Determine™ 4L

herbicide

PEEL BACK BOOK HERE

Department of Agriculture
STATE OF HAWAII
LICENSED
PERIOD 2011-2013 LIC. NO.

FOR CONTROL OF MANY ANNUAL AND PERENNIAL GRASSES AND HERBACEOUS WEEDS

ACTIVE INGREDIENT:	**% BY WT.**
Diuron: 3-(3,4-dichlorophenyl)-1,1-dimethylurea	40.7%
INERT INGREDIENTS:	59.3%
TOTAL:	100.0%

Contains 4.0 pounds of Diuron per gallon.

KEEP OUT OF REACH OF CHILDREN

CAUTION

FIRST AID

IF SWALLOWED:
- Call a poison control center or doctor immediately for treatment advice.
- Have person sip a glass of water if able to swallow.
- Do not induce vomiting unless told to do so by a poison control center or doctor.
- 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.

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

Have the product container or label with you when calling a poison control center or doctor or going for treatment. You may also contact PROSAR at 1-877-250-9291 for emergency medical treatment information.

For additional precautionary, handling, and use statements, see inside of this booklet.

Department of Agriculture
STATE OF HAWAII
LICENSED
PERIOD 2014-2016 LIC. NO.
8275.81

M A N A

Manufactured for:
Makhteshim Agan of North America, Inc.
4515 Falls of Neuse Road
Suite 300
Raleigh, NC 27609

EPA Reg. No. 66222-54

EPA 052907/032409/Notif 061209/051311/Rev A

14235

EPA Est. No. 37429-GA-001[BT]; 37429-GA-002[BO]; 70989-MO-001[OS]
Letter(s) in lot number correspond(s) to superscript in EPA Est. No.

Net Contents: 2.5 Gallons

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PRECAUTIONARY STATEMENTS
HAZARDS TO HUMANS AND DOMESTIC ANIMALS
CAUTION

Harmful if swallowed.

PERSONAL PROTECTIVE EQUIPMENT (PPE)

Some of the materials that are chemical resistant to this product are polyethylene and polyvinyl chloride. If you want more options, follow the instructions for Category A on an EPA chemical resistance category selection chart.

All pilots, flaggers, and groundboom applicators must wear:

- Long-sleeved shirt and long pants
- Shoes plus socks

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

- Long-sleeved shirt and long pants
- Shoes plus socks
- Chemical-resistant gloves made of any waterproof material such as polyethylene or polyvinyl chloride
- A NIOSH-approved particulate filtering respirator equipped with N, R, or P class filter media. The respirator should have a NIOSH approval number prefix TC-84A. It is recommended that you require the respirator wearer be fit tested and trained in the use, maintenance, and limitations of the respirator.
- Chemical-resistant apron when mixing, loading, or cleaning equipment or spills

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.

ENGINEERING CONTROLS

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.

Pilots must use an enclosed cockpit that meets the requirements listed in the Worker Protection Standard (WPS) for agricultural pesticides [40 CFR 170.240(d)(6)].

Flaggers supporting aerial applications must use an enclosed cab that meets the definition in the Worker Protection Standard for Agricultural Pesticides [40 CFR 170.240(d)(5)] for dermal protection. In addition, flaggers must wear long-sleeved shirt, long pants, shoes, and socks.

USER SAFETY RECOMMENDATIONS

Users should:

- Wash hands thoroughly with soap and water after handling and 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.
- 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

For terrestrial uses, do not apply directly to water, to areas where surface water is present, or to intertidal areas below the mean high water mark. Do not contaminate water when disposing of equipment washwaters. Apply this product only as specified on this label.

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.

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 intervals. 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:

- Coveralls
- Chemical-resistant gloves made of any waterproof material
- Shoes plus socks

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.

Non-crop weed control is not within the scope of the Worker Protection Standard. Do not enter or allow others to enter until sprays have dried.

IMPORTANT: Read the entire DIRECTIONS FOR USE and the LIMITATION OF WARRANTY AND LIABILITY before using this product. If terms are not acceptable, return the unopened product container to the place of purchase at once. Determine™ 4L herbicide should be used only in accordance with recommendations on this label or in separate published recommendations. Makhteshim Agan of North America, Inc. will not be responsible for losses or damages resulting from use of this product in any manner not specifically recommended by Makhteshim Agan of North America, Inc. User assumes all risk associated with non-recommended use.

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.EP, C01-0132C, (W.D.WA). For further information, please refer to http://www.epa.gov/espp/wtc/.

GENERAL INFORMATION

Determine 4L is a liquid flowable to be mixed with water and applied as a spray for selective control of weeds in certain crops and for nonselective weed control on noncropland areas. It is noncorrosive to equipment, nonflammable, and nonvolatile.

Determine 4L may be applied to soil prior to emergence of weeds to control susceptible weed seedlings for an extended period of time. The degree of control and duration of effect will vary with the amount of chemical applied, soil texture, rainfall, and other conditions. Soils high in clay or organic matter require higher dosages than soils low in clay or organic matter for equivalent herbicide performance. Moisture is required to activate the herbicide. Best results occur if rainfall (or sprinkler irrigation) occurs within 2 weeks of application.

Determine 4L applied before emergence of crop and weeds is an effective procedure because susceptible weeds are controlled in an early, vulnerable seedling stage before they compete with the crop. With favorable moisture conditions, Determine 4L continues to control weeds for some time as the crop becomes better able to compete. Should weed seedlings begin to break through the preemergence treatment in significant numbers, secondary weed control procedures should be implemented; these include cultivation and postemergence herbicide application.

Determine 4L may also be used to control emerged weeds. Results vary with rate applied and environmental conditions. Best results are obtained on succulent weeds growing under conditions of high humidity and temperature of 70°F or higher. Addition of a surfactant to the spray (where recommended) increases contact effects of Determine 4L.

Determine 4L may be used as a directed postemergence application. Contact of crop foliage and/or fruit with spray or mist must be avoided on the following crops: artichoke, corn (field), cotton, sorghum (grain), sugarcane, and established plantings of apples, bananas, plantains, blueberries, caneberries, gooseberries, citrus, grapes, macadamia nuts, olives, papayas, peaches, pears, pecans, walnuts, and certain tree plantings as injury may occur.

Under specified conditions (see **RECOMMENDED USES**), Determine 4L without surfactant may be applied over the top of alfalfa (established, dormant, or semi dormant), asparagus (established), birdsfoot trefoil (established, dormant), grass seed crops (established), oats, red clover (established, dormant), sugarcane, wheat, and pineapple.

Weed species vary in susceptibility to Determine 4L, and they may be more difficult to control when under stress. Combinations of Determine 4L with other herbicides (as registered) increase the number of weed species controlled. Consult labels of the companion product for this and other information. Observe all precautions and limitations on labeling of all products used in mixtures.

Since the effect of Determine 4L varies with soils, uniformity of application, and environmental conditions, it is suggested that growers limit their first use to small areas.

IMPORTANT USE PRECAUTIONS:

Injury to or loss of desirable trees or other plants may result from failure to observe the following: Draining or flushing equipment on or near desirable trees or other plants, or on areas where their roots may extend, or in locations where the chemical may be washed or moved into contact with their roots may injure these plants. Do not use on home plantings of trees, shrubs, or herbaceous plants or lawns, walks, driveways, tennis courts, or similar areas. Trees or other desirable plants whose roots extend into a treated crop use area may be injured. Thoroughly clean all traces of Determine 4L from application equipment immediately after use. Flush tank, pumps, hoses, and boom with several changes of water after removing nozzle tips and screens (clean parts separately).

RESISTANCE MANAGEMENT

Biotypes of certain weeds listed on this label are resistant to Determine 4L and other herbicides with the same mode of action, even at exaggerated application rates. Biotypes are naturally occurring individuals of a species that are identical in appearance but have slightly different genetic compositions; the mode of action of an herbicide is the chemical interaction that interrupts a biological process necessary for plant growth and development.

If weed control is unsatisfactory, it may be necessary to re-treat problem areas using a product with a different mode of action.

If resistant weed biotypes are suspected or known to be present, use a combination of tillage, re-treatment, tank mix partners, and/or sequential herbicide applications with Determine 4L to help control these biotypes, or use a planned herbicide rotation program where other herbicides having different modes of action are used.

SPRAY DRIFT MANAGEMENT

Requirements for reducing spray drift for Determine 4L ground and aerial applications:

Use best practices to avoid drift to all other crops and nontarget areas. Do not apply when conditions favor drift from target areas. The interaction of many equipment- and weather-related factors determines the potential for spray drift. Avoiding spray drift at the application site is the responsibility of the applicator. The applicator must follow the most restrictive precautions to avoid drift, including those found in this labeling as well as applicable state and local regulations and ordinances. A drift control agent may reduce drift; however, it may also decrease weed control.

- Make aerial or ground applications only when the wind speed is less than or equal to 10 miles per hour.
- Do not make aerial or ground applications into temperature inversions.
- Apply with medium or coarser spray (according to ASAE Standard 572) for standard nozzles.
- **Additional requirements for ground applications:**
  When applying to crops, apply with nozzle height no more than 2 feet above the ground or crop canopy.
- **Additional requirements for aerial applications:**
  The spray boom should be mounted on the aircraft so as to minimize drift caused by wing tip vortices. The boom length must not exceed 75% of the wingspan or 90% of rotor blade diameter. Use upwind swath displacement. When applying to crops, do not release spray at a height greater than 6 to 10 feet above the ground or crop canopy. Do not apply by air if sensitive nontarget crops are within 100 feet of the application site. Nozzles must always point backward parallel with the airstream and never be pointed downwards more than 45 degrees.

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 Inversions**).

Controlling Droplet Size (General Techniques)

- 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 3/4 of the wingspan or rotor length 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 spray 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. Temperature inversions are characterized by increasing temperatures with altitude and are common on nights with limited cloud cover and light to no wind. They begin to form as the sun sets and often continue into the morning. Their presence can be indicated by ground fog; however, if fog is not present, inversions can also be identified by the movement of smoke from a ground source or an aircraft smoke generator. Smoke that layers and moves laterally in a connected cloud (under low wind conditions) indicates an inversion, while smoke that moves upwards and rapidly dissipates indicates 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, nontarget crops) is minimal (e.g. when wind is blowing away from the sensitive areas).

CHEMIGATION STATEMENT: Refer to the section of this labeling entitled **APPLICATION THROUGH IRRIGATION SYSTEMS - CHEMIGATION** for use directions for chemigation. If supplemental labeling is not available, you may not apply this product through chemigation systems. Do not apply this product through any irrigation system unless the instructions for chemigation are followed.

