EEB files

246332
RECORD NO.

111601
SHAUGHNESSEY NO.

REVIEW NO.

EEB REVIEW

DATE: IN 06-23-89 OUT JUL 20 1989

FILE OR REG. NO. 89-OR-21

PETITION OR EXP. NO.

DATE OF SUBMISSION 06-07-89

DATE RECEIVED BY EFED 06-23-89

RD REQUESTED COMPLETION DATE 07-08-89

EEB ESTIMATED COMPLETION DATE 07-08-89

RD ACTION CODE/TYPE OF REVIEW 510

TYPE PRODUCT(S) Herbicide

DATA ACCESSION NOS.

PRODUCT MANAGER NO. D. Stubbs (41)

PRODUCT NAME(S) Goal (Oxyfluorfen)

COMPANY NAME Oregon Dept. of Agriculture

SUBMISSION PURPOSE Proposed Sec. 18 for weed control in grasses grown for seed

SHAUGHNESSEY NO.	CHEMICAL AND FORMULATION	% AI
111601	Oxyfluorfen	19.4

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EEB REVIEW

Chemical: Oxyfluorfen Product: Goal 1.6E Herbicide

100 Submission Purpose and Label Information

100.1 Submission Purpose and Pesticide Use

The State of Oregon is requesting an emergency exemption (Section 18) for the use of Goal 1.6 Herbicide to control weeds and volunteer crops.

100.2 Formulation Information

Active Ingredient:
Oxyfluorfen 19.4%
Inert Ingredients 80.6%

Contains 1.6lb ai per gallon.

100.3 Application Methods, Directions, Rates

(See attached proposed section 18 label - Exhibit 2)

100.4 Target Organism

(See attached proposed section 18 label - Exhibit 2)

101 Hazard Assessment

101.1 Discussion

The State of Oregon is requesting an emergency exemption for the use of Goal to control weeds and volunteer crops. Multiple applications are allowed but can not exceed the maximum application rate of 30 oz. per acre or 0.375 lbs ai per acre. It is recommended for late preemergence through early postemergence control of annual broadleaf weeds, annual grasses, and the seedling stage of perennial grasses, including volunteer crops, in established perennial grasses grown for seed.

101.2 Likelihood of Adverse Effects on Nontarget Organisms

Terrestrial Organisms

Minimal hazard is expected for terrestrial or aquatic organisms. The toxicity to birds and mammals is low to moderate. Bluegill sunfish is the most sensitive freshwater fish with an LC_{50} 200 ppb. [illegible]

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The daphnid is less sensitive with an LC_{50} of 1.5 ppm. Ground application would be expected to minimize the contamination from spray drift. However, runoff would be expected. The Estimated Environmental Concentration (EEC) is as follows:

0.375 lbs (ai/A)	x	0.01 (1% runoff)	x	10 A. (from 10 A. drainage basin)	=	0.0375 lb (tot. runoff)

EEC of 1b a.i. direct application to 1 A. pond 6-foot deep = 61 ppb

Therefore, EEC = 61 ppb x 0.0375 (1b) = 2.3 ppb

This concentration is approximately 0.11 the bluegill LC_{50}.

Based on these items, minimal hazard is expected for aquatic and terrestrial species.

101.3 Endangered Species Considerations

Endangered fauna are not expected to be at risk from this use of oxyfluorfen. However Oregon has three endangered plants, Bradshaw's lomatium, Mulheur wire lettuce, and MacFarlane's four-o'clock. The application for this exemption indicates that Benton, Lane, Linn, Marion, and Polk counties are included. These counties are known to have populations of Bradshaw's lomatium. The remaining plants are not found in these counties. Based on this the Oregon Natural Heritage Database was contacted and two populations were found to be in hazardous locations (See Attachment A for specific locations). Both populations would be at risk from runoff. One is located in a ditch which runs next to a field of grass grown for seed and the other in a dry streambed 100 ft from the crop. Although the latter site would be expected to be affected by ground spraying, the population next to the field would be expected to receive direct spray. To prevent hazard, the applicant should develop conservation measures necessary to avoid effects to the Bradshaw's lomatium. These measures should be submitted to Diana Huang of the USFWS Portland Field Office for approval. The applicant then should notify EPA. (Attached are records of telephone contacts made relative to this action.)

101.4 Adequacy of Toxicity Data

The existing database is adequate to assess hazards to nontarget wildlife under the proposed exemption.

