)
- Tiller® (fenoxaprop-p-ethyl + 2,4-D + MCPA)*
- Tordon™ (picloram)
- Touchdown® (glyphosate)
- 2,4-D*

*When tank mixing with products that contain either 2,4-D or dicamba, do not exceed the annual per acre application rate for each active ingredient for that crop.

See “VI. Food/Feed Crop Specific Information” section for more information for more details. Read and follow the applicable Restrictions and Limitations and Directions for Use on all products involved in tank mixing. Physical incompatibility, reduced weed control, or crop injury may result from mixing **HM-0452** with other pesticides (fungicides, herbicides, insecticides, or miticides), additives, or fertilizers. Therefore always determine compatibility before tank mixing this product with any other pesticide.

Compatibility Test for Mix Components – Before mixing components, always perform a compatibility jar test.

For 20 gallons per acre spray volume, use 3.3 cups (800 ml) of water. For other spray volumes adjust accordingly. Only use water from the intended source at the source temperature.

Add components in the sequence indicated in the Mixing Order using 2 teaspoons for each pound or 1 teaspoon for each pint of specified label rate per acre.

Always cap the jar and invert 10 cycles between component additions.

When the components have all been added to the jar, let the solution stand for 15 minutes. Evaluate the solution for uniformity and stability. The spray solution should not have free oil on the surface, nor fine particles that precipitate to the bottom, nor thick (clabbered) texture. If the spray solution is not compatible, repeat the compatibility test with the addition of a suitable compatibility agent. If the solution is still incompatible, do not mix the ingredients in the same tank.

Mixing Order: If an inductor is used, rinse it thoroughly after each component has been added. Maintain constant agitation during application.

1. Water. Begin by agitating a thoroughly clean sprayer tank half full of clean water.
2. Agitation. Maintain constant agitation throughout mixing and application.
3. Products in PVA bags. Place any product contained in water-soluble bags into the mixing tank. Wait until all water-soluble PVA bags have fully dissolved and the product is evenly mixed in the spray tank before continuing.
4. Water-dispersible products (such as dry flowables, wettable powders, suspension concentrates, and suspo-emulsions)
5. Water-soluble products (such as **HM-0452**).
6. Emulsifiable concentrates (such as oil concentrate, when applicable).
7. Water-soluble additives (such as liquid fertilizers (28-0-0; 32-0-0), when applicable).*
8. Remaining quantity of water.

*If sprayable fluid fertilizer is used as the carrier.

Always perform the Compatibility Test before mixing into the spray tank. Also, when using a sprayable fluid fertilizer as the carrier, any product contained in PVA bags must first be completely dissolved in water before the contents can be added to the fertilizer mix.

V. Restrictions and Limitations

- Maximum seasonal use rate: Refer to Table 5.
- Do not make more than two applications per season regardless of individual application rates
- Preharvest Interval (PHI): Refer to "Food/Feed Crop Specific Information"
- Restricted entry Interval (REI): 48 Hours
- Crop Rotational Restrictions:

The interval between application and planting rotational crop is given below. Always exclude counting days when the ground is frozen. Planting at intervals less than specified below may result in crop injury. Moisture is essential for the degradation of this herbicide in soil.

Planting/replanting restrictions for **HM-0452** applications of 3 2/3 pints per acre or less: No rotational cropping restrictions apply at 120 days or more following application. Additionally, for annual crop uses in this label including sorghum, follow the preplant use directions under "VI. Food/Feed Crop Specific Information." For barley, oat, wheat, and other grass seedlings, the interval between application and planting is 10 days per 2/3 pint per acre.

Planting/replanting restrictions for applications of more than 3 2/3 pints and up to 4 3/4 pints of **HM-0452** per acre: Corn, sorghum, and all other crops grown in areas with 30" or more of annual rainfall may be planted 120 days or more after application. Barley, oat, wheat and other grass seedlings may be planted, if the interval from application to planting is 10 days per 2/3 pint per acre east of the Mississippi River and 15 days per 2/3 pint per acre west of the Mississippi River. For all other crops in areas with less than 30" of annual rainfall, the interval between application and planting is 180 days or more.

Do not plant cotton for at least 30 days after application and after allowing for a minimum accumulation of 1" rainfall or overhead irrigation. Do not apply west of the Rockies or to geographic areas with average annual rainfall less than 25".

- Arid (dry) conditions: It is extremely important that the addition of a suitable Nonionic Surfactant, Oil, or sprayable fertilizer be used when applying **HM-0452**. Higher rates of **HM-0452** may be needed to control susceptible weeds in this environment.
- Rainfast Period: Rainfall or irrigation occurring within 4 hours after postemergence applications may reduce effectiveness of **HM-0452**.
- Stress: Do not apply to crops under stress such as stress due to lack of moisture, hail damage, flooding, herbicide injury, mechanical injury, or widely fluctuating temperatures, as unsatisfactory control may result.
- Do not apply to crops that show injury (leaf phytotoxicity or plant stunting) produced by any other prior herbicide applications, because this injury may be enhanced or prolonged.
- Do not apply this product through any type of irrigation equipment. Do not contaminate irrigation ditches or water used for domestic purposes.
- Do not apply more than 8 pints per application and no more than 2 applications per year.