SELECTIVE USE IN CROPS

PREEMERGENCE USE (Germinating Weeds): Determine 4L at recommended rates controls annual weeds and grasses such as:

0.6 to 0.8 quart/A
Barnyardgrass (Watergrass)
Crabgrass
Lambsquarters
Pigweed
Purslane
Ragweed

1.2 to 1.6 quarts/A
Annual Bluegrass
Annual Sweet Vernalgrass
Annual Groundcherry
Annual Morningglory
Chickweed
Corn Spurry
Dogfennel
Fiddleneck (Amsinckia)
Foxtail
Gromwell
Knawel
Pennycress
Rattail Fescue
Red Sprangletop
Shepherdspurse
Tansymustard
Velvetgrass
Wild Buckwheat
Wild Lettuce
Wild Mustard

1.6 to 4.8 quarts/A
Ageratum
Annual Lovegrass
Annual Ryegrass
Annual Smartweed
Annual Sowthistle
Corn Speedwell
Dayflower
Flora's Paintbrush
Hawksbeard
Horseweed
Johnsongrass (Seedling)
Kochia
Kyllinger (Kyllinga)
Marigold
Mexican Clover
Orchardgrass
Peppergrass
Pineappleweed
Pokeweed
Rabbit Tobacco
Rice Grass
Sandbur
Spanishneedles
Velvetleaf (Buttonweed)
Wild Radish

Partial Control:

0.8 quart/A
Cocklebur
Morningglory, Annual
Prickly Sida (Teaweed)
Sesbania
Sicklepod

3.2 quarts/A
Horsenettle
Quackgrass

6.4 to 8.0 quarts/A
Guineagrass
Maidencane
Pangolagrass

APPLICATION DIRECTIONS

AERIAL APPLICATION: For alfalfa, barley (winter), cotton (preplant or preemergence only), grass seed crops (PNW only), sugarcane, wheat (winter) and rights-of-way, application may be made by aircraft in a minimum of 3 gallons of water per acre unless otherwise noted. Avoid overlapping of spray swath and avoid application under conditions where excessive drift may occur. Where land is bedded, make application parallel to rows.

GROUND APPLICATION: Use a boom power sprayer properly calibrated to a constant speed and rate of delivery. Openings in screens should be 50 mesh or larger. Continuous agitation in the spray tank is required to keep the material in suspension.

Agitate by mechanical or hydraulic means. If bypass or return line is used, it should terminate at bottom of tank. Avoid overlapping and shut off spray booms while starting, turning, slowing, or stopping, or injury to crop may result.

PREEMERGENCE: For preemergence application, use sufficient spray volume and pressure to uniformly distribute the spray solution over treated soil. Preemergence weed control will be reduced on high organic matter soils such as peat or muck.

POSTEMERGENCE: For postemergence application, use sufficient spray volume and pressure for thorough coverage of weed foliage. For selective applications and applications near sensitive crops, use low spray pressure to keep spray drift to a minimum. Determine 4L at recommended rates controls seedling annual weeds such as annual morningglory, barnyardgrass (watergrass), crabgrass, crowfoot, goosegrass, pigweed, and purslane. Addition of a surfactant to the spray (where recommended) increases contact effects of Determine 4L. Best results are obtained on succulent weeds growing under conditions of high humidity and temperatures over 70°F or higher.

SPRAY PREPARATION: Mix proper amount of Determine 4L into necessary volume of water. Where use of surfactant is recommended, dilute with ten parts of water and add as last ingredient to nearly full spray tank.

TANK MIXTURES: Determine 4L may be tank mixed with other herbicides and/or adjuvants registered for crop or noncrop use in this label. Refer to the label of the tank mix product(s) for any additional use instructions or restrictions.

REPLANTING: Unless otherwise directed, do not replant treated areas to any crop within 2 years after last application, as injury to subsequent crops may result. **Note:** For crops grown in the arid west, reductions in normal irrigation practices for the crop in production or a summer fallow period without supplemental irrigation may require the crop rotation intervals to be extended.

When such conditions occur, a field bioassay should be completed prior to planting any desired crop. A successful bioassay means growing to maturity a test strip of the crops intended for production. The test crops strip should cross the entire field including knolls, low areas, and areas where any berms were located. The results of this bioassay may require the rotation intervals to be extended.

RATES: All rates of Determine 4L are expressed as broadcast rates. Where band applications are specified, use proportionately less. For example, use 1/3 of the broadcast rate when treating a 14-inch band where row spacing is 42 inches. Where a range of dosages is given, use the lower rate on coarse-textured soils low in clay or organic matter and the higher rate on the fine-textured soils high in clay or organic matter. For postemergence application, use the lower rate on smaller weeds and the higher rate on the larger weeds.

SOIL LIMITATIONS: Crop injury may result from failure to observe the following: Unless otherwise directed, do not use on sand, loamy sand, gravelly soils, or exposed subsoils; nor on pecans where organic matter is less than 0.5%; nor on alfalfa, apples, artichokes, barley (winter), citrus, cotton, grapes, oats, olives, papayas, peaches, pears, sorghum, sugarcane, walnuts, and winter wheat where organic matter is less than 1%; nor on blueberries, birdsfoot trefoil, caneberries, gooseberries, macadamia nuts, and peppermint where organic matter is less than 2%.

FIELD CROPS (see SOIL LIMITATIONS): A good seedbed must be prepared before premergence use of Determine 4L, as crop injury may result if application is made to ground which is cloddy or compacted resulting in improperly planted seed. Plant seed to depth specified. Unless otherwise directed, the surface of the soil should not be cultivated or disturbed after application of Determine 4L and before emergence of the crop, as weed control may be reduced and crop injury may result. However, if moisture is insufficient to activate the herbicide, a shallow cultivation (rotary hoe preferred) should be made after emergence of crops while weeds are small enough to be controlled by mechanical means.

FRUIT AND NUT CROPS (see SOIL LIMITATIONS): Unless otherwise directed, make a single application per year as a directed spray, avoiding contact of foliage and fruit with spray or drift. Do not graze livestock in treated orchards or groves.

RECOMMENDED USES

ALFALFA

Treat only stands established for 1 year or more. Do not apply to seedling alfalfa nor to alfalfa/grass mixtures. Do not apply to alfalfa under stress from disease, insect damage, shallow root penetration (such as on shallow hard pans), alkali spots, nor to flooded fields, as crop injury may result. Do not spray on snow-covered or frozen ground. In alfalfa, Determine 4L may only be applied once per year. Do not exceed 2.4 quarts per acre per year.

Arizona, Nevada: Use 1.2 to 2.4 quarts per acre. Apply in fall after alfalfa becomes dormant but no later than January.

California (Dormant and Semi-Dormant Varieties): Use 1.2 to 2.4 quarts per acre. Apply in fall or winter after alfalfa becomes dormant or semi-dormant but before growth begins in the spring. Crop injury may result if application is made to actively growing alfalfa. For best results, apply before weeds have emerged or become established (2 inches in height or diameter). Control of established weeds is improved by applying Determine 4L with a suitable contact herbicide registered for such use. Sufficient rainfall for soil activation of Determine 4L is unlikely in California after February 1. Treated areas may be replanted to any crop after 1 year from last application if rate does not exceed 1.6 quarts per acre.

Eastern Colorado, Kansas: For control of tansymustard, apply 0.8 quart per acre shortly after emergence of mustard in the fall or winter. Use 1.6 quarts per acre if weeds are 2 to 4 inches in height. Alternatively, if other annual weeds are present, apply 1.6 to 2.4 quarts per acre in February or March.

Idaho, Oregon, Washington: For control of annual weeds, use 1.2 to 2.4 quarts per acre. Apply in fall after alfalfa becomes dormant but no later than mid-December.

Other Areas Where Alfalfa Becomes Winter Dormant: Use 1.2 to 2.4 quarts per acre (1.2 to 1.6 quarts per acre East of Appalachian Mountains). Apply in March or early April but before spring growth begins.

APPLE

Aerial application is prohibited.

Use Determine 4L alone or apply as a tank mixture with Sinbar® Herbicide.
Do not apply more than 3.2 quarts per acre per application and no more than 3.2 quarts per acre per year. When using Determine 4L in a sequential treatment program, allow a minimum of 90 days between applications. Do not make more than two applications of Determine 4L per year.

Determine 4L Alone: Use only under trees established in the orchard for at least 1 year. Do not treat varieties grafted on full-dwarf root stocks. Apply 3.2 quarts per acre in the spring from March through May. In the Far West, apply 3.2 quarts per acre to small weeds less than 2 inches in height or diameter under dormant trees. Alternatively, treatments to small weeds may be applied at 1.6 quarts per acre postharvest followed by 1.6 quarts per acre prior to bud break.

Georgia: Apply 1.6 to 2.4 quarts per acre in the spring. Repeat application in the fall but do not use more than 3.2 quarts per acre per year. Add a surfactant to improve control of small emerged weeds.

Determine 4L plus Sinbar: Use only under trees established in the orchard for at least 2 years. Apply either in the spring or after harvest in the fall before weeds emerge or during early seedling stage of weed growth.

	RATE PER ACRE					
	1 to 2% Organic Matter			More Than 2% Organic Matter		
Soil Texture	Determine 4L Qts./Acre		Sinbar Lbs./Acre	Determine 4L Qts./Acre		Sinbar Lbs./Acre
Sandy Loam	0.8	+	1.0	1.2	+	1.5
Loam, Silt Loam, Silt	1.2	+	1.5	1.6	+	2.0
Clay Loam, Clay	1.6	+	2.0	1.6	+	2.0

Where crop is grown under furrow irrigation or under raised-berm flood irrigation (trees 4 to 6 inches above waterline), apply only as a band treatment. Do not treat trees planted in the bottom of irrigation furrows, nor trees grown under flat flood or basin irrigation, as injury to trees may result. Where complete weed control to harvest is desired, additional weed control measures may be required during the growing season.

ARTICHOKE

Aerial application is prohibited.

California: Apply 1.6 to 3.2 quarts per acre in late fall or early winter after the last cultivation. Apply before weeds germinate or to emerging seedlings. Direct spray to cover the area between the rows and at the base of artichoke plants keeping contact with crop plants at a minimum.

ASPARAGUS

Aerial application is prohibited.

Apply as a band or broadcast treatment. Do not apply to young plants during the first growing season (except as noted below), nor to newly seeded asparagus, nor on plants with exposed roots, as severe injury may result. Preemergence weed control will be reduced on soils with greater than 5% organic matter.

Established Plantings: On light sandy soils and other soils low in clay or organic matter, apply 0.8 to 1.6 quarts per acre. On soils high in clay or organic matter, use 1.6 to 3.2 quarts per acre. Two applications may be used. The first application should be made before weeds become established but no earlier than 4 weeks before spear emergence and no later than the early cutting period. If weeds are controlled into the cutting period by cultural practices, application may be delayed until immediately after the last cultivation. A second application may be made immediately following completion of harvest provided rainfall is expected. When two applications are used in one season, do not exceed 2.4 quarts per acre per application. In Washington (irrigated crop), apply a single treatment of 3.2 quarts per acre. If treatment is delayed until late winter or early spring, incorporation of the chemical in the top 1 to 2 inches of soil may substitute for lack of rain to activate the herbicide.

Newly Planted Crowns (San Joaquin Delta, California): Make a single treatment of 1.6 to 3.2 quarts per acre on soils high in clay or organic matter. Use the lower rate on clay loams and the higher rate on peat soils. Do not use on soils containing less than 2% organic matter. Soil must be settled by rainfall or irrigation prior to treatment. Do not treat crowns planted to a depth of less than 2 inches.

BANANA AND PLANTAIN

Aerial application is prohibited.

New Plantings: To control annual weeds, apply 1.2 to 2.4 quarts per acre after planting but before weed or crop emergence. Do not apply to loose soil directly over the planting material.

