



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

file
10/16

FEB 10 1994

JUDY OLDHAM
HELENA CHEMICAL COMPANY
6075 POPLAR AVE.
SUITE 500
MEMPHIS, TN 38119

OFFICE OF
PREVENTION, PESTICIDES AND
TOXIC SUBSTANCES

Subject: Label Amendment Submission of 8/24/93 In Response to PR Notice 93-7
EPA Reg. No. 5905-245
HELENA BRAND DIURON 80 WP WEED KILLER

Dear Registrant:

The labeling cited above and submitted in connection with registration under the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA), as amended, is accepted subject to the comments reflected on the enclosed sheet. A copy of your proposed labeling stamped "ACCEPTED WITH COMMENTS" is enclosed.

WHAT THIS ACCEPTANCE MEANS:

Based on your certification, the Agency has accepted the labeling changes that are necessary to comply with the Worker Protection Standard (WPS) labeling requirements of 40 CFR part 156, subpart K, described in PR Notices 93-7 and 93-11. Any other labeling changes submitted in connection with this amendment application but not directly related to compliance with the WPS have not been reviewed or accepted by the Agency. If you wish to make such changes, you must submit a separate amendment application proposing them. If your product is currently suspended, the acceptance of this labeling amendment does not affect the suspension in any way.

WHAT YOU NEED TO DO NEXT:

By the next label printing make all the specified changes to your labeling. Send to EPA one (1) copy of the final printed labeling:

- BEFORE selling or distributing any product bearing the final printed labeling
- AND
- WITHIN one year from date of this acceptance.



Recycled/Recyclable
Printed with Soy/Canola Ink on paper that
contains at least 50% recycled fiber

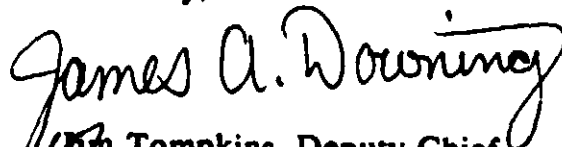
Submit the final printed labeling via the U.S. Postal Service to:

Document Processing Desk (FIN-LABEL)
Office of Pesticide Programs (7505C)
U.S. Environmental Protection Agency
401 M Street, SW
Washington, D.C. 20460-0001

Hand or courier deliveries of final printed labeling may be made to:

Document Processing Desk (FIN-LABEL)
Office of Pesticide Programs
Room 266A, Crystal Mall 2
1921 Jefferson Davis Highway
Arlington, VA 22202

Sincerely,



Jim Tompkins, Deputy Chief
Registration Support Branch
Registration Division (7505W)

Attachment

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
Office of Pesticide Programs
Registration Division

Judy Oldham
HELENA CHEMICAL CO
6075 POPLAR AVE SUITE 500
MEMPHIS TN 38119

Comment for: EPA Reg Nr.5905-245
HELENA BRAND DIURON 80 WP WEED KILLER

The following specific comments pertain to your WPS labeling submission concerning the product cited above:

Remove the statement "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." from its current position within the Agricultural Use Box and place it above the Agricultural Use Box.

DIURON 80W

WEED KILLER

FOR CROP AND NON-CROP WEED CONTROL

ACTIVE INGREDIENT:	
Diuron (3-(3,4-dichlorophenyl)-1,1-dimethylurea)	80.00%
INERT INGREDIENTS:	20.00%
TOTAL	100.00%

KEEP OUT OF REACH OF CHILDREN

CAUTION

See Side Panel for Additional Precautionary Statements

ACCEPTED
with COMMENTS
in EPA Letter Dated

FEB 10 1994

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

5905-245

EPA REG. NO.: 5905-245

EPA EST. NO.:

NET WEIGHT:

MANUFACTURED BY
HELENA CHEMICAL COMPANY
MEMPHIS, TN 38119

**PRECAUTIONARY STATEMENTS
HAZARDS TO HUMANS AND DOMESTIC ANIMALS**

CAUTION

Harmful if swallowed, inhaled, or absorbed through skin. Do not get in eyes or on skin. Do not breathe spray mist.

STATEMENT OF PRACTICAL TREATMENT

IF SWALLOWED: Induce vomiting by touching the back of the throat with the finger. Get medical attention. Do not induce vomiting or give anything by mouth to an unconscious person.

IF INHALED: Remove the victim to fresh air.

IF ON SKIN: Remove by washing. Get medical attention if irritation persists.

IF IN EYES: Flush with plenty of water. Get medical attention.