103 Conclusions

EEB has reviewed the proposed emergency exemption for the use of Goal 1.6E Herbicide on grass grown for seed in Oregon. EEB concludes that the proposed use will not result in hazard to

nontarget fauna.

One endangered plant species (Bradshaw's lomatium) may be exposed to the herbicide via application to grass grown for seed. Application under this proposed exemption should not be authorized until FWS has had an opportunity to review and approve the conservation measures submitted by the applicant.

Dennis J. McLane, Wildlife Biologist Dennis McLane Date: 7-17-89
Ecological Effects Branch
Environmental Fate and Effects Division (H7507C)

Raymond W. Matheny, Supervisory Biologist Raymond W. Matheny Date: 7/17/89
Ecological Effects Branch
Environmental Fate and Effects Division (H7507C)

James W. Akerman, Chief James W. Akerman Date: 7/17/89
Ecological Effects Branch
Environmental Fate and Effects Division (H7507C)

RECORD OF TELEPHONE CALL OR VISITOR date time

INCOMING CALL X OUTGOING CALL 7-13-89

name of person

James Kagen

address telephone number

Oregon Natural Heritage 8-560-229-5078
Database

brief summary of conversation

As per the advise of Mr. Meinck of the Oregon Department of Agriculture and Mr. Dizika of the New York Natural Heritage Program, I called Mr. Jim Kagen concerning the location of the Bradshaw's lomatium relative to grass grown for seed. He indicated that there are two locations: one in a dry stream bed 100 feet or so from the crop and another growing in a ditch directly beside the field near Finley Wildlife Refuge.

recorded by
Dennis McLane

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RECORD OF TELEPHONE CALL OR VISITOR | date | time

INCOMING CALL | OUTGOING CALL X | 6-29-89 | 11:20

name of person

Diana Hwang

address | telephone number

FTS-429-6179

brief summary of conversation

Ms. Hwang indicated that Robert Meinck of The Oregon Department of Agriculture who had access to the Oregon Natural Heritage Data Base.

recorded by

Dennis McLane

RECORD OF TELEPHONE CALL OR VISITOR date time

INCOMING CALL X OUTGOING CALL 7-05-89

name of person

Robert Meinck

address telephone number

Oregon Department of Agriculture 8-503-378-3776

brief summary of conversation

Mr. Meinck was responding to my inquiry as to the location of the endangered plant, Bradshaw's lomatium relative to the grass grown for seed. He was unable to determine if the two locations overlapped. He suggested that the fall application (no latter than Dec 15) wo uld provide some margin of safety for the lomatium because it dies back each year as well as the mode of action. I indicated Goal has non-crop uses which usuallyy means it is a wide spectrum herbicide. He gave me the two other contacts: Jim Kagen, of the Oregon Natural Heritage Data Base and botanist: Ed Alverson, Who proposed the species for listing. Their phone are 503-229-5078 and 503-753-3051, respectively.

recorded by

Dennis McLane

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RECORD OF TELEPHONE CALL OR VISITOR date time

INCOMING CALL OUTGOING CALL X 7-05-89

name of person

Peter Dizika

address telephone number

New York Natural Heritage 8-518-439-7488

brief summary of conversation

Mr. Dizika was responding to my inquiry as to the location of the endangered plant, Bradshaw's lomatium relative to the grass grown for seed. He indicated that a small population in West Eugene off of Green Hill Road surrounded by rye grass.

recorded by

Dennis McLane

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RECORD OF TELEPHONE CALL OR VISITOR date time

INCOMING CALL OUTGOING CALL X 6-28-89 11:20

name of person

Roger Varderstass

address telephone number

brief summary of conversation

Mr. Varderstass indicated that Bradshaw's lomatium does grow along roadways right's-of-way and in some locations are near grass growing sites.

recorded by

Dennis McLane from Ray Matheny notes

RECORD OF TELEPHONE CALL OR VISITOR

INCOMING CALL OUTGOING CALL X

date 7-14-89

time 3:40

name of person

Diana Hwang

address

telephone number

FTS-429-6179

brief summary of conversation

Called Ms. Hwaug to request FWS assistance in the protection of Bradshaw's lomation from the application of Goal to grass grown for seed in Oregon. She was informed that Jim Kagen of the Oregon Natural Heritage Database knows of two locations which are likely to be injured by the use of Goal. EEB requested she work with the Oregon Department of Agriculture, the applicant, to prevent adverse effects to Bradshaw's lomation. At her suggestion, in the review, I requested that the Oregon Department of Agriculture develop conservation measures to protect the plant. These measures would be subject to her approval. She agreed to this arrangement.