Table 5. Crop Specific Restrictions and Limitations

Crop	Maximum Rate Per Acre Per Application	Maximum Rate Per Acre Per Season	Livestock Grazing or Feeding ¹	Aircraft Application
Between Crop Applications ²	3 2/3 pints	4 3/4 pints	Yes	Yes
Pasture, Hay, Silage	2 1/2 pints	4 3/4 pints	Yes	Yes
Sorghum	2/3 pints	2/3 pints	Yes	Yes
Wheat	2 pints	4 pints	Yes	Yes

¹ Refer to “Food/Feed Crop Specific Information” for grazing and feeding restrictions.
² Postharvest, Fallow, Crop Stubble and Set-Aside for broadleaf weed control. Refer to Restrictions & Limitations in Section V for possible crop rotational restrictions.

VI. Food/Feed Crop Specific Information

PASTURES, RANGELAND AND GRASS (HAY, SILAGE)

HM-0452 is directed for use on pasture (including pasture grown for hay), rangeland, grass grown for hay or silage, between crop applications/fallow systems, Conservation Reserve Programs, and general farmstead (non-cropland only).

Refer to Tables 1 and 2 for rate selection based on targeted weed or brush species. Some weed species will require tank mixes for adequate control.

PASTURE & RANGELAND RESTRICTIONS:

Retreatments may be made as needed; however:

- Do not make more than 2 applications per year.
- Do not exceed a total of 2 1/2 pints of **HM-0452** per treated acre during a growing season.
- Minimum of 30 days between applications.
- If grass is to be cut for hay, Agricultural Use requirements for the Worker Protection Standard are applicable.
- For program lands, such as Conservation Reserve Program, consult program rules to determine whether grass or hay may be used. The more restrictive requirements of the program rules or this label must be followed.
- Do not exceed a combined total of 2.0 pounds a.e. of dicamba per acre per year.

HM-0452 contains 0.125 pound a.e. of dicamba per pint. When tank mixing with products that contain dicamba, do not exceed a combined total of 1.0 pound of a.e. per acre per application.

HM-0452 contains 0.29 pound a.e. of 2,4-D per pint. When tank mixing with products that contain 2,4-D, do not exceed a combined total of 4.0 pounds of a.e. per acre per year.

Uses described in this section also pertain to small grains (such as barley, corn, forage sorghum, oats, rye, sudangrass, or wheat) grown for pasture, hay, and silage only. Newly seeded areas including small grains grown for pasture or hay, may be injured if rates of **HM-0452** are greater than 1 1/4 pints per acre are applied in one application.

In newly established hybrid Bermudagrass, Pangolagrass, and stargrasses (*Cynodon* spp.) use 1 to 2 pints of **HM-0452** per acre to control or suppress weeds after planting vegetative propagules (stolons) of hybrid bermudagrasses. In addition to the weeds listed in Tables 1 and 2, this rate of **HM-0452** will control or suppress annual sedges, broadleaf signalgrass, crabgrass, and goosegrass. Best results will be obtained if **HM-0452** is applied at the germinating stage of weeds. Under favorable conditions, this is usually 7–10 days after planting these grasses. Reduced control can be expected if weeds are allowed to reach 1” in height before application or if germination of weeds occurs 10 days after application.

Use on bentgrass, susceptible grass pastures (such as carpetgrass, buffalograss, or St. Augustine grass), lezpedeza, wild winter peas, vetch, clover, and alfalfa pastures may result in some degree of plant injury.

When perennial weeds are reaching maturity, mowing and allowing some regrowth will enhance control.

For pasture renovations, wait 3 weeks per 1 1/4 pints of **HM-0452** used per acre before interseeding or injury may occur.

If grasses are grown for seed or for seed-down purposes, do not apply after grass reaches joint stage.

Grazing and Feeding Non-Lactating Animals: Do not graze non-lactating animals within 7 days of treatment. Do not permit meat animals being finished for slaughter to graze treated fields within 30 days of slaughter.

Grazing and Feeding Lactating Animals: Do not graze lactating dairy animals within 7 days of treatment.

Dry hay and Silage: Treated grasses may be harvested for dry hay or silage but do not harvest within 37 days of treatment.

Pasture and Rangeland Tank Mixes

HM-0452 may be applied in tank mixes with one or more of the following herbicides:

Amber®	Clarity®	Rave™
Banvel®	Dicamba DMA*	2,4-D*

*When tank mixing with products that contain either 2,4-D or dicamba, do not exceed the annual per acre application rate for each active ingredient for that crop.

SORGHUM

Rates and Timings

Apply 2/3 pint of **HM-0452** per acre to sorghum in the 3–5 leaf stage (4”–8” tall). For best performance apply when weeds are small (less than 3” tall).

Applications of **HM-0452** to sorghum during periods of rapid growth may result in temporary leaning of plants or rolling leaves. These effects are usually outgrown within 10–14 days. Sorghum growing under conditions of stress such as high moisture, low fertility, and abnormal temperature may be more sensitive to applications of **HM-0452**. Do not use surfactants or oils with post-emergence applications of **HM-0452** on sorghum crops. Do not use **HM-0452** if the potential for sorghum injury is not acceptable.

