



# Department of Pesticide Regulation



Mary-Ann Warmerdam  
Director

Arnold Schwarzenegger  
Governor

November 1, 2010

Ms. Ana Cristina Rodriguez  
State Registration and Regulatory Affairs Manager  
E.I. DuPont de Nemours and Company  
1007 Market Street (S300/419)  
Wilmington, Delaware 19898-0001

Dear Ms. Rodriguez:

The active ingredient, hexazinone, has been detected in ground water in five California counties since 2007. The Department of Pesticide Regulation (DPR) has investigated those detections and has determined that residues detected in Fresno and San Joaquin counties resulted from legal agricultural use of pesticide products containing hexazinone.

Pursuant to Food and Agricultural Code section 13149(c), DPR will initiate the cancellation process for all agricultural use products containing hexazinone, including your products listed below, if you do not request a hearing within 30 days from the date of this letter.

DuPont Velpar DF Herbicide, EPA Reg. No. 352-581-AA  
DuPont Velpar L Herbicide EPA Reg. No. 352-392-AA  
DuPont Velpar Alfamax Gold Herbicide EPA Reg. No. 352-666-ZA  
DuPont Velpar Alfamax Herbicide EPA Reg. No. 352-665-AA  
DuPont Alfamax MP Herbicide EPA Reg. No. 352-634-AA  
DuPont Velpar ULW Herbicide EPA Reg. No. 352-450-AA  
DuPont Westar Herbicide EPA Reg. No. 352-626-AA

If a hearing is requested, it will occur within 180 days of the request. Your company must submit a written report and documented evidence to support the continued registration, sale, and use of hexazinone within 30 days of the scheduled hearing. Details are included in the following documents enclosed with this letter:

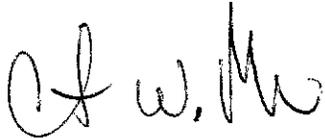
- (1) Notice of Hexazinone Residue Detections in California Ground Water and Registrant Opportunity to Request a Hearing.
- (2) Information Regarding the Determination that Hexazinone Residues in Ground Water in Fresno and San Joaquin Counties Resulted from Legal Agricultural Use.
- (3) Information on the Registrant Report and Documented Evidence.



Ms. Ana Cristina Rodriguez  
November 1, 2010  
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If you have any questions or need further assistance, please contact Ms. Ann Hanger in DPR's Pesticide Registration Branch at 916-324-3535 or <ahanger@cdpr.ca.gov>.

Sincerely,

A handwritten signature in black ink, appearing to read "C. Reardon". The signature is fluid and cursive, with the first letter of each name being significantly larger and more stylized.

Chris Reardon  
Chief Deputy Director  
916-445-4000

Enclosures

cc: Ms. Polly Frenkel, Chief Counsel (w/Enclosures)  
Ms. Ann Prichard, Environmental Program Manager II (w/Enclosures)  
Ms. Ann Hanger, Staff Environmental Scientist (w/Enclosures)



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**NOTICE OF HEXAZINONE RESIDUE DETECTIONS IN CALIFORNIA  
GROUND WATER AND REGISTRANT OPPORTUNITY  
TO REQUEST A HEARING**

Hexazinone residues have been detected in California ground water. Based on the results of investigations conducted in Fresno and San Joaquin counties by the Department of Pesticide Regulation (DPR), the Director has determined that hexazinone residues detected in ground water resulted from legal agricultural pesticide use.

The following pesticide products containing the active ingredients hexazinone are registered for sale and use in California as agricultural use herbicides for weed control:

<u>Registrant</u>	<u>Brand Name</u> <u>EPA Reg. No.</u>
E. I. Du Pont De Nemours and Co., Inc.	DuPont Velpar DF Herbicide EPA No. 352- 581-AA DuPont Velpar L Herbicide EPA No. 352- 392-ZA DuPont Velpar Alfamax Gold Herbicide EPA No. 352- 666-AA DuPont Velpar Alfamax Herbicide EPA No. 352- 665-AA DuPont Alfamax MP Herbicide EPA No. 352- 634-AA DuPont Velpar ULW Herbicide EPA No. 352- 450-AA DuPont Westar Herbicide EPA No. 352- 626-AA
Helena Chemical Company	Velossa EPA No. 5905- 579-AA.

Pursuant to section 13149(b) of the Food and Agricultural Code (FAC), notice is hereby given of the Director's determination and that hexazinone registrants have 30 days from the date of this notice to request a hearing. If a registrant does not request a hearing within 30 days, the registrations of its hexazinone agricultural use product(s) will be cancelled pursuant to FAC section 13149(c).

If a hearing is requested, it will be held within 180 days after the initial request is received. The hearing is public and will be held by a subcommittee of the Pesticide Registration and Evaluation Committee (PREC). The PREC Subcommittee consists of one member each from the State Water Resources Control Board, the Office of Environmental Health Hazard Assessment, and DPR.

As required by FAC section 13150, all registrants requesting a hearing are required to submit a report and documented evidence to support the continued registration, sale and use of hexazinone. The report and documented evidence are due to DPR 30 days before the scheduled hearing date. A registrant may specify that it intends to rely upon a report and documented evidence by another registrant. The report and documented evidence should be submitted to DPR in portable document format (PDF) on a compact disc (CD) and in hard copy to facilitate review by the Subcommittee and allow posting to DPR's Web site. A notice will be issued specifying the date, time and location of the PREC Subcommittee hearing.

Each registrant, or its designated agent, will be given time at the hearing to provide oral testimony and answer the Subcommittee's questions about the registrant's report and any other material submitted by registrants to DPR. The public will also be given time to provide oral testimony to the Subcommittee.

The written hearing request and requests for additional information should be directed to Ms. Ann Hanger, Registration Branch, DPR, 1001 I Street, P.O. Box 4015, Mail Stop 3D, Sacramento, California 95812-4015. Ms. Hanger can be reached at (916) 324-3535 or <ahanger@cdpr.ca.gov>.



Ann Prichard, Chief  
Pesticide Registration Branch  
Department of Pesticide Regulation

11-1-2010

Date

cc: Ms. Ann Hanger

## **Information Regarding the Determination that Hexazinone Residues in Fresno and San Joaquin Counties Resulted from Legal Agricultural Pesticide Use**

Hexazinone, a persistent, mobile herbicide, was registered in California in the late 1970s. It is primarily used in the production of alfalfa and timber crops and, to a much lesser degree, on rights-of-way. Hexazinone's physical and chemical properties indicated that it is persistent and mobile and it was placed on the Groundwater Protection List in Title 3, California Code of Regulations (3 CCR) section 6800(b) list in 1992. The Groundwater Protection List is a list of pesticides with the potential to pollute ground water. The Department of Pesticide Regulation (DPR) has currently analyzed over 3,800 samples from 2,300 wells for the presence of hexazinone residues and has detected these residues in California ground water intermittently since 1994 at levels ranging from 0.05 to 0.27 parts per billion (ppb) in 26 wells. These detections have largely occurred in alfalfa growing regions with a history of hexazinone use. See table on page 2.

DPR determined that residues of hexazinone in ground water were due to legal agricultural use based on the following criteria:

1. Well water samples were analyzed for hexazinone using a method approved by the department that provided unequivocal identification of hexazinone (mass spectroscopy), pursuant to Food and Agricultural Code section 13149(d).
2. In Fresno County three wells contained residues of hexazinone within section M17S19E36. In San Joaquin County the two wells with hexazinone detections were in adjacent sections 02S02E19 and 02S02E30. Detection of a pesticide in more than one well in the same section of land or adjacent sections is one of the factors considered to indicate contamination due to agricultural use.
3. Two of the three Fresno County wells also contained residues of diuron, and two also contained breakdown products of atrazine/simazine. The detection section M17S19E36 is surrounded on three sides by current leaching ground water protection areas (GWPA's), where atrazine, diuron and simazine are regulated to protect ground water. Section 02S02E19 in San Joaquin County is a current runoff GWPA based on previous detections of atrazine, diuron, simazine, and breakdown products of atrazine/simazine. Pesticides detected within a leaching or runoff GWPA, respectively are thought to move to ground water via similar pathways.
4. Hexazinone is formulated in products registered for agricultural use in California.
5. The application of hexazinone in products registered for agricultural use was documented historically in pesticide use reports in the sections of land in Fresno and San Joaquin counties that met criterion 2.
6. The investigations in cooperation with the County Agricultural Commissioners in Fresno and San Joaquin counties revealed no evidence that hexazinone residues resulted from a point source, nonagricultural use, or illegal agricultural use.

## Hexazinone Detections in California Ground Water

County	Location <sup>1</sup>	Wells Sampled For Hexazinone	Hexazinone Positive Wells <sup>2</sup>			
			Unique Positive Wells	Highest conc. (ppb)	First Year Detected	Last Year Sampled
Colusa	15N03W36	2	1	0.056	1998	1998
Fresno	14S21E21	3	1	0.063	2001	2006
Fresno	14S22E13	3	1	0.07	2000	2006
Fresno	17S19E36 <sup>3</sup>	4	3	0.274	2007	2008
Los Angeles	01S09W27	1	1	0.069	2008	2008
Merced	09S14E23	3	1	0.11	1997	1997
San Joaquin	01N05E16	2	1	0.092	2008	2008
San Joaquin	02S04E22	5	1	0.096	2002	2002
San Joaquin	02S05E23	2	1	0.11	1996	2002
San Joaquin	02S05E24	6	1	0.07	1996	2002
San Joaquin	02S06E19 <sup>3</sup>	3	1	0.072	2009	2009
San Joaquin	02S06E30 <sup>3</sup>	1	1	0.093	2009	2009
Solano	06N01E05	4	1	0.094	2002	2002
Solano	06N01E23	2	1	0.126	2007	2007
Solano	06N01W36	4	1	0.092	1995	1995
Stanislaus	04S09E19	5	1	0.27	1996	1996
Stanislaus	04S11E31	5	1	0.263	2004	2004
Stanislaus	06S08E26	2	1	0.062	2007	2007
Stanislaus	07S08E14	1	1	0.073	2001	2002
Stanislaus	07S09E06	2	1	0.094	2007	2007
Tulare	22S27E07	1	1 <sup>4</sup>	0.22	1994	1995
Tulare	22S27E18	6	3 <sup>4</sup>	0.24	1994	1995

<sup>1</sup> Township, range and section of the well(s). A section is approximately one square mile.

<sup>2</sup> Data in these columns apply only to wells that have had at least one sample with a hexazinone concentration above the reporting limit.

<sup>3</sup> Section used to determine that hexazinone residues were due to legal agricultural use.

<sup>4</sup> Detections resulted from point source contamination.



DuPont Crop Protection  
Stine-Haskell Research Center  
P.O. Box 30  
Newark, DE 19714-0030

November 23, 2010

Ms. Ann Hanger  
Pesticide Registration Branch  
California Department of Pesticide Regulation  
1001 I Street, P.O. Box 4015, Mail Stop 3D  
Sacramento, CA 95812-4015

Dear Ms. Hanger:

DuPont is in receipt of your notice dated November 1, 2010, advising us of hexazinone residue detections in California groundwater, and the opportunity afforded us as a registrant to request a hearing. Further, it is our understanding that the California Department of Pesticide Regulation (DPR) will initiate a cancellation process for all agricultural use products containing hexazinone if such a hearing is not requested.

To avert initiation of this cancellation process, and in accordance with section 13149 of the Food and Agricultural Code, DuPont hereby requests that DPR schedule a hearing so that we might provide oral testimony and address subcommittee questions in support of the continued sale and use of hexazinone containing products in California.

DuPont recognizes it's obligation to deliver a report and documented evidence at least thirty (30) days prior to the scheduled hearing. Additionally, we would respectfully propose that prior to this submission it may be advantageous for us to meet and discuss various resolution alternatives. Should DPR be agreeable we would suggest a meeting date based on your availability, during the first or second week of February 2011.

Thank you in advance for your consideration, and we look forward to your response. Should you have any questions regarding this correspondence I may be reached at (302) 366-6417 or at [jack.cain@usa.dupont.com](mailto:jack.cain@usa.dupont.com).

Sincerely,

Jack Cain  
Senior Registration Manager  
DuPont Crop Protection

cc: Ms. A. C. Rodriguez  
Mr. K. Sherman  
Dr. A. Barefoot

## INFORMATION ON THE REGISTRANT'S REPORT AND DOCUMENTED EVIDENCE

Pursuant to Food and Agricultural Code (FAC) section 13150(a), each registrant must submit a report and documented evidence that demonstrate both of the following:

- (1) That the presence in the soil of any active ingredient, other specified ingredient, or degradation product does not threaten to pollute the groundwater of the state in any region within the state in which the pesticide may be used according to the terms under which it is registered.
- (2) That any active ingredient, other specified ingredient, or degradation product that has been found in groundwater has not polluted, and does not threaten to pollute, the groundwater of the state in any region within the state in which the pesticide may be used according to the terms under which it is registered.

NOTE: Pollution as defined in FAC 13142(j) means the introduction into the ground waters of the state of an active ingredient, other specified product, or degradation product of an active ingredient of a pesticide above a level, with an adequate margin of safety that does not cause adverse health effects.

### **Suggested information to be covered in the report and documented evidence:**

- A. Name of active ingredient
- B. Name and address of registrant.
- C. Name and phone number of contact person(s).
- D. Name, EPA registration number, and label of each of your product(s) containing the detected active ingredient, other specified ingredient or associated degradation product, registered in California for agricultural use
- E. Date of initial registration of each product in California, if known.
- F. Documented evidence that the material detected in soil does not threaten to pollute ground water in any region of the state when used according terms under which it is registered; and that the material detected in ground water has not polluted, and does not threaten to pollute, ground water in any region of the state when used according to terms under which it is registered.
- G. The registrant may submit potential mitigation measures and rationale for their adoption, including proposed restriction or agricultural use modification for certain areas of the state or for the entire state.
- H. The registrant may submit evidence that agricultural use modification or cancellation of the product(s) will cause severe economic hardship on the state's agricultural industry. Such evidence should show why the registrant's product is the preferred material for use and also the additional costs to growers if agricultural use modifications are made or alternative products are used.
- I. The registrant may recommend a level of the material in the soil or ground water that does not significantly diminish the safety margin for adverse health effects.

**DuPont Velpar DF Herbicide**

**DPR Reg. No. 352-581-AA**



# DuPont<sup>TM</sup> Velpar<sup>®</sup> DF herbicide

089708  
Template No. 1440

### Dispersible Granules

Active Ingredient	By Weight
Hexazinone	
[3-cyclohexyl-6-(dimethylamino)-1-methyl-1,3,5-triazine-2,4(1H,3H)-dione]	75%
Other Ingredients	25%
EPA Reg. No. 352-581	<b>TOTAL 100%</b>

**KEEP OUT OF REACH OF CHILDREN  
DANGER PELIGRO**  
 Si usted no entiende la etiqueta, busque a alguien para que se la explique a usted en detalle. (If you do not understand this label, find someone to explain it to you in detail.)

**FIRST AID**  
**IF IN EYES:** Hold eye open and rinse slowly and gently with water for 15-20 minutes. Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye. Call a poison control center or doctor for treatment advice.  
**IF ON SKIN OR CLOTHING:** Take off contaminated clothing. Rinse skin immediately with plenty of water for 15-20 minutes. Call a poison control center or doctor for treatment advice.  
**IF SWALLOWED:** Call a poison control center or doctor immediately for treatment advice. Have person sip a glass of water if able to swallow. Do not induce vomiting unless told to do so by a poison control center or doctor. Do not give anything by mouth to an unconscious person.  
**NOTE TO PHYSICIAN:** Probable mucosal damage may contraindicate the use of gastric lavage.  
 Have the product container or label with you when calling a poison control center or doctor, or going for treatment. You may also contact 1-800-441-3837 for medical emergencies involving this product.

See back panel for additional precautionary statements.



## Net 20 lb Nonrefillable Container

<sup>YZ</sup> <sup>EL</sup>  
EPA Est. No. 11773-IA-001; 352-IL-001  
Superscript used is located in the 6th and 7th positions of the lot number.

**LABELING ACCEPTABLE**  
 STATE OF CALIFORNIA  
 DEPARTMENT OF PESTICIDE REGULATION  
 PESTICIDE REGISTRATION  
 Date 2/22/74 Reviewer [Signature]  
 Reg. No. 352-581-AA



# DuPont™ Velpar® DF

herbicide

## PRECAUTIONARY STATEMENTS HAZARDS TO HUMANS AND DOMESTIC ANIMALS

### DANGER! CAUSES EYE DAMAGE.

Corrosive, causes irreversible eye damage. Harmful if swallowed. Do not get in eyes or on clothing. Avoid contact with skin. Wash thoroughly with soap and water after handling.

## PERSONAL PROTECTIVE EQUIPMENT (PPE)

### Applicators and other handlers must wear:

- Long-sleeved shirt and long pants.
- Shoes plus socks.
- Protective eyewear.

Discard clothing and other absorbent materials that have been drenched or heavily contaminated with this product's concentrate. Do not reuse them. 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.

## USER SAFETY RECOMMENDATIONS

**USERS SHOULD:** Wash hands before eating, drinking, chewing gum, using tobacco or using the toilet. Remove clothing/PPE immediately if pesticide gets inside, then wash thoroughly and put on clean clothing. Remove PPE immediately after handling this product, and as soon as possible wash thoroughly and put on clean clothing.

## ENVIRONMENTAL HAZARDS

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

The active ingredient, hexazinone, in this product is known to leach through soil into ground water under certain conditions as a result of agricultural use. Use of this chemical in areas where soils are permeable, particularly where the water table is shallow, may result in ground-water contamination.

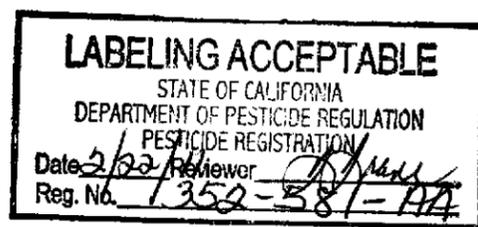
See Directions for use in Supplemental Labeling attached.

## Agricultural Use Requirements

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

**NOTICE TO BUYER:** Purchase of this material does not confer any rights under patents of countries outside of the United States.

Attach Directions for Use Here



Sold by: E. I. du Pont de Nemours and Company,  
1007 Market Street, Wilmington, DE 19898 U.S.A.

A01431285

Made in U.S.A.





# DuPont™ Velpar® DF herbicide

A01431203  
(SL-1582 010311 12-23-10)  
Made in U.S.A.

## Dispersible Granules

<b>Active Ingredient</b>	<b>By Weight</b>
Hexazinone	
[3-cyclohexyl-6-(dimethylamino)-1-methyl-1,3,5-triazine-2,4(1H,3H)-dione]	75%
<b>Other Ingredients</b>	25%
EPA Reg. No. 352-581	<b>TOTAL 100%</b>

### KEEP OUT OF REACH OF CHILDREN

## DANGER PELIGRO

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

### FIRST AID

**IF IN EYES:** Hold eye open and rinse slowly and gently with water for 15-20 minutes. Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye. Call a poison control center or doctor for treatment advice.  
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**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.  
**NOTE TO PHYSICIAN:** Probable mucosal damage may contraindicate the use of gastric lavage. Have the product container or label with you when calling a poison control center or doctor, or going for treatment. You may also contact 1-800-441-3637 for medical emergencies involving this product.