PERSONAL PROTECTIVE EQUIPMENT

Applicators and other handlers must wear:

Long-sleeved shirt and long pants

Waterproof gloves

Shoes plus socks

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

USER SAFETY RECOMMENDATIONS

Users should:

Wash hands before eating, drinking, chewing gum, using tobacco or using the toilet.

Remove clothing immediately if pesticide gets inside. Then wash thoroughly and put on clean clothing.

STORAGE AND DISPOSAL

Do not contaminate water, food or feed by storage or disposal of equipment washwaters. Wastes resulting from the use of this product may be disposed of on site or at an approved waste disposal facility.

CONTAINER DISPOSAL: Completely empty bag into application equipment. Then dispose of empty bag in a sanitary landfill or by incineration, or if allowed by state and local authorities by burning. If burned, stay out of smoke.

CHEMIGATION PROHIBITION

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

DIRECTIONS FOR USE

It is a violation of Federal law to use this product in a manner inconsistent with its labeling. 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 other handlers of agricultural pesticides. It contains requirements for training, decontamination, notification, and emergency assistance. It also contains specific instructions and exceptions pertaining to the statements on this label about personal protective equipment (PPE), and restricted-entry interval. The requirements in this box only apply to uses of this product that are covered by the Worker Protection Standard.

Do not 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.

Do not enter or allow worker entry into treated areas during the restricted-entry interval (REI) of 12 hours. Exception: if the product is soil-injected or soil-incorporated, the Worker Protection Standard under certain circumstances, allows workers to enter the treated area if there will be no contact with anything that has been treated.

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

- Coveralls
- Waterproof gloves
- 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. ~~Keep children and pets out of the treated area until sprays have dried.~~

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GENERAL INFORMATION

HELENA BRAND DIURON 80WP WEED KILLER is a wettable powder to be mixed in water and applied as a spray for control of weeds. It is non-corrosive to equipment, non-flammable and non-volatile.

HELENA BRAND DIURON 80WP may be applied to the soil prior to emergence of weeds to control susceptible weed seedlings for an extended period depending on dosage rate used.

Results vary with soil type. Heavy soils (high organic matter) require higher dosage rates than lighter soils (low in organic matter) to obtain equivalent herbicidal performance. Best results occur if rainfall (or irrigation) occurs within two weeks of application.

HELENA BRAND DIURON 80WP also may be used to control emerged seeding annual weeds by including a surfactant in the spray mixture. Best results are obtained on succulent weeds growing under high humidity and temperatures of 70°F or higher.

Since the effect of **HELENA BRAND DIURON 80WP** varies with soils, uniformity of application and environmental conditions, it is suggested that growers limit their first use to small areas; this is especially important where the operator is not completely familiar with requirements for precise application, since over dosage can result in injury to crops.

USE PRECAUTIONS

Injury to or loss of desirable trees or other plants may result from failure to observe the following: Do not apply (except as recommended for crop use), or drain or flush 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. Do not use on lawns, walks, driveways, tennis courts, or similar areas. Prevent drift of dry powder or spray to desirable plants. Do not contaminate domestic water. Keep from contact with fertilizer, insecticides, fungicides and seeds. [SEE SOIL LIMITATIONS].

Thoroughly clean all traces of **HELENA BRAND DIURON 80WP** from application equipment immediately after use. Flush tank, pump, hose, and boom with several changes of water after removing nozzle tips and screens (clean these parts separately).

DIRECTIONS

Before spraying, calibrate equipment to determine quantity of water necessary to uniformly cover area to be treated. Weigh proper amount of **HELENA BRAND DIURON 80WP** and mix into necessary volume of water. Material must be kept in suspension at all times by continuous agitation. Except for small areas, use fixed boom power sprayers properly calibrated to insure a constant rate of application. Openings in screens should be equal to or larger than 50 mesh. Agitate by mechanical or hydraulic means in the spray tank. If by-pass or return line is used, it should terminate at bottom of tank to minimize foaming. Do not use air agitation.

When a range of dosage rates is listed, use the lower rates in lighter soils (sandy loams, and soil low in organic matter), and the higher rates on heavier soils (clay loams, clays, and soils high in organic matter).

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GENERAL WEED CONTROL: To control most weeds for an extended period of time on non-cropland such as utility, highway, pipeline and railroad right of ways, petroleum tank farms, lumberyards, storage areas, industrial plant sites, and around farm buildings.

Apply to these areas at the rate of 5 to 20 lbs. of HELENA BRAND DIURON 80WP per acre to control most annual weeds. Use 20 to 60 lbs. per acre for perennial weeds; additional treatment may be required where a longer period of control is desired or when hard to kill, deep-rooted perennial weeds such as Johnsongrass are present. In low rainfall areas, HELENA BRAND DIURON 80WP may not provide satisfactory control of deep-rooted perennial weeds.