If sorghum is grown for pasture, hay or silage, refer to “Pastures, Rangeland and Grass (Hay, Silage)” under “VI. Food/Feed Crop Specific Information” for livestock grazing and feeding restrictions.

Sorghum Tank Mixes

HM-0452 may be applied in tank mixes with one or more of the following herbicides:

Atrazine	Buctril®	Paramount®	Permit®
Basagran®	Laddock® S-12	Peak®	

SORGHUM RESTRICTIONS:

- Do not graze or feed treated sorghum forage or silage prior to mature grain stage.
- Make no more than one postemergence application per growing season.
- Do not permit meat or dairy animals to consume treated crop as fodder or forage for 30 days following application.
- Do not apply **HM-0452** to sorghum grown for seed production.
- Pre-Harvest interval is 30 days.
- Do not exceed a combined total of 2.0 pounds a.e. of dicamba per acre per year.

HM-0452 contains 0.125 pound a.e. of dicamba per pint. When tank mixing with products that contain dicamba, do not exceed a combined total of 1.0 pound of a.e. per acre per application. When tank mixing with products that contain 2,4-D ester, do not exceed a combined total of 0.5 pound a.e. per acre per year.

HM-0452 contains 0.29 pound a.e. of 2,4-D per pint. When tank mixing with products that contain 2,4-D (acid, salt, or amine), do not exceed a combined total of 1.0 pound a.e. per acre per year. When tank mixing with products that contain 2,4-D ester, do not exceed a combined total of 0.5 pound a.e. per acre per year.

WHEAT (Fall and Spring-seeded)

If small grains are grown for pasture or hay only, refer to Pastures, Rangeland and Grass (Hay, Silage). Do not graze or harvest for livestock feed prior to crop maturity.

Do not use **HM-0452** in wheat underseeded with legumes.

EARLY SEASON APPLICATION:

Apply up to 2 pints of **HM-0452** per acre to wheat unless using one of the wheat specific programs below.

Early season applications to spring-seeded wheat must be made after tillering and before wheat reaches the 6-leaf stage.

Early season applications to fall-seeded wheat must be made after tillering and prior to the jointing stage.

Care should be taken in staging early developing wheat varieties such as TAM 107, Madison, or Wakefield to be certain that the application occurs prior to the jointing stage.

Specific Use Programs For Fall-Seeded Wheat Only:

Up to 3/4 pints of **HM-0452** per acre may be applied on fall-seeded wheat after the wheat begins to tiller for suppression of perennial weeds, such as field bindweed. Applications may be made in the fall following a frost but before a killing freeze. Periods of extended stress such as cold and wet weather may enhance the possibility of crop injury. For fall applications only, do not use if the potential for crop injury is not acceptable.

Preharvest Applications:

HM-0452 can be used to control weeds that may interfere with harvest of wheat. Apply up to 1 1/4 pints of **HM-0452** per acre as a broadcast or spot treatment to annual broadleaf weeds when wheat is in the hard dough stage and the green color is gone from the nodes (joints) of the stem. Best results will be obtained if application can be made when weeds are actively growing but before weeds canopy. A waiting interval of 14 days is required before harvest. Do not use preharvest-treated wheat for seed unless a germination test is performed on the seed with an acceptable result of 95% germination or better. For control of additional broadleaf weeds or grasses, **HM-0452** may be tank mixed with other herbicides such as Ally or GlyStar® Plus that are registered for preharvest use in wheat.

WHEAT RESTRICTIONS:

- Do not exceed a combined total of 2.0 pounds a.e. of dicamba per acre per year.
- Postemergence:
 - Make no more than one application per crop cycle.
 - Do not apply more than 2 pints per acre per application.
- Preharvest:
 - Make no more than one application per crop cycle.
 - Do not apply more than 1 1/4 pints per acre per application.
 - Pre-Harvest interval is 14 days.

HM-0452 contains 0.125 pound a.e. of dicamba per pint. When tank mixing with products that contain dicamba, do not exceed a combined total of 1.0 pound of a.e. per acre per application. Do not exceed a combined total of 2.0 pounds a.e. of dicamba per acre per year.

HM-0452 contains 0.29 pound a.e. of 2,4-D per pint. When tank mixing with products that contain 2,4-D, do not:

- Exceed a combined total of 1.25 pounds a.e. per acre crop cycle of 2,4-D for postemergent use.
- Exceed 0.5 pound of a.e. per acre per crop cycle of 2,4-D for pre-harvest application.
- Exceed a total of 1.75 pounds of a.e. per acre per crop cycle for all uses.

Preharvest use of **HM-0452** is not registered for use in California.

Table 6 – Wheat Tank Mixes

TANK MIX PARTNER	RATE PER ACRE
Aim™	0.3 ounce
Ally® ¹	0.05–0.1 ounce
Amber® ¹	0.14–0.28 ounce
Bronate®	0.75–1.5 pints
Buctril®	1–1.5 pints
Canvas® ¹	0.2–0.4 ounce
Curtail™	2–2.67 pints
Dakota® ²	16 fluid ounces
Express® ¹	0.083–0.167 ounce

TANK MIX PARTNER	RATE PER ACRE
Finesse® ¹	0.167–0.33 ounce
Glean® ¹	0.167 ounce
Harmony® Extra ¹	0.167–0.33 ounce
Karmex® ³	0.5–1.5 pounds
2, 4-D amine	4–20 fluid ounces
Metribuzin ³ (Sencor®)	0.25–0.375 pound a.i.
Peak® ¹	0.25–0.38 ounce
Stinger™	4–5.33 fluid ounces
Tiller® ²	1–1.7 pints

¹ Do not use low rates of sulfonyleurea herbicide, such as Ally®, Amber®, Canvas®, Express®, Finesse®, Glean®, Harmony® Extra, and Peak® on more mature weeds or on dense vegetative growth.