Established Plantings: For control of annuals and for top-kill of perennials such as bermudagrass, birdseed grass, and guineagrass, apply 2.4 to 4.8 quarts per acre plus surfactant. Avoid contact of banana and plantain plants with spray or drift, as injury may result. When tall, dense weed growth is present, remove weed growth before application. If application is made to soil free of weeds, omit surfactant from the spray mixture. Repeat treatment as needed. Apply at 6-week intervals or longer for a maximum of 9.6 quarts of Determine 4L per acre (broadcast basis) in 12 months.

Do not replant treated area to any crop within 2 years after last application, as injury to subsequent crops may result. Exception: Sugarcane or pineapple may be planted after 1 year.

BARLEY (WINTER)

Western Oregon, Western Washington: For drill-planted barley, make a single application of 1.2 to 1.6 quarts per acre as soon as possible after planting but before emergence of barley.

Do not replant treated areas to any crop within 1 year after last application, as injury to subsequent crops may result.

BERMUDAGRASS PASTURES (NEWLY SPRIGGED)

Aerial application is prohibited.

Apply 0.8 to 2.4 quarts after planting and before emergence of bermudagrass or weeds. Alternatively, for control of emerged annual weeds up to 4 inches in height, apply 0.4 to 0.8 quart per acre; add a surfactant per 25 gallons of spray. If bermudagrass has emerged at time of treatment, temporary burn of exposed plant parts may occur. Plant sprigs (stolons) 2 inches deep in a well-prepared seedbed. Do not treat areas where sprigs are planted less than 2 inches deep, as crop injury may result. Do not graze or feed foliage from treated areas to livestock within 70 days after application.

BIRDSFOOT TREFOIL (LOTUS)

Aerial application is prohibited.

Western Oregon: Treat only stands established for at least 1 year. Do not apply to seedling trefoil, as injury may result. Make a single application of 1.6 quarts per acre when trefoil is dormant (October 15 to December 15). Do not replant treated areas to any crop within 1 year after last application, as injury to subsequent crops may result.

BLUEBERRY, CANEBERRY, GOOSEBERRY

Aerial application is prohibited.

Use only in fields which have been established for at least 1 year. Do not apply to berries interplanted with fruit trees. Do not apply to plants where roots are exposed, as injury may result. Apply as a band treatment at base of canes or bushes. For spring application, apply before germination and growth of annual weeds.

Arkansas, Florida, Georgia, Mississippi, Missouri, New Hampshire, North Carolina, South Carolina-Blueberry: Apply 1.2 to 1.6 quarts per acre in the spring and repeat treatment after harvest in the fall. Add a surfactant to improve control of small emerged weeds.

California-Blackberry, Boysenberry, Dewberry, Loganberry, Raspberry: For control of winter annual weeds, apply 1.6 quarts per acre in October or November. Repeat at the same rate in late spring to control summer annuals. A single application of 2.4 quarts per acre in January or February will control annual weeds in some areas, but the separate fall and spring schedule is preferred.

Indiana, Michigan, Ohio-Blueberry: Apply 1.6 to 3.2 quarts per acre in late spring. Alternatively, apply 1.6 quarts per acre in the fall and repeat at the same rate in the spring.

Indiana, Michigan, Ohio-Raspberry: Apply 2.4 quarts per acre in late spring.

Maine, Massachusetts-Blueberry: Apply 1.6 quarts per acre in late spring.

Maryland, New Jersey-Blueberry: For control of winter annual weeds, apply 1.6 quarts per acre from October to December, or make a single application of 2.0 quarts per acre in early to mid-spring.

Western Oregon, Western Washington-Blueberry, Caneberry, Gooseberry: For control of winter annual weeds, apply 1.6 quarts per acre in October or November. Repeat at the same rate in late spring to control summer annual weeds. A single application of 2.4 quarts per acre in January or February will control both winter and summer annual weeds in some areas, but the separate fall and spring schedule is preferred.

CITRUS

Aerial application is prohibited.

Time application as indicated for specific areas. However, application may be made any time of the year where sprinkler or flood irrigation can be timed to activate the herbicide. Established perennial weeds require other special control procedures.

Determine 4L may be applied in citrus in combination with registered paraquat and glyphosate formulations. Read and follow specific label instructions, precautions, and restrictions on the label of the tank mix partner when applying Determine 4L in combination with other products.

Note: For citrus trees four or less years of age, make a maximum of two applications per year. Where Determine 4L is used in a sequential treatment program, allow a minimum of 60 days between applications. For citrus trees four or more years of age, make a maximum of two applications per year. When Determine 4L is used in a sequential treatment program, allow a minimum of 80 days between applications.

Arizona (except Yuma area), California (except Imperial and Coachella Valleys): Apply 2.4 to 3.2 quarts per acre shortly after grove has been laid up in final form (nontillage program) in late fall or early winter. Alternatively, apply 1.6 quarts per acre in October or November and repeat at the same rate in March or April. Subsequent annual applications of 1.6 to 2.4 quarts per acre will usually give adequate weed control.

Do not use more than 3.2 quarts per treated acre in any one application. Do not apply more than 6.4 quarts per treated acre per year. This amount corresponds to 6.4 pounds of diuron, the active ingredient in Determine 4L. The maximum allowable use rate for diuron is 6.4 pounds per treated acre per year inclusive of all diuron formulations used within one year.

Florida: Use only as a band application. Do not use "Trunk to Trunk".

East Coast/Flatwoods Areas-(low permeable soils)

Apply from 1.6 quarts per acre to a maximum of 6.4 quarts per acre for control of annual broadleaf weeds and annual grasses. Addition of an approved surfactant will improve control of emerged weeds.

Do not use more than 6.4 quarts per treated acre in any one application.

Do not apply more than 6.4 quarts per treated acre per year. This amount corresponds to 6.4 pounds of active ingredient.

The maximum allowable use rate for diuron is 6.4 pounds active ingredient per treated acre per year inclusive of all diuron formulations used within 1 year.

Ridge Areas-except Highland Co. (highly permeable soils)
Apply from 1.6 quarts per acre to a maximum of 3.2 quarts per acre for control of annual broadleaf weeds and annual grasses. Addition of an approved surfactant will improve control of emerged weeds. Do not use more than 3.2 quarts per treated acre in any one application.

Do not apply more than 6.4 quarts per treated acre per year. This amount corresponds to 6.4 pounds of active ingredient.

The maximum allowable use rate for diuron is 6.4 pounds active ingredient per treated acre per year inclusive of all diuron formulations used within 1 year.

Ridge Areas-Highland Co. (highly permeable soils)
Apply from 1.6 quarts per acre to a maximum of 3.2 quarts per acre for control of annual broadleaf weeds and annual grasses. Addition of an approved surfactant will improve control of emerged weeds. Do not use more than 3.2 quarts per treated acre in any one application.

Do not apply more than 4.8 quarts per treated acre per year. This amount corresponds to 4.8 pounds of active ingredient.

The maximum allowable use rate for diuron is 4.8 pounds active ingredient per treated acre per year inclusive of all diuron formulations used within 1 year.

Do not use at less than 60-day intervals.

Puerto Rico: Make a single application of 3.2 quarts per acre or apply 2.4 to 3.2 quarts per acre followed by the same rate 4 to 6 months later. On bearing citrus, apply anytime when seasonal rains are expected. On nonbearing trees, apply when winter banks are pulled down.

Do not use more than 3.2 quarts per treated acre in any one application. Do not apply more than 6.4 quarts per treated acre per year. This amount corresponds to 6.4 pounds of diuron, the active ingredient in Determine 4L. The maximum allowable use rate for diuron is 6.4 pounds per treated acre per year inclusive of all diuron formulations used within one year.

Texas: Apply 1.6 to 3.2 quarts per acre for annual weeds. Use 3.2 quarts per acre for control of seedling johnsongrass. Spring treatments give best results. Well-established weeds should be eliminated by cultivation prior to treatment.

Do not use more than 3.2 quarts per treated acre in any one application. Do not apply more than 6.4 quarts per treated acre per year. This amount corresponds to 6.4 pounds of diuron, the active ingredient in Determine 4L. The maximum allowable use rate for diuron is 6.4 pounds per treated acre per year inclusive of all diuron formulations used within one year.

CORN (FIELD)

Aerial application is prohibited.

Postemergence: Make a single application of 0.6 quart per acre in combination with nonpressure nitrogen solution. If nitrogen solution is not used, apply 0.8 quart per acre with surfactant. Apply as directed spray when corn is at least 20 inches high and weeds are no taller than 3 inches.

DO NOT APPLY OVER TOP OF CORN.
Do not replant to any crop within 1 year after last application, as injury to subsequent crops may result. Exception: Cotton, corn, and grain sorghum may be planted the spring following treatment.

Preemergence-Arkansas, Louisiana, Mississippi, Tennessee: Make a single application of 0.5 to 0.8 quart per acre as a broadcast or band treatment after planting but before corn emerges. Plant corn at least 1.5 inches deep. Do not replant treated areas to crops other than corn or cotton within 4 months following band treatment and 6 months following broadcast treatment, as injury to subsequent crops may result.

Preplant-Louisiana:
Use Precautions: Do not apply to sand or loamy sand soils. Do not use on soils with less than 1% organic matter, as crop injury may result. Plant corn at least 1.5 inches deep. Do not spray over the top of corn plants.

Determine 4L may be used for burndown of existing annual weeds and residual control of weeds prior to planting field corn. **Do not use on sweet corn.** Complete any planned tillage prior to application. Apply herbicide treatments before weeds germinate or before weed seedlings are more than 2 inches tall. If weeds are emerged prior to application, the addition of a nonionic surfactant is recommended. Tillage following application should be avoided to prevent incorporation of the herbicide into the corn seed germination zone, which may result in crop injury. Dragging treated soil from beds will concentrate the herbicide in middles and reduce residual weed control on beds.

Apply 1.0 to 1.6 pints per acre from 15 to 45 days prior to anticipated planting. Refer to the table below for use rates in preplant applications. Do not exceed suggested use rates for individual soil textures shown in the table below. If less than the maximum rate of application for a soil is applied preplant, subsequent pre-

emergence applications of Determine 4L may be made. However, the total combined application rate for Determine 4L applied preplant and preemergence may not exceed the maximum suggested use rate for either application method.

Determine 4L Alone:

Soil Texture	Rate/Acre
Sandy Loam, Loam, Silt Loam, Silt	1.0 pt.
Sandy Clay Loam, Clay Loam, Silty Clay Loam, Sandy Clay	1.3 pts.
Silty Clay, Clay	1.6 pts.

The risk of injury from preplant applications of Determine 4L is reduced where substantial rainfall (greater than 0.5 inch) occurs between application and planting.

Preplant Tank Mixing: When emerged weeds taller than 2 inches or weeds not listed on this label are present, Determine 4L may be tank mixed with other products labeled for preplant applications in corn including Glyphosate Original, Gramoxone® Extra, Roundup® Ultra, and Touchdown®. The addition of dry spray grade ammonium sulfate at the rate of 2.0% w/w (17 pounds per 100 gallons finished spray solution) is suggested to enhance performance of Determine 4L plus glyphosate tank mixes.