recorded by

Dennis McLane

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NEIL GOLDSCHMIDT
GOVERNOR

Oregon Department of Agriculture

635 CAPITOL STREET NE, SALEM, OREGON 97310-0110

June 5, 1989

Mr. Donald R. Stubbs, Section Head
Emergency Response Group (TS-767C)
Environmental Protection Agency
Crystal Mall Building 2
1921 Jefferson Davis Highway
ARLINGTON VA 22202

SPECIFIC EXEMPTION TO USE GOAL HERBICIDE (OXYFLUORFEN) FOR WEED CONTROL IN GRASSES GROWN FOR SEED IN OREGON

The Oregon Department of Agriculture requests approval of this application for a specific exemption under Section 18, FIFRA, as amended in Part 166, Title 40, CFR 166.3 to use Goal Herbicide (oxyfluorfen) to control various weeds in grasses grown for seed.

The following is a brief summary of the items of information required in 40 CFR 166.3 (a):

1. The pesticide intended to be used is Goal 1.6E Herbicide (active ingredient: oxyfluorfen, 1.6 lbs./gal.) manufactured by Rohm and Haas Company of Philadelphia, Pennsylvania, EPA Reg. No. 707-174.

2. Increasingly stringent restrictions on the use of open field burning as a sanitation practice in grass seed production in Oregon have seriously limited the number of grass seed fields burned in recent years. Herbicides previously registered for grass seed fields were developed for use in conjunction with thermal sanitation, and do not adequately control seedling grasses in unburned situations. The most serious problem is failure to control volunteer crop seedlings in certified seed production fields, which leads to rejection of fields for certification (Exhibit 1, Burril-Gutbrod). Such stands must then be taken out of production and reseeded at considerable cost to the grower. The spread and level of infestation of several herbicide-tolerant weeds such as Bromus carinatus and Poa trivialis are also serious problems resulting from limitations on field burning. Further restrictions on the use of thermal sanitation in grass seed production are currently being considered by the Oregon state legislature. These restrictions will decrease the acreage allowed to be burned each year, thereby increasing the unburned acreage, which unavoidably has large amounts of residue and extremely high numbers of viable grass seeds on the soil surface. Since performance of available herbicides is already impaired by the presence of residue and excessive numbers of weed seedlings, reductions in field burning will intensify the problems of controlling seedling weedy grasses and volunteer crops.

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Registrations for use of atrazine and simazine on grasses grown for seed have been withdrawn by CIBA-GEIGY, and use of those herbicides will stop when stocks have been depleted. Manufacture of propham and chlorpropham has ceased, and PPG Industries does not plan to renew restrictions of either material for grasses grown for seed. Diuron and terbacil are therefore the only broad-spectrum, soil-residual herbicides still registered and available for use on grasses grown for seed, and each is registered only on certain species of established grasses because of the possibility of crop injury on other grasses. Performance of Enquik against seedling grasses, particularly volunteer perennial ryegrass and tall fescue, has been unsatisfactory because of its lack of translocation within the plant and its lack of residuality in the soil. All other registered herbicides, i.e., ethofumesate, fenoxaprop, MSMA, and various phenoxy compounds, are highly selective between species, and do not control volunteer seedlings of perennial grass crops.

Research over the past several years has identified various herbicides which might replace atrazine, simazine, chlorpropham, and propham in grass seed production. Indeed, some alternative herbicides control weeds in unburned fields more effectively than atrazine or simazine. Emergency exemption for oxyfluorfen is being requested at this time because this herbicide would provide the necessary level of weed control with a tolerable amount of crop injury, and it has the support of the manufacturer.

3. Weeds and volunteer crops not adequately controlled by registered herbicides which could be controlled or suppressed by oxyfluorfen:

   a. Annual (A) and perennial (P) grasses not controlled in the seedling stage in the absence of open field burning by any herbicide registered for use in established perennial ryegrass and not adequately controlled even with open field burning.

Lolium multiflorum	(A)	Italian ryegrass
Lolium perenne	(P)	Perennial ryegrass
Festuca arundinacea	(P)	Tall fescue

   b. Volunteer crop seedlings partially controlled by herbicides registered for use in each respective crop, and partially controlled as weeds in all other crops, but controlled to a satisfactory degree only with open field burning.