² Do not use as a tank mix treatment with Dakota or Tiller on Durum wheat. Do not tank mix with Tiller if wild oat is the larger weed.

³ Tank mixes with Karmex and metribuzin are for use in fall-seeded wheat only.

Between Crop Applications/Fallow Systems, Conservation Reserve Programs, and General Farmstead

These uses are considered Food/Feed Crops when harvested, grazed or foraged. Consult section on “General Tank Mixing Information” for adjuvant restrictions and section on “Additives” for specific use directions.

Feeding and Grazing Restrictions for Wheat: Do not graze or feed animals within 7 days of treatment.

VII. Non-Food/Feed Use (Land not Harvested, Grazed or Foraged) – Specific Information

BETWEEN CROP APPLICATIONS

Preplant Directions (Postharvest, Fallow, Crop Stubble, Set-Aside) For Broadleaf Weed Control

Note:

- Plant only labeled crops within 29 days following application.
- Limited to 2 applications per year.
- Minimum of 30 days between applications.
- Do not exceed a combined total of 2.0 pounds a.e. of dicamba per acre per year.

HM-0452 contains 0.125 pound a.e. of dicamba per pint. When tank mixing with products that contain dicamba, do not exceed a combined total of 1.0 pound of a.e. per acre per application.

HM-0452 contains 0.29 pound a.e. of 2,4-D per pint. When tank mixing with products that contain 2,4-D, do not exceed a combined total of 2.0 pounds of a.e. per acre per year.

HM-0452 can be applied postharvest in the fall, spring, or summer during the fallow period or to crop stubble/set-aside acres. Apply to weeds after crop harvest (postharvest) and before a killing frost or in the fallow cropland or crop stubble the following spring or summer.

See “V. Restrictions and Limitations” for the specified interval between application and planting to prevent crop injury.

Rates and Timings:

Apply 1–3 2/3 pints of **HM-0452** per acre. Refer to Table 1 to determine use rates for specific targeted weed species. Retreatments may be made as needed; however, do not exceed a total of 4 3/4 pints of **HM-0452** per treated acre during a growing season. For best performance, apply **HM-0452** when annual weeds are less than 6” tall, when biennial weeds are in the rosette stage and to perennial weed regrowth in late summer or fall following a mowing or tillage treatment. The most effective control of upright perennial broadleaf weeds such as Canada thistle and Jerusalem artichoke occurs if **HM-0452** is applied when the majority of weeds have at least 4–6” of regrowth or for weeds such as field bindweed and hedge bindweed that are in or beyond the full bloom stage. The addition of liquid fertilizers (28-0-0, 32-0-0) at 1/2 GPA has shown to increase efficacy.

Avoid disturbing treated areas following application. Treatments may not kill weeds that develop from seed or underground plant parts such as rhizomes or bulblets, after the effective period for **HM-0452**. For seedling control, a follow-up program or other cultural practices could be instituted.

Between Crop Tank Mixes:

In tank mixes with one or more of the following herbicides, apply 1.0–1.25 pints of **HM-0452** per acre for control of annual weeds, or 1.25–3.25 pints of **HM-0452** per acre for control of biennial and perennial weeds.

- | | | |
|--------------|------------------------------|-------------------|
| • Aim™ | • Fallowmaster®* | • Landmaster® BW* |
| • Ally® | • Fallow Star™* | • Paramount® |
| • Amber® | • Finesse® | • Sencor® |
| • Atrazine | • Glyphosate (GlyStar® Plus) | • Tordon™ 22K |
| • Curtail™* | • Gramoxone® Extra | • Touchdown® |
| • Cyclone® | • Kerb™ | • 2,4-D* |
| • Distinct®* | | |

*When tank mixing with products that contain 2,4-D or dicamba, do not exceed the annual per acre application rate for each active ingredient for that crop.

APPLICATIONS TO FALLOW GROUND PRIOR TO PLANTING COTTON

Rates and Timings

Apply **HM-0452** as a broadcast or spot treatment to emerged and actively growing weeds at the rate of 1 to 3 2/3 pints per acre. The most effective control of weeds occurs if application is made when weeds are in the 2–4 leaf stage and rosettes are less than 2" across.

Cropping Restrictions

Do not plant cotton for at least 30 days after application and after allowing for a minimum accumulation of 1" rainfall or overhead irrigation. Do not apply west of the Rockies or to geographic areas with average annual rainfall less than 25".

Tank Mix Treatments

For control of grasses or additional broadleaf weeds, OUTLAW may be tank mixed with CAPROL®, GRAMAXONE® Extra, and glyphosate herbicides.

FOREST MANAGEMENT

Do not apply under drip line of desirable trees or adjacent to desirable vegetation.