For weed control on small areas, use one-half cupful of HELENA BRAND DIURON 80WP per 100 sq. ft. for a dosage of approximately 50 lbs. per acre.

IRRIGATION AND DRAINAGE DITCHES: Apply 5 to 20 lbs. per acre to control most annual weeds; use 20 to 60 lbs. per acre to control both annual and perennial weeds. For irrigation ditches and during the non-crop season, and when ditch is not in use. To minimize movement of HELENA BRAND DIURON 80WP with irrigation water (to avoid possible crop injury), it is essential that the herbicide be fixed in the soil by moisture. Apply before expected seasonal rainfall (if possible when soil in the ditch is still moist). Following treatment, rainfall has not totalled at least 4 inches, fill ditch with water and allow the water to stand for 72 hours; then drain off the water before using ditch. Do not treat any ditch into which roots of trees or other desirable plants may extend as injury may result.

SELECTIVE USE IN CROPS

[SEE SOIL LIMITATIONS]

WEEDS CONTROLLED: HELENA BRAND DIURON 80 WP as a pre-emergence treatment selectively controls germinating seedling weeds in certain crops. Rates of 1/2 to 1 lb. per acre control some annuals including crabgrass, barnyardgrass, pigweed, purslane, lambsquarters, and ragweed. At 1 1/2 to 2 lbs. per acre, seedling weeds, such as bluegrass (poa annua), annual sweet vernalgrass, foxtail, rattail fescue, red sprangletop, velvetgrass, chickweed, corn spurry, dog fennel, Amsinckia (fiddleneck), gramwell, groundsel, knawel, shepherdspurse, tansymustard, wild lettuce, wild mustard, annual ground cherry and annual morningglory are controlled. In addition, 2 to 6 lbs. per acre control weeds such as annual lovegrass, annual ryegrass, sandbur, ricegrass, orchardgrass, seedling Johnsongrass, annual smartweed, annual sowthistle, buttonweed, corn speedwell, horseweed, kochia, kyllinga, Mexican clover, hawksbeard, peppergrass, pineappleweed, pokeweed, rabbit tobacco, ageratum, Spanishneedles and wild radish.

Partial control of quackgrass and horsetail usually occurs with 4 lbs. per acre; partial control of maidencane, pangolagrass and guineagrass usually occurs with treatment of 8 to 10 lbs. per acre.

Results vary with soil types (the lower rates are effective on the lighter soils and higher rates on heavier soils) and environmental conditions. Sufficient moisture in the form of rainfall or irrigation is necessary after treatment to carry the chemical into the root zone of germinating weeds. Any well established weeds should first be eliminated by mechanical or other means. For best results, the soil should first be eliminated by mechanical or other means. For best results, the soil should be well prepared and as free as possible from trash and clods. Unless otherwise directed, surface of the soil should not be cultivated or disturbed after application of HELENA BRAND DIURON 80WP as efficiency may be reduce.

HELENA BRAND DIURON 80WP plus a surfactant is an effective treatment of emerged seedling weeds for use as a directed post emergence spray in certain crops. Rates as low as 1/2 lbs. HELENA BRAND DIURON 80WP per acre plus a surfactant controls seedling pigweed. Rates 1/2 lb. per acre controls seedling weeds such as crabgrass, goosegrass, barnyardgrass (watergrass), crowfoot, pigweed, purslane, and annual morningglory. Best results are obtained under conditions of high humidity and temperatures over 70°F.

SOIL LIMITATIONS: Crop injury may result from failure to observe the following: Unless otherwise directed, do not use (1) on light (sand, loamy sand or gravelly) soils or exposed subsoils (2) on alfalfa, apples, barley, citrus, cotton (pre-plant and lay-by) grapes, olives, pears, plumosus fern, sorghum, sugarcane and winter wheat where organic matter is less than 1% (3) on blueberries, birdsfoot trefoil, caneberrries, gladiolus, and gooseberries where organic matter is less than 2%.

Unless otherwise directed, do not replant treated areas to any crops within two

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C R O P S

ALL RATES 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" band where row spacing is 42". Unless otherwise directed, surface of soil should not be cultivated or disturbed after application as crop injury may result. (SEE SOIL LIMITATIONS)

ALFALFA: Use in areas where alfalfa becomes winter dormant and in areas of California (north of the Tehochapi Mountains) where alfalfa becomes semi-dormant. Use 1 1/2 to 3 lbs. per acre (except east of the Appalachian Mountains use 1 1/2 to 2 lbs.). Apply anytime after alfalfa is dormant in the Fall but before crop begins growth in the Spring. For control of volunteer alfalfa seedlings in the Far West, use 4 lbs. per acre (SEE SOIL LIMITATIONS).