### PRECAUTIONARY STATEMENTS

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#### DANGER! CAUSES EYE DAMAGE.

Corrosive, causes irreversible eye damage. Harmful if swallowed. Do not get in eyes or on clothing. Avoid contact with skin. Wash thoroughly with soap and water after handling.

#### PERSONAL PROTECTIVE EQUIPMENT (PPE)

**Applicators and other handlers must wear:**  
 Long-sleeved shirt and long pants. Shoes plus socks. Protective eyewear.  
 Discard clothing and other absorbent materials that have been drenched or heavily contaminated with this product's concentrate. Do not reuse them. 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.

#### USER SAFETY RECOMMENDATIONS

**USERS SHOULD:** Wash hands before eating, drinking, chewing gum, using tobacco or using the toilet. Remove clothing/PPE immediately if pesticide gets inside, then wash thoroughly and put on clean clothing. Remove PPE immediately after handling this product, and as soon as possible wash thoroughly and put on clean clothing.

#### ENVIRONMENTAL HAZARDS

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

VELPAR® DF, when applied in late spring or after cutting at the following rates, will control these species listed below:

#### 2/3 - 2 Lb/Acre

Crabgrass	<i>Digitaria spp</i>	Lambsquarters, common	<i>Chenopodium album</i>
Fleabane	<i>Coryza spp</i>	Pigweed, redroot	<i>Amaranthus retroflexus</i>
Foxtail	<i>Setaria spp.</i>		
Jimsonweed	<i>Datura stramonium</i>		

#### SEED ALFALFA (CA, ID, MT, NV, OR, UT, WA)

VELPAR® DF may be used for general broadleaf weed and grass control in established alfalfa grown for seed.

#### DORMANT VARIETIES

Make a single application of DuPont™ Velpar® DF after alfalfa becomes dormant and before new growth exceeds 2 inches in height in the spring. Where weeds have emerged, use a surfactant.

#### NON-DORMANT AND SEMI-DORMANT VARIETIES

In the following states, make a single application of Velpar® DF during the winter months when alfalfa plants are in the least active stage of growth.

#### WEEDS CONTROLLED

Refer to the Alfalfa - Weeds Controlled section for specific use rates and weeds controlled.

#### USE PRECAUTIONS AND RESTRICTIONS

##### SEED ALFALFA

- Do not apply within 30 days of harvest (cutting for hay), or feeding of forage or grazing.
- Do not use Velpar® DF on fields with sandy loam or loamy sand soils having less than 1% organic matter.
- Do not exceed 2/3 pound per acre on fields with sandy loam or loamy sand soils having 1-2% organic matter.
- Do not exceed 2/3 pound per acre on seed alfalfa that has been established for only one growing season.

#### SEED ALFALFA

#### WALLA WALLA COUNTY, WASHINGTON

VELPAR® DF Herbicide may be used for the suppression of prickly lettuce and quackgrass and control of Canada thistle (seedling), Kochia, and certain other weeds in established alfalfa grown for seed.

#### Use Rates: 1 1/3 to 2 pounds per acre

Kochia	<i>Kochia scoparia</i>
Lettuce, prickly*	<i>Lactuca serriola</i>
Quackgrass*	<i>Elytrigia repens</i>
Thistle, Canada (seedling)	<i>Cirsium arvense</i>

\* Suppression

#### USE PRECAUTIONS AND RESTRICTIONS SEED ALFALFA - WALLA WALLA COUNTY WASHINGTON

Do not exceed 2 pounds Velpar® DF herbicide per acre per application.  
 Do not exceed 2 pounds (1.5 pounds active ingredient hexazinone) per acre per year.

#### SPRAY EQUIPMENT

Apply Velpar® DF using a fixed boom power sprayer or aerial equipment.  
 For ground applications apply in a minimum of 20 gallons of spray solution per acre and by air in a minimum of 5 gallons.

#### CHEMIGATION

#### ALFALFA

Apply this product only through center pivot or linear-move sprinkler 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. Severe alfalfa injury may result following application after cutting if either the regrowth is more than 2" high or significant stubble is left after alfalfa cutting.

If you have questions about calibration, you may contact State Extension Service specialists, equipment manufacturers or other experts. A person knowledgeable of the chemigation system and responsible for its operation, or under the supervision of the responsible person, shall shut the system down and make necessary adjustments when needed.

#### DORMANT APPLICATIONS

Select the appropriate rate (see Use Rates section) for soil texture and organic matter content using 0.25" to 0.75" of sprinkler irrigation as a continuous injection during the application. Best results are obtained when soil is moist at time of application, and when weeds have not germinated or are less than 2" tall or across.

#### APPLICATION AFTER CUTTING

Apply Velpar® DF at 5.3 ounces per acre to stubble after cutting, following hay removal, and before regrowth exceeds 2" in height. Apply Velpar® DF using 0.25" to 0.75" of sprinkler irrigation as a continuous injection during the application. Best results are obtained when soil is moist at time of application and when weeds have not germinated or are less than 2" tall or across.

**NOTE:** Making an application when daily temperatures are forecast to be in the mid-to-high 90 degree range within 3 to 5 days after treatment may increase the potential for crop injury.

#### SPRINKLER CHEMIGATION

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.

#### MIXING INSTRUCTIONS

- Fill the supply tank 1/4 to 1/3 full of water.
- While agitating, add the required amount of DuPont™ Velpar® DF and continue agitation until the Velpar® DF is fully dispersed, at least 5 minutes.
- Once the Velpar® DF is fully dispersed, maintain agitation and continue filling tank with water. Velpar® DF must be thoroughly mixed with water before adding any other material.
- As the tank is filling, add tank mix partners (if desired). Follow use precautions and directions on the tank mix partner label.
- After thorough mixing, the agitation system can be stopped to prevent excessive foaming in the tank. Once thoroughly mixed the solution in the supply tank does not require additional agitation unless specified on the companion products label. If foaming occurs in the injection supply tank, a defoaming agent (defoamer) may be added.
- Apply Velpar® DF spray mixture within 48 hours of mixing to avoid product degradation.

#### USE PRECAUTIONS AND RESTRICTIONS - CHEMIGATION

- Do not connect an irrigation system (including greenhouse systems) used for pesticide application to a public water system unless the pes-

#### Rate Chart for Impregnating Fertilizer with Velpar® DF

Fertilizer Rate/Acre	2/3 Lbs	1 Lbs	1 1/3 Lbs	2 Lbs
250 lbs	5.3 lbs/ton	8.0 lbs/ton	10.6 lbs/ton	16.0 lbs/ton
300 lbs	4.4 lbs/ton	6.6 lbs/ton	8.8 lbs/ton	13.3 lbs/ton
350 lbs	3.7 lbs/ton	5.7 lbs/ton	7.5 lbs/ton	11.4 lbs/ton
400 lbs	3.3 lbs/ton	5.0 lbs/ton	6.7 lbs/ton	10.0 lbs/ton
450 lbs	2.9 lbs/ton	4.4 lbs/ton	5.9 lbs/ton	8.9 lbs/ton

For rates other than those listed, use the following formula to calculate the amounts of Velpar® DF to be impregnated per ton of dry fertilizer.

$$\text{Lbs Velpar® DF Per Acre} \times 1 \text{ Ton Fertilizer} = \text{Lbs Velpar® DF per Ton of Fertilizer}$$

#### APPLICATION

Uniform application of Velpar® DF-impregnated dry fertilizer is essential for satisfactory weed control. Accurate calibration of the application equipment is essential for uniform distribution to the surface. The customary method of application is to apply 1/2 the labeled rate and overlap 50%. This results in the best distribution pattern.

#### WEEDS CONTROLLED

VELPAR® DF is labeled for the control or suppression of the following species in high and low bush blueberry crops:

Aster, heath*	<i>Aster ericoides</i>	Lambsquarters, common	<i>Chenopodium album</i>
Barriardgrass	<i>Echinochloa crus-galli</i>	Lettuce, Miner's	<i>Montia perfoliata</i>
Blackberry* (briar)	<i>Rubus spp</i>	Lettuce, prickly*	<i>Lactuca serriola</i>
Bluegrass,		Mustard, blue	<i>Chorispora tenella</i>
Kentucky (perennial)*	<i>Poa pratensis</i>	Mustard, Jim Hill (tumble)	<i>Sisymbrium altissimum</i>
Brome, downy (cheatgrass)	<i>Bromus tectorum</i>	Orchardgrass*	<i>Dactylis glomerata</i>
Broomsedge*	<i>Andropogon virginicus</i>	Orchardgrass (seedling)	<i>Dactylis glomerata</i>
Carrot, wild*	<i>Daucus carota</i>	Panicgrass (witchgrass)	<i>Panicum capillare</i>
Catchfly, English	<i>Silene gallica</i>	Panicum, fall	<i>Panicum dichotomiflorum</i>
Chamomile, mayweed	<i>Anthemis cotula</i>	Pearly everlasting	<i>Anaphalis margaritacea</i>
Cherry, wild	<i>Prunus serotia</i>	Pennycress, field	<i>Thlaspi arvense</i>
Chickweed, common	<i>Stellaria media</i>	Pigweed, redroot	<i>Amaranthus retroflexus</i>
Cinquefoil	<i>Potentilla spp</i>	Quackgrass	<i>Agropyron repens</i>
Cockle, white*	<i>Melandrium album</i>	Raphanus	<i>Raphanus raphanistrum</i>
Dandelion, common*	<i>Taraxacum officinale</i>	Radish, wild	<i>Ambrosia elatior</i>
Dandelion, false*		Ragweed, common	<i>Rubus spp</i>
(spotted catsear)	<i>Hypochoeris radicata</i>	Rasperry* (briar)	<i>Sisymbrium irio</i>
Daisy, oxeye	<i>Chrysanthemum leucanthemum</i>	Rocket, London	<i>Barbarea vulgaris</i>
Dock, curly*	<i>Rumex crispus</i>	Rocket, common yellow	<i>Lolium multiflorum</i>
Dogfennel	<i>Eupatorium capillifolium</i>	Ryegrass, Italian (annual)	<i>Lolium perenne</i>
Fescue*	<i>Festuca spp</i>	Ryegrass, perennial*	<i>Tragopogon spp</i>
Fiddleneck, tarweed	<i>Amsinckia lycopsoides</i>	Salsify	<i>Capsella bursa-pastoris</i>
Filaree	<i>Erodium spp</i>	Shepherdspurse	<i>Polygonum pensylvanicum</i>
Fireweed*(willowweed)	<i>Epilobium angustifolium</i>	Smartweed, Pennsylvania	<i>Rumex acetosella</i>
Fleabane, flax-leaved	<i>Coryza bonariensis</i>	Sorrel, red	<i>Rumex angiocarpus</i>
Flixweed	<i>Descurainia Sophia</i>	Sorrel, sheep	<i>Spergula arvensis</i>
Foxtail, yellow	<i>Setaria lutescens</i>	Spurry, corn	<i>Fragaria virginiana</i>
Goldenrod	<i>Solidago spp</i>	Strawberry, wild	<i>Descurainia pinnata</i>
Groundsel, common	<i>Senecio vulgaris</i>	Tansymustard (pinnate)	<i>Chenopodium ambrosioides</i>
Hawkweed	<i>Hieracium spp</i>	Tea, Mexican*	<i>Holcus lanatus</i>
Horseweed/marestail	<i>Coryza canadensis</i>	Velvetgrass	<i>Achillea spp</i>
Jimsonweed	<i>Datura stramonium</i>	Yarrow	

Dogbane**	<i>Apocynum spp</i>	Laurel, sheep	<i>Kalmia angustifolia</i>
Meadow-sweet	<i>Filipendula ulmaria</i>	Rose, wild**	<i>Rosa spp</i>
Blackberry, trailing	<i>Rubus ursinus</i>		

\* Suppression - a visible reduction in plant population and/or plant vigor as compared to an untreated area and generally not accepted as control.

\*\* Harder to control species.

#### CHRISTMAS TREES

DuPont™ Velpar® DF is labeled for control of certain weeds where the following species are grown:

Fir, Douglas (western US only)	<i>Pseudotsuga menziesii</i>	Pine, loblolly	<i>Pinus taeda</i>
Fir, Fraser	<i>Abies fraseri</i>	Pine, ponderosa	<i>Pinus ponderosa</i>
Fir, grand	<i>Abies grandis</i>	Pine, Scotch	<i>Pinus sylvestris</i>
Fir, noble	<i>Abies procera</i>	Spruce, Sitka	<i>Picea sitchensis</i>
Pine, Austrian	<i>Pinus nigra</i>		

Unless otherwise directed in separately published DuPont instructions, do not use Velpar® DF on Christmas trees in the following states:

Alabama	Florida	Mississippi	North Carolina	Texas
Arkansas	Louisiana	New Hampshire	Pennsylvania	Vermont
Connecticut	Maine	New Jersey	Rhode Island	Virginia
Delaware	Maryland	New York	South Carolina	West Virginia
Georgia	Massachusetts			

#### APPLICATION INFORMATION

##### EASTERN US

Apply Velpar® DF as a broadcast spray in the spring prior to bud break. If application is made after bud break, use directional spray equipment to prevent contact with foliage.

##### WESTERN US

Areas of greater than 20 inches annual rainfall - Velpar® DF may be applied as a broadcast spray in the spring prior to conifer bud break. If application is made after bud break, use directional spray equipment to prevent contact with foliage.  
 Areas of less than 20 inches annual rainfall - Velpar® DF may be applied in the fall before the soil freezes or in the spring after snow cover melts, but before conifer bud break occurs.

#### USE RATES

The rates listed below are for broadcast application. For band application, use proportionately less; for example, use 1/2 of the broadcast rates when treating a 3-foot band where row spacing is 6 feet. Use the higher end of the rate range on the heavier soil type. Do not use more than one application of Velpar® DF per year.

THIS PRODUCT, AND AS SUCH AS PESTICIDE, MUST BE STORED AND USED IN ACCORDANCE WITH THE LABEL.

### ENVIRONMENTAL HAZARDS

Do not apply directly to water, or to areas where surface water is present or to intertidal areas below the mean high water mark. Do not contaminate water when disposing of equipment washwaters. The active ingredient, hexazinone, in this product is known to leach through soil into ground water under certain conditions as a result of agricultural use. Use of this chemical in areas where soils are permeable, particularly where the water table is shallow, may result in ground-water contamination.

### DIRECTIONS FOR USE

It is a violation of federal law to use this product in a manner inconsistent with its labeling. DuPont™ VELPAR® DF must be used only in accordance with instructions on this label, or in supplemental DuPont 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.

The correct use rates by crop and geographical area, specified on the label, and proper mixing/loading site considerations and application procedures must be followed to minimize potential for hexazinone movement into ground water. Users are encouraged to consult with their state Department of Agriculture, Extension Service, or other pesticide lead agency for information regarding soil permeability, aquifer vulnerability, and best management practices for their area.

### PRODUCT INFORMATION

VELPAR® DF herbicide is a water-dispersible granule that is mixed in water and applied as a spray for weed control in certain crops, Christmas trees, forestry site preparation and release areas, and industrial areas. It may also be applied as a basal soil treatment for brush control in reforestation areas, rangeland, pastures and noncrop areas.

VELPAR® DF is an effective general herbicide providing both contact and residual control of many annual and biennial weeds and woody plants. It is also effective for control of most perennial weeds.

VELPAR® DF is noncorrosive to equipment.

Care must be exercised when applying VELPAR® DF near desirable trees or shrubs as they can absorb VELPAR® DF through roots extending in to treated areas.

This product may be applied on agricultural and non-agricultural sites that contain areas of temporary surface water caused by collection of water between planting beds, in flooded ruts, or in other depressions created by management activities. It is permissible to treat intermittent drainage, intermittently flooded low lying sites, seasonally dry flood plains and transitional areas between upland and lowland sites when no water is present. It is also permissible to treat marshes, swamps and bogs after water has receded, as well as seasonally dry flood deltas. DO NOT make applications to natural or man-made bodies of water such as lakes, reservoirs, ponds, streams and canals.

### ENVIRONMENTAL CONDITIONS AND BIOLOGICAL ACTIVITY

VELPAR® DF is absorbed through the roots and foliage. Moisture is required to activate VELPAR® DF in the soil. Best results are obtained when the soil is moist at the time of application and 1/4–1/2 inches of rainfall occurs within 2 weeks after application.

For best results, apply VELPAR® DF preemergence or postemergence when weeds are less than 2 inches in height or diameter. Herbicidal activity is most effective under conditions of high temperature (above 80 °F), high humidity, and good soil moisture. Herbicidal activity may be reduced when vegetation is dormant, semi-dormant, or under stress (e.g. temperature or moisture).

Herbicidal activity will usually appear within 2 weeks after application to susceptible plants under warm, humid conditions; while 4–6 weeks may be required when weather is cool or dry, or when susceptible plants are under stress. If rainfall after application is inadequate to activate VELPAR® DF in the soil, plants may recover from contact effects and continue to grow.

On woody plants, symptoms usually appear within 3–6 weeks after sufficient rainfall has carried the herbicide into the root zone during periods of active growth. Defoliation and subsequent re-foliation may occur, but susceptible plants are killed.

The degree and duration of control will depend on the following:

- Use rate
- Weed spectrum and size at time of application
- Environmental conditions at and following treatment

Where a rate range is shown, use the higher levels of the dosage range on hard-to-control species, fine-textured soils, or soils containing greater than 5% organic matter or carbon. Use the lower levels of the dosage range on coarse-textured soils and/or on soils low in organic matter. Refer to specific uses for rate ranges.

### APPLICATION INFORMATION

VELPAR® DF may be applied by ground equipment and, where permitted, aerial equipment. Use rates, minimum spray gallonage, and other application information are described for various uses.

Dispose of the equipment washwater by applying it to a use-site listed on this label or in accordance with directions given in the "Storage and Disposal" section of this label.

Before spraying, calibrate equipment to determine the quantity of water necessary to uniformly and thoroughly cover the vegetation and soil in a measured area to be treated. Make sure the volume of water is sufficient to completely suspend the VELPAR® DF.

### TANK MIXTURES

VELPAR® DF herbicide may be tank mixed with other herbicides and /or adjuvants registered for the uses (crops) specified in the label. Refer to the label of the tank mix partner(s) for any additional use instructions or restrictions. The most restrictive label provisions apply. If other label instructions conflict with this label do not tank mix the herbicide and/or adjuvant with VELPAR® DF herbicide.

### INVASIVE SPECIES MANAGEMENT

This product may be considered for use on public, private, and tribal lands to treat certain weed species infestations that have been determined to be invasive, consistent with the Federal Interagency Committee for the Management of Noxious and Exotic Weeds (FICMNEW) National Early Detection and Rapid Response (EDRR) System for invasive plants. Effective EDRR systems address invasions by eradicating the invader where possible, and controlling them when the invasive species is too established to be feasibly eradicated. Once an EDRR assessment has been completed and action is advised, a Rapid Response needs to be taken to quickly contain, deny reproduction, and if possible eliminate the invader. Consult your appropriate state extension service, forest service, or regional multidisciplinary invasive species management coordination team to determine the appropriate Rapid Response provisions and allowed treatments in your area.

### RESISTANCE

When herbicides that affect the same biological site of action are used repeatedly over several years to control the same weed species in the same field, naturally-occurring resistant biotypes may survive a correctly applied herbicide treatment, propagate, and become dominant in that field. Adequate control of these resistant weed biotypes cannot be expected. If weed control is unsatisfactory, it may be necessary to retreat the problem area using a product affecting a different site of action.