Replanting: Only cotton and corn may be replanted within 6 months of preplant applications of Determine 4L. To avoid crop injury following replanting, avoid disturbing the original bed.

COTTON

Use Precautions: During a single crop season, do not exceed the following amount of Determine 4L per acre, as injury to subsequent crops may result; 0.8 quart on sandy loam, 1.5 quarts on clay loam, and 2.2 quarts on clay. Do not make more than 3 applications of Determine 4L per year.

DO NOT SPRAY OVER THE TOP OF COTTON PLANTS.
Do not apply to sand or loamy sand soils except as noted below.

Do not use on soils with less than 1% organic matter, as crop injury may result.

Seedling disease may weaken plants and increase the possibility of injury from the use of trifluralin products followed by Determine 4L. These treatments should be used only in conjunction with a standard fungicide seed treatment plus a good supplemental soil fungicide program such as captan-PCNB mixture.

Do not use Determine 4L in preplant or preemergence applications where soil-applied organophosphate insecticides are used due to potential for severe cotton injury and possible stand loss.

Do not allow livestock to graze treated cotton.

Note: When using Determine 4L in a sequential treatment program, allow a minimum of 21 days between applications.

PREPLANT
Arizona, California: Use Determine 4L alone or apply as a separate operation following preplant broadcast treatment with trifluralin products (incorporated according to directions on the trifluralin product label). Apply Determine 4L as a broadcast spray after beds are formed, pre-irrigated, and final seedbeds prepared. Prior to planting, drag off the tops of the beds and plant in moist soil not treated with Determine 4L. Treated soil is returned to the bed after planting when irrigation furrows are reformed after cotton has emerged. If more than two furrowing-out operations are performed prior to lay-by, or deep furrows are made early, weed control may be reduced in furrow bottoms.

Determine 4L Alone: Apply 0.8 to 1.6 quarts per acre.

Determine 4L following trifluralin products:

Soil Texture	Rate/Acre	
	Trifluralin products	Determine 4L
Sandy Loam, Loam, Silt Loam, Silt	1 pint	0.5-0.8 quart
Sandy Clay Loam, Clay Loam, Silty Clay Loam, Sandy Clay, Clay	1.5 pints	0.8-1.0 quart

PREPLANT
Except Arizona, California: Determine 4L may be used for burndown of existing annual weeds and residual control of weeds prior to planting cotton. Complete any planned tillage prior to application. Apply herbicide treatments before weeds germinate or before weed seedlings are more than 2 inches tall. If weeds are emerged prior to application, the addition of a nonionic surfactant is recommended. Tillage following application should be avoided to prevent incorporation of the herbicide into the cotton seed germination zone which may result in crop injury. Dragging treated soil from beds will concentrate the herbicide in middles and reduce residual weed control on the beds.

Apply 0.5 to 1.6 quarts per acre from 15 to 45 days prior to anticipated planting. Refer to the table below for use rates in preplant applications. Do not exceed suggested use rates for individual soil textures shown in the table below. If less than the maximum rate of application for a given soil is applied preplant, subsequent preemergence applications of Determine 4L may be made. However, the total combined application rate for Determine 4L applied preplant and preemergence may not exceed the maximum suggested use rate for either application method.

Determine 4L Alone:

Soil Texture	Rate/Acre
Loamy Sand (Louisiana only)	0.5 quart
Sandy Loam, Loam, Silt Loam, Silt	0.8 quart
Sandy Clay Loam, Clay Loam, Silty Clay Loam, Sandy Clay	1.0 quart
Silty Clay, Clay	1.6 quarts

Preemergence application of herbicides with a similar mode of action to that of diuron following preplant application of Determine 4L may result in cotton injury. When preplant applications of Determine 4L are followed by preemergence applications of herbicides with a similar mode of action (for example of Meturon®, Cotoron®, or other products containing fluometuron), the product containing fluometuron should be used at the minimum rate of application for the soil under consideration in order to reduce potential for crop injury. This is most critical where applications of Determine 4L are made less than 30 days preplant, on coarse-textured soils, and on soils low in organic matter. The risk of injury from preplant applications of Determine 4L is reduced where substantial rainfall (greater than 0.5 inch) occurs between application and planting. Read and follow any additional precautions on this label when using this product for preplant weed control in cotton.

Preplant Tank Mixes: When emerged weeds taller than 2 inches or weeds not listed on the Determine 4L label are present, Determine 4L may be tank mixed with other products labeled for preplant applications in cotton. The addition of dry spray grade ammonium sulfate at the rate of 2.0% w/w (17 lbs. per 100 gallons finished spray solution) is suggested to enhance performance of Determine 4L plus glyphosate tank mixes.

REPLANTING: Only cotton and corn may be planted within 6 months of preplant applications of Determine 4L. To avoid crop injury following replanting, avoid disturbing the original bed.

PREEMERGENCE

Except Arizona, California: Use Determine 4L alone or apply as a separate operation following preplant treatment with trifluralin products. Apply Determine 4L after planting but before cotton emerges.

Do not treat cotton in deep furrows, as crop injury may result.

Use only where cotton is planted on flat or raised seedbeds. Shallow incorporation (no deeper than 0.25 inch) with a rotary hoe or similar equipment following planting usually improves results, especially during dry weather. A wide press wheel should be used on the planter to provide a level seedbed for subsequent early season postemergence treatments. If moisture is insufficient to activate Determine 4L or if soil becomes crusted before crop emerges, a shallow rotary hoeing (no deeper than 0.25 inch) should be made before weeds become established. Determine 4L should not be applied preemergence following application of the maximum rate for a given soil applied preplant. If less than the maximum rate is used preplant, additional Determine 4L may be applied preemergence. However, the total amount of Determine 4L applied preplant and preemergence must not exceed the maximum suggested use rate for either preplant or preemergence applications.

Determine 4L Alone: Make a single application as a broadcast or band spray, using the following broadcast rates. Use proportionately less for band treatment.

Soil Texture	Rate/Acre
Sandy Loam, Loam, Silt Loam, Silt	0.8 quart
Sandy Clay Loam, Clay Loam, Silty Clay Loam, Sandy Clay	1.0 quart
Silty Clay, Clay	1.6 quarts

PREEMERGENCE APPLICATIONS OF DETERMINE 4L FOLLOWING TRIFLURALIN PRODUCTS: Apply trifluralin products prior to planting as a broadcast or band treatment. Incorporate according to the directions on the trifluralin labels. As a separate operation, apply Determine 4L after planting but before cotton emerges. Use the following broadcast rates. For band treatment, use proportionately less.

Soil Texture	Rate/Acre	
	Trifluralin products	Determine 4L
Sandy Loam, Loam, Silt Loam, Silt	1 pint	0.8 quart
Sandy Clay Loam, Clay Loam, Silty Clay Loam, Sandy Clay, Clay, Silty Clay	1.5 pints	1.0 to 1.6 quarts

POSTEMERGENCE: Apply Determine 4L only as a directed spray to cover weed foliage. Adjust nozzles to minimize contact of cotton leaves with spray or drift, or crop injury may result. Applications may also be made in hooded/shielded sprayers.

Early Season: Apply when cotton is at least 6 inches tall and when weeds are not actively growing and do not exceed 2 inches in height. Apply as a band or broadcast treatment at the following rate. Two applications may be made if needed.

Annual Weed Problem (up to 2 inches tall)	Rate Per Acre
Cotton 6 to 8 inches	0.4 quart
Cotton 8 to 12 inches	0.6 quart

For control of seedling perennial grass such as johnsongrass in directed sprays and partial control of nutsedge, or when weed growth is under drought stress or over 2 inches in height, add 2.0 to 3.5 pounds active DSMA or 1.65 to 2.0 lbs. active MSMA to above spray mixture. If DSMA or MSMA are used, do not apply after first bloom.

For enhanced weed control in hooded/shielded sprayer applications, add MSMA or DSMA as suggested above; or add registered paraquat or glyphosate formulations according to label recommendations. Consult product labels for specific recommendations and precautions for hooded sprayer applications.

LATE SEASON (LAY-BY): Apply 0.8 to 1.2 quarts (0.8 to 1.6 quarts in Arizona and California) per acre when cotton is at least 12 inches high (at least 20 inches for Pima S-2). For control of germinating weed seedlings, apply to soil beneath cotton plants and between rows immediately after last cultivation. In irrigated cotton, best weed control is obtained if the field is irrigated within 3 to 4 days after application to thoroughly wet the surface of the ground over the row to carry the herbicide into the root zone of germinating weeds. Alternatively, for control of emerged annual weeds (4 inches or less in height) at lay-by time, make a single application in combination with surfactant, or use 0.4 to 0.6 quart per acre plus surfactant and repeat later if needed.

REPLANTING: If initial seeding fails to produce a stand, cotton may be replanted in soil treated preemergence with Determine 4L alone or following preplant application of trifluralin products. Wherever possible, avoid disturbing original bed. If necessary to rework soil before replanting, use shallow cultivation such as discing. Do not relist nor move soil into the original drill area. Plant seed at least 1 inch deep. Do not re-treat field with a second preplant or preemergence application of herbicide during the same crop year, as injury to crop may result.

SUBSEQUENT CROPS

Determine 4L Herbicide Type of Application	That May Follow Treated Cotton
Band pre or postemergence	Any crop 4 months after last application.
Band pre plus postemergence or Broadcast preemergence (and preplant) or Broadcast preemergence plus band postemergence	Cotton, soybeans, corn, or grain sorghums (not sorgos or forage sorghums nor grass sorghums) the next spring. Do not replant treated areas to any other crop within 1 year after last application, as injury to subsequent crops may result.
Broadcast postemergence (lay-by)	Cotton, corn, grain sorghums (not sorgos or forage sorghums nor grass sorghums) the next spring. Do not replant treated areas to any other crop within 1 year after last application, as injury to subsequent crops may result.
For subsequent crops in fields where trifluralin products are used, follow instructions on the trifluralin product label.	

FILBERTS

Aerial application is prohibited.

Determine 4L is recommended for control of certain weeds in filbert orchards established for at least 1 year. Do not apply more than 2.2 quarts per acre per application nor more than 3.2 quarts per acre per year. When using Determine 4L in a sequential treatment program, allow a minimum of 150 days between applications. Apply a maximum of two applications per year.

Apply Determine 4L as a directed spray avoiding contact on the foliage and fruit with spray or drift. Make an initial treatment of 2.2 quarts per acre in the late fall or early winter after harvest. Repeat

annually with 2.2 quarts per acre, or apply 1.6 quarts per acre in October or November after harvest and repeat at the same rate in March or April.

Do not apply when nuts are on the ground.

Do not graze livestock in treated orchards.

Do not use on light sandy soils.

If trees are planted on hillsides, the elimination of weeds and ground cover may cause excessive soil erosion. Under these conditions, strip applications of Determine 4L (at proportionately lower rates) may be made near the trees or to the tree rows perpendicular to the slope.

GRAPE

Aerial application is prohibited.

Apply only as a band treatment to established vineyards at least 3 years old. On soils low in clay or organic matter (1 to 2%), severe plant injury may result if heavy rainfall or more than 1 inch of irrigation occurs soon after treatment. This risk must be assumed by the user.