Treat only stands established for one year or more. Do not apply to seedling alfalfa nor to alfalfa grass mixtures; do not apply to established alfalfa with unusually shallow root penetration (such as shall hard pans, in alkali spots) as crop injury may result.

PACIFIC NORTHWEST: Apply in the Fall after alfalfa becomes dormant but no later than mid-December.

ARIZONA, CALIFORNIA, AND NEVADA: Application may be made on dormant alfalfa as late as January.

EASTERN COLORADO AND KANSAS: For control of tansymustard, apply 1 lb. shortly after emergence of mustard in the Fall or winter and 2 lbs. if weeds are 2 to 4 inches tall. If other annual weeds are present, use 2 to 3 lbs. in February or March.

OTHER AREAS: Where alfalfa becomes winter dormant, apply in March or early April before Spring growth begins.

APPLES AND PEARS: Use only under trees established in the orchard for at least 1 year. Apply 4 lbs. per acre to area under individual trees or as a band in the tree row; avoid contact of foliage or fruit (SEE SOIL LIMITATIONS). Apply in the Spring (March through May). Do not treat dwarf varieties.

FAR WEST: Treatment may be made in winter (December through February) or apply 2 lbs. as postharvest treatment followed by 2 lbs. in the Spring

ASPARAGUS: Do not apply to newly seeded asparagus nor to young plants during the first growing season after setting nor on plants with exposed roots as severe injury may result. Apply as a band or broadcast treatment. On light sandy soils and other soils low in clay or organic matter, apply 1 to 2 lbs. per acre. On soil high in clay or organic matter, use 2 to 4 lbs. 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 3 lbs. per acre per application. In Washington (irrigated crop), apply only a single treatment of 4 lbs. per acre in late November or December.

BARLEY (Winter) - WESTERN OREGON AND WESTERN WASHINGTON: Apply a single treatment of 1 1/2 to 2 lbs. per acre as soon as possible after planting but before emergence of barley. Do not apply to cloddy or compacted ground where seed is exposed or improperly planted. Treated area should not be replanted to any rotational crop within 1 year after last application as injury to the subsequent crop may result. SEE SOIL LIMITATIONS

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BIRDSFOOT TREFOIL (lotus) - WESTERN OREGON: Treat only established stands at least 1 year old. Apply a single treatment of 2 lbs. per acre when trefoil is dormant (October 15 to December 15; See Soil Limitations). Do not apply to seedling trefoil as injury may result. Do not replant treated areas to any crop within 1 year after application as crop injury may result. (SEE SOIL LIMITATIONS)

BLUBERRIES, CANEBERRIES AND GOOSEBERRIES: Apply only to fields which have been established for at least 1 year. Do not apply to berries interplanted with fruit trees; do not apply to plants whose roots are exposed as injury may result. Spray only ground at base of bushes; avoid spraying foliage as injury may result. (SEE SOIL LIMITATIONS)

CALIFORNIA - Raspberries, Blackberries, Boysenberries, Dewberries, and Loganberries: For control of winter annual weeds, apply 2 lbs. per acre as a band application at base of canes or bushes in October or November. A second treatment at the same rate in late spring controls summer annuals. A single application of 3 lbs. per acre in January or February will control both winter and summer annuals in some areas but the separate Fall and Spring schedule are preferred.

WESTERN WASHINGTON AND WESTERN OREGON - Blueberries, Caneberries, and Gooseberries: Same schedule as recommended in California. (SEE SOIL LIMITATIONS)

INDIANA, MICHIGAN AND OHIO - Blueberries: Make a band application of 2 to 4 lbs. per acre in late Spring but before germination and growth of annual weeds. As an alternative, apply 2 lbs. per acre in the Fall and repeat at the same rate in the Spring. (SEE SOIL LIMITATIONS)

INDIANA, MICHIGAN AND OHIO - Raspberries: Make a single application as a band treatment at the rate of 3 lbs. per acre in the Spring before germination and growth of annual weeds.