To better manage herbicide resistance through delaying the proliferation and possible dominance of herbicide resistant weed biotypes, it may be necessary to change cultural practices within and between crop seasons such as using a combination of tillage, retreatment, tank-mix partners and/or sequential herbicide applications that have a different site of action. Weed escapes that are allowed to go to seed will promote the spread of resistant biotypes.

It is advisable to keep accurate records of pesticides applied to individual fields to help obtain information on the spread and dispersal of resistant biotypes. Consult your agricultural dealer, consultant, applicator, and/or appropriate state agricultural extension service representative for specific alternative cultural practices or herbicide instructions available in your area.

### INTEGRATED PEST MANAGEMENT

This product may be used as part of an Integrated Pest Management (IPM) program that can include biological, cultural, and genetic practices aimed at preventing economic pest damage. IPM principles and practices include field scouting or other detection methods, correct target pest identification, population monitoring, and treating when target pest populations reach locally determined action thresholds. Consult your state cooperative extension service, professional consultants or other qualified authorities to determine appropriate action treatment threshold levels for treating specific pest/crop systems in your area.

### AGRICULTURAL USES

#### AGRICULTURAL USE REQUIREMENTS

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

Do not 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 48 hours.

PPE required for early entry to treated areas that is permitted under the Worker Protection Standard and that involves contact

in the supply tank does not require additional agitation unless specified on the companion products label. If foaming occurs in the injection supply tank, a defoaming agent (defoamer) may be added.

6. Apply VELPAR® DF spray mixture within 48 hours of mixing to avoid product degradation.

#### USE PRECAUTIONS AND RESTRICTIONS - CHEMIGATION

- 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.
- Distributing treated water in an uneven manner can result in crop injury, lack of effectiveness, or over-tolerance pesticide residues in the crop. Therefore, to ensure that the mixture is applied evenly at the labeled rate, use sufficient water, apply the mixture for the proper length of time and ensure sprinkler produces a uniform water pattern.
- Do not permit run-off during chemigation.

#### POSTING OF AREAS TO BE TREATED

Posting of areas to be chemigated is required when 1) any part of a treated area is within 300 feet of sensitive areas such as residential areas, labor camps, businesses, daycare centers, hospitals, in-patient clinics, nursing homes, or any public areas such as schools, parks, playgrounds, or other public facilities not including public roads, or 2) when the chemigated area is open to the public such as golf courses or retail greenhouses.

Posting must conform to all the following requirements:

- Treated areas shall be posted with signs at all usual points of entry and along likely routes of approach from the listed sensitive areas. When there are no usual points of entry, signs must be posted in the corners of the treated areas and in any other location affording maximum visibility to sensitive areas.
- The printed side of the sign must face away from the treated area towards the sensitive area. The signs shall be printed in English. Signs must be posted prior to application and must remain posted until foliage has dried and soil surface water has disappeared. Signs may remain in place indefinitely as long as they are composed of materials to prevent deterioration and maintain legibility for the duration of the posting period.
- All words shall consist of letters at least 2 1/2 inches tall, and all letters and the symbol shall be a color which sharply contrasts with their immediate background. At the top of the sign shall be the words "KEEP OUT", followed by an octagonal stop sign symbol at least 8 inches in diameter containing the word "STOP". Below the symbol shall be the words "PESTICIDE IN IRRIGATION WATER".
- Posting required for chemigation does not replace other posting and reentry requirements for farm worker safety.

### REPLANTING (FOLLOWING ALFALFA)

- Do not replant treated areas to any crop except corn, root crops or sugarcane within two years after treatment, as crop injury may result.
- Corn may be planted 12 months after the last treatment in areas of moderate to high rainfall (greater than 20 inches), provided the use rate did not exceed 1 lb per acre.
- Root crops such as potatoes, sugarbeets, radish and carrots may be planted 12 months after last treatment, provided the use rate does not exceed 2/3 lb per acre. Sites with use rates higher than 2/3 lb per acre must not be replanted to any root crop within 2 years after application of VELPAR® DF, or unacceptable crop injury may result.
- In areas where irrigation is needed to produce the crop, the crop rotation intervals listed may need to be extended if the normal irrigation amount is reduced for any reason.
- Sugarcane may be planted any time following treatment.
- In California, do not replant seed alfalfa areas to any crop within two years after treatment, as crop injury may result.

### CROP ROTATION

#### Field Bioassay

In arid climates (10 inches of rainfall or less per year) or areas where drought conditions have prevailed for one or more years, a field bioassay must be completed prior to planting any desired crop. The results of this bioassay may require the rotation intervals listed above to be extended.

A successful bioassay means growing to maturity a test strip of the crop(s) intended for production. The test crop(s) strip must cross the entire field including knolls, low areas, and areas where any berms were located.

### ALFALFA - IMPREGNATION ON

#### DRY BULK FERTILIZER (EXCEPT CALIFORNIA AND ARIZONA)

Dry bulk fertilizer may be impregnated or coated with VELPAR® DF for application to established alfalfa. All instructions on this label must be followed along with state regulations relating to dry bulk fertilizer blending, impregnating and labeling.

If fertilizer materials are excessively dusty, use a suitable additive to reduce dust prior to impregnation, as dusty fertilizer will result in poor distribution during application. The dry fertilizer must be properly impregnated and uniformly applied to the alfalfa to avoid crop injury and/or poor weed control.

To impregnate the fertilizer, use a system consisting of a conveyor or closed drum used to blend dry bulk fertilizer. Any commonly used fertilizer can be impregnated with DuPont™ VELPAR® DF, except potassium nitrate or sodium nitrate. Do not use VELPAR® DF on limestone.

Use a minimum of 250 lb dry bulk fertilizer per acre and up to a maximum of 450 lb per acre. To impregnate or coat the dry bulk fertilizer with VELPAR® DF, mix 2 2/3 pounds of VELPAR® DF with sufficient water to make one gallon of suspension and thoroughly agitate. Direct the nozzles to deliver a fine spray of this suspension toward the fertilizer for thorough coverage while avoiding spray contact with mixing equipment. Uniform impregnation of VELPAR® DF to dry bulk fertilizer will vary, and if the absorptivity is not adequate, the use of an absorbent powder may be required to produce a dry, free-flowing mixture. "Microcel E" is the absorbent powder of choice. When another herbicide is used with VELPAR® DF, mix and impregnate the fertilizer immediately.

Apply impregnated fertilizer as soon as possible after impregnation for optimum performance.

Select the rate of VELPAR® DF to apply per acre from the appropriate section of this label. Then refer to the rate chart below to determine the amount of VELPAR® DF that is to be impregnated on a ton of dry bulk fertilizer, based on the amount of fertilizer to be distributed in one acre.

#### Rate Chart for Impregnating Fertilizer with VELPAR® DF

Fertilizer Rate/Acre	VELPAR® DF Rate Per Acre			
	2/3 Lbs	1 Lbs	1 1/3 Lbs	2 Lbs
250 lbs	5.3 lbs/ton	8.0 lbs/ton	10.6 lbs/ton	16.0 lbs/ton
300 lbs	4.4 lbs/ton	6.6 lbs/ton	8.8 lbs/ton	13.3 lbs/ton
350 lbs	3.7 lbs/ton	5.7 lbs/ton	7.5 lbs/ton	11.4 lbs/ton
400 lbs	3.3 lbs/ton	5.0 lbs/ton	6.7 lbs/ton	10.0 lbs/ton
450 lbs	2.9 lbs/ton	4.4 lbs/ton	5.9 lbs/ton	8.9 lbs/ton

For rates other than those listed, use the following formula to calculate the amounts of VELPAR® DF to be impregnated per ton of dry fertilizer.

$$\text{Lbs VELPAR® DF Per Acre} \times 1 \text{ Ton Fertilizer} = \text{Lbs VELPAR® DF per Ton of Fertilizer}$$

#### APPLICATION

Uniform application of VELPAR® DF-impregnated dry fertilizer is essential for satisfactory weed control. Accurate calibration of the application equipment is essential for uniform distribution to the surface. The customary method of application is to apply 1/2 the labeled rate and overlap 50%. This results in the best distribution pattern.

### USE PRECAUTIONS AND RESTRICTIONS - ALFALFA

- Best results are obtained when 1/2–1 inches of rainfall or sprinkler irrigation occurs within two weeks after application, when soil is moist at time of application, and when weeds have not germinated or are less than 2 inches in height or diameter. Heavy rainfall or excessive irrigation after application may result in crop injury or poor performance of the herbicide.
- On soils high in organic matter (greater than 5%), the effectiveness of VELPAR® DF can be significantly reduced and weed control may be unsatisfactory.
- Avoid overlapping of spray swaths and shut off spray booms while starting, turning, slowing or stopping or crop injury may result.
- Crop injury, including mortality, may result in fields with restricted root growth due to non-uniform soil profiles such as gravel basins and clay lenses.
- Crop injury may result if hot weather, mid-to-high 90 degree range or higher, occurs within a few days after application.
- Do not apply to snow-covered or frozen ground.
- Crop injury to alfalfa can be influenced by several factors including alfalfa variety, soil conditions, uniformity of application and environmental conditions, etc., if no prior use history for the site or variety, treat only a small area when first using VELPAR® DF.
- If abnormally dry conditions exist following application, restrict the first irrigation to no more than 1/2 acre inch of water.
- Temporary yellowing of alfalfa may occur following VELPAR® DF applications.
- Treat only stands of alfalfa established for one year or for one growing season (except in California), provided:
  - The alfalfa stand has a well developed tap root structure that is at least 10 inches in length (0.25 inch diameter below the crown) throughout the field and the crop is healthy, vigorous, and not under stress from weather conditions, low fertility, insects or disease damage.
  - In areas with shorter growing seasons, such as, higher elevations, adequate alfalfa tap root growth may not occur and especially when alfalfa is grown together with a cover or nurse crop. If an adequate tap root is not present, delay application of VELPAR® DF until the alfalfa has gone through a minimum of two growing seasons.

The rates listed below are for broadcast application. For band application, use proportionately less; for example, use 1/2 of the broadcast rates when treating a 3-foot band where row spacing is 6 feet. Use the higher end of the rate range on the heavier soil type. Do not use more than one application of VELPAR® DF per year.

Soils	VELPAR® DF (Lb/Acre)	
	First Year Plantings	Established Trees
<b>Coarse Texture</b> Loamy sand, sandy loam (50-85% sand)	1 1/3	1 1/3 - 1 2/3
<b>Medium Texture</b> Loam, silt loam, silt, clay loam, sandy clay loam	1 1/3 - 1 2/3	1 2/3 - 2 1/3
<b>Fine Texture</b> Silty clay loam, clay loam, sandy clay, silty clay, clay	1 2/3 - 2	2 1/3 - 2 2/3

**First year plantings** - Transplant stock that is 2 years old or more (1 year old for loblolly pine). Apply VELPAR® DF only if rainfall has settled the soil around the base and root systems of the transplants.

**Established trees** - Trees that have been planted in the plantation for 1 year or more.

### WEEDS CONTROLLED

VELPAR® DF is labeled for the control or suppression of the following weed species in Christmas tree crops:

Aster, heath*	<i>Aster ericoides</i>	Fescue*	<i>Festuca spp</i>
Barryardgrass	<i>Echinochloa crus-galli</i>	Fleabane	<i>Conyza spp</i>
Bentgrass, common	<i>Agrostis alba</i>	Foxtail	<i>Setaria spp</i>
Bluegrass, annual	<i>Poa annua</i>	Goldenrod*	<i>Solidago spp</i>
Bromegrass	<i>Bromus spp</i>	Groundsel, common	<i>Senecio vulgaris</i>
Burnweed, American*	<i>Erechtites hieracifolius</i>	Horseweed/marestail	<i>Conyza canadensis</i>
Carrot, wild	<i>Daucus carota</i>	Orchardgrass*	<i>Dactylis glomerata</i>
Crabgrass*	<i>Digitaria spp</i>	Ragweed, common	<i>Ambrosia elatior</i>
Curly dock*	<i>Rumex crispus</i>	Ryegrass, Italian (annual)	<i>Lolium multiflorum</i>
Daisy, oxeye	<i>Chrysanthemum leucanthemum</i>	Ryegrass, perennial*	<i>Lolium perenne</i>
Dandelion, common*	<i>Taraxacum officinale</i>	Smartweed, Pennsylvania	<i>Polygonum pensylvanicum</i>
Dandelion, false* (spotted catsear)	<i>Hypochoeris radicata</i>	Velvetgrass, common	<i>Holcus lanatus</i>

\* Suppression – a visible reduction in plant population and/or plant vigor as compared to an untreated area and generally not accepted as control.

### SPRAY EQUIPMENT

VELPAR® DF may be applied by ground equipment or by air. Select a spray volume that will ensure a thorough and uniform application. Apply a minimum of 5 gallons per acre by air and a minimum of 10 gallons per acre by ground equipment.

### USE PRECAUTIONS AND RESTRICTIONS

#### CHRISTMAS TREES

- Do not use VELPAR® DF in nurseries, seed beds, or ornamental plantings.
- Do not add a surfactant in applications over the top of conifers.
- Weed control results from spring applications depend on sufficient moisture to activate VELPAR® DF.
- Livestock may be grazed immediately following a broadcast application of VELPAR® DF at rates of 1.5 pounds per acre or less, and treated vegetation may be cut, dried, and fed after 38 days.
- Do not cut treated vegetation for feed, or graze livestock on treated areas for 60 days following application of VELPAR® DF at broadcast rates exceeding 1.5 pounds per acre.
- Poor weed and brush control may result from the following:
  - Heavy duff or slash present at the time of application.
  - Use on poorly drained sites.
  - Applications made when soil is saturated with water and rain is imminent within 24 hours.
  - Applications to soils high in organic matter (greater than 5%).
- Injury may occur when DuPont™ VELPAR® DF is used on the following:
  - Trees that show poor vigor, insect damage, disease, winter injury, or other stress conditions.
  - Any soil containing less than 1% organic matter.
  - Loamy sand or sandy loam with less than 2% organic matter (except Jeffrey Pine and Ponderosa Pine).
  - Foliage after bud break.
  - Gravelly or rocky soils, exposed subsoils, clay knobs, sand, or sandy soil with 85% or more sand.

### PINEAPPLE

VELPAR® DF is labeled for control of certain weeds in pineapple.

### APPLICATION INFORMATION

Mix the proper amount of VELPAR® DF in water. Add a surfactant at the rate of 0.25% V/V.

Use the lower rates on coarse-textured soils or in areas where rainfall exceeds 65 inches per year. Use the higher rates on fine-textured soils or in areas where rainfall is less than 65 inches per year.

**Intercrop period** - Apply VELPAR® DF as a broadcast spray in 100–400 gallons of water per acre at the rate of 1/3 - 2 1/3 pounds per acre. For aerial application, use at least 10 gal water per acre.

**Post mulch, preplant** - Apply VELPAR® DF as a broadcast spray in 100–400 gallons of water per acre at the rate of 1/3 - 2 1/3 pounds per acre.

**Post plant, before planted cuttings start active growth** - Apply VELPAR® DF as a broadcast spray in 100–400 gallons of water per acre at the rate of 1/3 - 2 1/3 pounds per acre. When weed growth has escaped control by other herbicide applications, a post-planting application may be made after the planted cuttings start to grow.

**Prior to forcing first ratoon** - Apply VELPAR® DF as a broadcast spray in 100–400 gallons of water per acre at the rate of 1/3 - 2 1/3 pounds per acre.

**Directed postemergence (pineapple and weeds) inter-space application** - Apply VELPAR® DF as a directed spray 3–10 months after planting in 50–200 gallons of water per acre (broadcast basis) at the rate of 1/3 - 2 1/3 pounds per acre (broadcast basis) using a stroller boom or knapsack.

**Directed spot treatments for perennial grasses before floral induction** - Spray perennial grasses postemergence to wet (50–200 gallons per acre depending on size) with 1 1/3 - 2 1/3 pounds per 100 gallons of water as a spot treatment.

**Treatments to field edges and roadsides** - Apply VELPAR® DF at 2 1/3 - 4 8/10 pounds per acre in 100–400 gallons of water.

### WEEDS CONTROLLED

VELPAR® DF is labeled for the control or suppression of the following species in pineapple crops:

Ageratum, tropic	<i>Ageratum conyzoides</i>	Kao haole*	<i>Leucaena glauca</i>
Balsamapple	<i>Momordica charantia</i>	Moana loa vine*	<i>Canavalia cathartica</i>
Castorbean	<i>Ricinus communis</i>	Morningglory	<i>Ipomoea spp</i>
Crabgrass	<i>Digitaria spp</i>	Oxalis	<i>Oxalis spp</i>
Crotalaria	<i>Crotalaria spp</i>	Popolo	<i>Solanum sandwicense</i>
Dallisgrass	<i>Paspalum dilatatum</i>	Richardsonium	<i>Richardsonia spp</i>
Guineagrass	<i>Panicum maximum</i>	Vaseygrass	<i>Paspalum urvillei</i>
Junglelice	<i>Echinochloa colonum</i>		

\* Suppression – a visible reduction in plant population and/or plant vigor as compared to an untreated area and generally not accepted as control.

### USE PRECAUTIONS AND RESTRICTIONS - PINEAPPLE

- Do not exceed 4.8 lb VELPAR® DF per acre per crop.
- Do not apply VELPAR® DF within 181 days of harvest.

### SUGARCANE

VELPAR® DF is labeled for selective weed control in sugarcane except in the State of Florida.

#### APPLICATION INFORMATION

**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 48 hours.  
 PPE required for early entry to treated areas that is permitted under the Worker Protection Standard and that involves contact with anything that has been treated, such as plants, soil, or water, is :  
 Coveralls  
 Chemical resistant gloves made of any waterproof material  
 Shoes plus socks  
 Protective eyewear

## ALFALFA

DuPont™ VELPAR® DF is labeled for control of certain weeds in established alfalfa grown for hay or seed production.

- Do not apply within 30 days of harvest (cutting for hay), or feeding of forage or grazing.
- Do not exceed 2 pounds per acre per application.
- Do not exceed 2 pounds (1.5 pounds active ingredient hexazinone) per acre per year.

## APPLICATION INFORMATION

### NON-DORMANT AND SEMI-DORMANT VARIETIES

In the following states, make a single application of VELPAR® DF during the winter months when alfalfa plants are in the least active stage of growth.

Arizona	Montana	Oklahoma	Utah
California	Nebraska	Oregon	Washington
Colorado	Nevada	South Dakota	Wyoming
Idaho	New Mexico	Texas	
Kansas	North Dakota		

In the following states, make a single application of VELPAR® DF either in the spring before new growth exceeds 2 inches in height or to alfalfa stubble after cutting, following hay removal and before regrowth exceeds 2 inches in height.

Arkansas	Maine	New Jersey	Tennessee
Connecticut	Maryland	New York	Vermont
Delaware	Massachusetts	North Carolina	Virginia
Illinois	Michigan	Ohio	West Virginia
Indiana	Minnesota	Pennsylvania	Wisconsin
Iowa	Missouri	Rhode Island	
Kentucky	New Hampshire		

**NOTE:** Severe alfalfa injury may result following application, if after cutting the regrowth is more than 2 inches high, or there is significant stubble left after cutting or grazing, or the air temperature is above 90 °F.