Do not apply more than 4 quarts per acre as a single maximum use rate. Do not apply more than 8 quarts per acre per year. When using Determine 4L in a sequential treatment program, allow a minimum of 90 days between applications. Avoid direct or indirect spray contact to foliage and green bark (nonbarked vines with the exception of undesirable suckers). Apply a maximum of two applications per year.

New York, Pennsylvania-Perennial Grasses: Use only in established vineyards (at least 4 years old) for spot control of perennial grasses such as orchardgrass, quackgrass, and ryegrass. Apply in the spring as a band treatment to ridged soil (2 to 4 inches high) under trellis at the rate of 6.4 to 8 quarts per acre. Band width should not exceed 30 inches. Do not apply more than once every 4 years. Use only on heavy soil types such as loams, silt loams, clay loams. Do not use in areas where grape roots are shallow or exposed because of high bedrock or poor drainage or erosion, as injury to grapevines may result.

East of the Rocky Mountains: On soils low in clay or organic matter (1 to 2%), apply 1.6 to 2.4 quarts per acre. On soils high in clay or organic matter, apply 2.4 to 4.8 quarts per acre. Apply in the spring just prior to germination of annual weeds.

West of the Rocky Mountains: For best results, apply during the winter months when weeds are less than 2 inches in height or diameter. Rainfall or overhead sprinkler irrigation sufficient to wet the soil to a depth of 2 inches is necessary to activate the herbicide. Abnormally heavy rainfall following application just before spring growth may move the herbicide into the root zone of grapes which could result in injury. For initial treatment, apply 2.4 to 3.2 quarts per acre. Subsequent annual applications of 1.6 quarts per acre will usually give adequate weed control. Do not apply to vines with trunks less than 1.5 inches in diameter, as injury may result.

GRASS SEED CROPS
(Perennial except where specifically indicated)

Except as noted, apply only to established plantings at least 1 year old.

Note: Apply a single application per year at up to 2.4 quarts per acre. May be applied by aerial application in the Pacific Northwest only. Do not make more than one application per year.

Colorado, Kansas, Missouri, New Mexico, Oklahoma: On sand bluestem, side oats grama, and switchgrass, apply 1.6 to 2.4 quarts per acre during the dormant period shortly before weed seedlings emerge. Do not apply after crop begins growth in the spring, as crop injury may result. In fields where ash residues have accumulated from burning straw, use 2.4 quarts per acre. Spread unburned chaff or straw with a harrow or chopper before application.

Eastern Oregon, Eastern Washington: On perennial bluegrass and fescue, apply 0.8 to 2.4 quarts per acre as broadcast in enough diluent to get even distribution. Apply in spring before rapid growth of the crop begins and when the windgrass is still small (1- to 4-leaf). DO NOT use on coarse- (sandy-) textured soils.

Western Oregon, Western Washington: On alta fescue, Astoria bentgrass, Highland bentgrass, Kentucky bluegrass (Merion bluegrass), and orchardgrass, apply 1.6 to 2.4 quarts per acre between October 1 and November 15. In fields where ash residues have accumulated from burning straw, use 2.4 quarts per acre. Spread unburned chaff or straw with a harrow or chopper before application. For best results, apply as soon as possible after fall rains start. Established weeds beyond the two- to four-leaf stage should be removed prior to treatment.

Well-established vigorous stands of spring planted alta fescue, Kentucky bluegrass, and orchardgrass may be treated the following fall, provided the crop is planted before April 1 and treatment is not applied before October 15; apply 1.6 quarts per acre.

Oregon and Washington: Apply in the fall to perennial ryegrass at the rate of 0.8 to 1.6 quarts per acre and to tall fescue at the rate of 1.6 to 3.2 quarts per acre. Use a sufficient volume of water (a minimum of 25 gallons per acre) for thorough coverage of weed foliage. For best results, make applications at the onset of the fall rains and before weeds have become established (typically October 1 through November 15). Established weeds beyond the 2- to 4-leaf stage should be removed prior to treatment.

Apply only to well-established vigorous stands. Do not apply to perennial ryegrass stands less than one year old. Use mechanical agitation and avoid overlap of spray patterns. Weed control efficacy may be reduced in fields where ash residues have accumulated from burning straw.

Annual Ryegrass for the Creation of Rows: Apply 0.8 to 1.6 quarts per acre as a directed or shielded spray so the intended crop row area is not treated. These applications should be made where excessive populations of annual ryegrass are anticipated to volunteer from previous crops. Applications can be made as a directed/shielded spray during seeding or after emergence of annual ryegrass. These applications generally will occur between October 1 and January 15. Determine 4L is most effective when applied before annual ryegrass volunteer plants have more than 2 leaves. If larger plants are to be treated, addition of a labeled postemergence herbicide will provide more effective control.

Adjust nozzle heights and spacing to allow the establishment of the desired row width (generally about 3 inches) and spacing (generally 9 to 12 inches). Use of low pressure nozzles, shielded nozzles, or drop nozzles to reduce spray movement in the intended crop row area is recommended.

Fine Fescue Grass Seed Crops (including chewings, creeping red, and hard fescue types): For the suppression of rattail fescue, apply 0.8 to 1.6 quarts per acre on soils having at least 1% organic matter. Do not use on sand, loamy sand, gravelly soils, or exposed subsoils.

Crop Stage and Application Timing: Determine 4L is recommended for use on healthy vigorous stands of fine fescue. Determine 4L can be applied to stands established at least 1 year, or to new plantings that have been established for at least 6 months and have a minimum of eight tillers at time of application. Apply in the fall before grass weeds are beyond the one- to two-leaf stage and before broadleaf weeds are larger than 1- to 2-inches tall or across. Use the high end of the rate range for large weeds or where weed populations are high.

Approximately 1/2 to 1 inch of rainfall or sprinkler irrigation is needed to move Determine 4L into the weed zone before weeds develop an established root system. Weeds larger than the size indicated or those having a well-established root system before Determine 4L is properly activated by rainfall/irrigation may not be adequately controlled.

Weed control may be reduced by heavy straw residues or ash from field burning.

Tank Mixes: Determine 4L can be applied either alone or in a program involving tank mixes with other herbicides and adjuvants. When using a tank mix with other herbicides, use 0.8 to 1.2 quarts per acre unless prior experience indicates it is safe to use higher rates. Tank mixes with other herbicides can increase the risk of crop injury. When using a certain tank mix for the first time, limit use to a small area to determine safety before treating large areas.

Use Precautions:
Do not replant treated areas to any crop within 2 years of last application, as injury to subsequent crops may result.

Do not apply to snow-covered or frozen ground, as injury to the crop or poor weed control may result.

Do not treat stands lacking in vigor due to poor fertility, environmental stress, insect or disease, or damage from other herbicides.

New Plantings-Oregon, Idaho, Washington: For use in newly planted bentgrass, chewings fescue, Kentucky bluegrass, perennial ryegrass, orchardgrass, and tall fescue. During planting operation, spray a suitable brand of activated charcoal as a 1-inch band on soil surface at 15 pounds per acre of crop where row spacing is 20 inches (300 pounds per acre broadcast basis). Mount nozzles to apply directly over seed rows to prevent crop injury. Follow with Determine 4L as a single broadcast spray at the rate of 2.0 to 2.4 quarts per acre. Apply as soon as possible after planting but before crops or weeds emerge and before rains or sprinkler irrigation. Fall or spring plantings may be treated. Best results usually occur with early fall plantings. Treatment will not control downy brome or wild oats.

PERENNIAL RYEGRASS, TALL FESCUE, KENTUCKY BLUEGRASS, AND FINE FESCUE (Grown for Seed)

For control of certain broadleaf weeds and annual grasses, apply this product only to well-established vigorous stands of grasses as directed below. Use sufficient water (a minimum of 25 gallons per acre) for thorough coverage of weed foliage. For best results, make application at the onset of fall rains and before weeds become established (typically October 1 through November 15). Weeds beyond the 2- to 4-leaf stage will usually not be controlled. Use higher rates within the range listed when treating larger weeds and heavier weed infestation. Weed control may be reduced where straw or ash residues have accumulated on the soil surface. Lack of moisture to activate the herbicide may reduce weed control. Tank mixtures or sequential treatments with other herbicides may reduce crop tolerance and increase risk of crop injury. When using Determine 4L in a tank mix or in a sequential treatment with other herbicides, do not use the maximum rates listed below unless compatibility and the potential for phytotoxicity have been evaluated. Crop tolerance may be reduced, and the likelihood of crop injury may increase when crop is under stress caused by weather, diseases, and insects.

Perennial Ryegrass (Established)(Oregon Only): Apply 0.8 to 1.6 quarts per acre per season (October 1 through mid-January) to control seedling grasses and broadleaf weeds such as annual bluegrass and others named on this label.

Tall Fescue (Established)(Oregon Only): Apply 1.6 to 2.4 quarts per acre per season (October 1 through mid-January) to control seedling grasses and broadleaf weeds such as rattail fescue and others named on this label.

Kentucky Bluegrass (Established stands east of the Cascade Mountains)(Oregon, Washington Only): Apply 1.2 to 2.4 quarts per acre per season (October 1 through mid-January) for suppression of rattail fescue and certain other seedling grasses and broadleaf weeds named on this label. Downy brome is not controlled. Do not use on *Poa trivialis* grass seed varieties.

Fine Fescue (Illahee, Rainier, Chewings, and related varieties including Hard Fescue)(Established stands west of the Cascade Mountains)(Oregon Only): Apply 0.8 to 1.6 quarts per acre for suppression of rattail fescue and certain other seedling grasses and broadleaf weeds named on this label. Make only 1 application per year. Do not use this product more than two years in succession in the same field.

ESTABLISHED PERENNIAL BLUEGRASS (Grown for Seed) (Washington, Oregon, Idaho)

Broadcast 0.4 to 1 quart per acre in sufficient diluent to provide even distribution of product for weed suppression. Apply in the spring before rapid growth of bluegrass begins and when windgrass is still small (1- to 4-leaf). Do not use on coarse- (sandy-) textured soils.

MACADAMIA NUT

Aerial application is prohibited.

Hawaii: Use only under trees established in the orchard for at least 1 year. Apply 1.6 to 4.8 quarts per acre immediately after harvest, preferably before weeds emerge. If weeds have emerged, add surfactant. Re-treat as needed but do not exceed 8.0 quarts per acre per year.

OATS

Aerial application is prohibited.

Do not replant treated areas to any crop within 1 year after last application, as injury to subsequent crops may result.

Drill-Planted Spring Oats-Idaho, Eastern Oregon, Eastern Washington: Use in areas where average annual rainfall exceeds 16 inches. Make a single application of 0.8 to 1.2 quarts per acre after planting either before or after oats emerge but within 6 weeks of planting. Best results are usually obtained when application is made 3 to 4 weeks after planting. Apply before weeds are 3 to 4 inches in height.

Drill-Planted Winter Oats and Mixture with Peas or Vetch-Western Oregon, Western Washington: Make a single application of 1.2 to 1.6 quarts per acre as soon as possible after planting but before crop emergence.

OLIVE (CALIFORNIA)

Aerial application is prohibited.