MASSACHUSETTS - Blueberries: For control of summer annuals, make a single application as a band treatment at a rate of 2 lbs. per acre in late Spring, but before germination and growth of weeds. (SEE SOIL LIMITATIONS)

NEW JERSEY - Blueberries: For control of winter annuals weeds, apply 2 lbs. per acre as a band treatment in October, November or December. (SEE SOIL LIMITATIONS)

CITRUS: Use only under trees established in the grove for at least 1 year. Apply as a directed spray avoiding contact of foliage and fruit with spray or drift. Time application as indicated for specific areas, except application may be initiated any time for the year where sprinkler or flood irrigation can be timed to activate the herbicide. Established perennial weeds require other special control procedures. Do not apply under citrus trees that have been subjected to freezing within 6 months; do not apply in home plantings of citrus or in areas where the roots of other valuable plants or trees may extend as injury may result. (SEE SOIL LIMITATIONS)

ARIZONA (except Yuma area) and CALIFORNIA (except Imperial and Coachella Valleys) - Oranges, Lemons and Grapefruits: Make a single application of 3 to 4 lbs. per acre as a broadcast spray shortly after grove has been laid up in final form (non-tillage program) in late Fall or early Winter. As an alternative, apply 2 lbs. per acre in October or November, and repeat at the same rate in March or April. Subsequent annual applications of 2 to 3 lbs. will usually give adequate weed control.

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FLORIDA (except Martin, Palm Beach, Broward and Dade Counties) - Oranges, Grapefruit, Tangelos and Tangerines: Apply 4 lbs. per acre followed by the same rate 4 to 6 months later. As an alternative, make a single application of 4 to 8 lbs. per acre. On non-bearing trees, treat when winter banks are pulled down. On bearing citrus apply any time when seasonal rains are expected.

For control of paragrass, guineagrass maidenrue, primrose willow, seamyrtle and loosestrife in ditches adjacent to citrus groves, use 1 lb. HELENA BRAND DIURON 80WP per 1000 sq. foot (40 lbs. per acre) using sufficient spray volume (at least 4 gals. per 1000 sq. ft.) to provide thorough and uniform coverage of the ditch. Apply in the spring before weed growth starts or after removal of vegetation. Repeat treatment on a spot basis to control hard to kill species such as guineagrass. In bedded groves do not treat water furrows between the beds as injury to the trees may result.

TEXAS - Oranges and Grapefruit: Apply a single treatment of 2 to 4 lbs. per acre for annual weeds. Use 4 to 6 lbs. per acre for control of Johnsongrass seedlings. Best results accompany application in the spring; well established weeds should be eliminated by cultivation after treatment.

CORN (FIELD)

POST-EMERGENCE - Apply $\frac{1}{2}$ lb. per acre in combination with nonpressure nitrogen solution. If nitrogen solution is used, apply 1 lb. HELENA BRAND DIURON 80WP per acre and add $1\frac{1}{2}$ pts. of a surfactant per 40 gals. spray mixture. Apply as a single directed post-emergence spray when the corn is at least 20 inches high and weeds are not taller than 3 inches. **DO NOT APPLY OVER TOP OF CORN.** Do not replant to any crop within one year except that cotton, corn and grain sorghum may be planted the spring following treatment.

PRE-EMERGENCE - ARKANSAS, LOUISIANA, MISSISSIPPI AND TENNESSEE: Make a single treatment of $\frac{1}{2}$ to 1 lb. per acre as a broadcast or band treatment using the higher dosage on heavier soils (loam, clay loam). Do not use on light (sand, loamy sand or gravelly) soils as injury may result: plant corn at least $1\frac{1}{2}$ 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 crop injury may result

GLADIOLUS - EAST OF ROCKY MOUNTAINS: Apply 1 to 2 lbs. per acre as pre-emergence and or directed post-emergence treatments. If used for both do not exceed 1 lb. of HELENA BRAND DIURON 80WP per acre per application, or a total of 2 lbs. per season. On cornel plantings, apply 2 lb. per acre pre- or post-emergence, but not more than once. Do not use on cornel plantings in Florida: do not spray over top of gladiolus foliage nor allow spray to drift onto foliage as injury may result. (SEE SOIL LIMITATIONS)

GRAPES: Apply only to established vineyards (at least 3 years old) as a band treatment to grape rows. Do not apply to vines with trunks less than $1\frac{1}{2}$ inches in diameter as injury may result. (SEE SOIL LIMITATIONS)

NOTE: On soils low in clay or organic matter (less than 2%) severe plant injury may result if unusually heavy rains follow treatment and this risk must be assumed by the user.

EAST OF THE ROCKY MOUNTAINS: On soils low in clay or organic matter (1 to 2%), use 2 to 3 lbs. per acre; on soils high in clay or organic matter, use 3 to 6 lbs. Apply in the spring just prior to germination and growth of annual weeds.

NEW YORK AND PENNSYLVANIA - CONTROL OF PERENNIAL GRASSES: Apply only to established vineyards (at least 4 years old) for spot control of perennial grasses such as quackgrass, ryegrass and orchard grass as a band treatment to ridged soil (2 to 4 inches high) under the Trellis at the rate of 8 to 12 lbs. per acre. Band width should not exceed 30 inches. Make one application in the spring of the year and do not apply the 8 to 12 lbs. per acre rate 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, poor drainage, or erosion, as injury to grapes may result.