Festuca arundinacea	(P)	Tall fescue
Festuca rubra and related species	(P)	Fine and hard fescues
Dactylis glomerata	(P)	Orchardgrass
Poa pratensis	(P)	Kentucky bluegrass
Agrostis tenuis	(P)	Bentgrass

c. Annual and perennial weedy grasses not adequately controlled in the seedling stage in the absence of open field burning by any herbicide registered for use in established perennial ryegrass, tall fescue, and bentgrass in the fall.

Lolium multiflorum	(A)	Italian ryegrass
Bromus carinatus	(P)	California or mountain brome
Poa trivialis	(P)	Roughstalk bluegrass

d. Annual and perennial weedy grasses not adequately controlled in the seedling stage in the absence of open field burning by any herbicide registered for use in established orchardgrass.

Lolium multflorum	(A)	Italian ryegrass
Bromus carinatus	(P)	California (or mountain) brome
Poa trivialis	(P)	Roughstalk bluegrass
Poa annua	(A)	Annual bluegrass
Vulpia myuros	(A)	Rattail fescue

e. Annual weedy grasses not adequately controlled in the absence of open field burning by any herbicides registered for use in fine fescue.

Poa annua	(A)	Annual bluegrass
Vulpia myuros	(A)	Rattail fescue

4. Time period oxyfluorfen is needed:

September 1, 1989 to January 15, 1990

5. a. Pesticides currently registered:

Atrazine - Registration covering use on perennial ryegrass and orchardgrass was withdrawn by the manufacturer March 2, 1987.

Simazine - Registration covering use on perennial ryegrass, bentgrass, fine fescues, orchardgrass, and tall fescue was withdrawn by the manufacturer March 2, 1987.

Propham - Manufacture has ceased and registration covering use on perennial ryegrass, bentgrass, fine fescues, orchardgrass, and tall fescue is being withdrawn by manufacturer.

Chlorpropham - Manufacture has ceased and registration covering use on perennial ryegrass, bentgrass, fine fescues, orchardgrass, and tall fescue is being withdrawn by manufacturer.

Diuron - Registration for use on bentgrass, Kentucky bluegrass, orchardgrass, and tall fescue only. Not effective against Bromus spp. and performs poorly against volunteer crop seedlings and many weedy grasses in high residue, unburned conditions.

Terbacil - Registered for use on Kentucky bluegrass and fine fescues only. Crop injury commonly occurs at rates required for control of most seedling grasses.

Ethofumesate - Registered for use on Italian ryegrass, perennial ryegrass, bentgrass, and tall fescue only. No control of volunteer crop seedlings under any conditions. Control of Bromus carinatus and Poa trivialis only under optimal conditions or at higher than labeled rates, controls Poa annua and Vulpia myuros when used in conjunction with field burning.

Fenoxaprop - Registered for use on perennial ryegrass, fine fescues, tall fescue, and certain varieties of Italian ryegrass only. Controls only certain specific weeds such as Avena fatua and Poa trivialis, and does not control volunteer crop seedlings under any conditions.

Sethoxydim - Registered for use on fine fescues only. Does not control Vulpia myuros, Poa annua, or volunteer fine fescue.

Fluazifop - Registered for use on fine fescues only. No control of Vulpia myuros, Poa annua, or volunteer fine fescue.

MSMA - Registered for use on Italian ryegrass, perennial ryegrass, Kentucky bluegrass, and fine fescues only. Controls only certain specific weeds and does not control volunteer crop seedlings under any conditions.

Bensulide - Registered for use in bentgrass only.

2,4-D - Registered only for control of broadleaf weeds in established grasses.

Dicamba - Registered for control of broadleaf weeds in established grasses. Higher rates registered for control of seedling grasses in Kentucky bluegrass only, where it sometimes causes crop injury.

Monocarbamide dihydrogensulfate (Enquik) - Recently registered (by exemption from tolerance requirements, EPA Reg. No. 612-4) for postemergent application to reduce volunteer seedlings. Degree of control of grass seedlings has often been poor. Factors adversely affecting performance include lack of any translocation within

plants, necessitating complete coverage of all foliage, and absence of any residuality within the soil. Experience in the field during the past two years indicates that some species, including volunteer perennial ryegrass, are susceptible only at the 1-leaf growth stage when Enquik is applied during cloudy, wet weather. Lack of complete synchrony in the germination and emergence of weedy grasses and volunteer crop seedlings prevents a single application of this herbicide from providing efficacious control of such pests. Performance in years when early fall rains germinate grasses by October 1 and when Enquik is applied during periods of sunny weather has been more satisfactory; seedlings at the 2-leaf growth stage have been controlled. Label suggests avoiding treatment when rain is expected, which severely limits its usefulness in Oregon.