California: Use only under trees established in the grove for at least 1 year. Apply 1.6 quarts per acre after the grove has been laid up in final form in late October or November. Repeat at same rate in March or April. Remove weed growth prior to treatment.

ORNAMENTALS

Aerial application is prohibited.

Refer to **SOIL LIMITATIONS** section of this label for additional directions, precautions, and restrictions.

Ornamental Bulb Crops (Bulbous Iris, Narcissus)-Western Washington: Make a single application of 3.2 quarts per acre. Apply after planting but no later than 4 weeks prior to bulb emergence (usually late September or October). Do not replant treated areas to any crop within 1 year after last application, as injury to subsequent crops may result.

Plumosus Fern-Florida: Hand weed and mow fern, then make a single application of 2.4 quarts per acre within 3 to 5 days. Do not cultivate or disturb soil after application, as crop injury may result. Treat only established stands at least 1 year old.

PAPAYA

Aerial application is prohibited.

Use only under trees established in the orchard for at least 1 year. Apply 2.0 to 4.0 quarts per acre, preferably before weeds emerge. If weeds have emerged, add a surfactant.

In Hawaii only, for control of weeds in orchards less than one year old, use as a post-plant treatment between rows. Use only in orchards that are lined with mulch paper in the crop row. Apply preemergent or postemergent in sufficient gallonage for wetting of weeds and soil. Spray up to mulch paper only. Do not apply more than 4.0 quarts per acre per year. Do not allow spray to contact papaya foliage or other desirable vegetation. Do not graze livestock in treated areas.

PEAS (Austrian Field)

Aerial application is prohibited.

Western Oregon: Determine 4L is recommended for selective control of certain weeds in Austrian field peas.

Apply 1.2 to 1.6 quarts Determine 4L per acre as a broadcast spray with air or ground equipment as soon as possible after planting but before crop emerges for control of weeds such as chickweed, sheperdspurse, wild mustard, fiddleneck, lambsquarters, pigweed, and annual bluegrass. Use lower rate on coarse-textured soils and higher rate on fine-textured soils.

Do not use Determine 4L on sand, sandy loam, gravelly soils, or exposed subsoils or on soils having less than 1% organic matter, as crop injury may result. Do not replant treated area to another crop within 1 year of application. Crop injury may result if severe winter stress or disease or insect damage to the crop follows application.

PEACH

Aerial application is prohibited.

Determine 4L may be applied alone or as a tank mix with Sinbar.

Where crop is grown under furrow irrigation or under raised-berm flood irrigation (trees 4 to 6 inches above waterline), apply only as a band treatment. Do not treat trees planted in the bottom of irrigation furrows nor trees grown under flat flood or basin irrigation, as injury to trees may result. Where complete weed control to harvest is desired, additional weed control measures may be required during the growing season.

Determine 4L Alone: Use only under trees established in the orchard for at least 3 years. Apply 1.6 to 2.2 quarts per acre in the early spring before weeds emerge or during the early seedling stage of weed growth; do not apply more than 2.2 quarts per acre per application in all areas except California. In California, apply 1.6 to 3 quarts per acre; do not apply more than 3 quarts per acre per application. Do not apply within 3 months of harvest. In the Far West, do not apply within 8 months of harvest.

Georgia: On trees established for at least 2 years, apply 1.6 to 2.2 quarts per acre in the spring. Repeat application in the fall but do not exceed 4.0 quarts per acre per year. Add surfactant to improve control of small emerged weeds.

Determine 4L plus Sinbar: Use only under trees established in the orchard for at least 2 years. Apply either in the spring or after harvest in the fall before weeds emerge or during early seedling stage of weed growth.

	RATE PER ACRE					
	1 to 2% Organic Matter			More Than 2% Organic Matter		
Soil Texture	Determine 4L Qts./Acre		Sinbar Lbs./Acre	Determine 4L Qts./Acre		Sinbar Lbs./Acre
Sandy Loam	0.8	+	1.0	1.2	+	1.5
Loam, Silt Loam, Silt	1.2	+	1.5	1.6	+	2.0
Clay Loam, Clay	1.6	+	2.0	1.6	+	2.0

PEAR

Aerial application is prohibited.

Use only under trees established in the orchard for at least 1 year. Do not treat varieties grafted on full-dwarf root stocks. Apply 3.2 quarts per acre in the spring from March through May. In the Far West, apply 3.2 quarts per acre to weeds less than 2 inches in height or diameter under dormant trees. Alternatively, apply to small weeds at 1.6 quarts per acre postharvest followed by 1.6 quarts per acre prior to budbreak.

PECAN

Aerial application is prohibited.

Use Determine 4L alone or as a tank mix with Sinbar. Make a single band or broadcast application as a directed spray using a minimum of 30 gallons of water per acre. Apply in the spring before weeds emerge or during the early seedling stage of growth.

Soil Texture	RATE PER ACRE				
	Determine 4L Alone*		Tank Mix** Determine 4L + Sinbar		
Sandy loam	1.6 quarts	OR	1.2 quarts	+	1.5 pounds
Loam, Silt loam, Silt	2.4 quarts		1.4 quarts	+	1.75 pounds
Clay loam, Clay	3.2 quarts		1.6 quarts	+	2.0 pounds

*Use only under trees established in the grove for at least 3 years, and on soils with at least 0.5% organic matter.
** Use only under trees established in the grove for at least 1 year, and on soils with at least 1% organic matter.
Note: Do not use on eroded areas where subsoil or roots are exposed, nor on trees that are diseased or lacking in vigor, nor on trees planted in irrigation furrows, as injury may occur.

PEPPERMINT

Aerial application is prohibited.

Washington, Oregon, Idaho: Apply 0.6 to 0.8 quart per acre on soils having 1 to 2% organic matter. Apply 0.8 to 1.6 quarts per acre on soils having 2.1 to 3.0% organic matter. Apply 1.6 to 2.4 quarts per acre on soils having more than 3.0% organic matter.

Use Precautions: Do not apply to stands of mint suffering from stress due to low fertility, drought, winter injury, insects, disease, or damage from other herbicides or other causes.

Do not apply to snow-covered or frozen ground, as injury to the crop or poor weed control may result.

Do not apply to sand, loamy soil, gravelly soils, or exposed subsoils. Do not apply to soils that have a high salt content and/or high water table or poor drainage that retards mint root development resulting in a shallow root system. Do not apply to soils having less than 1% organic matter.

Application Timing: Apply Determine 4L to established (at least one year) stands of mint during the late winter dormant period or after flaming in the spring prior to the emergence of new growth. Do not cultivate after application.

If weeds are present at time of application, the use of a surfactant at 0.25% v/v or crop oil concentrate at 1.0% v/v may be used to increase the performance of Determine 4L postemergence to weeds.

Tank Mixes and Sequential Treatments: Determine 4L can be applied either alone or in a program involving tank mixes and/or sequential treatments with other herbicides and adjuvants providing Determine 4L is not applied to actively growing mint plants.

When using a tank mix with other herbicides, use the lower end of the Determine 4L use rate range unless prior experience indicates it is safe to use higher rates. Tank mixes and sequential treatments with other herbicides can increase the risk of crop injury. When using a certain tank mix or sequential treatment for the first time, limit use to a small area to determine safety before treating large areas.

PINEAPPLE

Aerial application is prohibited.

Hawaii: Apply 1.6 to 4.8 quarts per acre as a broadcast spray just before or immediately after planting but prior to weed emergence. Use 1.6 to 3.2 quarts per acre after harvesting the plant crop or ratoon crop (for the first ratoon crop as well as subsequent ratoon crops) but before differentiation. For plant crop only, addi-

tional broadcast or interspace applications may be made prior to differentiation at the rate of 1.6 quarts per acre at intervals of not less than 2 months. Additional applications to plant crop may be made as needed to interspace only using 1.6 quarts per acre. Do not apply more than 9.6 quarts per acre as broadcast sprays nor more than 12.8 quarts total per acre per plant crop. Treated areas may be planted to pineapple or sugarcane 1 year after last application.

Florida: Apply 3.2 to 5.0 quarts per acre as a broadcast spray just before or immediately after planting but prior to weed emergence. For ratoon crop, use 3.2 quarts per acre after harvesting plant crop. For plant crop only, a second and third broadcast or interspace application may be made prior to differentiation at the rate of 1.6 quarts per acre at intervals of not less than 2 months. Additional applications to plant crop may be made as needed to interspace only using 1.6 quarts per acre. Do not apply more than three broadcast sprays (maximum 9.6 quarts per acre) prior to differentiation nor more than 12.8 quarts total per acre per plant crop. Treated areas may be planted to pineapple or sugarcane 1 year after last application.

Puerto Rico: Apply 3.0 to 5.0 quarts per acre as a broadcast spray before or immediately after planting but prior to weed emergence. Preemergence application controls weeds such as pigweed, crotalaria, morninggloryy, purslane, crabgrass, foxtail, goosegrass, fall panicum, and sourgrass.

RED CLOVER

Aerial application is prohibited.

Western Oregon: Make a single application of 1.6 quarts per acre on established red clover stands at least 9 months old. Apply when red clover is dormant between October 15 to December 15. Do not apply to seedling red clover. Do not replant treated area to any crop within 1 year after last application, as injury to subsequent crops may result.

Treatment will control annual weeds such as bluegrass, chickweed, hawksbeard, rattail fescue, ryegrass, and velvetgrass.

SORGHUM (Grain)

Aerial application is prohibited.

DO NOT SPRAY OVER TOP OF SORGHUM.

Southwestern States: Apply 0.2 to 0.4 quart per acre plus surfactant. Apply as a directed postemergence spray after sorghum is 15 inches tall to control weeds 2 to 4 inches in height. Use lower rate on broadleaf weeds up to 2 inches tall. Use the higher rate on grasses up to 2 inches and broadleaf weeds up to 4 inches tall. When the lower rate is used, a second application may be made if needed. Do not exceed 0.4 quart per acre. Treatment of weeds under drought stress is usually ineffective.

Do not replant treated areas to crops other than cotton or corn within 4 months following band treatment and 6 months following broadcast treatment, as injury to subsequent crops may result.

SUGARCANE

To prevent possible crop injury on new cane varieties, tolerance to Determine 4L should be determined prior to adoption as field practice. Do not treat sugarcane growing on thinly covered sub-soils or rocky areas, as crop injury may result. Temporary chlorosis and stunting of the crop may result from application over emerged cane. Application over emerged cane should be made only as directed below without the addition of a surfactant or crop oil concentrate. To minimize chlorosis and stunting, use directed postemergence sprays.

Preemergence-Florida: For high organic soils, apply 1.6 to 3.2 quarts per acre as a broadcast or band spray prior to weed emergence after planting or after harvesting plant crop (for ratoon crop).

Postemergence-Florida: Make one or two applications of 1.6 quarts per acre as needed by directed spray inter-row. Alternatively, for panicum control, make up to three applications of 0.4 to 0.8 quart per acre plus surfactant as a directed spray after cane has emerged but before panicum exceeds 2 inches in height. Adjust nozzles to spray beneath cane plants and between rows to cover weed foliage and to minimize contact of cane leaves with spray or drift. Do not apply more than 4.8 quarts total per acre between planting (or ratooning) and harvest.