WEST OF THE ROCKY MOUNTAINS: Apply in December, January, or February. For initial treatment, make a single application of 3 to 4 lbs. per acre, subsequent annual applications of 2 lbs. will usually give adequate weed control. As an alternative to the above schedule, apply 2 lbs. of HELENA BRAND DIURON 80WP per acre in October or November and repeat application at the same rate in March or April.

GRASS SEED CROPS (Perennial): in areas as specified, apply only to established plantings at least 1 year old. In fields where ash residues have accumulated from burning straw use 3 lbs. per acre; spread unburned chaff or straw with harrow or chopper before application.

COLORADO, KANSAS, NEW MEXICO AND OKLAHOMA: On switchgrass, side oak grama and sand bluestem, apply 2 or 3 lbs. 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 chopper before application.

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C O T T O N
(SEE SOIL LIMITATIONS)

PRE-PLANT: ARIZONA AND CALIFORNIA ONLY: Apply 1 to 2½ lbs. per acre as a broadcast spray after furrows for pre-planting irrigation have been formed; apply either just prior to planting or after the pre-planting irrigation but before seed beds are dragged off in preparation for planting. (SEE SOIL LIMITATIONS)

Prior to planting, drag off the top of the seed bed and plant in untreated soil. Treated soil is returned to the bed after planting when irrigation furrows are reformed. If more than 2 furrowing-out operations are performed prior to lay by weed control in the furrow bottoms may be lost. A lay-by application also may be made but the combined total per season must not exceed 1.2 lbs. HELENA BRAND DIURON 80WP per acre on sandy loam, nor 2.2 lbs. HELENA BRAND DIURON 80WP per acre on clay

PRE-EMERGENCE (EXCEPT ARIZONA AND CALIFORNIA): Make a single application as a broadcast or a band spray after planting but before cotton emerges. Use at the following rates:

BROADCAST TREATMENT

Soil Type*	Spray Mixture Lbs. Diuron in 25 to 40 gals. Water per Acre	Lbs Diuron Applied Per Acre
Loamy sand	0.6	0.5
Sandy loam, loam, silt loam and silt	1.0	0.8
Sandy clay loam, clay loam, silty clay loam, and sand clay	1.25	1.0
Silty clay and clay	2.0	1.6

*Do not use on sand as crop injury may result. Do not treat cotton in deep furrows as crop injury may result.

B A N D T R E A T M E N T

Use proportionately less; for example, for 14 inch band on 42 inch row, use ⅓ of broadcast rate.

Apply immediately after cotton is planted; wherever possible, planting and spraying should be combined in one operation. For best results, soil should be well prepared and as free as possible from trash and clods. Shallow incorporation (no deeper than ¼ inch) with a rotary hoe or similar equipment following planting usually improves results particularly during dry weather.

A wide press wheel following planting should be used to provide a level seed bed for subsequent early season post-emergence treatments.

Treatment usually provides weed control for a period of 3 to 8 weeks. Sufficient moisture (usually 1 to 2 inches) in the form of rainfall or irrigation is necessary after treatment to carry the chemical into the root zone of germinating weeds; best results are obtained when this occurs within 2 weeks after application. If moisture is insufficient to activate HELENA BRAND DIURON 80WP or if soil becomes crusted before crop emerges, a shallow rotary hoeing (no deeper than ¼ inch) should be made before weeds become well established. If initial seeding fails to produce a stand, cotton may be replanted in soil treated with HELENA BRAND DIURON 80WP. Wherever possible, avoid disturbing original bed. If necessary to rework soil before replanting use shallow cultivation such as disking; do not relist nor move soil into the original drill area, plant seed at least 1 inch deep, do not retreat field with a second pre-emergence application of HELENA BRAND DIURON 80WP during the same crop year as injury to the crop may result.

POST-EMERGENCE: EARLY SEASON: Apply in combination with surfactant as a directed spray when cotton is at least 6 inches tall and when weeds do not exceed 2 inches in height, a second application may be made if needed. Control of weeds under drought stress or over 2 inches in height is usually impractical. Apply as a band treatment only, directing spray to cover weed foliage. **DO NOT SPRAY OVER TOP OF COTTON.** Use pressure of 20 to 25 psi and adjust nozzles to minimize contact of cotton leaves with spray or drift, or crop injury may result.