MCPA - Registered only for control of broadleaf weeds in established grasses.

Bromoxynil - Registered only for control of broadleaf weeds in established grasses.

Clopyralid + 2,4-D or MCPA - Registered only for control of broadleaf weeds in established grasses.

b. Alternative methods:

Monocarbamide dihydrogensulfate (Enquik) does not promise and is unable to provide the degree of control of volunteer perennial ryegrass and tall fescue seedlings needed to meet seed certification standards. Performance of diuron and terbacil against volunteer crop seedlings and certain herbicide tolerant weeds is unsatisfactory in the absence of field burning. Poor control is probably caused by failure of those herbicides to penetrate the post-harvest crop residue on the soil surface in adequate quantities soon enough after seedling germination. Registrations of atrazine, simazine, propham, and chlorpropham have been dropped by their manufacturers. No other herbicides currently registered provide broad-spectrum control of seedling grasses.

Open field burning by itself provides fairly good control of seedling weeds and volunteer crops, but burning was done on only 45 percent of the acreage of grasses grown for seed because of restrictions imposed by laws of Oregon and regulations of the Oregon Department of Environmental Quality. An alternative thermal sanitation practice, propane flaming, which is more costly and less effective than open field burning, was used on 17 percent of the grass acreage. Propane flaming provides a useful reduction in the amount of residue on the soil surface, but fails to destroy the viability of most of the weed

and volunteer crop seeds. The Oregon state legislature is also considering further restrictions on use of propane flaming. Each year an average of 19 percent of the established perennial grasses reach the end of their useful stand life, and are destroyed and replanted to other crops or to new grass stands. The remaining 19 percent of the acreage receiving only mechanical residue removal is the portion most at risk of severe weed infestation and contamination by volunteer crop seedlings, and most urgently need treatment with oxyfluorfen. Fields already infested with high densities of grassy weeds (possibly because they were not field-burned sometime in the recent past) are at high risk of continued infestation, even if they can be field-burned in a particular year, because of the absence of suitable herbicide treatments.

Mechanical cultivation and hand weeding are impractical for control of seedling grasses which may be present at densities from one hundred to several thousand per square foot. Mechanical cultivation between the rows used to be done during the early stages of stand establishment, but was never functional in later years of a stand life when the established plants grow larger and the area available for cultivation diminishes.

6. Proposed rates of oxyfluorfen:

a. Pounds of active ingredient per acre and total in Oregon

Tall fescue, orchardgrass, bentgrass, and Kentucky bluegrass	0.375 lbs. a.i./acre	32,400 lbs. total
Perennial ryegrass	0.25 lbs. a.i./acre	18,156 lbs. total
Fine fescues	0.125 lbs. a.i./acre	844 lbs. total
Total all crops		51,400 lbs. total

b. Formulated product per acre and total in Oregon

Tall fescue, orchardgrass, bentgrass, and Kentucky bluegrass	30 ounces/acre	20,250 gal. total
Perennial ryegrass	20 ounces/acre	11,348 gal. total
Fine fescues	10 ounces/acre	527 gal. total
Total all crops		32,125 gal. total

c. Preharvest interval

No grazing will be allowed. Prohibition will be based on lack of residue data on grass forage to indicate whether meat, milk, and egg tolerances of 0.05 ppm for oxyfluorfen would be met and also on the likelihood that early grazing would reduce grass seed yield.

150 days minimum to seed harvest

d. Proposed label (Exhibit 2)

7. Anticipated acreage:

a. A total crop acreage and anticipated oxyfluorfen usage in Oregon:

	1987-1988 Acres	1988-1989 Acres	Estimated % to be Treated with Oxyfluorfen*
Tall fescue,	69,370	55,500	80.0
orchardgrass,	25,670	14,700	57.3
bentgrass,	11,250	9,000	80.0
Kentucky bluegrass	27,860	7,200	25.8
Previous 4 species total	134,150	86,400	64.4
Perennial ryegrass	90,780	72,600	80.0
Fine fescues	27,110	6,800	24.9
Total all perennial grasses	252,040	165,800	65.8