Postemergence-Hawaii: Apply 1.6 to 4.8 quarts per acre as a broadcast spray prior to weed emergence after planting or after harvesting plant crop or ratoon crop. Sequential applications of 1.6 to 3 quarts per acre may be made as a broadcast spray over emerged cane or by directed spray inter-row.

If weeds are emerged, add a surfactant to the spray mixture at the rate of 1 to 2 quarts per 100 gallons and apply as a directed spray. Do not apply more than three treatments nor more than 9.6 quarts per acre in Hawaii between planting (or ratooning) and harvest. Treated areas may be replanted to sugarcane or pineapple 1 year after last application.

Postemergence-Puerto Rico: Apply 3.2 to 5.0 quarts per acre as a broadcast spray prior to weed emergence after planting or after harvesting plant crop or ratoon crop. A second and third appli-

cation of 1.6 to 3.2 quarts per acre may be made as a broadcast spray over emerged cane or by directed spray inter-row.

If weeds are emerged, add a surfactant and apply as a directed spray.

Do not apply more than 3 treatments nor more than 8 quarts per acre in Puerto Rico between planting (or ratooning) and harvest. Treated areas may be replanted to sugarcane or pineapple 1 year after last application.

Louisiana, Texas: Apply 2.4 to 3.0 quarts per acre. Determine 4L may be applied as a broadcast spray after planting and following the harvesting of sugarcane. Determine 4L may also be applied broadcast in late winter. Application is best when made prior to weed emergence. Determine 4L may be applied as a post-directed spray immediately after the last cultivation. Direct the spray application to the base (no more than 1/3 the plant height) of the sugarcane plants. When small weeds (3 inches or less) are present at application, add a surfactant at 0.25% v/v or crop oil concentrate at 1.0% v/v to the spray mix.

Use Precautions: Temporary leaf yellowing may occur following application. Do not apply more than 6 quarts per acre broadcast per year. Use proportionately less for band applications.

TREE PLANTINGS

Aerial application is prohibited.

Colorado, Montana, Nebraska, North Dakota, South Dakota, Wyoming: Use only under established plantings 1 year or older of American elm, caragana, cottonwood, Douglas fir, green ash, honeysuckle, Ponderosa pine, red cedar, Russian olive, and Siberian elm. Use 2.0 to 4.0 quarts per acre. Apply as a band 4-feet wide in the tree row (2 feet on each side of row). For example, 1.6 ounces Determine 4L treats 135 feet of tree row (2 feet on each side of row) at the rate of 4.0 quarts per acre. Apply as a directed spray in the early spring before weeds emerge and before trees leaf out. Do not apply to foliage of trees, nor under trees growing in low areas, as injury may result.

Idaho, Oregon, Washington: Determine 4L is recommended for control of weeds to aid in the establishment of hybrid poplar plantings. Apply at 0.8 to 2.4 quarts per acre depending upon soil texture and organic matter content. Use 0.8 to 1.6 quarts per acre on coarse-textured soils and 1.6 to 2.4 quarts per acre on medium- to fine-textured soils. Do not use on gravelly soils or on any soil having less than 0.5% organic matter, as injury to trees may result. **Injury may result from applications to poplar plantings grown on sandy soil with low organic matter with sprinkler irrigation.** When applied in a band, the application rate will be in proportion to the area banded on a per acre basis.

Apply in late winter or early spring as a uniform broadcast spray before or after planting but prior to bud swell or as a directed spray after bud swell. Apply before weeds emerge or after emergence while weeds are small. Some rainfall or water is necessary to move Determine 4L into the weed root zone before weeds become well established. If weeds are present at time of treatment, add a surfactant at 1 to 2 quarts per 100 gallons of spray solution.

PREPLANT: Take precautions to prevent treated soil (usually top 1 inch) from coming into contact with roots of trees during the planting process, as injury may result.

POST-PLANT (BROADCAST): It is best to wait until rain or irrigation has settled the soil around the newly planted trees before applying Determine 4L. If trees are dormant, a broadcast application can be made.

POST-PLANT (DIRECTED): If buds have started to swell, use a directed spray pattern that prevents Determine 4L from contact with trees, as injury may result. During the growing season (from bud swell to leaf drop), Determine 4L may be applied (alone or with tank mix) between tree rows in shielded and directed sprays.

Determine 4L can be tank mixed with a glyphosate herbicide preplant and as a directed spray to broaden the spectrum of weeds controlled and improve post-emergence activity. Use 0.8 to 2.4 quarts Determine 4L plus glyphosate herbicide (according to label recommendations) depending upon soil type and weeds to be controlled. **Note:** There are several formulations of glyphosate herbicide. Check the glyphosate herbicide label to verify that the intended use as a pre-plant or post-directed spray on hybrid poplar plantations is allowed. Avoid contact of glyphosate herbicide with foliage, green stems, trees, or other desirable vegetation because severe damage or destruction may result.

TRITICALE (Oregon only)

Aerial application is prohibited.

Crop injury may result where severe winter stress, disease, or insect damage follows application. Winter-sensitive varieties may be less tolerant of Determine 4L than winter-hardy varieties. Crop injury may result from failure to observe the following: Do not use on sand or loamy sand soils nor on gravelly or sandy loams with less than 1% organic matter. Do not use on thinly covered or exposed subsoils (clay knolls). Do not treat triticale planted less than 1 inch deep. Do not treat triticale where winter climatic conditions have caused “heaving” of plants. Do not treat triticale

plants lacking in vigor due to poor emergence, insect damage, disease, high alkalinity, or other causes. Do not apply after triticale has reached the "boot stage" of maturity. Unless specified otherwise, do not use with surfactants or nitrogen solution. Do not replant treated areas to any other crop within one year after last treatment (except as noted), as injury to subsequent crops may result.

East of Cascade Range: Where average annual rainfall exceeds 16 inches, make a single application at the rate of 0.8 to 1.2 quarts per acre. For early fall-planted triticale (seeded before September 10), apply 3 to 6 weeks after planting but before weeds are 3 to 4 inches tall. Treatment after October 1 has generally given best results. Application should not be made after soil freezes in the fall. Triticale planted in late October should not be treated until the following spring. For spring treatment, apply as soon as triticale starts to grow. Treatment made prior to April 10 will usually give good results, provided weed growth is less than 4 inches tall. Application later than May 1 may give poor results. Alternatively, make a single application of 0.4 to 0.8 quart Determine 4L plus 0.25 lb. bromoxynil per acre as a tank mix, in either the fall after triticale has emerged but before soil freezes or in the spring as soon as soil thaws. Apply before weeds are more than 2 inches tall or across.

Where average annual rainfall is 10 to 16 inches, following fall planting, make a single application of 0.8 to 1.2 quarts per acre where sufficient moisture is available to germinate triticale seed. Apply before soil freezes and before weeds are two inches tall. Application later than March 1 may give poor results. If fall-planted triticale fails to grow due to winter kill or adverse growing conditions after fall treatment, only fields treated before November 1 may be replanted to spring triticale. Spring triticale should not be planted before April 1 and only after deep discing and plowing to a depth of 4 to 6 inches prior to planting. Do not make a second application during the same crop year, or injury to the crop may result.

West of Cascade Range: Make a single application of 1.2 to 1.6 quarts per acre as soon as possible after planting. If triticale and weeds have emerged, apply before weeds are 3 to 4 inches tall. Alternatively, apply a tank mixture of Determine 4L plus bromoxynil as detailed above in **East of Cascade Range** section.

Other areas: Make a single application in the spring as soon as triticale (fall-planted) starts to grow and before weeds are 2 inches tall. Application later than May 1 may give poor results.

WALNUT (ENGLISH)

Aerial application is prohibited.

California, Oregon, Washington: Use only under trees which have been established in the orchards for at least 1 year. As an initial treatment, apply 2.2 quarts per acre after the orchard has been laid up in final form (no-tillage program) in late fall or early winter. Re-treat annually with 1.6 to 2.2 quarts per acre. In California, apply 1.6 to 3 quarts per acre. Alternatively, apply 1.6 quarts per acre in October or November, and repeat at the same rate in March or April.

Do not use on sand, loamy sand, gravelly soils, or exposed subsoils, nor where organic matter is less than 1%.

Do not graze livestock in treated orchards and groves.

Do not make more than two applications per year. Do not apply more than 3.2 quarts per acre per year. In California, do not apply more than 3 quarts per acre per year. When using Determine 4L in a sequential treatment program, allow a minimum of 150 days between applications.

In all areas except California, the maximum application rate is 2.2 quarts per acre, and the maximum application rate per year is 3.2 quarts per acre. In California only, the maximum application rate is 3 quarts per acre, and the maximum application rate per year is 3 quarts per acre.

WHEAT (WINTER)

Use Precautions: Crop injury may result where severe winter stress, disease, or insect damage follows application. Winter-sensitive varieties may be less tolerant of Determine 4L than winter-hardy varieties. Crop injury may result from failure to observe the following: Do not use on sand or loamy sand soils nor on gravelly or sandy loams with less than 1% organic matter. Do not use on thinly covered or exposed sub-soil areas (clay knolls). Do not treat wheat planted less than 1 inch deep. Do not treat wheat where winter climatic conditions have caused "heaving" of plants. Do not treat wheat plants lacking in vigor due to poor emergence, insect damage, disease, high alkalinity, or other causes. Do not apply after wheat has reached the "boot" stage of maturity. Unless specified otherwise, do not use with surfactants or nitrogen solution. Do not replant treated areas to any other crop within 1 year after last treatment (except as noted), as injury to subsequent crops may result.

Idaho, Oregon, Washington-East of Cascade Range: Where average annual rainfall exceeds 16 inches, make a single application of 0.8 to 1.2 quarts per acre. Fall Treatment: For early fall-planted wheat (seeded before September 10), apply 3 to 6 weeks after planting but before weeds are 3 to 4 inches tall. Treatment after October 1 has generally given best results. Application should not be made after soil freezes in the fall. Wheat planted in late October should not be treated until the following spring. Spring Treatment: Apply as soon as wheat starts to grow. Treatment made prior to April 10 will usually give good results provided weed growth is less than 4 inches tall. Application later than May 1 may give poor results.

Alternatively, make a single application of 0.4 to 0.8 quart Determine 4L plus 0.25 pound bromoxynil per acre as a tank mixture in either the fall after wheat has emerged but before soil freezes or in the spring as soon as soil thaws. Apply before weeds are more than 2 inches tall or across. Where average annual rainfall is 10 to 16 inches following fall planting, make a single application of 0.8 to 1.2 quarts per acre when sufficient moisture is available to germinate wheat seed. Apply before soil freezes and weeds are 2 inches tall. Application later than March 1 may give poor results.

Note: If fall-planted wheat fails to grow due to winter kill or adverse growing conditions after fall treatment, only fields treated before November 1 may be replanted to spring wheat. Spring wheat should not be planted before April 1 and only after deep discing and plowing to a depth of 4 to 6 inches prior to planting. Do not make a second application during the same crop year, or injury to the crop may result.

Oregon, Washington-West of Cascade Range: Make a single application of 1.2 to 1.6 quarts per acre as soon as possible after planting. If wheat and weeds have emerged, apply before weeds are 3 to 4 inches tall. Alternatively, apply a tank mixture of Determine 4L plus bromoxynil as detailed above in **East of Cascade Range** section.