Do not apply more than 1 gallon of product per acre per year.

Maximum: 1 application per year.

Forest Site Preparation

Budbreak Spray: For control of alder, susceptible broadleaf weeds, and susceptible woody plants before planting forest seedlings, apply up to 2 quarts per acre in a minimum of 10 gallons spray mixture per acre. Apply as an oil spray (see "Mixing Instructions") after alder buds break, but before foliage is 1/4 full size. A water spray including 2 to 4 quarts per acre of diesel oil, fuel oil, stove oil, or crop oil concentrate may also be used.

Foliage Spray: To control alder and susceptible woody plants before planting forest seedlings, apply up to 4 pints per acre in a minimum of 10 gallons spray mixture per acre. If desired, apply as a water spray including up to 1 quart of diesel oil, fuel oil, stove oil, or crop oil concentrate per gallon of water (see "Mixing Instructions"). For best results, apply after alder foliage has reached full size.

Conifer Release: Some Conifers are more susceptible to **HM-0452** than others. To control alder, susceptible broadleaf weeds, and susceptible woody plants in young conifer stands, apply up to 2 pints per acre in a minimum of 10 gallons spray mixture per acre. This spring foliage treatment should be applied as a water spray when 3/4 of the brush foliage has full size leaves and before new conifer growth reaches 2 inches in length. Such stages usually occur between early May and mid-June, but application timing should be based on growth stages of brush and conifers. Application may cause leader deformation and other conifer injury, but trees should overcome it during the next growing season.

To control tanoak, madrone, ceanothus, canyon live oak, and manzanita, and to release Douglas fir, hemlock, Sitka spruce or grand fir, apply up to 3 pints per acre in a minimum of 10 gallons spray mixture per acre. This spring foliage treatment should be applied as a water spray including, if desired, up to 1 quart of diesel oil, fuel oil, stove oil, or crop oil concentrate per gallon of water (see "Mixing Instructions"). Make application before new growth on Douglas fir is 2 inches long. To release ponderosa pine from the same species, treat before new pine growth begins in the spring. Addition of oil or oil concentrate may cause unacceptable injury to pines. For dormant applications in late winter or early spring for control of susceptible woody species such as alder, willow, poplars, cherry, vine maple, ceanothus, tanoak, madrone, and manzanita, apply up to 3 pints per acre in a minimum of 10 gallons spray mixture (with diesel oil, etc.) per acre. This dormant treatment should be applied in diesel oil, fuel oil, stove oil, or other suitable diluent such as water plus crop oil concentrate (see "Mixing Instructions"). Do not use in plantations where pine and larch are among the desired crop species.

To control hazel dodder (*Cuscuta coryli*) in the Lake states, apply up to 2 pints per acre in a minimum of 10 gallons spray mixture per acre. Apply as a water spray when new shoot growth of hazel is complete (usually mid-July).

After conifer species such as white pine, ponderosa pine, jack pine, red pine, black spruce, white spruce, red spruce, and balsam fir cease growth and harden off and brush is still actively growing in late summer, apply up to 3 pints per acre in a minimum of 10 gallons water spray mixture per acre. Apply as a water spray to control certain competing hardwoods such as alder, aspen, birch, hazel and willow. However, if possible injury cannot be tolerated, do not use since this treatment may cause conifer injury.

Forest Roadsides: To control susceptible broadleaf weeds and woody plants on forest roadsides, apply 1 to 3 pints per acre in a minimum of 10 gallons water spray mixture per acre. Apply as a water spray and, if necessary to ensure penetration of foliage, include up to 3 quarts per acre of diesel oil, fuel oil, stove oil, or crop oil concentrate (see "Mixing Instructions").

**ROADSIDES; MEDIANS; HIGHWAY, RAILROAD, UTILITY AND PIPELINE RIGHTS-OF-WAY;
VACANT LOTS; AROUND UTILITY INSTALLATIONS, TRANSFORMERS, PUMP HOUSES,
AND BUILDINGS; STORAGE AREAS; FENCES; GUARDRAILS; LUMBER YARDS;
INDUSTRIAL SITES; AIRPORTS; TANK FARMS; FARMSTEADS;
AND SIMILAR NONCROP AREAS**

Do not apply under drip line of desirable trees or adjacent to desirable vegetation.

For control of many broadleaf weeds and small woody plants, apply 2/3 to 2 pints per acre diluted in 10 gallons of water. Use the high rate for woody plants. Applications may be as broadcast sprays, small area sprays or spot treatments. For small areas or spot spraying, use 2 fluid ounces per gallon of water and spray weeds to runoff. Regardless of the method of application, use adequate spray volume for full coverage of weeds. Preferred application timing is in the early spring when sufficient weeds have emerged, and when weeds are small and actively growing, but before weeds exceed size limits described in weed tables. Summer applications to older, drought-stressed weeds are less effective. However, weeds are more susceptible again in the fall when cooler, wetter conditions support active growth before a killing frost. For fall treatment of mature weeds or perennial weed regrowth, use up to 1.0 pints per acre diluted in 10 gallons of water. Several seasons of spring plus fall treatments may be necessary to control certain perennials. Use of oil sprays or the addition of spray adjuvants improves weed control, but also increases the risk of damage to desirable ground covers.