### DORMANT VARIETIES

Make a single application of DuPont™ VELPAR® DF after alfalfa becomes dormant and before new growth exceeds 2 inches in height in the spring. Where weeds have emerged, use a surfactant.

## USE RATES

Use higher rates on hard-to-control species. (see **Weeds Controlled** section below) fine textured soils, soils containing greater than 5% organic matter, or under adverse environmental conditions such as temperature extremes or when weeds are stressed due to low rainfall.

For dormant alfalfa, use a surfactant approved for crops at the rate of 0.25% v/v (1 quart per 100 gallons of spray solution). Select the appropriate rate for soil texture and organic matter content as follows:

Soils	VELPAR® DF (Lb/Acre) Percent Organic Matter in Soil		
	<1%	1-5%	>5%
<b>Coarse Texture</b> Loamy sand, sandy loam	2/3 - 1	2/3 - 1	1 1/3 - 2
<b>Medium Texture</b> Loam, silt loam, silt, clay loam, sandy clay loam	2/3 - 1	1 - 2	1 1/3 - 2
<b>Fine Texture</b> Silty clay loam, sandy clay, silty clay, clay	1 - 2	1 - 2	1 1/3 - 2

### NOTE:

- In the states of MT, ND, SD, and WY, do not exceed a use rate of 1 1/3 pounds per acre on medium and fine textured soils.
- In the state of Montana (MT), do not apply to soils with less than 1.5% organic matter.
- In the state of Wyoming (WY):  
Do not apply to soils with less than 0.5% organic matter.  
Apply to irrigated alfalfa only.

## WEEDS CONTROLLED

VELPAR® DF when applied preemergence or early postemergence at the following rates, is labeled for the control or suppression of the following species in alfalfa:

1/3 - 2/3 Lb/Acre			
Tansymustard	<i>Descurainia pinnata</i>		
2/3 - 1 1/3 Lb/Acre			
Bluegrass, annual	<i>Poa annua</i>	Mustard, Jim Hill (tumble)	<i>Sisymbrium altissimum</i>
Brome, downy (cheatgrass)	<i>Bromus tectorum</i>	Mustard, wild	<i>Brassica kaber</i>
Buckwheat, wild	<i>Polygonum convolvulus</i>	Orchardgrass (seedling)	<i>Dactylis glomerata</i>
Catchfly, English	<i>Silene gallica</i>	Pennycress, field	<i>Thlaspi arvense</i>
Chamomile, mayweed (dogfennel)	<i>Anthemis cotula</i>	Pigweed, redroot	<i>Amaranthus retroflexus</i>
Chickweed, common	<i>Stellaria media</i>	Radish, wild	<i>Raphanus raphanistrum</i>
Fiddleneck, tarweed	<i>Amsinckia lycopsoides</i>	Rocket, London	<i>Sisymbrium irio</i>
Filaree	<i>Erodium sp.</i>	Rocket, common yellow	<i>Barbarea vulgaris</i>
Flixweed	<i>Descurainia Sophia</i>	Salsify	<i>Tragopogon spp.</i>
Groundsel, common	<i>Senecio vulgaris</i>	Shepherdspurse	<i>Capsella bursa-pastoris</i>
Henbit*	<i>Lamium amplexicaule</i>	Speedwell, purslane	<i>Veronica peregrina</i>
Lettuce, Miner's	<i>Montia perfoliata</i>	Spurry, corn	<i>Spergula arvensis</i>
Mustard, blue	<i>Chorispora tenella</i>		

1 1/3 - 2 Lb/Acre			
Alfalfa* (seedling)	<i>Medicago sativa</i>	Lettuce, prickly*	<i>Lactuca serriola</i>
Barley, foxtail (seedling)	<i>Hordeum jubatum</i>	Mallow, common	<i>Malva neglecta</i>
Bluegrass, perennial* (spring only)	<i>Poa spp.</i>	Ryegrass, Italian (annual)	<i>Lolium multiflorum</i>
Cockle, white*	<i>Melandrium album</i>	Quackgrass*	<i>Elytrigia repens</i>
Dandelion, common*	<i>Taraxacum officinale</i>	Speedwell, ivyleaf	<i>Veronica hederifolia</i>
Dandelion, false* (spotted catsear)	<i>Hypochaeris radicata</i>	Tea, Mexican*	<i>Chenopodium ambrosioides</i>
Foxtail*	<i>Setaria spp.</i>		<i>Cirsium arvense</i>
Kochia	<i>Kochia scoparia</i>	Thistle, Canada (seedling)	<i>Salsola iberica</i>
Lambsquarters, common	<i>Chenopodium album</i>	Thistle, Russian	

\* Suppression - a visible reduction in plant population and/or plant vigor as compared to an untreated area and generally not accepted as control.

throughout the field and the crop is healthy, vigorous, and not under stress from weather conditions, low fertility, insects or disease damage.

- In areas with shorter growing seasons, such as, higher elevations, adequate alfalfa tap root growth may not occur and especially when alfalfa is grown together with a cover or nurse crop. If an adequate tap root is not present, delay application of VELPAR® DF until the alfalfa has gone through a minimum of two growing seasons.

- In California, fall planted alfalfa may be treated in the following winter months with VELPAR® DF at 1/3 to 2/3 pounds per acre (use higher rate for fine textured soils) provided:
  - alfalfa root growth exceeds 6 inches in length
  - vegetative top growth of alfalfa has lateral development of secondary growth
  - alfalfa is healthy and vigorous, not growing under stress from insect, disease, winter injury or other types of stress.
- Injury may result to alfalfa plants that fail to meet these growth criterion listed above.
- Do not use VELPAR® DF on seedling alfalfa, alfalfa-grass mixtures, or other mixed stands as injury may result to the seedling alfalfa or companion crop.
- Do not use a surfactant with DuPont™ VELPAR® DF when treating non-dormant alfalfa.
- Do not use VELPAR® DF on gravelly or rocky soils, exposed subsoils, hardpan, sand, poorly drained soil, or alkali soils.

## BLUEBERRY

### HIGH BUSH BLUEBERRIES

VELPAR® DF is labeled for control of certain herbaceous and woody weeds in established high bush blueberry fields.

#### APPLICATION INFORMATION

VELPAR® DF may be applied to high bush blueberries that have been established for 3 or more years. Apply VELPAR® DF in the spring before the lower leaves of the blueberry plant have fully expanded. Avoid contact of the leaves with the spray solution. Using calibrated ground spray equipment, make the application in sufficient water to provide thorough and uniform coverage to the treated area (usually 20 gallons per acre). Shut off spray booms when starting, turning, slowing or stopping, or injury to the crop may result.

#### USE PRECAUTIONS AND RESTRICTIONS

- Do not apply through any type of irrigation system.
- Do not apply within 90 days of harvest.
- Do not apply to flooded field with standing water.
- Application to blueberry foliage will result in crop injury.
- Since the effect of VELPAR® DF on blueberries varies with soil type, plant vigor, uniformity of applications and amount of rainfall, it is suggested that growers limit their first use to small areas.

## USE RATES (Lbs/Acre)

Soil texture	less than or equal to 3% organic matter	greater than 3% organic matter
<b>Coarse</b> loamy sand, sandy loam (50-85% sand)	1.3	1.6
<b>Medium</b> loam, silt loam, silt, clay loam, sandy clay loam		2.6
<b>Fine</b> silty clay loam, clay loam, sandy clay, silty clay, clay	1.3 - 2*	2.6

\*Use the higher rate as the soil organic matter approaches 3%.

## LOW BUSH BLUEBERRIES

VELPAR® DF may be used for the control of certain weeds in low bush blueberries.

#### APPLICATION INFORMATION

VELPAR® DF may only be applied to pruned blueberry fields in the spring before leaf emergence. Using calibrated ground spray equipment, make the application in sufficient water to provide thorough and uniform coverage to the treated area (usually 20 gallons per acre). Shut off spray booms when starting, turning, slowing or stopping, or injury to the crop may result.

#### USE PRECAUTIONS AND RESTRICTIONS

##### LOWBUSH BLUEBERRIES

- Do not apply through any type of irrigation system.
- Do not apply to flooded field with standing water.
- Do not apply within 450 days of harvest.
- Do not exceed 2.4 pounds per acre if field has been treated with hexazinone within the past 8 years.
- Application to blueberry foliage will result in crop injury.
- Since the effect of VELPAR® DF on blueberries varies with soil type, plant vigor, uniformity of applications and amount of rainfall, it is suggested that growers limit their first use to small areas. If excessive leaf drop is observed after treatment, reduce rate in future applications.
- Maintain a 50 foot buffer from any well head or water reservoir.

#### LOW BUSH BLUEBERRIES (LBS/ACRE)

Soil texture	less than or equal to 3% organic matter	greater than 3% organic matter
<b>Coarse</b> loamy sand, sandy loam (50-85% sand)	1.2	1.6
<b>Medium</b> loam, silt loam, silt, clay loam, sandy clay loam		2
<b>Fine</b> silty clay loam, clay loam, sandy clay, silty clay, clay	1.2 - 2.4*	2.4 - 3.6**

\*Use the higher rate as the soil organic matter approaches 3%.

\*\*Use the higher rate for harder to control species.

## IMPREGNATION ON DRY BULK FERTILIZER

Dry bulk fertilizer may be impregnated or coated with VELPAR® DF for application to established high bush or low bush blueberries.. All instructions on this label must be followed along with state regulations relating to dry bulk fertilizer blending, impregnating and labeling. If fertilizer materials are excessively dusty, use a suitable additive to reduce dust prior to impregnation, as dusty fertilizer will result in poor distribution during application. The dry fertilizer must be properly impregnated and uniformly applied to the alfalfa to avoid crop injury and/or poor weed control.

To impregnate the fertilizer, use a system consisting of a conveyor or closed drum used to blend dry bulk fertilizer. Any commonly used fertilizer can be impregnated with VELPAR® DF, except potassium nitrate or sodium nitrate. Do not use VELPAR® DF on limestone. Use a minimum of 250 lb dry bulk fertilizer per acre and up to a maximum of 450 lb per acre. To impregnate or coat the dry bulk fertilizer with VELPAR® DF, mix 2 2/3 pounds of VELPAR® DF with sufficient water to make one gallon of suspension and thoroughly agitate. Direct the nozzles to deliver a fine spray of this suspension toward the fertilizer for thorough coverage while avoiding spray contact with mixing equipment. Uniform impregnation of DuPont™ VELPAR® DF to dry bulk fertilizer will vary, and if the absorptivity is not adequate, the use of an absorptive powder may be required to produce a dry, free-flowing mixture. "Microcel E" is the absorbent powder of choice. When another herbicide is used with VELPAR® DF, mix and impregnate the fertilizer immediately. Apply impregnated fertilizer as soon as possible after impregnation for optimum performance. Select the rate of VELPAR® DF to apply per acre from the appropriate section of this label. Then refer to the rate chart below to determine the amount of VELPAR® DF that is to be impregnated on a ton of dry bulk fertilizer, based on the amount of fertilizer to be distributed in one acre.

## SUGARCANE

VELPAR® DF is labeled for selective weed control in sugarcane except in the State of Florida.

## APPLICATION INFORMATION

Apply a single treatment of VELPAR® DF per year using a fixed-boom sprayer and a minimum of 25 gallons per acre unless otherwise directed.

## HAWAII

Apply VELPAR® DF pre- or postemergence at the following rates for the indicated soil texture:

Soils	DuPont™ VELPAR® DF (Lb/Acre) (Plus surfactant 0.25% by volume)
<b>Coarse Texture</b> Sand, loamy sand, sandy loam	2/3 - 1 2/10
<b>Medium Texture</b> Loam, silt loam, silty clay loam	2/3 - 2 1/3
<b>Fine Texture</b> Clay, gray hydromorphic clay	2 1/3 - 4 8/10

Use the higher levels of the labeled rate ranges on soils high in organic matter. Do not apply more than twice the highest labeled rate for the indicated soil texture per crop (18-24 months). Add an adjuvant for all uses.

For preemergence use only, DuPont™ VELPAR® DF may be applied with aerial equipment using at least 10 gallons of spray per acre. Apply VELPAR® DF herbicide as a spot spray application for emerged weeds in sugarcane. Mix 1 to 4 pounds of VELPAR® DF per 100 gallons of water. Apply a sufficient volume of spray solution to thoroughly wet weed foliage but do not exceed a use rate of 4.8 pounds per acre. Use the lower concentrations on coarse-textured soils that are low in organic matter, and use the higher concentrations on fine-textured soils that are high in organic matter.

## LOUISIANA

Apply 2/3 - 1 2/10 pound of VELPAR® DF per acre broadcast in the fall before sugarcane emerges or in the spring before active cane tiller-ing begins. Fall treatments of 2/3 - 1 2/10 pound per acre may be followed by a spring treatment of 2/3 - 1 2/10 pound per acre. Do not apply more than 2 pound per year. Use the lower rates on coarse textured soils and the higher rates on fine textured soils.

## PUERTO RICO

For preemergence treatments, apply 1/3 - 2/3 pound of VELPAR® DF per acre.

For postemergence treatments, apply 1/3 - 2/3 pound of VELPAR® DF per acre to weeds after they have emerged. Use the lower rates on coarse-textured soils and the higher rates on fine-textured soils (high in clay or organic matter). Each ratoon may receive up to 2/3 pound of VELPAR® DF per acre.

For spot treatment of emerged weeds, VELPAR® DF may be applied with a knapsack sprayer in concentrations of 1/3 - 2/3 pound per 100 gallons of water. Apply a sufficient spray volume to wet the weed foliage. Do not exceed 100 gallons of spray per treated acre. Use the lower concentration on coarse-textured soils and the higher concentration on fine-textured soils.

Note: Since it is difficult to calibrate "spot" knapsack applications, extra care must be taken not to exceed the rate equivalent of the maximum of 2/3 pound VELPAR® DF per acre.

Do not apply more than 1 1/3 pound of VELPAR® DF per acre per crop season.

## TEXAS

Apply 2/3 - 2 1/3 pound of VELPAR® DF per acre. On plant cane, apply the herbicide before the cane emerges or as a directed layby treatment. On stubble cane, apply VELPAR® DF preemergence to early postemergence (up to the 3-leaf stage) or as a directed layby treatment. A pre- or early postemergence treatment may be followed by a layby treatment, provided at least 60 days have elapsed and 3 inches of rain-fall or sprinkler irrigation have occurred since the first treatment.

Do not apply more than 2 1/3 pound of VELPAR® DF per acre per season.

Use the following rates according to the different soil textures:

Soils	Preemergence	VELPAR® DF (Lb/Acre) +	Layby
<b>Coarse Texture*</b> Sandy loam	1/3		1/3
<b>Medium Texture</b> Loam, silt loam	9/10		9/10
<b>Fine Texture</b> Clay loam	1 1/3		1 1/3

\* With at least 2% organic matter

On dormant cane, a surfactant may be added to the spray mixture to increase control of emerged weeds.

## WEEDS CONTROLLED

VELPAR® DF is labeled for the control or suppression of the following species in sugarcane crops:

Ageratum, tropic*	<i>Ageratum conyzoides</i>	Morningglory, hairy	<i>Ipomoea pentaphylla</i>
Alexandergrass	<i>Brachiaria plantaginea</i>	Morningglory, three-lobed	<i>Ipomoea triloba</i>
Balsamapple	<i>Momordica charantia</i>	Mustard, wild	<i>Sinapis arvensis</i>
Barnyardgrass	<i>Echinochloa crus-galli</i>	Oxalis	<i>Oxalis spp.</i>
Bermudagrass*	<i>Cynodon dactylon</i>	Paintbrush, Flora's	<i>Emilia sonchifolia</i>
Burnweed, American (fireweed)	<i>Erechtites hieracifolius</i>	Panicum, browripot	<i>Panicum fasciculatum</i>
Crabgrass, common	<i>Stellaria media</i>	Paspalum, ricegrass	<i>Paspalum orbiculare</i>
Crabgrass, large	<i>Digitaria sanguinalis</i>	Paspalum, sour	<i>Paspalum conjugatum</i>
Crabgrass, smooth	<i>Digitaria ischaemum</i>	Pigweed, redroot	<i>Amaranthus retroflexus</i>
Crotalaria, fuzzy	<i>Crotalaria incana</i>	Pigweed, slender (green)	<i>Amaranthus viridis</i>
Crotalaria, showy	<i>Crotalaria spectabilis</i>	Pigweed, smooth	<i>Solanum chlorostachys</i>
Cuphea, tarweed	<i>Cuphea carthagenensis</i>	Popolo	<i>Solanum sandwicense</i>
Dallisgrass	<i>Paspalum dilatatum</i>	Purslane, common	<i>Portulaca oleracea</i>
Fingergrass, radiate	<i>Chloris radiata</i>	Sandbur	<i>Portulaca oleracea</i>
Fingergrass, swollen	<i>Chloris barbata</i>	Sensitive plant (hila hila)	<i>Cenchrus spp.</i>
Foxtail, bristly	<i>Setaria verticillata</i>	Signalgrass, broadleaf	<i>Mimosa spp.</i>
Foxtail, yellow	<i>Setaria lutescens</i>	Sowthistle, common	<i>Brachiaria platyphylla</i>
Geranium, Carolina	<i>Geranium carolinianum</i>	Spanishneedles	<i>Sonchus oleraceus</i>
Goosegrass	<i>Elusine indica</i>	Spranglepot	<i>Bidens bipinnata</i>
Gumegrass	<i>Panicum maximum</i>	Spurge, prostrate	<i>Leptochloa spp.</i>
Henbit	<i>Lamium amplexicaule</i>	Spurge, graceful	<i>Euphorbia humistrata</i>
Itchgrass*	<i>Chloris barabata</i>	Sunflower	<i>Chamaesyce hypericifolia</i>
Job's-tears	<i>Lamium amplexicaule</i>	Vaseygrass	<i>Helianthus spp.</i>
Johnsongrass (seedling)	<i>Sorghum halepense</i>	Waltheria (hia loa)	<i>Paspalum urvillei</i>
Junglerice	<i>Echinochloa colonum</i>		<i>Waltheria spp.</i>
Lambsquarters, common	<i>Chenopodium album</i>		
Millet, Texas	<i>Panicum texanum</i>		

\* Suppression - a visible reduction in plant population and/or plant vigor as compared to an untreated area and generally not accepted as control.

## USE PRECAUTIONS AND RESTRICTIONS - SUGARCANE

- Do not plant any crop other than sugarcane following an application of DuPont™ VELPAR® DF.
- Do not feed sugarcane forage to livestock.
- Do not apply VELPAR® DF:
  - Within 180 days of harvest in Hawaii.
  - Within 234 days of harvest in Louisiana.
  - Within 288 days of harvest in Puerto Rico.
  - Within 234 days of harvest in Texas.
- To avoid injury to sugarcane, observe the following precautions:
  - Do not use VELPAR® DF on cane that shows poor vigor because of insect damage, disease, or winter injury, or shows symptoms of other stress conditions such as drought stress.
  - Do not add a surfactant in applications unless otherwise specified.
  - Do not use VELPAR® DF on gravelly or rocky soils, thinly covered subsoils, or coarse-textured soils (sands to sandy loams) with less than 1% organic matter.
  - Temporary chlorosis of the crop may result from application over emerged cane. Applications during active cane growth must be directed to cover the weeds and soil while minimizing crop contact.
  - Do not use VELPAR® DF on varieties known to be susceptible to herbicides.
  - Extremely heavy rainfall after application may result in poor weed control and/or crop injury, especially if the application is made to dry soil.