Other Areas of Oregon, Washington: Make a single application in the spring as soon as wheat (fall-planted) starts to grow and before weeds are 2 inches tall. Application later than May 1 may give poor results.

Kansas, Oklahoma, Texas: Do not use on sand or sandy loam soils. Use 0.8 quart per acre on silt and silt loam soils and 1.2 to 1.6 quarts per acre on clay, clay loam, and silty clay loam soils.

Central Plains, Midwest: Use 0.8 to 1.6 quarts per acre.

Northeast: Use 0.8 to 1.2 quarts per acre.

NONCROP WEED CONTROL

SPECIFIC DIRECTIONS

Mix proper amount of Determine 4L into volume of water necessary to obtain uniform coverage. If a surfactant is used, dilute with 10 parts of water and add as last ingredient to nearly full tank. Determine 4L must be kept in suspension at all times. Agitate by mechanical or hydraulic means in the spray tank. If bypass or return line is used, it should terminate at bottom of tank to minimize foaming. Openings in screens should be equal to or larger than 50 mesh.

Note: Determine 4L may be applied by either ground application equipment or by air application equipment (helicopter only) for the control of various weeds and grasses in rights-of-way sites. When making aerial applications, apply in sufficient water volume to ensure thorough coverage of the site to be treated; generally 3 gallons of water per acre are sufficient.

Do not exceed an application rate of 2 gallons per acre of formulated product except in areas of high rainfall (more than 40 inches per year) or dense vegetation (more than 90% weed ground cover). In areas with high rainfall or dense vegetation, a maximum application of 3 gallons per acre of formulated product is allowed. Do not make more than two applications per year. If products containing diuron are used in a sequential program, allow a minimum of 90 days between applications.

General Weed Control: To control most annual weeds for an extended period of time on uncultivated nonagricultural areas (such as airports, highway, utility and railroad rights-of-way including switch yards and storage yards, sewage disposal areas); uncultivated agricultural areas (noncrop producing which includes farmyards, fuel storage areas, fence rows, barrier strips); industrial sites (outdoor, such as lumberyards, pipeline, and tank farms), apply 4 to 12 quarts per acre of formulated product to control annual weeds including:

Broadleaves
4 to 12 quarts/acre

Ageratum
Chickweed
Cocklebur
Corn Speedwell
Corn Spurry
Dayflower
Dogfennel
Fiddleneck (Amsinckia)
Flora's Paintbrush
Gromwell
Groundcherry, Annual
Hawksbeard
Horsenettle
Horseweed
Knawel
Kochia
Lambsquarters
Marigold
Mexican Clover
Morningglory, Annual
Pennycress
Pigweed
Pineappleweed
Pokeweed
Prickly Lettuce
Prickly Sida (Teaweed)
Purslane
Rabbit Tobacco
Ragweed
Sesbania
Shepherdspurse
Sicklepod
Smartweed, Annual
Sowthistle, Annual
Spanishneedles
Tansymustard
Velvetleaf (Buttonweed)
Wild Buckwheat
Wild Lettuce
Wild Mustard
Wild Radish

Grasses
4 to 6.4 quarts/acre

Barnyardgrass (Watergrass)
Bluegrass, Annual
Crabgrass
Foxtail
Kyllinger (Kyllinga)
Lovegrass, Annual
Orchardgrass
Peppergrass
Quackgrass
Rattail Fescue
Red Sprangletop
Ricegrass
Ryegrass, Annual
Sandbur
Seedling Johnsongrass
Velvetgrass
Vernalgrass, Sweet, Annual

6.4 to 12 quarts/acre

Guineagrass
Maidencane
Pangolagrass

Irrigation and drainage ditches: Apply 4 to 12 quarts per acre to control most annual weeds as shown above. Apply only when water is not in the ditch. For irrigation ditches, apply during the noncrop season and when ditch is not in use. To avoid crop injury, it is essential to minimize movement of Determine 4L in irrigation water. The herbicide must be fixed in the soil by moisture. Apply before expected seasonal rainfall, if possible, when soil in the ditch is still moist. Following treatment, if rainfall has not totaled at least 4 inches, fill ditch with water and allow to stand for 72 hours. Drain off any waste water remaining before using ditch. Do not treat any ditch area into which roots of trees or other desirable plants may extend, as injury may result.

APPLICATION THROUGH IRRIGATION SYSTEMS – CHEMIGATION
Apply this product only through sprinkler (including center pivot, lateral move, end tow, side (wheel) roll, traveler, big gun, solid set, or hand move) irrigation systems. Do not apply this product through any other type of irrigation system.

Crop injury, lack of effectiveness, or illegal pesticide residues in the crop can result from nonuniform distribution of treated water. If you have questions about calibration, you should contact State Extension Service specialists, equipment manufacturers, or other experts.

Do not connect an irrigation system (including greenhouse systems) used for pesticide application to a public water system unless the pesticide label-prescribed safety devices for public water systems are in place.

A person knowledgeable of the chemigation system and responsible for its operation or under the supervision of the responsible person, shall shut the system down and make necessary adjustments should the need arise.

CHEMIGATION SYSTEMS CONNECTED TO PUBLIC WATER SYSTEMS

If the chemigation system is connected to a public water supply, the following conditions must also be met:

- Public water systems means a system for the provision to the public of piped water for human consumption if such system has at least 15 service connections or regularly serves an average of at least 25 individuals daily at least 60 days out of the year.

- Chemigation systems connected to public water systems must contain a functional reduced-pressure zone, backflow preventer (RPZ), or the functional equivalent in the water supply line upstream from a point of pesticide introduction. As an option to the RPZ, the water from the public water system should be discharged into a reservoir tank prior to pesticide introduction. There shall be a complete physical break (air gap) between the outlet end of the fill pipe and the top or overflow rim of the reservoir tank of at least twice the inside diameter of the fill pipe.
- The pesticide injection pipeline must contain a functional, normally closed, solenoid-operated valve located on the intake side of the injection pump and connected to the system interlock to prevent fluid from being withdrawn from the supply tank when the irrigation system is either automatically or manually shut down.
- The system must contain functional interlocking controls to automatically shut off the pesticide injection pump when the water pump motor stops, or in cases where there is no water pump, when the water pressure decreases to the point where pesticide distribution is adversely affected.
- Systems must use a metering pump, such as a positive displacement injection pump (e.g., diaphragm pump), effectively designed and constructed of materials that are compatible with pesticides and capable of being fitted with a system interlock.
- Upon completion of herbicide application, remove scale, pesticide residues, and other foreign matter from the supply tank and entire injector system. Flush thoroughly with clean water.

SPRINKLER CHEMIGATION

For sprinkler irrigation, meter Determine 4L at a continuous uniform rate during the entire irrigation period. Continuous agitation of the pesticide supply tank for the duration of the application period is recommended.

To apply a pesticide using sprinkler chemigation, the chemigation system must meet the following specifications:

- The system must contain a functional check valve, vacuum-relief valve, and low-pressure drain appropriately located on the irrigation pipeline to prevent water source contamination from backflow.
- The pesticide injection pipeline must contain a functional, automatic, quick-closing check valve to prevent the flow of fluid back toward the injection pump.
- The pesticide injection pipeline must also contain a functional, normally closed, solenoid-operated valve located on the intake side of the injection pump and connected to the system interlock to prevent fluid from being withdrawn from the supply tank when the irrigation system is either automatically or manually shut down.
- The system must contain functional interlocking controls to automatically shut off the pesticide injection pump when the water pump motor stops.
- The irrigation line or water pump must include a functional pressure switch, which will stop the water pump motor when the water pressure decreases to the point where pesticide distribution is adversely affected.
- Systems must use a metering pump, such as a positive displacement injection pump (e.g., diaphragm pump), effectively designed and constructed of materials that are compatible with pesticides and capable of being fitted with a system interlock.
- Do not apply when wind speed favors drift beyond the area intended for treatment.

STORAGE AND DISPOSAL

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

PESTICIDE STORAGE: Store product in original container only, away from other pesticides, fertilizer, food, or feed.

PESTICIDE DISPOSAL: Wastes resulting from the use of this product may be disposed of on site or at an approved waste disposal facility.

CONTAINER HANDLING:

Nonrefillable Container (five gallons or less): Nonrefillable container. Do not reuse or refill this container. Offer for recycling, if available. Clean container promptly after emptying. Triple rinse as follows: Empty the remaining contents into application equipment or a mix tank and drain for 10 seconds after the flow begins to drip. Fill the container 1/4 full with water and recap. Shake for 10 seconds. Pour rinsate into application equipment or a mix tank or store rinsate for later use or disposal. Drain for 10 seconds after the flow begins to drip. Repeat this procedure two more times. Then offer for recycling or reconditioning, or puncture and dispose of in a sanitary landfill, or incineration, or if allowed by state and local authorities, by burning. If burned, stay out of smoke. **DO NOT REUSE EMPTY CONTAINER.**

Nonrefillable Container (greater than five gallons): Nonrefillable container. Do not reuse or refill this container. Offer for recycling, if available. Clean container promptly after emptying. Triple rinse as follows: Empty the remaining contents into application equipment or a mix tank. Fill the container 1/4 full with water. Replace and tighten closures. Tip container on its side and roll it back and forth, ensuring at least one complete revolution, for 30 seconds. Stand the container on its end and tip it back and forth several times. Turn the container over onto its other end and tip it back and forth several times. Empty the rinsate into application equipment or a mix tank or store rinsate for later use or disposal. Repeat this procedure two more times.

LIMITATION OF WARRANTY AND LIABILITY

Read the entire directions for use, conditions of warranties and limitations of liability before using this product. If terms are not acceptable, return the unopened product container at once.

By using this product, user or buyer accepts the following **CONDITIONS, DISCLAIMER OF WARRANTIES** and **LIMITATIONS OF LIABILITY**.

CONDITIONS: The directions for use of this product are believed to be adequate and must be followed carefully. However, it is impossible to eliminate all risks associated with the use of this product. Crop injury, ineffectiveness or other unintended consequences may result because of such factors as weather conditions, presence of other materials, or the manner of use or application, all of which are beyond the control of Makhteshim Agan of North America, Inc. All such risks shall be assumed by the user or buyer.

DISCLAIMER OF WARRANTIES: To the extent consistent with applicable law, Makhteshim Agan of North America, Inc. makes no other warranties, express or implied, of merchantability or of fitness for a particular purpose or otherwise, that extend beyond the statements made on this label. No agent of Makhteshim Agan of North America, Inc. is authorized to make any warranties beyond those contained herein or to modify the warranties contained herein. To the extent consistent with applicable law, Makhteshim Agan of North America, Inc. disclaims any liability whatsoever for special, incidental or consequential damages resulting from the use or handling of this product.

LIMITATIONS OF LIABILITY: To the extent consistent with applicable law, the exclusive remedy of the user or buyer for any and all losses, injuries or damages resulting from the use or handling of this product, whether in contract, warranty, tort, negligence, strict liability or otherwise, shall not exceed the purchase price paid or at Makhteshim Agan of North America, Inc.'s election, the replacement of product.

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