Plant Response: Bent grass, other warm season or southern grasses, alfalfa, clover, or other legumes may be killed or injured. Do not apply when grass is in boot to milk stage, or after heading begins, if grass production is desired. Do not apply to newly seeded areas until grass is well established. Do not reseed for at least 30 days following application.

Conservation Reserve Programs and General Farmstead

HM-0452 is directed for use for Conservation Reserve Programs, general farmstead (non-cropland only), weed and brush control, or use in State Recognized Noxious Weed areas (non-cropland areas).

Refer to Tables 1 and 2 for rate selection based on targeted weed or brush species. Some weed species will require tank mixes for adequate control.

Retreatments may be made as needed; however, do not exceed a total of 4 3/4 pints of **HM-0452** per treated acre during a growing season.

NOTE: Do not make more than 2 applications per year. Minimum of 30 days between applications.

For control of annual and perennial weeds, do not make more than 2 applications per year with a minimum of 30 days between applications. For control of woody plants, do not make more than 1 application per year.

Farmstead and Fence-row Treatment Application Instructions

HM-0452 may be applied using water or oil and water emulsions in spot application to control undesirable vegetation using handgun or similar types of application equipment. In addition to weed species listed in Tables 1 and 2, these treatments may be used to control or suppress woody plant species listed in Table 7.

To prepare soil and water emulsions, mix in the order and proportions indicated below.

The solution should remain milky colored without an oily layer on top when under agitation. If an oily layer forms, increase the amount of emulsifier or change to a more effective emulsifier.

Do not exceed 40 gallons of spray solution per treated acre per application. One gallon of **HM-0452** in forty gallons of spray solution contains 1.0 pound acid equivalent of dicamba and 2.3 pounds acid equivalent of 2,4-D. Spray plants to wet. Do not allow this spray mix to contact desirable vegetation.

To control brush, briars, and weeds along fence-rows surrounding pasture and ranch lands, and fallow fields, use a tank mix of 1.5% **HM-0452**, 88.5% water, 10% diesel oil, and sufficient emulsifier (to mix the diesel and emulsifier). The diesel oil in this tank mix will damage or kill desirable grasses and should not be used in pastures or where damage to desirable species cannot be tolerated.

9. Water: Begin by agitating a thoroughly clean sprayer tank with the desired quantity of clean water. Maintain constant agitation during complete mixing procedure.
10. Emulsifier: Add 0.5% volume to volume of water.
11. **HM-0452**: add 1.5 gallons per 100 gallons of total intended solution.
12. Diesel Oil: Add 10 gallons per 100 gallons of total intended solution.

Maintain constant agitation during application. Under good agitation, the spray solution should be milky white with no oil layer on top. If oil layer forms, increase the amount of emulsifier or change to a more effective emulsifier.

FOR SPRAYING FOLIAR APPLICATIONS:

1. Spray when leaves have reached full size but have not hardened due to drought or maturity.
2. Spray individual plants to wet with handgun.
3. For larger stems (up to 3" in diameter) and hard to control species, direct spray stream to base of stems to wet the stem at soil surface in addition to wetting the foliage.
4. Do not apply under drip line of desirable trees or adjacent to desirable vegetation.

FOR DORMANT BASAL APPLICATIONS:

1. Increase diesel oil content to 15% or 15 gallons of diesel oil per 100 gallons of total solution.
2. Spray in late winter and early spring before plants break dormancy.
3. Spray the bottom 24" of the target stem to wet on all sides.
4. For larger stems (up to 3" in diameter) and hard to kill species direct the spray solution to the base of target stems to wet the soil at the stem/soil junction in addition to wetting the stem.
5. Do not apply under drip line of desirable trees or adjacent to desirable vegetation.

FOR CUT SURFACE TREATMENTS:

Apply **HM-0452** in an undiluted state as a cut surface treatment to control unwanted trees and prevent sprouts of cut trees.

- **Frill or Girdle Treatments:** Make a continuous cut or a series of overlapping cuts using an axe to girdle tree trunk. Spray or paint the cut surface with **HM-0452**.
- **Stump Treatments:** Spray or paint freshly cut surface with **HM-0452**. The cambium layer (the area adjacent to the bark) should be thoroughly wet. Treat stumps within 6 hours after cutting.
- **Basal spray, Cut Surface (stumps and frill):** Limit of one basal spray or cut surface application per year.

SOD FARMS

For best results, do not mow turf 1 to 2 days before or after application. Turf watering should be delayed until the day after application. Do not apply to newly seeded areas until grass is well established and has been mowed several times. A period of about 30 days after application is usually a sufficient interval before reseeding. Seeding a small area and observing response is recommended before large scale seeding.

Cool Season Grasses:

To control many emerged broadleaf weeds in cool season turfgrasses such as tall fescue, bluegrass, or perennial ryegrass, apply 1.0–4.0 pints per acre. Apply when weeds are small and actively growing under good moisture conditions. Do not use on centipede, carpetgrass, St. Augustine, bentgrass, or Dichondra turf, or where desirable clovers are present.