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BAND TREATMENT
AMOUNT PER ACRE OF CROPLAND WHEN APPLIED TO
14" BAND ON 42" ROWS (IN 10 TO 15 GALS. WATER)

Weed Problem	Diuron 80WP	Active Diuron
Annual Weeds	0.18 lb. (2.8 ozs.)	0.14 lb. (0.4 lb.)
Pigweed	0.09 lb. (1.4 ozs.)	0.07 lb. (0.2 lb.)

LATE SEASON (LAY-BY) - Use 1 to 1½ lbs. HELENA BRAND DIURON 80WP (1 to 2 lbs. in Arizona and California) in 25 to 40 gals. water per acre as a directed spray (SEE SOIL LIMITATIONS). Apply when cotton is at least 12 inches high (at least 20 inches for Pima S-2). Keep contact of spray or drift on cotton plants to a minimum. **DO NOT SPRAY OVER TOP OF COTTON.** For control of germinating weed seedlings, apply immediately after last cultivation, directing spray to cover the soil beneath cotton plants and between rows. Alternatively, for control of emerged annual weeds (4 inches or less in height) at lay-by time, add 1 pt. surfactant for each 25 gals. spray; apply as a directed spray to cover weed foliage beneath cotton plants and between rows. **NOTE:** Treatment of ½ to ¾ lb. HELENA BRAND DIURON 80WP per acre plus surfactant followed by the same treatment later, if needed, may be used as an alternate to the preceding recommendation.

In irrigated cotton, best pre-emergence weed control is obtained if the field is irrigated within 3 to 4 days after application; thoroughly wet the surface of the ground over the row to carry the herbicide into the root zone of germinating weeds.

SUBSEQUENT CROPS

SEE SOIL LIMITATIONS

Diuron Type of Application	Crops That May Follow Treated Cotton
Band pre- or post emergence	Any crop 4 months after last application.
Band pre- plus post-emergence or Broadcast pre-emergence (and pre plant) or Broadcast pre-emergence plus band post-emergence	Cotton, soybeans, corn or grain sorghums (not sorghos or forage sorghums) the next spring. Do not replant treated acres to any other crop within one year after last application as injury to subsequent crops may result.
Broadcast post-emergence (lay by)	Cotton, corn, grain sorghums (not forage sorghums nor grass sorghums) the next spring. Do not replant treated areas to any other crop within one year after last application as injury to subsequent crops may result.

NOTE: During a single crop season, do not exceed the following amount of HELENA BRAND DIURON 80WP per acre as injury to subsequent crops may result. 0.8 lbs on loamy sand; 1.2 lbs. on sandy loam, 1.6 lbs on clay loams; and 2.2 lbs on clay

WESTERN OREGON: On alta fescue, Highland bentgrass, Astoria bentgrass, orchardgrass, Kentucky bluegrass (Merion bluegrass), apply 2 to 4 lbs per acre between October 1 and November 15. In fields where ash residues have accumulated from burning straw, use 3 to 4 lbs. per acre; spread unburned chaff or straw with a harrow or chopper before application. If perennial velvetgrass (Holcus lanatus) is a problem, use 4 lbs. per acre. For best results, apply as soon as possible after fall rains start. Established weeds (beyond 2 to 4 leaf stage) should be removed prior to treatment.

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Well established vigorous stands of spring planted alta lescue orchardgrass and Kentucky bluegrass may be treated the following fall provided the crop is planted before April 1 and treatment is not applied before October 15 use HELENA BRAND DIURON 80WP at 2 lbs per acre

OLIVES - CALIFORNIA: Use only under trees established in the grove for at least 1 year. Do not apply in acres where roots of other valuable plants or trees may extend as injury may result. Apply 2 lbs. per acre after the grove is laid up in final form in late October or November. A second application of 2 lbs. per acre should be made in March or April. Remove weed growth prior to treatment. Avoid contact of foliage with spray or drift. SEE SOIL LIMITATIONS

PINEAPPLE - HAWAII: Apply 4 to 8 lbs per acre as a broadcast spray immediately after planting and prior to weed emergence. Use 4 lbs per acre after harvesting plant crop (for ratoon crop). For plant crop only, a second and third broadcast or interspace application may be made prior to differentiation at the rate of 2 lbs. per acre at intervals of not less than 2 months. Additional applications to plant crop may be made as needed to interspace only using 2 lbs. per acre. Do not apply more than 3 broadcast sprays (maximum 12 lbs per acre) prior to differentiation nor more than 16 lbs. per acre per plant crop. Treated areas may be planted to pineapple or sugar cane 1 year after last application.

PLUMOSUS FERN - FLORIDA: Treat only established stands at least 1 year old. Apply 3 lbs. per acre following hand weeding and 3 to 5 days after mowing of fern (SEE SOIL LIMITATIONS). Do not cultivate or disturb soil after application as crop injury may result.