## FORESTRY

### SITE PREPARATION

VELPAR® DF is labeled for weed and brush control in areas where the following species are grown:

### EASTERN US AND LAKE STATES

Fir, balsam	<i>Abies balsamea</i>	Pine, shortleaf	<i>Pinus echinata</i>
Pine, Austrian	<i>Pinus nigra</i>	Pine, slash	<i>Pinus Elliottii</i>
Pine, loblolly	<i>Pinus taeda</i>	Pine, Virginia	<i>Pinus virginiana</i>
Pine, longleaf	<i>Pinus palustris</i>	Spruce, black	<i>Picea mariana</i>
Pine, ponderosa	<i>Pinus ponderosa</i>	Spruce, red	<i>Picea rubens</i>
Pine, red	<i>Pinus resinosa</i>	Spruce, white	<i>Picea glauca</i>
Pine, Scotch	<i>Pinus sylvestris</i>		

### WESTERN US

Fir, Douglas	<i>Pseudotsuga menziesii</i>	Pine, lodgepole	<i>Pinus contorta</i>
Fir, grand	<i>Abies grandis</i>	Pine, ponderosa	<i>Pinus ponderosa</i>
Fir, Noble	<i>Abies procera</i>	Spruce, blue	<i>Picea pungens</i>
Fir, white	<i>Abies concolor</i>	Spruce, Englemann	<i>Picea engelmannii</i>
Pine, Jeffrey	<i>Pinus jeffreyi</i>	Spruce, Sitka	<i>Picea sitchensis</i>

### APPLICATION INFORMATION

#### EASTERN US

Apply VELPAR® DF from early spring to early summer after hardwoods have broken bud and before the foliage has hardened off.

Soils	VELPAR® DF (Lb/Acre)
<b>Coarse Texture</b>	
Sand, loamy sand, sandy loam	2 2/3 - 4
<b>Medium Texture</b>	
Loam, silt loam, sandy clay loam	4 - 5 1/3
<b>Fine Texture</b>	
Silty clay loam, clay loam, sandy clay, silt, silty clay, clay	5 1/3 - 6 2/3

The rates listed are for broadcast application. Use the lower rates on coarse textured soils and soils low in organic matter. Use the higher rates on fine textured soils and soils high in organic matter. Use the higher rates where weeds identified with an \* in the Weeds Controlled list predominate.

#### WESTERN US

For **SITE PREPARATION**, VELPAR® DF may be applied at 1.3 to 4 pounds per acre. Use the lower rates on coarse textured soils and soils low in organic matter. Use the higher rates on fine textured soils and soils high in organic matter. Use the higher rates where weeds identified in this label as "suppression" predominate.

In areas where other conifer species may be mixed in with the conifers listed above, VELPAR® DF may be applied if the user has prior experience with VELPAR® DF on the other conifer species. With no prior experience, it is advised that either a small area of plantings be tested for conifer safety prior to treating larger areas, or make no application of VELPAR® DF in these areas within the site preparation area. Conifer species that are sensitive to VELPAR® (hexazinone) DF, such as, sugar pine and western larch, require 18 months before interplanting on treated sites. Applications made to shelter wood sites may also result in mortality to over-story conifers. Factors that may influence conifer sensitivity in these sites could include application rate, conifer species, soil characteristics, uniformity of spray distribution across the treatment swath and environmental stress.

**Rain Belt** (areas of high spring rainfall): For best results, apply in late winter or spring when weeds and brush are actively growing.

**Snow Belt** (areas of low spring rainfall): For best results, apply in the fall before soil freezes, or in the spring after snow cover melts in anticipation of rainfall. Weed and brush control results from spring applications will be dependent on sufficient rainfall following application to activate VELPAR® DF.

### PLANTS CONTROLLED

DuPont™ VELPAR® DF is labeled for the control or suppression of the following species in site preparations for forestry crops:

#### HERBACEOUS PLANTS

Asters		Foxtail	<i>Setaria spp</i>
Aster, heath*	<i>Aster ericoides</i>	Goldenrod*	<i>Solidago spp</i>
Barnyardgrass	<i>Echinochloa crus-galli</i>	Groundsel, common	<i>Senecio vulgaris</i>
Bentgrass	<i>Agrostis spp</i>	Horseweed/marestail	<i>Coryza canadensis</i>
Bluegrass, annual	<i>Poa annua</i>	Mullein, common**	<i>Verbascum thapsus</i>
Bromegrass	<i>Bromus spp</i>	Orchardgrass*	<i>Dactylis glomerata</i>
Carrot, wild	<i>Daucus carota</i>	Pinegrass	<i>Calamagrostis rubescens</i>
Crabgrass*	<i>Digitaria spp</i>	Quackgrass*	<i>Agropyron repens</i>
Daisy, oxeye	<i>Chrysanthemum leucanthemum</i>	Ragweed, common	<i>Ambrosia elatior</i>
Dandelion, common*	<i>Taraxacum officinale</i>	Ryegrass, Italian (annual)	<i>Lolium multiflorum</i>
Dandelion, false* (spotted catsear)	<i>Hypochoeris radicata</i>	Ryegrass, perennial*	<i>Lolium perenne</i>
Dock, curly*	<i>Rumex crispus</i>	Smartweed, Pennsylvania	<i>Polygonum pennsylvanicum</i>
Elksedge	<i>Carex geyeri</i>	Squawcarpet	<i>Ceanothus prostratus</i>
Fescue*	<i>Festuca spp</i>	Thistle, Canada*	<i>Cirsium arvense</i>
Fireweed*(willowweed)	<i>Epilobium angustifolium</i>	Velvetgrass, common	<i>Holcus lanatus</i>
Fleabane	<i>Coryza spp</i>		

\*\* For western US site preparation, apply at 4 pounds per acre.

#### WOODY PLANTS

#### WESTERN US

Blue spruce	Grand fir	Noble fir	Western hemlock
Douglas fir	Jeffrey pine	Ponderosa pine	White fir
Englemann spruce	Lodgepole pine	Sitka spruce	

### APPLICATION INFORMATION

#### EASTERN US

Apply VELPAR® DF as a broadcast or banded spray in the spring prior to conifer bud break to lessen conifer injury potential.

#### WESTERN US

**Rainbelt** (areas of high spring rainfall): For best results, apply as a broadcast or banded spray in the late winter or spring when weeds are actively growing, but prior to conifer budbreak. If application is made after conifer bud break, use directional spray equipment to prevent contact with conifer foliage, as injury may result.

**Snowbelt** (areas of low spring rainfall): For best results, apply as a broadcast or banded spray in the fall before soil freezes and after the final resting bud has hardened on the conifers. Or, spring applications may be made after snow cover melts in anticipation of rainfall prior to conifer budbreak. Weed control results from spring treatments will be dependent on sufficient rainfall following application to activate VELPAR® DF.

### USE RATES

The rates listed below are for broadcast application. For band application, use proportionately less. For example, use 1/2 of the broadcast rates when treating a 3-foot band where row spacing is 6 feet. Use the higher rate range for the harder to control (\*Suppression) weeds listed in the table below.

#### EASTERN US

Soil Description	VELPAR® DF (Lb/Acre)	
	First Year Plantings	Established Trees
Loamy sand, sandy loam(50-85% sand)	1 1/3	1 1/3 - 1 2/3
Loam, silt loam, silt, sandy clay loam	1 1/3 - 1 1/2	1 2/3 - 2 1/3
Silty clay loam, clay loam, sandy clay, silty clay, clay	1 1/2 - 1 8/10	2 1/3 - 2 2/3
Red pine only - Refer to labeled rates in the FORESTRY RELEASE - Use Rates Eastern US section of the label.		

#### WESTERN US

Refer to labeled rates in the FORESTRY RELEASE - Use Rates Western US section of the label.

### WEEDS CONTROLLED

VELPAR® DF is labeled for the control or suppression of the following species in release sites:

Asters	<i>Aster spp</i>	Fleabane	<i>Coryza spp</i>
Aster, heath*	<i>Aster ericoides</i>	Foxtail	<i>Setaria spp</i>
Barnyardgrass	<i>Echinochloa crus-galli</i>	Goldenrod*	<i>Solidago spp</i>
Bentgrass	<i>Agrostis spp</i>	Groundsel, common	<i>Senecio vulgaris</i>
Bluegrass, annual	<i>Poa annua</i>	Horseweed/marestail	<i>Coryza canadensis</i>
Brackenfern	<i>Pteridium aquilinum</i>	Orchardgrass*	<i>Dactylis glomerata</i>
Bromegrass	<i>Bromus spp</i>	Panicums	<i>Panicum spp</i>
Carrot, wild	<i>Daucus carota</i>	Pinegrass	<i>Calamagrostis rubescens</i>
Crabgrass*	<i>Digitaria spp</i>	Ragweed, common	<i>Ambrosia elatior</i>
Daisy, oxeye	<i>Chrysanthemum leucanthemum</i>	Ryegrass, Italian (annual)	<i>Lolium multiflorum</i>
Dandelion, common*	<i>Taraxacum officinale</i>	Ryegrass, perennial*	<i>Lolium perenne</i>
Dandelion, false* (spotted catsear)	<i>Hypochoeris radicata</i>	Smartweed, Pennsylvania	<i>Polygonum pennsylvanicum</i>
Dock, curly*	<i>Rumex crispus</i>	Squawcarpet	<i>Ceanothus prostratus</i>
Fescue*	<i>Festuca spp</i>	Velvetgrass, common	<i>Holcus lanatus</i>
Fireweed*(willowweed)	<i>Epilobium angustifolium</i>		

\* Suppression – a visible reduction in plant population and/or plant vigor as compared to an untreated area and generally not accepted as control.

### FORESTRY

#### IMPREGNATION ON DRY BULK FERTILIZER

DuPont™ VELPAR® DF is labeled for impregnating or coating dry bulk fertilizer to be applied on forested sites for the establishment or release of conifer plantations (except longleaf pine) as specified on this label.

#### PLANTS CONTROLLED

Fertilizer impregnated with VELPAR® DF is labeled for the control and suppression of the weeds and brush identified for the specific applications on this label. Consult the appropriate segment of this label to determine the appropriate rate of VELPAR® DF to be applied per acre. Apply this amount of VELPAR® DF to the volume of fertilizer to be applied per acre.

#### IMPREGNATION EQUIPMENT

To impregnate or coat the fertilizer use a system consisting of conveyor or closed drum used to blend dry bulk fertilizer.

#### IMPREGNATION INSTRUCTIONS

To impregnate dry bulk fertilizer with VELPAR® DF, mix the amount as prescribed above in a sufficient quantity of water to uniformly coat the desired amount of fertilizer. Suspensions of VELPAR® DF will require thorough agitation.

Direct the spray nozzles of the impregnation equipment to deliver a fine spray of the mixture toward the fertilizer for thorough coverage while avoiding contact with mixing equipment. The use of a spray pattern indicator may be beneficial to visually determine the uniformity of impregnation.

Uniform impregnation of dry bulk fertilizer may vary. If absorption of the spray is not adequate, the use of an absorptive powder or additive, such as "Microcel E" or "HiSil 233", may be required to produce a dry, free flowing mixture.

Apply the fertilizer as soon as possible after impregnation for optimum performance. Impregnated fertilizer may become lumpy and difficult to apply following storage.

Diammonium phosphate, potassium chloride, 16-16-16 and 24-4-4 have been successfully impregnated.

#### APPLICATION EQUIPMENT

Applications of impregnated fertilizer may be made by ground equipment or by air (helicopter or fixed wing). Accurate calibration and patterning of the equipment is essential for uniform distribution of the impregnated fertilizer on the soil surface.

### USE PRECAUTIONS AND RESTRICTIONS

#### FORESTRY - IMPREGNATED FERTILIZER

- If fertilizer materials are excessively dusty, use a suitable additive to reduce dust prior to impregnation. Application of dusty fertilizer which has been impregnated may result in off-target drift and injury to desirable vegetation. Such drift and associated injury may be aggravated by high wind conditions.
- The dry fertilizer must be properly impregnated and uniformly applied to avoid pine injury/mortality and poor weed and brush control.
- Uniform and precise application of the impregnated fertilizer is essential for satisfactory weed and brush control and to minimize pine injury. Overlaps or skips between adjoining swaths or non-uniform distribution of impregnated fertilizer within the swath will deliver poor results and may result in pine injury or mortality.
- Do not impregnate potassium nitrate, sodium nitrate or triple super phosphate fertilizers with VELPAR® DF as herbicidal action will be lost.

### USE PRECAUTIONS AND RESTRICTIONS

#### FORESTRY

#### 8 - 10 2/3 Lb/Acre

Aster, heath	<i>Aster ericoides</i>	Fingergrass	<i>Digitaria ciliaris</i>
Bahiagrass*	<i>Paspalum notatum</i>	Foxtail	<i>Setaria spp</i>
Bermudagrass*	<i>Cynodon dactylon</i>	Guineagrass	<i>Panicum maximum</i>
Blackberry	<i>Rubus spp</i>	Honeysuckle	<i>Lonicera spp</i>
Bluegrass	<i>Poa spp</i>	Horseweed/marestail	<i>Coryza canadensis</i>
Broomsedge	<i>Andropogon virginicus</i>	Lantana	<i>Lantana camara</i>
Camphorweed	<i>Heterotheca subaxillaris</i>	Lettuce, prickly	<i>Lactuca scariola</i>
Canada thistle*	<i>Cirsium arvense</i>	Natalgrass (red top)	<i>Rhynchosytrum repens</i>
Carrot, wild	<i>Daucus carota</i>	Plantain	<i>Plantago spp</i>
Chickweed	<i>Stellaria media</i>	Ragweed, common	<i>Ambrosia elatior</i>
Clovers	<i>Trifolium spp</i>	Smutgrass**	<i>Sporobolus indicus</i>
Dewberry	<i>Rubus trivialis</i>	Spanishneedles	<i>Bidens bipinnata</i>
Dogfennel	<i>Eupatorium capillifolium</i>	Vaseygrass	<i>Paspalum urvillei</i>
Fescue*	<i>Festuca spp</i>		

\* Suppression – a visible reduction in plant population and/or plant vigor as compared to an untreated area and generally not accepted as control.

\*\* Suppression may result with some of the giant (larger) smutgrass species.

### SPECIFIC WEED PROBLEMS

**Control of Canada Thistle in Crown Vetch** - DuPont™ VELPAR® DF is labeled for control of Canada thistle in established stands of crown vetch on noncrop sites. Make a single application of 1 - 1 2/3 lb of VELPAR® DF from late spring through mid-summer, when thistle is actively growing prior to flowering. Do not use a surfactant. Some discoloration of the crown vetch foliage may occur after application.

### SPRAY EQUIPMENT

Apply VELPAR® DF uniformly over the desired area using ground equipment or helicopter. Do not apply more than 8 lbs per acre by air. Use enough water for thorough coverage. For ground application this is usually a minimum of 25 gallons per acre. Higher application volumes may be needed to obtain uniform application with handgun equipment. For aerial applications (helicopter only) this is usually a minimum of 5 gallons per acre. Higher volumes of water may be needed when water temperatures are cold or the higher rates of VELPAR® DF are used.

### NON-CROP BRUSH CONTROL

VELPAR® DF is labeled for the control of undesirable brush in non-crop sites.

### APPLICATION INFORMATION

Apply VELPAR® DF from late winter through summer, prebud break until new growth hardens off. In areas where the soil remains frozen during the winter and spring rains are usually inadequate for soil activation, a fall or winter treatment may be applied before the soil freezes.

#### BROADCAST

Apply 5 1/3 to 10 2/3 lb of VELPAR® DF per acre as a coarse spray by ground equipment or 5 1/3 to 8 lb per acre by air (helicopter only). Use enough water for thorough coverage. For ground equipment, usually a minimum of 25 gallons per acre. For aerial equipment, usually a minimum of 10 gallons per acre. Higher volumes of water may be needed when water temperatures are cold or the higher rates of VELPAR® DF are used.

### BASAL (SOIL)

#### SINGLE STEM TREATMENT

Mix 2 2/3 pounds of VELPAR® DF with sufficient water to make one gallon of suspension and thoroughly agitate. Apply the VELPAR® DF suspension with an exact-delivery handgun applicator. This equipment delivers a thin stream of predetermined volume when triggered. Apply the VELPAR® DF suspension at the rate of 2 to 4 ml for each inch of stem diameter at breast height.

Direct the treatment to the soil within 3 feet of the root collar of woody plants to be controlled. For multi-stemmed and low-growing brush that have stem diameters that are difficult to determine, apply the VELPAR® DF suspension at the rate of 2 to 4 ml per 3 feet of canopy width. For tall, slender (columnar) brush types, apply 4 to 8 ml per 3 feet of height. Base the rate on whichever canopy dimension is greater (width or height).

When treating brush that requires more than a single delivery of the VELPAR® DF suspension, apply subsequent deliveries equally spaced around the target plant. If treating brush on sloping sites, apply most of the suspension on the uphill side of the stem. If treating resprouts from brush disturbed by cutting or other mechanical methods, the rate of application must be proportional to the original tree size, not just the size of sprout regrowth.

**LACING/S TREAKING** - Mix VELPAR® DF with water to form a concentrated suspension. Apply 5 1/3 to 10 2/3 lbs of VELPAR® DF per acre. Adjust the application equipment to deliver a narrow or straight stream spray pattern such that the swath width on the soil surface is 6 to 12 inches wide. Direct the spray at the base of the brush. Swaths or treated bands must be 2 to 4 feet apart. Apply the lower volumes for coarse textured soils or soils with low organic matter and the higher volumes for fine textured soils or soils with high organic matter.

### USE RATES

VELPAR® DF is labeled for the control or suppression of the following species in non-crop sites. Use lower rate on coarse-textured soils (sand to sandy loam). Use the higher rate on fine-textured soils (clay loam to clay) and on soils high in organic matter.

#### 5 1/3 to 10 2/3 Lb/Acre

Alder	<i>Alnus spp</i>	Manzanita, Greenleaf	<i>Arctostaphylos patula</i>
Ash	<i>Fraxinus spp</i>	Maple, red	<i>Acer rubrum</i>
Aspen	<i>Populus spp</i>	Mesquite	<i>Prosopis glandulosa</i>
Birch	<i>Betula spp</i>	Mulberry	<i>Morus spp</i>
Blackgum	<i>Nyssa sylvatica</i>	Oaks	<i>Quercus spp</i>
Bay, sweet	<i>Magnolia virginiana</i>	Osage-orange	<i>Maclura pomifera</i>
Catclaw acacia	<i>Acacia greggii</i>	Persimmon	<i>Diospyros spp</i>
Cedar, Eastern red	<i>Juniperus virginiana</i>	Plum, wild	<i>Prunus munsoniana</i>
Cherry, black	<i>Prunus serotina</i>	Poplar, balsam	<i>Populus balsamifera</i>
Chinaberry*	<i>Melia azedarach</i>	Poplar, yellow	<i>Liriodendron tulipifera</i>
Deerbrush	<i>Ceanothus integerrimus</i>	Privet	<i>Ligustrum spp</i>
Dogwood, flowering*	<i>Cornus florida</i>	Rose, multiflora	<i>Rosa multiflora</i>
Elm, American	<i>Ulmus Americana</i>	Sassafras*	<i>Sassafras albidum</i>
Elm, Chinese	<i>Ulmus parvifolia</i>	Soapweed, small (yucca)	<i>Yucca glauca</i>
Hackberry, common	<i>Celtis occidentalis</i>	Snowbrush (varnishleaf)	<i>Ceanothus velutinus</i>
Hawthorn	<i>Crataegus spp</i>	Sourwood	<i>Oxydendrum arboreum</i>
Hazel	<i>Corylus spp</i>	Sumac	<i>Rhus spp</i>
Hickory	<i>Carya spp</i>	Sweetgum	<i>Liquidambar spp</i>
Huisache	<i>Acacia farnesiana</i>	Tallow, Chinese	<i>Sapium sebiferum</i>
Juniper	<i>Juniperus spp</i>	Waxmyrtle	<i>Myrica cerifera</i>
Locust	<i>Robinia spp</i>	Whitebrush	<i>Aloysia gratissima</i>
Lotebush	<i>Ziziphus obtusifolia</i>	Willow	<i>Salix spp</i>

\* Suppression – a visible reduction in plant population and/or plant vigor as compared to an untreated area and generally not accepted as control.