Precautions:

- Do not use on creeping grasses such as bentgrass except as a spot treatment.
- Do not use on injury-sensitive southern grasses such as St. Augustinegrass.
- Do not use on dichondra or other herbaceous ground covers. Legumes may be damaged or killed.
- Reseeding: Delay reseeding at least 30 days following application. Preferably, with spring application, reseed in the fall and with fall application, reseed in the spring.
- Use sufficient spray solution for thorough and uniform coverage, and no less than 2 gallons per acre.

SOD FARM RESTRICTIONS:

- Do not apply more than 4 pints product (1.2 lbs ae) per acre per application.
- Do not make more than 2 applications per year (excluding spot treatments).
- Minimum spray interval between broadcast applications is 21 days.

HM-0452 contains 0.3 pound a.e. of 2,4-D per pint. When tank mixing with products that contain 2,4-D, do not exceed a combined total of 4.0 pounds of a.e. per acre per year excluding spot treatments.

ORNAMENTAL AND RECREATIONAL TURFGRASSES, LAWNS, GOLF COURSES (Fairways, Aprons, Tees, and Roughs), PARKS AND CEMETERIES

Refer to “Turf Use Requirements” in the “Non-Agricultural Use Requirements” section. For best results, do not mow turf 1 to 2 days before or after application. Turf watering should be delayed for at least 1 hour after application. Avoid contacting desirable trees, shrubs, flowers or vegetables since plant injury may result. Do not apply to newly seeded areas until grass is well established and has been mowed several times. A period of about 30 days after application is usually a sufficient interval before reseeding grasses (or other plants). Seeding a small area and observing response is recommended before large scale seeding.

Cool Season Grasses: To control many emerged broadleaf weeds in cool season turfgrasses such as tall fescue, bluegrass, or perennial ryegrass, apply 2.0–3.0 pints per acre (0.75 to 1.0 fluid ounces per 1,000 square feet). Preferred application timing for broadcast treatment is in the early spring when small weeds have emerged and are actively growing under good moisture conditions. For very weedy turf, a follow-up broadcast or spot application may be needed from 2 to 4 weeks later. Summer applications are typically spot treatments of individual weeds that have emerged after a spring broadcast treatment. In the fall when cooler, wetter conditions favor active weed growth, broadcast application may be appropriate for very weedy turf, such as an area that had no spring broadcast treatment. Do not use on centipede, carpetgrass, St. Augustine, bentgrass or Dichondra turf, or where desirable clovers are present.

Precautions:

- Do not use on creeping grasses such as bentgrass except as a spot treatment.
- Do not use on injury-sensitive southern grasses such as St. Augustinegrass.
- Do not use on dichondra or other herbaceous ground covers. Legumes may be damaged or killed.
- Reseeding: Delay reseeding at least 30 days following application. Preferably, with spring application, reseed in the fall and with fall application, reseed in the spring.

ORNAMENTAL TURFGRASS RESTRICTIONS:

- Do not apply more than 4 pints product (1.2 lbs ae) per acre per application.
- Do not make more than 2 applications per year (excluding spot treatments).
- Minimum spray interval between broadcast applications is 30 days.

HM-0452 contains 0.3 pound a.e. of 2,4-D per pint. When tank mixing with products that contain 2,4-D, do not exceed a combined total of 3.0 pounds of a.e. per acre per year excluding spot treatments.

Table 7. The following list of trees and vines can be controlled on farmsteads and fencerows as foliar, basal, or cut surface treatments:

Alder	Dogwood	Kudzu	Rose, McCartney
Ash	Elm	Locust, Black	Rose, Multiflora
Aspen	Grape	Maple	Sagebrush, Fringe
Basswood	Greenbriar	Mesquite	Sassafras
Beech	Hawthorn (Thornapple)	Oak	Spruce
Blackberry	Hemlock	Oak, Poison	Sumac
Blackgum	Hickory	Olive, Russian	Sweetgum
Cedar	Honeylocust	Persimmon, Eastern	Sycamore
Cherry	Honeysuckle	Pine	Tarbrush
Chinquapin	Hornbeam	Plum, Sand (Wild Plum)	Willow
Cottonwood	Huckleberry	Poplar	Witchhazel
Creosotebush	Huisache	Rabbitbrush	Yaupon
Dewberry	Ivy, Poison	Redcedar, Eastern	Yucca

Weeds listed in this label:

Common Name	Scientific Name
ANNUALS	
Beebalm, Spotted	<i>Monarda punctata</i>
Broomweed, Common	<i>Gutierrezia dracunculoides</i>
Buckwheat, Wild	<i>Polygonum convulvulus</i>
Buffalobur	<i>Solanum rostratum</i>
Burdock	<i>Arctium</i> spp.
Buttercup, Corn	<i>Ranunculus arvensis</i>
Chickweed, Common	<i>Stellaria media</i>
Cockle, Corn	<i>Agrostemma githago</i>
Cocklebur, Common	<i>Xanthium strumarium</i>
Coreopsis, Plains	<i>Coreopsis tinctoria</i>
Croton, Woolly	<i>Croton capitatus</i>
Devilsclaw,	<i>proboscidea luisianica</i>
Dogfennel (Cypressweed)	<i>Eupatorium capillifolium</i>
Eveningprimrose, Cutleaf	<i>Oenothera lacinata</i>
Flax	<i>Linum catharticum</i>
Fleabane, Annual	<i>Erigeron annuus</i>
Flixweed	<i>Descurainia sophia</i>
Henbit	<i>Lamium amplexicaule</i>
Knotweed, Prostrate	<i>Polygonum aviculare</i>
Kochia	<i>Kochia scoparia</i>
Lambsquarters, Common	<i>Chenopodium album</i>
Lettuce, Prickly	<i>Lactuca serriola</i>
Mallow, Common	<i>Malva neglecta</i>
Morningglory, Ivyleaf	<i>Ipomea hederacea</i>
, Tall	<i>Ipomea purpurea</i>
Mustard, Annual	<i>Brassica</i> spp.
Tansy	<i>Descurainia pinnata</i>
Pennycress, Field	<i>Thlaspi arvense</i>
Pepperweed, Virginia	<i>Lepidium virginicum</i>
Pigweed, Prostrate,	<i>Amaranthus blitoides</i>
, Redroot,	<i>Amaranthus retroflexus</i>
, Smooth,	<i>Amaranthus hybridus</i>
, Tumble	<i>Amaranthus albus</i>
Poorjoe	<i>Diodia teres</i>
Purslane, Common	<i>Portulaca oleracea</i>
Ragweed, Common,	<i>Ambrosia artemisiifolia</i>
, Lance-leaf,	<i>Ambrosia bidentata</i>
, Western	<i>Ambrosia psilostachya</i>
Sedge	<i>Cyperus compressus</i>
Shepherdspurse	<i>Capsella bursa-pastoris</i>
Smartweed, Pennsylvania	<i>Polygonum pennsylvanicum</i>
Sneezeweed, Bitter	<i>Helenium amurum</i>
Sunflower, Common (wild)	<i>Helianthus annuus</i>
Thistle, Russian	<i>Salsola iberica</i>

(continued)

Common Name	Scientific Name
BIENNALS AND PERENNIALS	
Bindweed, field	<i>Convolvulus arvensis</i>
Bittercress	<i>Cardamine</i> spp.
Buckeye	<i>Aesculus</i> spp.
Bullnettle	<i>Cnidoscopus stimulosus</i>
Chicory	<i>Cichorium intybus</i>
Clover, Hop	<i>Trifolium aureum</i>
Dandelion	<i>Taraxacum officinale</i>
Dock, Curly	<i>Rumex crispus</i>
Elderberry	<i>Sambucus canadensis</i>
Goldenrod, Missouri	<i>Solidago missouriensis</i>
Goldenweed, Common	<i>Isocp, a cprpmopifolia</i>
Groundsel	<i>Senecio vulgaris</i>
Honeysuckle, Hairy	<i>Lonicera</i>
Horsenettle	<i>Solanum caroliniense</i>
Ivy, Poison	<i>Rhus radicans</i>
Knapweed, Black	<i>Centaurea nigra</i>
, Russian	<i>Centaurea repens</i>
, Spotted	<i>Centaurea maculosus</i>
Marshelder	<i>Ina annua</i>
Mesquite	<i>Prosopis juliflora</i>
Milkweed, Antelopehorn	<i>Asciepius</i>
Nightshade, Silverleaf	<i>Solanum elaeagnifolium</i>
, Black	<i>Solanum nigrum</i>
Persimmon, Eastern	<i>Diospyros virginiana</i>
Rabbitbrush	<i>Chrysanthemus pulchellus</i>
Ragwort, Tansy	<i>Senecio jacobia</i>
Redvine	<i>Brunnichia ovata</i>
Sagebrush, Fringed	<i>Artemisia frigida</i>
Smartweed, Swamp	<i>Polygonum coccineum</i>
Sorrel, Red (Sheep Sorrel)	<i>Rumex acetosella</i>
Sowthistle, Perennial	<i>Sonchus arvensis</i>
Spurge, Leafy	<i>Euphorbia esula</i>
Starthistle, Yellow	<i>Centaurea solstitialis</i>
Tallow Tree, Chinese	<i>Sapium sebiferum</i>
Thistle, Bull	<i>Cirsium vulgare</i>
, Canada	<i>Cirsium arvense</i>
, Musk	<i>Carduus nutans</i>
, Plumeless	<i>Carduus acanthoides</i>
Vetch	<i>Vicia</i> spp.
Yankeeeweed	<i>Eupatorium compositifolium</i>

Food/Feed Crop Uses

This product can be used on the following:

- Conservation Reserve Program Land
- Fallow Systems (Between Crop Application)
- General Farmstead
- Grain Sorghum
- Grass (Hay or Silage)
- Industrial Sites
- Pastures
- Rangeland
- Rights-of-way
- Roadsides
- Non-crop Areas
- Wheat
- Sod Farms
- Ornamental & Recreational Turf

Look inside for complete Restrictions and Limitations and Application Instructions.

These crops are considered Food/Feed crops only when harvested, grazed, or foraged. Otherwise, they are considered non-Food/Feed uses.

CONDITIONS OF SALE AND WARRANTY

The DIRECTIONS FOR USE of this product reflect the opinion of experts based on field use and tests. The directions are believed to be reliable and must be followed carefully. Crop injury, ineffectiveness, or other unintended consequences may result because of such factors as weather conditions or presence of other materials. All such risks shall be assumed by the Buyer.

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NOTES

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