SORGHUM (GRAIN) - SOUTHWESTERN STATES: Apply $\frac{1}{4}$ to $\frac{1}{2}$ lb. per acre as a directed post-emergence broadcast or band treatment after sorghum is 15 inches tall to control weed 2 to 4 inches in height DO NOT SPRAY OVER TOP OF SORGHUM. Add 1 pt. of a surfactant per 25 gals. spray. Apply at spray pressures of 20 to 25 psi to minimize drift. Use lower rate on broadleaved weeds up to 2 inches tall. Use the higher rate on grasses up to 2 inches and broadleaved weeds up to 4 inches tall. When the lower rate is used, a second application may be made if needed provided that the total herbicide applied in one crop year does not exceed $\frac{1}{2}$ lb. of Diuron 80WP 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 treatments and 6 months following broadcast treatment as crop injury may result. (SEE SOIL LIMITATIONS)

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SUGAR CANE: To prevent possible crop injury on new cane varieties, tolerance to HELENA BRAND DIURON 80WP should be determined prior to adoption as field practice. Do not treat sugar cane growing on thinly covered sub-soils or rocky areas as crop injury may result; see Soil Limitations. Temporary chlorosis of the crop may result from application over emerged cane; to minimize chlorosis, use directed post-emergence sprays. (SEE SOIL LIMITATIONS)

FLORIDA: For high organic soils, apply 2 to 4 lbs. per acre as a broadcast or band spray prior to weed emergence after planting or after harvesting plant crop (for ratoon crop). A second and third application of 2 lbs. per acre may be made as needed by directed spray inter row. Do not apply more than 3 treatments nor more than 6 lbs. total per acre between planting (or ratooning) and harvest.

HAWAII AND PUERTO RICO: Apply 4 to 8 lbs. per acre as a broadcast spray prior to weed emergence after planting or after harvesting plant crop (for ratoon crop). A second and third application of 2 to 4 lbs. 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 qt. per 100 gals. and apply as a directed spray. DO NOT SPRAY OVER TOP OF CANE.

Do not apply more than 3 treatments nor more than 10 lbs. (Puerto Rico) or 12 lbs. (Hawaii) total per acre between planting (or ratooning) and harvest. Treated areas may be planted to sugar cane or pineapple one year after last application.

LOUISIANA: Use on plant cane seeded on fallowed ground. Make a single application of 3 to 3 $\frac{1}{4}$ lbs. per acre at either of the following times: FALL TREATMENT (August through October) - Treat a 2 ft. band over the row after planting of cane but before weeds or cane emerge. SPRING TREATMENT

bend over the row before weeds or cane emerge.

WHEAT (WINTER): Seed bed must be well prepared before pre-emergence application. Crop injury may result if application is made to ground which is cloddy or compacted, resulting in exposed or improperly planted seed. Whenever seed bed preparation and planting are carried out during abnormally dry weather, resulting in a surface layer of dust over planted seeds, application should not be made until the dust is settled by rainfall or irrigation

[SEE SOIL LIMITATIONS]

Do not use on thinly covered or exposed sub-soil areas (clay knobs) as injury to the crop may result; see Soil Limitations. Treated areas should not be replanted to any other crop within 1 year after last application as injury to the subsequent crop may result.

Do not apply post-emergence treatments where winter climatic conditions have caused heaving of wheat plants or after wheat has reached the boot stage as injury to the crop may result.

KANSAS, OKLAHOMA AND TEXAS: Make a single post-emergence application at the rate of 1 1/2 to 2 lbs. per acre. Apply 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.

WASHINGTON, OREGON AND IDAHO - EAST OF CASCADE RANGE: Make a single application at the rate of 1 to 1 1/2 lbs. per acre.

In areas having an average annual rainfall exceeding 16 inches **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 in the spring. 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.

In areas having an average annual rainfall from 10 to 16 inches **FALL OR WINTER TREATMENT** - After wheat is planted in the fall apply when sufficient moisture is available to germinate wheat seed. Make application before weeds are 2 inches tall and before the soils freeze. 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 with **HELENA BRAND DIURON 80WP** 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 disking and plowing to a depth of 4 to 6 inches prior to planting. Do not retreat field with a second application of **HELENA BRAND DIURON 80WP** during the same crop year or injury to the crop may result.

WEST OF CASCADE RANGE: Make a single application at the rate of 1 1/2 to 2 lbs. per acre. Apply as soon as possible following planting. If wheat and weeds have emerged, apply before weeds are 3 to 4 inches tall.

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