### INDUSTRIAL TURFGRASS

DuPont™ VELPAR® DF is labeled for selective weed control in established stands of bermudagrass and/or bahiagrass in noncrop areas.

### APPLICATION TIMING

Rescue* Fireweed*(willowweed) Flabane	<i>Festuca spp</i> <i>Epilobium angustifolium</i> <i>Coryza spp</i>	Histle, Canada* Velvetgrass, common	<i>Cirsium arvense</i> <i>Holcus lanatus</i>
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\*\* For western US site preparation, apply at 4 pounds per acre.

WOODY PLANTS			
Ash	<i>Fraxinus spp</i>	Hickory	<i>Carya spp</i>
Aspen, big tooth	<i>Populus grandidentata</i>	Honeysuckle*	<i>Lonicera spp</i>
Aspen, trembling	<i>Populus tremuloides</i>	Manzanita, Greenleaf	<i>Arctostaphylos patula</i>
Birch	<i>Betula spp</i>	Maple, red*	<i>Acer rubrum</i>
Blackgum	<i>Nyssa sylvatica</i>	Oaks	<i>Quercus spp</i>
Cherry, black	<i>Prunus serotina</i>	Poplar, balsam	<i>Populus balsamifera</i>
Deerbrush	<i>Ceanothus velutinus</i>	Snowbrush (varnishleaf)	<i>Ceanothus velutinus</i>
Dogwood, flowering*	<i>Cornus florida</i>	Sweetwood*	<i>Oxydendrum arboretum</i>
Em	<i>Ulmus spp</i>	Sweetgum	<i>Liquidambar spp</i>
Hawthorn	<i>Crataegus spp</i>	Willows	<i>Salix spp</i>
Hazel	<i>Corylus spp</i>		
* Suppression is a visible reduction in plant competition (reduced population and/or vigor) as compared to an untreated area. Degree of suppression will vary with rate applied, size of plants at application and environmental conditions following treatment. Species indicated above, especially resprouts of these species, may require a follow up treatment for acceptable control. Burning, as a follow up treatment, will enhance control of resprouts.			

Within several weeks after VELPAR® DF activation by rainfall, affected vegetation may be burned, if desired. This burn may further enhance control of vegetation. Burn the vegetation only after any residual stand is completely defoliated, at least twice, allowing for sufficient root uptake of VELPAR® DF. In the West, results may take one to two years in areas of low rainfall.

## SPRAY EQUIPMENT

When applied as a liquid spray using water as the carrier, VELPAR® DF may be applied by ground equipment or by air (helicopter only).

For ground application, use enough water for thorough coverage, usually a minimum of 25 gallons per acre. For aerial applications, use at least 5 gallons of water per acre.

## GRID APPLICATION

Mix 2 2/3 pounds of VELPAR® DF with sufficient water to make one gallon of suspension and thoroughly agitate. Intermittent agitation may be required to maintain the VELPAR® DF in suspension.

Apply the VELPAR® DF suspension directly to the soil surface in a grid pattern using an exact delivery handgun applicator. This equipment delivers a thin stream of predetermined volume. VELPAR® DF must be applied during the period from hardwood bud break to early summer.

Application rate and grid pattern will depend on soil texture and woody plant composition. Use the lower rates on coarse textured soils and when the major component of the hardwoods are susceptible species. Use the high rates on fine-textured soils and where weeds identified in this label as “partial control or suppression” predominate.

Application Patterns and Rates For VELPAR® DF Suspension			
	ML/Spot	Grid (Ft)	Lb/Acre
<b>Coarse</b>	0.6	3 X 3	2
	2.0	4 X 4	4
	3.1	4 X 6	4
<b>Medium/Fine</b>	1.6	3 X 3	5.3
	2.8	4 X 4	5.3
	3.5	4 X 4	6.6
		4 X 4	6.6
		4 X 6	6.6

## BASAL (SOIL)

## SINGLE STEM TREATMENTS

Mix 2 2/3 pounds of VELPAR® DF with sufficient water to make one gallon of suspension and thoroughly agitate. Apply the VELPAR® DF suspension with an exact-delivery handgun applicator. This equipment delivers a thin stream of predetermined volume when triggered. Apply the VELPAR® DF suspension at the rate of 2 to 4 ml for each inch of stem diameter at breast height. Direct the treatment to the soil within 3 feet of the root collar of woody plants to be controlled.

For multi-stemmed and low-growing brush that have stem diameters that are difficult to determine, apply the VELPAR® DF suspension at the rate of 2 to 4 ml per 3 feet of canopy width. For tall, slender (columnar) brush types, apply 4 to 8 ml per 3 feet of height. Base the rate on whichever canopy dimension is greater (width or height). Apply the lower volumes for coarse textured soils or soils with low organic matter soils and the higher volumes for fine textured soils or soils with high organic matter. When treating brush that requires more than a single delivery of the DuPont™ VELPAR® DF suspension, apply subsequent deliveries equally spaced around the target plant. If treating brush on sloping sites, apply most of the suspension on the uphill side of the stem. If treating resprouts from brush disturbed by cutting or other mechanical methods, the rate of application must be proportional to the original tree size, not just the size of sprout regrowth.

## USE PRECAUTIONS AND RESTRICTIONS

## SITE PREPARATION

- Where burning is desired, burn the vegetation only after any residual brush has completely defoliated, at least twice, allowing for sufficient root uptake of VELPAR® DF.
- Following harvest, allow sufficient time for stumps and injured trees to adequately resprout before applying VELPAR® DF.

# FORESTRY – RELEASE

VELPAR® DF is labeled for conifer release where the following species are grown:

## EASTERN US AND LAKE STATES

Fir, balsam	<i>Abies balsamea</i>	Pine, Virginia	<i>Pinus virginiana</i>
Pine, loblolly	<i>Pinus taeda</i>	Spruce, black	<i>Picea mariana</i>
Pine, longleaf	<i>Pinus palustris</i>	Spruce, Norway	<i>Picea abies</i>
Pine, red	<i>Pinus resinosa</i>	Spruce, white	<i>Picea rubens</i>
Pine, shortleaf	<i>Pinus echinata</i>		<i>Picea glauca</i>
Pine, slash	<i>Pinus elliotii</i>		

## WESTERN US

Fir, Douglas	<i>Pseudotsuga menziesii</i>	Pine, lodgepole	<i>Pinus contorta</i>
Fir, grand	<i>Abies grandis</i>	Pine, ponderosa	<i>Pinus ponderosa</i>
Fir, Noble	<i>Abies procera</i>	Spruce, blue	<i>Picea pungens</i>
Fir, white	<i>Abies concolor</i>	Spruce, Englemann	<i>Picea engelmannii</i>
Hemlock,Western	<i>Tsuga heterophylla</i>	Spruce, Sitka	<i>Picea sitchensis</i>
Pine, Jeffrey	<i>Pinus jeffreyi</i>		

## APPLICATION INFORMATION

### EASTERN US

Apply VELPAR® DF from early spring to early summer after hardwoods have broken bud and before full leaf expansion.

Applications made over the top of pines may result in excessive pine injury under conditions of high humidity and temperature (80 degrees F).

### WESTERN US

**Rainbell** (areas of high spring rainfall): For best results, apply in late winter or spring when brush is actively growing, but prior to conifer bud-break. Dominant trees are less susceptible to injury. Applications where the spray comes into direct contact with conifers after dormancy break in the spring or before the final resting bud has hardened in the fall may severely injure or kill the trees.

**Snowbell** (areas of low spring rainfall): For best results, apply in the fall before soil freezes and after the final resting bud has hardened on the conifers. Or, spring applications may be made after snow cover melts in anticipation of rainfall prior to conifer budbreak. Brush control results from spring treatments will be dependent on sufficient rainfall following application to activate VELPAR® DF.

## USE RATES

The rates listed below are for broadcast application. Do not use more than one application of VELPAR® DF per year. Use the higher rate range for the harder to control\* (suppression) species in the PLANTS CONTROLLED listings of the Site Prep and Release sections.

EASTERN US			
Crop Species	Soil Description	VELPAR® DF (Lb/Acre)	Established Trees

<sup>and may result in pine injury or mortality.</sup>

- Do not impregnate potassium nitrate, sodium nitrate or triple super phosphate fertilizers with VELPAR® DF as herbicidal action will be lost.

## USE PRECAUTIONS AND RESTRICTIONS

## FORESTRY

- Do not use VELPAR® DF in nurseries, seedbeds, or ornamental plantings.
- On tracts of land where various soil types are present and VELPAR® DF rate selection is difficult, conifer damage or less-than-expected vegetation suppression may occur due to the different rates required for various soil types.
- Poor weed and brush control may result from the following:
  - Heavy duff or slash present at time of application
  - Use on poorly drained sites
  - Applications made when the soil is saturated with water and rain is imminent within 24 hours
  - Applications to soils high in organic matter (greater than 5%)
- Following harvest, allow stumps and injured trees sufficient time to adequately resprout before applying VELPAR® DF.
- Where burning is desired, burn vegetation after any brush has completely defoliated, at least twice, allowing for sufficient root uptake of VELPAR® DF.
- Do not use VELPAR® DF on frozen soils; use in spring after snow melt.
- Do not add a surfactant in applications over the top of conifers.
- Weed control results from spring applications depend on sufficient moisture to activate VELPAR® DF.
- When applying VELPAR® DF after transplanting, wait until rainfall has settled the soil around the base and root systems of the transplants before making the treatment.
- Crop injury may occur when VELPAR® DF is used:
  - On trees that show poor vigor, insect damage, disease, winter injury, or other stress conditions
  - On any soil containing less than 1% organic matter
  - On loamy sand or sandy loam with less than 2% organic matter, except Jeffrey pine and Ponderosa pine
  - On conifer foliage after conifer bud break
  - On gravelly or rocky soils, exposed subsoils, clay knobs, sand, or sandy soil with 85% or more sand.
- Livestock may be grazed immediately following a broadcast application of DuPont™ VELPAR® DF at rates of 1.5 pounds per acre or less, and treated vegetation may be cut, dried, and fed after 38 days.
- Do not cut treated vegetation for feed, or graze livestock on treated areas for 60 days following application of VELPAR® DF at broadcast rates exceeding 1.5 pounds per acre.

## YELLOW POPLAR PLANTINGS

VELPAR® DF is labeled for the control of herbaceous weeds in the establishment of yellow poplar plantations. Applications may be made over the top of planted seedlings after the soil has settled around the root systems but before the seedlings have broken dormancy (bud break). A subsequent application may be made before dormancy break in the Spring of the second year. USE RATES: Use the rate range specified in the "RELEASE- HERBACEOUS WEED CONTROL" section for pine plantations - eastern US.

For ground application, use sufficient spray volume for uniform and thorough coverage of the site to be sprayed, usually a minimum of 25 gallons per acre. For aerial applications, use a minimum of 5 gallons of water per acre. For broader spectrum control VELPAR® DF may be tank mixed with DuPont™ ESCORT® XP herbicide. Add ESCORT® XP at a rate of 1/2 ounce per acre with the prescribed rate of VELPAR® DF.

## USE PRECAUTIONS AND RESTRICTIONS

## YELLOW POPLAR PLANTINGS

- Applications of VELPAR® DF and tank mixes of VELPAR® DF and DuPont™ ESCORT® XP made to yellow poplar seedlings that are suffering from loss of vigor caused by insects, disease, drought, winter damage, animal damage, excessive soil moisture, planting shock or other stresses may injure or kill the seedlings.
- Applications of VELPAR® DF and tank mixes of VELPAR® DF and ESCORT® XP must only be made after adequate rainfall has closed the planting slit and settled the soil around the roots following transplanting.
- The use of surfactant with VELPAR® DF is not advised for applications made over the tops of seedlings.
- Careful consideration must be given by an experienced and knowledgeable forester to ensure the specific growth requirements of yellow poplar will be provided by the selected planting site. Treatment of yellow poplar planted on a site inadequate to meet its requirements may injure or kill the seedlings.

## PASTURE / RANGELAND

VELPAR® DF is labeled for control of brush and weeds in pasture.

## BERMUDAGRASS / BAHIAGRASS

VELPAR® DF is labeled for control of smutgrass and other weeds in established stands of bermudagrass and bahiagrass.

### APPLICATION INFORMATION

Make a single application of VELPAR® DF per year when weeds are actively growing.

### WEEDS CONTROLLED - USE RATES

VELPAR® DF effectively controls the following weeds at the rates shown in pastures. Use a lower rate on coarse-textured soils (sand to sandy loam). Use the higher rate on fine-textured soils (clay loam to clay) and on soils high in organic matter.

9/10 - 1 1/2 Lb/Acre			
Barley, little	<i>Hordeum pusillum</i>	Oxalis	<i>Oxalis spp</i>
Barnyardgrass	<i>Echinochloa crus-galli</i>	Passionflower, maypop	<i>Passiflora incarnate</i>
Dogfennel	<i>Eupatorium capillifolium</i>	Pepperweed, Virginia	<i>Lepidium virginicum</i>
Fescue	<i>Festuca spp</i>	Pigweed	<i>Amaranthus spp</i>
Lespedeza	<i>Lespedeza cuneata</i>	Smutgrass*	<i>Sporobolus indicus</i>

\* Suppression may result with some of the giant (larger) smutgrass species.

Suppression – a visible reduction in plant population and/or plant vigor as compared to an untreated area and generally not accepted as control.

### SPRAY EQUIPMENT

Apply VELPAR® DF uniformly over the desired area using ground equipment only.

For ground application, use enough water for thorough coverage usually a minimum of 25 gallons per acre. The use of a surfactant may increase the potential for bermudagrass or bahiagrass injury.

### USE PRECAUTIONS AND RESTRICTIONS

#### BERMUDAGRASS/BAHIAGRASS

- For bermudagrass that may be grown in the states of ID, OR,UT or WA, determine the suitability of using VELPAR® DF by treating a small area at a labeled application rate prior to treating larger areas. The smaller treated area must be observed for any signs of herbicidal injury during 60 days of normal growing conditions to determine if the treatment is safe to bermudagrass. If this evaluation is not completed prior to use, the user assumes the responsibility for any plant damage or other liability resulting from the use of VELPAR® DF on bermudagrass.
- Use VELPAR® DF only in stands of bermudagrass and bahiagrass established for at least one year. Do not treat newly sprigged or sodded areas.
- Some temporary discoloration of the bermudagrass or bahiagrass may occur after application.
- Treatment of mixed pastures containing forage species other than bermudagrass or bahiagrass may result in injury or mortality to the other forage species.
- Injury may result when desirable grasses are under stress from drought, insects, disease, cold temperature, or poor fertility.
- Injury to or loss of desirable trees or other plants may result if VELPAR® DF is applied or if equipment is drained or flushed on or near desirable trees or other plants, on areas where their roots may extend, or in locations where the chemical may be washed or moved into contact with their roots.
- Severe crop injury may occur if applications are made on gravelly or rocky soils, thinly covered subsoils, or soils with less than 1% organic matter.
- Livestock may be grazed immediately following a broadcast application of DuPont™ VELPAR® DF at rates of 1.5 pounds per acre or less, and treated vegetation may be cut, dried, and fed after 38 days.

## PASTURE/RANGELAND

### BRUSH CONTROL

VELPAR® DF may be used either broadcast or as a basal-soil treatment for the control of undesirable brush in pasture or rangeland.

### APPLICATION INFORMATION

Apply VELPAR® DF from late winter through summer, pre-budbreak until new growth hardens off.

In areas where the soil remains frozen during the winter and spring rains are usually inadequate for soil activation, a fall or winter treatment may be applied before the soil freezes.

For broadcast rates needed to control the species below, see the **Foresbry - Release, Use Rates** section.

### BRUSH CONTROLLED

VELPAR® DF is labeled for the control or suppression of the following brush species in pasture and rangeland:

Alder	<i>Alnus spp</i>	Manzanita, Greenleaf	<i>Arctostaphylos patula</i>
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# INDUSTRIAL TURFGRASS

DuPont™ VELPAR® DF is labeled for selective weed control in established stands of bermudagrass and/or bahiagrass in noncrop areas.

## APPLICATION TIMING

Make a single application of VELPAR® DF per year when weeds are actively growing.

## WEEDS CONTROLLED - USE RATE

VELPAR® DF effectively controls the following weeds at the rates shown in industrial turf (unimproved only). Use a lower rate on coarse-textured soils (sand to sandy loam). Use the higher rate on fine-textured soils (clay loam to clay) and on soils high in organic matter.

9/10 - 1 1/2 Lb/Acre			
Barley, little	<i>Hordeum pusillum</i>	Passionflower, maypop	<i>Passiflora incarnate</i>
Barnyardgrass	<i>Echinochloa crus-galli</i>	Pepperweed, Virginia	<i>Lepidium virginicum</i>
Dogfennel	<i>Eupatorium capillifolium</i>	Pigweed	<i>Amaranthus spp</i>
Fescue	<i>Festuca spp</i>	Smutgrass*	<i>Sporobolus indicus</i>
Lespedeza	<i>Lespedeza cuneata</i>		
Oxalis	<i>Oxalis spp</i>		

\* Suppression may result with some of the giant (larger) smutgrass species.

Suppression – a visible reduction in plant population and/or plant vigor as compared to an untreated area and generally not accepted as control.

## SPRAY EQUIPMENT

Apply VELPAR® DF uniformly over the desired area using ground equipment only.

For ground application, use enough water for thorough coverage usually a minimum of 25 gallons per acre. The use of a surfactant is not advised.

## USE PRECAUTIONS AND RESTRICTIONS

### ALL NON-CROP SITES

- For bermudagrass that may be grown in the states of ID, OR, UT or WA, determine the suitability of using VELPAR® DF by treating a small area at a labeled application rate prior to treating larger areas. The smaller treated area must be observed for any signs of herbicidal injury during 60 days of normal growing conditions to determine if the treatment is safe to bermudagrass. If this evaluation is not completed prior to use, the user assumes the responsibility for any plant damage or other liability resulting from the use of VELPAR® DF on bermudagrass.
- Injury to or loss of desirable trees or other plants may result if VELPAR® DF is applied or if equipment is drained or flushed on or near desirable trees or other plants, on areas where their roots may extend, or in locations where the chemical may be washed or moved into contact with their roots.
- Application spray drift may injure desirable plants.
- Poor weed and brush control may result from the following:
  - Use on poorly drained sites
  - Applications made when the soil is saturated with water and rain is imminent within 24 hours.
  - Applications to soils high in organic matter (greater than 5%).
- Following mechanical cutting or clearing, allow stumps and injured trees sufficient time to adequately resprout before applying VELPAR® DF.
- Do not use VELPAR® DF on frozen soils.
- Leave treated soil undisturbed to reduce the potential for VELPAR® DF movement by soil erosion due to wind or water.
- Do not use VELPAR® DF on lawns, driveways, tennis courts, or other residential or recreational areas.
- Weed and brush control results from spring applications depend on sufficient moisture to activate DuPont™ VELPAR® DF.
- Livestock may be grazed immediately following a broadcast application of VELPAR® DF at rates of 1.5 pounds per acre or less, and treated vegetation may be cut, dried, and fed after 38 days.
- Do not cut treated vegetation for feed, or graze livestock on treated areas for 60 days following application of VELPAR® DF at broadcast rates greater than 1.5 pounds and up to 8 pounds per acre.
- For VELPAR® DF rates above 8 pounds per acre, do not cut treated vegetation for forage or hay nor graze domestic animals for 1 year following application.
- There are no grazing or haying restrictions for the directed basal-soil applications of VELPAR® DF.
- Use VELPAR® DF only in stands of bermudagrass and bahiagrass turfgrasses established for at least one year. Do not treat newly sprigged or sodded areas.
- Some discoloration of the bermudagrass or bahiagrass turfgrasses may occur after application.
- Injury may result when desirable turfgrasses are under stress from drought, insects, disease, cold temperature, or poor fertility.
- Severe turfgrass injury may occur if applications are made on gravelly or rocky soils, thinly covered subsoils, or soils with less than 1% organic matter.

# ADDITIONAL INSTRUCTIONS, PRECAUTIONS, AND RESTRICTIONS FOR AGRICULTURAL AND NON-AGRICULTURAL USES

## SPRAY TANK CLEAN OUT

Thoroughly clean all traces of VELPAR® DF from application equipment immediately after use. Flush the tank, pump, hoses, and boom with several changes of water after removing nozzle tips and screens (clean these parts separately). Dispose of the equipment wash water by applying it to a use-site listed on this label.

## SPRAY DRIFT MANAGEMENT

The interaction of many equipment and weather-related factors determines the potential for spray drift. The applicator is responsible for considering all these factors when making application decisions. Avoiding spray drift is the responsibility of the applicator.

### IMPORTANCE OF DROPLET SIZE

The most effective drift management strategy is to apply the largest droplets which are consistent with pest control objectives. The presence of sensitive species nearby, the environmental conditions, and pest pressure may affect how an applicator balances drift control and coverage. Applying larger droplets reduces drift potential, but will not prevent drift if applications are made improperly or under unfavorable environmental conditions. A droplet size classification system describes the range of droplet sizes produced by spray nozzles. The American Society of Agricultural and Biological Engineers (ASABE) provide a Standard that describes droplet size spectrum categories defined by a number of reference nozzles (fine, coarse, etc.). Droplet spectra resulting from the use of a specific nozzle may also be described in terms of volume mean diameter (VMD). Coarser droplet size spectra have larger VMD's and lower drift potential.

### CONTROLLING DROPLET SIZE - GROUND APPLICATION

- Nozzle Type** - Select a nozzle type that is designed for the intended application. With most nozzle types, narrower spray angles produce larger droplets. The use of low-drift nozzles will reduce drift potential.
- Pressure** - The lowest spray pressures recommended for the nozzle produce the largest droplets. Higher pressure reduces droplet size and does not improve canopy penetration. When higher flow rates are needed, using a higher-capacity nozzle instead of increasing pressure results in the coarsest droplet spectrum.
- Flow Rate/Orifice Size** - Using the highest flow rate nozzles (largest orifice) that are consistent with pest control objectives reduces the potential for spray drift. Nozzles with higher rated flows produce coarser droplet spectra.

### CONTROLLING DROPLET SIZE – AIRCRAFT

- Nozzle Type** - Solid stream, or other low drift nozzles produce the coarsest droplet spectra.
- Number of Nozzles** - Using the minimum number of nozzles with the highest flow rate that provide uniform coverage will produce a coarser droplet spectrum.
- Nozzle Orientation** - Orienting nozzles in a manner that minimizes the effects of air shear will produce the coarsest droplet spectra. For some nozzles such as solid stream, pointing the nozzles straight back parallel to the airstream will produce a coarser droplet spectrum than other orientations.
- Pressure** – Selecting the pressure that produces the coarsest droplet spectrum for a particular nozzle and airspeed reduces spray drift potential. For some nozzle types such as solid streams, lower pressures can produce finer droplet spectra and increase drift potential.

### BOOM LENGTH (AIRCRAFT), AND APPLICATION HEIGHT

- Boom Length (aircraft)** - Using shorter booms decreases drift potential. Boom lengths are expressed as a percentage of an aircraft's wingspan or a helicopter's rotor blade diameter. Shorter boom length and proper positioning can minimize drift caused by wingtip or rotor vortices.
- Application Height (aircraft)** - Applications made at the lowest height that are consistent with pest control objectives and the safe operation of the aircraft will reduce the potential for spray drift.
- Application Height (ground)** - Applications made at the lowest height consistent with pest control objectives, and that allow the applicator to keep the boom level with the application site and minimize bounce, will reduce the exposure of spray droplets to evaporation and wind, and reduce spray drift potential.

### WIND

Drift potential is lowest when applications are made in light to gentle sustained winds (2-10 mph), which are blowing in a constant direction. Many factors, including droplet size and equipment type also determine drift potential at any given wind speed. AVOID GUSTY OR WINDLESS CONDITIONS. Local terrain can also influence wind patterns. Every applicator is expected to be familiar with local wind patterns and how they affect spray drift.

### TEMPERATURE AND HUMIDITY

Setting up equipment to produce larger droplets to compensate for droplet evaporation can reduce spray drift potential. Droplet evaporation is most severe when conditions are both hot and dry.

### SURFACE TEMPERATURE INVERSIONS

Drift potential is high during a surface temperature inversion. Surface inversions restrict vertical air mixing, which may cause small suspended droplets to

The rates listed below are for broadcast application. Do not use more than one application of VELPAR® DF per year. Use the highest rate range for the harder to control\* (suppression) species in the PLANTS CONTROLLED listings of the Site Prep and Release sections.

#### EASTERN US

Crop Species	Soil Description	VELPAR® DF (Lb/Acre) Established Trees
Loblolly pine	Loamy sand, sandy loam	1 1/3 - 2
Longleaf pine	Loam, silt loam, silt, sandy clay loam	1 1/3 - 2 2/3
Shortleaf pine	Silty clay loam, clay loam, sandy clay, silty clay, clay	3 - 4
Virginia pine	Loamy sand, sandy loam	1 1/3 - 2 2/3
Slash pine	Loam, silt loam, silt, sandy clay loam	2 2/3 - 4
Red pine	Silty clay loam, clay loam, sandy clay, silty clay, clay	4 - 5 1/3

#### Established Trees

- 4 years of age from transplanting on coarse-textured soils
- 3 years of age from transplanting on medium-textured soils
- 2 years of age from transplanting for Red Pine

#### WESTERN US

Application rates by soil type for VELPAR® DF in the following western conifers: Blue spruce, Douglas fir, Englemann spruce, Grand fir, Jeffrey pine, Lodgepole pine, Noble fir, Ponderosa pine, Sitka spruce, Western hemlock and White fir.

Soil Description	DuPont™ VELPAR® DF (Lb/Acre)
Loamy sand, sandy loam	1 1/3 - 3
Loam, silt loam, sandy clay loam	2 2/3 - 4
Silt, silty clay loam, clay loam, sandy clay, silty clay, clay	3 - 4

For first year plantings utilizing bare root stock, treat only transplant stock that is 2 years old (2-0, 1-1) or more, except (1-0) for Ponderosa and Jeffrey pines. Apply VELPAR® DF only if rainfall has settled the soil around the base and root systems of the transplants.

## BRUSH CONTROLLED

VELPAR® DF is labeled for the control or suppression of the following species in conifer release sites:

Ash	<i>Fraxinus spp</i>	Hawthorn	<i>Crataegus spp</i>
Aspen, big tooth	<i>Populus grandidentata</i>	Hazel	<i>Corylus spp</i>
Aspen, trembling	<i>Populus tremuloides</i>	Honeysuckle*	<i>Lonicera spp</i>
Birch	<i>Betula spp</i>	Manzanita, Greenleaf	<i>Arctostaphylos patula</i>
Elder, box	<i>Acer negundo</i>	Maple, red*	<i>Acer rubrum</i>
Brambles	<i>Rubus spp</i>	Oaks	<i>Quercus spp</i>
Cherry, black	<i>Prunus serotina</i>	Poplar, balsam	<i>Populus balsamifera</i>
Cherry, pin	<i>Prunus pensylvanica</i>	Snowbrush (varnishleaf)	<i>Ceanothus velutinus</i>
Deerbrush	<i>Ceanothus integerrimus</i>	Sourwood*	<i>Oxydendrum arboretum</i>
Dogwood, flowering*	<i>Cornus florida</i>	Sweetgum	<i>Liquidambar spp</i>
Elm	<i>Ulmus spp</i>	Willows	<i>Salix spp</i>

\* Suppression – a visible reduction in plant population and/or plant vigor as compared to an untreated area and generally not accepted as control.

In addition to brush controlled, herbaceous species listed in Weeds Controlled section of Release-Herbaceous Weed Control may be controlled with these applications.

## SPRAY EQUIPMENT

When applied as a liquid spray using water as the carrier, VELPAR® DF may be applied by ground equipment or by air (helicopter only).

For ground applications, use sufficient spray volume for thorough and uniform coverage of the site to be treated, usually a minimum of 25 gallons per acre. For aerial applications, use a minimum of 5 gallons per acre.

## GRID APPLICATION

Mix 2 2/3 pounds of VELPAR® DF with sufficient water to make one gallon of suspension and thoroughly agitate. Intermittent agitation may be required to maintain the VELPAR® DF in suspension.

Apply the VELPAR® DF suspension directly to the soil surface in a grid pattern using an exact delivery handgun applicator. This equipment delivers a thin stream of predetermined volume. VELPAR® DF must be applied during the period from hardwood bud break to early summer.

Application rate and grid pattern will depend on soil texture and woody plant composition. Use the lower rates on coarse textured soils and when the major component of the hardwoods are susceptible species. Use the high rates on fine-textured soils and where weeds identified in the label as "partial control or suppression" predominate.

#### Application Patterns and Rates For VELPAR® DF Suspension

	ML/Spot	Grid (Ft)	Lb/Acre
<b>Coarse</b>	0.5	3 X 4	1.3*
	1.2	3 X 6	2
	2.1	4 X 6	2.6
<b>Medium/Fine</b>	1.2	3 X 3	4
	2.3	3 X 6	4
	1.6	3 X 3	5.3
	3.1	3 X 6	5.3

\* Use on deep sands with pines four years or more of age.

## BASAL (SOIL)

### SINGLE STEM TREATMENT

Mix 2 2/3 pounds of VELPAR® DF with sufficient water to make one gallon of suspension and thoroughly agitate. Apply the VELPAR® DF suspension with an exact-delivery handgun applicator. This equipment delivers a thin stream of predetermined volume when triggered. Apply the VELPAR® DF suspension at the rate of 2 to 4 ml for each inch of stem diameter at breast height. Direct the treatment to the soil within 3 feet of the root collar of woody plants to be controlled.

For multi-stemmed and low-growing brush that have stem diameters that are difficult to determine, apply the VELPAR® DF suspension at the rate of 2 to 4 ml per 3 feet of canopy width. For tall, slender (columnar) brush types, apply 4 to 8 ml per 3 feet of height. Base the rate on whichever canopy dimension is greater (width or height). Apply the lower volumes for coarse textured soils or low organic matter soils and the higher volumes for fine textured soils or high organic matter soils.

When treating brush that requires more than a single delivery of the VELPAR® DF suspension, apply subsequent deliveries equally spaced around the target plant. If treating brush on sloping sites, apply most of the suspension on the uphill side of the stem. If treating resprouts from brush disturbed by cutting or other mechanical methods, the rate of application must be proportional to the original tree size, not just the size of sprout regrowth.

## USE PRECAUTIONS AND RESTRICTIONS

### RELEASE - GRID & SINGLE STEM

- Application of DuPont™ VELPAR® DF basal soil spot treatments closer than 36 inches to conifer seedlings in their first season or directly up slope from these seedlings may result in injury or mortality.
- Use VELPAR® DF on seedlings in their first or fourth year and older. Injury may result from use on two and three year old seedlings where root growth is extensive but hardness is lacking.

## RELEASE

### HERBACEOUS WEED CONTROL

VELPAR® DF is labeled for controlling herbaceous weeds where these pine species are grown:

#### EASTERN US

Loblolly pine	Longleaf pine	Slash pine	Red pine
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may be applied before the soil freezes.

For broadcast rates needed to control the species below, see the **Forestry - Release, Use Rates** section.

#### BRUSH CONTROLLED

VELPAR® DF is labeled for the control or suppression of the following brush species in pasture and rangeland:

Alder	<i>Alnus spp</i>	Manzanita, Greenleaf	<i>Arctostaphylos patula</i>
Ash	<i>Fraxinus spp</i>	Maple, red	<i>Acer rubrum</i>
Aspen	<i>Populus spp</i>	Mesquite	<i>Prosopis glandulosa</i>
Birch	<i>Betula spp</i>	Mulberry	<i>Morus spp</i>
Blackgum	<i>Nyssa sylvatica</i>	Oaks	<i>Quercus spp</i>
Bay, sweet	<i>Magnolia virginiana</i>	Osage-orange	<i>Maclura pomifera</i>
Galclaw acacia	<i>Acacia greggii</i>	Parsimmon	<i>Diospyros spp</i>
Cedar, Eastern red	<i>Juniperus virginiana</i>	Plum, wild	<i>Prunus munsoniana</i>
Cherry, black	<i>Prunus serotina</i>	Poplar, balsam	<i>Populus balsamifera</i>
Chinaberry*	<i>Melia azedarach</i>	Poplar, yellow	<i>Liriodendron tulipifera</i>
Deerbrush	<i>Ceanothus integerrimus</i>	Privet	<i>Ligustrum spp</i>
Dogwood, flowering*	<i>Cornus florida</i>	Rose, multiflora	<i>Rosa multiflora</i>
Elm, American	<i>Ulmus americana</i>	Sassafras*	<i>Sassafras albidum</i>
Elm, Chinese	<i>Ulmus parvifolia</i>	Soapweed, small (yucca)	<i>Yucca glauca</i>
Hackberry, common	<i>Celtis occidentalis</i>	Snowbrush (varnishleaf)	<i>Ceanothus velutinus</i>
Hawthorn	<i>Crataegus spp</i>	Sourwood	<i>Oxydendrum arboretum</i>
Hazel	<i>Corylus spp</i>	Sumac	<i>Rhus spp</i>
Hickory	<i>Carya spp</i>	Sweetgum	<i>Liquidambar spp</i>
Huisache	<i>Acacia farnesiana</i>	Tallow, Chinese	<i>Sapium sebiferum</i>
Juniper	<i>Juniperus spp</i>	Waxmyrtle	<i>Myrica cerifera</i>
Locust	<i>Robinia spp</i>	Whitebrush	<i>Aloysia gratissima</i>
Lotebush	<i>Ziziphus obtusifolia</i>	Willow	<i>Salix spp</i>

\* Suppression – a visible reduction in plant population and/or plant vigor as compared to an untreated area and generally not accepted as control.

#### SPRAY EQUIPMENT AND APPLICATION TECHNIQUES

Basal (Soil)-Mix 2 2/3 pounds of VELPAR® DF with sufficient water to make one gallon of suspension and thoroughly agitate. Apply the VELPAR® DF suspension with an exact-delivery handgun applicator. This equipment delivers a thin stream of predetermined volume when triggered. Apply the VELPAR® DF suspension at the rate of 2 to 4 ml for each inch of stem diameter at breast height. Direct the treatment to soil within 3 inches of the root collar of woody plants to be controlled. When treating large stems and when more than one delivery of the VELPAR® DF suspension is needed per stem, make applications on opposite sides of the stem. Do not apply more than 1/3 gallon of the VELPAR® DF suspension per acre per year. Intermittent agitation may be required to maintain the VELPAR® DF in suspension.

## USE PRECAUTIONS AND RESTRICTIONS

### PASTURE/RANGELAND

- Injury to or loss of desirable trees or other plants may result if VELPAR® DF is applied or if equipment is drained or flushed on or near desirable trees or other plants, on areas where their roots may extend, or in locations where the chemical may be washed or moved into contact with their roots.
- Poor weed and brush control may result from the following:
  - Use on poorly drained sites
  - Applications made when the soil is saturated with water and rain is imminent within 24 hours
  - Applications to soils high in organic matter (greater than 5%)
- Following mechanical cutting or clearing, allow stumps and injured trees sufficient time to adequately resprout before applying VELPAR® DF.
- Do not use VELPAR® DF on frozen soils.
- Leave treated soil undisturbed to reduce the potential for VELPAR® DF movement by soil erosion due to wind or water.
- Weed and brush control results depend on sufficient moisture to activate VELPAR® DF.
- When VELPAR® DF is applied as a basal soil treatment, there is no restriction on grazing by domestic animals nor on cutting surrounding vegetation for forage or hay.
- Livestock may be grazed immediately following a broadcast application of VELPAR® DF at rates of 1.5 pounds per acre or less, and treated vegetation may be cut, dried, and fed after 38 days.
- Do not cut treated vegetation for feed, or graze livestock on treated areas for 60 days following application of VELPAR® DF at broadcast rates exceeding 1.5 pounds per acre.

## NON-AGRICULTURAL USES

### 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.

Use on non-crop sites including industrial turfgrasses are not within the scope of the Worker Protection Standard.

When applied as a spray do not enter or allow worker entry into treated areas until sprays have dried.

## APPLICATION INFORMATION

DuPont™ VELPAR® DF is labeled for general weed and brush control as follows: uncultivated nonagricultural areas (such as, airports, highway, railroad and utility right-of-way, sewage disposal areas); uncultivated agricultural areas (non-crop producing, which includes: farmyards, fuel storage areas, fence rows, barrier strips); industrial sites (outdoor, such as, lumberyards, pipeline and tank farms).

## NON-CROP SITES

VELPAR® DF is labeled for control of many annual, biennial, and perennial weeds in non-crop sites.

### APPLICATION INFORMATION

Apply VELPAR® DF as a preemergence or postemergence spray when weeds are actively germinating or growing.

### WEEDS CONTROLLED - USE RATE

VELPAR® DF effectively controls the following weeds when applied at the use rates shown in industrial sites. When applied at lower rates, VELPAR® DF provides short-term control of the weeds listed; when applied at higher rates, weed control is increased and extended. Use lower rate on coarse-textured soils (sand to sandy loam). Use the higher rate on fine-textured soils (clay loam to clay) and on soils high in organic matter.

#### 2 2/3 - 5 2/3 Lb/Acre

Barryardgrass	<i>Echinochloa crus-galli</i>	Lespedeza	<i>Lespedeza cuneata</i>
Bindweed, field*	<i>Convolvulus arvensis</i>	Milkweed, common*	<i>Asclepias syriaca</i>
Bouncingbet*	<i>Saponaria officinalis</i>	Mustard, wild	<i>Sinapis arvensis</i>
Bromegrass	<i>Bromus spp</i>	Nutsedge*	<i>Cyperus spp</i>
Buffalograss*	<i>Buchloe dactyloides</i>	Oats, wild*	<i>Avena fatua</i>
Burdock	<i>Arctium spp</i>	Orchardgrass *	<i>Dactylis glomerata</i>
Cocklebur	<i>Xanthium spp</i>	Orchardgrass (seedling)	<i>Dactylis glomerata</i>
Crabgrass	<i>Digitaria spp</i>	Oxalis	<i>Oxalis spp</i>
Crown vetch	<i>Coronilla varia</i>	Paragrass	<i>Panicum purpurascens</i>
Curly dock*	<i>Rumex crispus</i>	Parship, wild	<i>Pastinaca sativa</i>
Dandelion, common*	<i>Taraxacum officinale</i>	Pigweed	<i>Amaranthus spp</i>
Dandelion, false* (spotted catspaw)	<i>Hypochaeris radicata</i>	Purslane, common	<i>Portulaca oleracea</i>
Dogbane*	<i>Apocynum cannabinum</i>	Quackgrass	<i>Agropyron repens</i>
Fiddleneck, tarweed	<i>Amsinckia lycopsoides</i>	Ryegrass, Italian (annual)	<i>Lolium multiflorum</i>
Filaree	<i>Erodium spp</i>	Smartweed	<i>Polygonum spp</i>
Flaxbane, flax-leaved	<i>Coryza bonariensis</i>	Sourge	<i>Euphorbia spp</i>
Goatsbeard vine (sweet briar)	<i>Arunus sylvester</i>	Star thistle	<i>Centaurea spp</i>
Goldenrod	<i>Solidago spp</i>	Trumpet creeper*	<i>Campsis radicans</i>
Horseweed/marestail	<i>Coryza canadensis</i>		

Use rates listed below are for broadcast application. Do not use more than one application of VELPAR® DF per year. Use the highest rate range for the harder to control\* (suppression) species in the PLANTS CONTROLLED listings of the Site Prep and Release sections.

#### TEMPERATURE AND HUMIDITY

Setting up equipment to produce larger droplets to compensate for droplet evaporation can reduce spray drift potential. Droplet evaporation is most severe when conditions are both hot and dry.

#### SURFACE TEMPERATURE INVERSIONS

Drift potential is high during a surface temperature inversion. Surface inversions restrict vertical air mixing, which may cause small suspended droplets to remain close to the ground and move laterally in a concentrated cloud. Surface inversions are characterized by increasing temperature 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. Mist or fog may indicate the presence of an inversion in humid areas. Inversions may also be identified by producing smoke and observing its behavior. Smoke that remains close to the ground, or moves laterally in a concentrated cloud under low wind conditions indicates a surface inversion. Smoke that moves upward and rapidly dissipates indicates good vertical air mixing.

#### SHIELDED SPRAYERS

Shielding the boom or individual nozzles can reduce the effects of wind. However, it is the responsibility of the applicator to verify that the shields are minimizing drift potential, and not interfering with uniform deposition of the product.

#### AIR ASSISTED (AIR BLAST) FIELD CROP SPRAYERS

Air assisted field crop sprayers carry droplets to the target via a downward directed air stream. Some may reduce the potential for drift, but if a sprayer is unsuitable for the application and/or set up improperly, high drift potential can result. It is the responsibility of the applicator to determine that a sprayer is suitable for the intended application, that it is configured properly, and that drift potential has been minimized.

Note: Air assisted field sprayers can affect product performance by affecting spray coverage and canopy penetration. Read the specific crop use and application equipment instructions to determine if an air assisted field crop sprayer can be used.

#### SENSITIVE AREAS

Making applications when there is a sustained wind moving away from adjacent sensitive areas (e.g., residential areas, bodies of water, known habitat for threatened or endangered species, non-target crops) is an effective way to minimize the effect of spray drift.

#### DRIFT CONTROL ADDITIVES

Using product compatible drift control additives can reduce drift potential. When a drift control additive is used, read and carefully observe cautionary statements and all other information on the additive's label. If using an additive that increases viscosity, ensure that the nozzles and other application equipment will function properly with a viscous spray solution. Preferred drift control additives have been certified by the Chemical Producers and Distributors Association (CPDA).

## STORAGE AND DISPOSAL

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

**Pesticide Storage:** Store product in original container only. Store in a cool, dry place.

**Pesticide Disposal:** Waste resulting from the use of this product may be disposed of on site or at an approved waste disposal facility.

**CONTAINER HANDLING:** Refer to the Net Contents section of this product's labeling for the applicable "Nonrefillable Container" or "Refillable Container" designation.

**Nonrefillable Plastic and Metal Containers (Capacity Equal to or Less Than 50 Pounds):** Nonrefillable container. Do not reuse or refill this container. Triple rinse container (or equivalent) promptly after emptying. Triple rinse as follows: Empty the remaining contents into application equipment or a mix tank. Fill the container 1/4 full with water and recap. Shake for 10 seconds. Pour 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, (a) for Plastic Containers, offer for recycling if available or puncture and dispose of in a sanitary landfill, or by incineration, or, if allowed by state and local authorities, by burning; if burned, stay out of smoke, or (b) for Metal Containers, offer for recycling if available or puncture and dispose of in a sanitary landfill, or by other procedures approved by state and local authorities.

**Nonrefillable Plastic and Metal Containers (Capacity Greater Than 50 Pounds):** Nonrefillable container. Do not reuse or refill this container. Triple rinse container (or equivalent) promptly after emptying. Triple rinse as follows: Empty the remaining contents into application equipment or a mix tank. Fill the container 1/4 full with water. Replace and tighten closures. Tip container on its side and roll it back and forth, ensuring at least one complete revolution, for 30 seconds. Stand the container on its end and tip it back and forth several times. Turn the container over onto its other end and tip it back and forth several times. Empty the rinsate into application equipment or a mix tank or store rinsate for later use or disposal. Repeat this procedure two more times. Then, (a) for Plastic Containers, offer for recycling if available or puncture and dispose of in a sanitary landfill, or by incineration, or, if allowed by state and local authorities, by burning; if burned, stay out of smoke, or (b) for Metal Containers, offer for recycling if available or reconditioning if appropriate or puncture and dispose of in a sanitary landfill, or by other procedures approved by state and local authorities.

**Nonrefillable Plastic and Metal Containers, e.g., Intermediate Bulk Containers (IBC) (Size or Shape Too Large to be Tipped, Refilled or Tamed Upside Down):** Nonrefillable container. Do not reuse or refill this container. Pressure rinse as follows: Empty the remaining product contents into application equipment or a mix tank. Insert pressure rinsing nozzle in the container, and rinse at about 40 PSI for at least 30 seconds. Drain rinsate for 10 seconds after the flow begins to drip. Pour or pump rinsate into application equipment or rinsate collection system. Then, (a) for Plastic Containers, offer for recycling if available or puncture and dispose of in a sanitary landfill, or by incineration, or, if allowed by state and local authorities, by burning; if burned, stay out of smoke, or (b) for Metal Containers, offer for recycling if available or reconditioning if appropriate or puncture and dispose of in a sanitary landfill, or by other procedures approved by state and local authorities.

**Nonrefillable Paper or Plastic Bags, Fiber Sacks including Flexible Intermediate Bulk Containers (FIBC) or Fiber Drums With Liners:** Nonrefillable container. Do not reuse or refill this container. Completely empty paper or plastic bag, fiber sack or drum liner by shaking and tapping sides and bottom to loosen clinging particles. Empty residue into application or manufacturing equipment. Then offer for recycling if available or dispose of empty paper or plastic bag, fiber sack or fiber drum and liner in a sanitary landfill, or by incineration, or, if allowed by state and local authorities, by burning. If burned, stay out of smoke.

**Refillable Fiber Drums With Liners:** Refillable container (fiber drum only). **Refilling Fiber Drum:** Refill this fiber drum with DuPont™ VELPAR® DF herbicide containing hexazine only. Do not reuse this fiber drum for any other purpose. Cleaning before refilling is the responsibility of the refiller. Completely empty liner by shaking and tapping sides and bottom to loosen clinging particles. Empty residue into application or manufacturing equipment. **Disposing of Fiber Drum and/or Liner:** Do not reuse this fiber drum for any other purpose other than refilling (see preceding). Cleaning the container (liner and/or fiber drum) before final disposal is the responsibility of the person disposing of the container. Offer the liner for recycling if available or dispose of liner in a sanitary landfill, or by incineration, or, if allowed by state and local authorities, by burning. If burned, stay out of smoke. If drum is contaminated and cannot be reused, dispose of it in the manner required for its liner. To clean the fiber drum before final disposal, completely empty the fiber drum by shaking and tapping sides and bottom to loosen clinging particles. Empty residue into application or manufacturing equipment. Then offer the fiber drum for recycling if available or dispose of in a sanitary landfill, or by incineration, or, if allowed by state and local authorities, by burning. If burned, stay out of smoke.

**All Other Refillable Containers:** Refillable container. **Refilling Container:** Refill this container with DuPont™ VELPAR® DF herbicide containing hexazine only. Do not reuse this container for any other purpose. Cleaning before refilling is the responsibility of the refiller. Prior to refilling, inspect carefully for damage such as cracks, punctures, abrasions, worn out threads and closure devices. Check for leaks after refilling and before transporting. **Disposing of Container:** Do not reuse this container for any other purpose other than refilling (see preceding). Cleaning the container before final disposal is the responsibility of the person disposing of the container. To clean the container before final disposal, empty the remaining contents from this container into application equipment or a mix tank. Fill the container about 10 percent full with water. Agitate vigorously or recirculate water with the pump for 2 minutes. Pour or pump rinsate into application equipment or rinsate collection system. Repeat this rinsing procedure two more times. Then, (a) for Plastic Containers, offer for recycling if available or puncture and dispose of in a sanitary landfill, or by incineration, or, if allowed by state and local authorities, by burning; if burned, stay out of smoke, or (b) for Metal Containers, offer for recycling if available or reconditioning if appropriate or puncture and dispose of in a sanitary landfill, or by other procedures approved by state and local authorities.

**Outer Pouches of Water Soluble Packets (WSP):** Nonrefillable container. Do not reuse or refill this container. Offer for recycling if available or, dispose of the empty outer foil pouch in the trash as long as WSP is unbroken. If the outer pouch contacts the formulated product in any way, the pouch must be triple rinsed with clean water. Add the rinsate to the spray tank and dispose of the outer pouch as described previously.

**Do not transport if this container is damaged or leaking.** If the container is damaged, leaking or obsolete, or in the event of a major spill, fire or other emergency, contact DuPont at 1-800-441-3637, day or night.

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## LIMITATION OF WARRANTY AND LIABILITY

NOTICE: Read this Limitation of Warranty and Liability Before Buying or Using This Product. If the Terms Are Not Acceptable, Return the Product at Once, Unopened, and the Purchase Price Will Be Refunded.

It is impossible to eliminate all risks associated with the use of this product. Such risks arise from weather conditions, soil factors, off target movement, unconventional farming techniques, presence of other materials, the manner of use or application, or other unknown factors, all of which are beyond the control of DuPont. These risks can cause: ineffectiveness of the product, crop injury, or injury to non-target crops or plants. WHEN YOU BUY OR USE THIS PRODUCT, YOU AGREE TO ACCEPT THESE RISKS.

DuPont warrants that this product conforms to the chemical description on the label thereof and is reasonably fit for the purpose stated in the Directions for Use, subject to the inherent risks described above, when used in accordance with the Directions for Use under normal conditions.

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## Common Groundsel; a Poisonous Weed of Alfalfa

W.Mick Canevari <sup>1</sup>

There are over one million acres of alfalfa in California grown in three major regions. The largest is the Sacramento and San Joaquin valleys at 66%, the remainder split between low desert and high elevation mountain counties.

Controlling weeds is an annual process through the production life of an alfalfa stand. Weed management is necessary to insure maximum production of high quality alfalfa and prevent the loss of moisture, nutrients, and other plant resources. Weeds can weaken plants and lead to a premature stand loss, lower forage quality, and cause economic losses.

Weed free alfalfa is an important step to produce high quality hay; it improves harvest efficiency by speeding the drying and baling time, expands marketing opportunities and commands a higher price. The presence of poisonous weeds will reduce the value or in many cases make it an unmarketable commodity. Weeds such as Common Groundsel *Senecio vulgaris*, Coast Fiddleneck *Amsinckia intermedia*, and Poison hemlock *Conium maculatum* can cause serious health issues or even death to cattle and horses. The incentive to produce high quality weed free alfalfa is substantial to achieve profitability.

Common groundsel is a pyrolizidine alkaloid PA (toxicant) containing plant that is commonly found in alfalfa and winter forages. Groundsel is especially a problem in alfalfa hay because it is toxic to animals in either dry hay or silage. Poisoning occurs in situations where animals cannot separate out the toxic plants while they feed--when they are mixed with the forage in a pasture, or when they are fed in hay or silage. The toxicant causes a liver disease that is chronic and progressive, resulting in death usually months after feeding, with few or no symptoms until 2 or 3 days before death. A lethal amount for cattle or horses is 5-7 percent of their body weight of groundsel or approximately 50 pounds. With lesser amounts consumed, the liver loses function, but no symptoms may be apparent until the animal is stressed by pregnancy, a new feed, a different toxin, etc. Clinical signs of chronic PA poisoning may often not appear for 2-8 months after the first ingestion of PA containing plants. Horses and cattle may also develop photosensitization. The damaged liver will not be able to purify the blood fast enough, and death is sudden. Sheep and goats have rumen bacteria that detoxify the alkaloids, so they are able to consume twice their body weight of groundsel without liver damage. Ensiling pyrolizidine alkaloid producing plants does not decrease toxicity to a safe level for feeding. **It is not recommended to feed PA containing plant material to cattle or horses.** In addition to herbicides, grazing by sheep sometimes is used to control these weeds but generally limited in to animal availability.

<sup>1</sup> Wm Mick Canevari, UCCE Advisor Emeritus, San Joaquin County, 2102 E Earhart Way, Ste 200, Stockton California 95206

## Biology

Common groundsel is prevalent and widespread in the central valley and low desert alfalfa regions of California and Arizona. It germinates and grows during the winter months when alfalfa is dormant. Groundsel produces abundant seeds, which spread by floating on the wind with their parachutes of hairs. One groundsel plant can produce as many as one million seeds in a season. Groundsel is a hardy plant that germinates over a wide range of temperatures beginning in Oct through March with moisture. Plants can survive cold temperatures and drought then flower and set seeds early in the spring. February to March is the primary period of bloom, though plants flower throughout the growing season.

## Control

There's been an increased effort for field research to document groundsel control measures with the increase of infestations reported and livestock poisoning. Several research trials were conducted in 2009,10 in San Joaquin County and the Sacramento valley evaluating best herbicide programs for control. Results clearly demonstrated many factors, the most important being that few herbicides can provide complete and full season control. Herbicides active on groundsel generally perform best at early germination periods when plants are small and using a combination of a post and pre emergent herbicide. Velpar®, Chateau® and Gramoxone®, are the key alfalfa herbicides that have shown various levels of effectiveness in controlling groundsel. Velpar pre and post emergent consistently shows the best long term control when rainfall and sunny days occur following application. Chateau gives very good pre emergent control but is not effective on emerged plants. Gramoxone has been inconsistent in providing post control of plants larger than 1-2" tall. Velpar is the only effective herbicide to provide consistent control over a wide range of conditions.

## Overview of Herbicides for Groundsel Control.

**Velpar:** *hexazinone:* Is considered the best herbicide for groundsel control. It is effective over a wide range of sizes and conditions. Its activity through foliar and root uptake make it unique to all other herbicides and extremely effective.

**Gramoxone:** *paraquat:* Provides post emergent control of groundsel at very small growth stages from cotyledon to 4 leaf stage but before branching occurs. Control

declines rapidly as plants begin to form axial buds/lateral branching. Complete coverage is essential. No soil activity so new germination continues.

**Chateau:** *fumioxifen*: Chateau is very effective as a preemergent herbicide. It does not provide post control of groundsel. The addition of Gramoxone with Chateau is a good combination but may not be completely effective in heavy populations and if treatments are made after germination has begun.

**Sencor:** *metribuzin*: Has little post activity on groundsel (cotyledon to two leaf) with larger plants not controlled. Very short soil residual properties.

**Raptor/Pursuit:** *Imazamox*. Will temporarily stunt groundsel plants but generally not kill them.. Not considered a good groundsel herbicide.

**2,4-DB:** Causes stunting under favorable weather conditions but does not provide complete control.

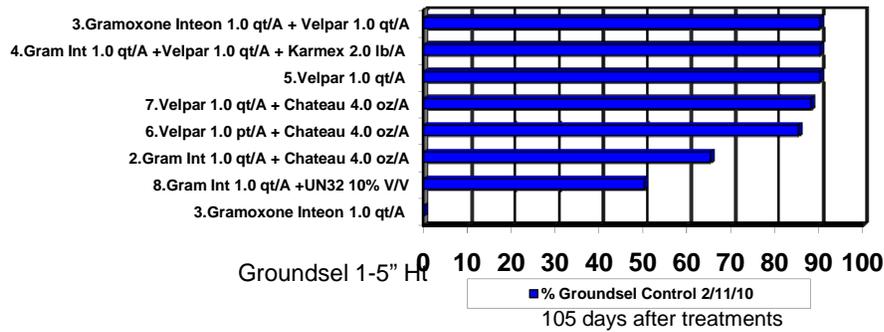
**Karmex,** *diruon*: Pre emergent soil active herbicide, not effective post or pre emergent.

**Prowl/** *trifluralin*: Not effective or used during groundsel germination periods.

**Solicam,** *norflurozone*: Soil active herbicide. Minimum effectiveness for pre emergent control of groundsel.

Figures 1 & 2. show herbicide performance from early and mid season application timings for controlling groundsel in an established alfalfa field in san Joaquin County, 2009/10. Trial was conducted by Mick Canevari, UCCE advisor in San Joaquin County.

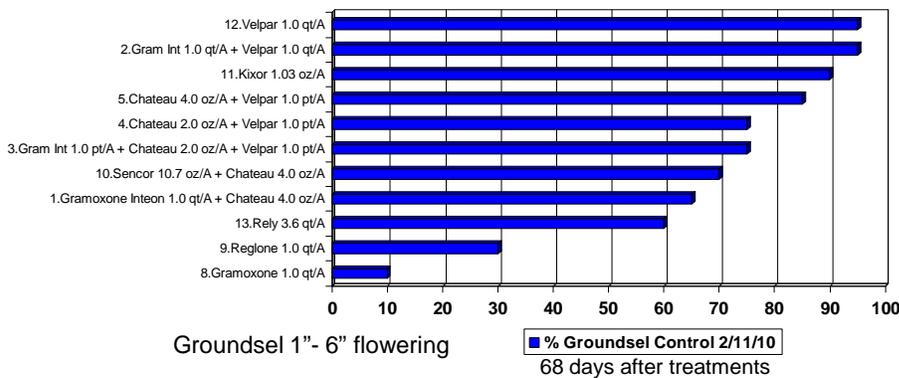
Figure 1  
Early Season Groundsel Control in Alfalfa



Application made: 10/26/09 ; All treatments included Phase oil @ 1.0 gal/100 gal

Figure 2  
Mid Season Groundsel Control in Alfalfa

Figure 2



Application: 12/3/09 ; All treatments included COC at 1 gal/100gal