* Normal stand life of 5.2 years for these six grass crops should result in reseeding of 48,163 acres or 19 percent of the 252,040 acres harvested in 1988 and a similar number in 1989. While the 1989 seedlings would be too young to treat with oxyfluorfen, removing potentially treated acres, a continued increase in total perennial grass seed acreage during 1988-89 growing season offsets this reduction. None of the 107,000 acres of Italian (annual) ryegrass will be treated due to the lack of herbicide tolerance in this annually planted crop. Grazing will be prohibited in any fields treated with oxyfluorfen; however, the 43,000 acres of tall fescue, orchardgrass, and perennial ryegrass not treated with oxyfluorfen would be available for grazing by sheep, along with the entire Italian ryegrass acreage, for a total of 150,000 acres which could be grazed. At a common stocking rate of 3 head per acre, this would approximately equal the current number of sheep grazing in the Willamette

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Valley from November through March. Selection of the 20 percent of established tall fescue and perennial ryegrass and 43 percent of orchardgrass not to be treated with oxyfluorfen would be made by the growers based on their individual desires to graze sheep in preference to more fully controlling weeds.

b. Perennial grass seed acreage of all counties in Oregon

County	Total crop acreage in 1987-89 growing season	Anticipated usage in 1989-90 growing season in acres
Benton	18,950	13,400
Clackamas	9,500	3,730
Jefferson	14,350	4,400
Lane	18,330	14,050
Linn	86,100	64,620
Marion	59,000	37,940
Polk	22,350	15,540
Union	11,110	3,200
Washington	970	760
Yamhill	9,830	7,230
All other counties	1,550	890
Total	252,040	165,800

8. Criteria which determine an emergency:

An emergency exists for all certified perennial ryegrass because of the absence of any effective herbicide treatment registered for control of volunteer crop seedlings. Volunteer seedlings cannot exceed 25 percent of all perennial ryegrass plants in a field if seed certification standards are to be met. Even when allowed, field burning by itself provides only partial control of volunteer perennial ryegrass, and stands would generally fail to meet seed certification standards. Herbicides which are registered for use in perennial ryegrass are able to control only certain species of seedling weeds, and frequently fail to control many weed species when used without prior field burning.

An emergency also exists for all unburned stands of certified tall fescue, orchardgrass, bentgrass, Kentucky bluegrass, and fine fescues because of the difficulty in controlling volunteer crops and many common grassy weeds with available herbicides in the absence of field burning. While at least one reasonably effective, broad-spectrum herbicide remains registered on each of those crops, the level of volunteer crop and weedy grass control is unsatisfactory without the use of field burning.

An emergency also exists in certain stands of these same crops even when they have been "open field burned" because of the presence of specific weeds which cannot be controlled by any registered herbicide. Weeds whose mere presence constitutes an emergency because of the lack of any effective herbicide treatment whether or not open field burning is performed include Bromus carinatus in all crops and Poa trivialis in bentgrass, Kentucky bluegrass, and orchardgrass. Additionally, heavy infestations of Poa trivialis in tall fescue and perennial ryegrass constitute an emergency despite the availability of fenoxaprop to suppress this species; serious yield losses will have occurred before this herbicide can be applied in the spring if seedlings are not controlled. High levels of Vulpia myuros, Poa annua, and Lolium multiflorum caused by failure to adequately control weeds in previous years (because of an inability to open field burn) also constitute an emergency even if a stand is burned in the current season. Extremely dense weed populations impair the performance of the soil-residual herbicides diuron and terbacil, and result in significant crop yield losses because of weed competition.

9. Economic benefits and losses:

a. Meeting seed certification standards is vital to the marketing of Oregon grass seed; the industry had gross sales of $211 million in 1988 for all annual and perennial species. Long-term average price advantage for certified versus uncertified grass seed is from $0.01 to $0.025 per pound or from 2 to 6 percent of the total price. This price differential was developed under conditions in which most of the seed grown was able to meet certification standards, and the premium would undoubtedly increase to $0.10 per pound or more if certified seed were to become scarce and uncertified seed relatively abundant. Restricted availability of open field burning and withdrawal of registrations for atrazine, simazine, propham, and chlorpropham jeopardize the entire industry. Even if seed certification standards were relaxed to allow large amounts of volunteer crop, the increasing prevalence of weeds in the absence of new herbicide registrations would reduce crop yields and increase seed cleaning costs. Uncontrolled Poa trivialis reduced perennial ryegrass yield by more than 50 percent in research by Mueller-Warrant and Brewster. While this particular weed can now be suppressed by fenoxaprop in certain crops, losses of similar magnitude can be expected for other aggressive weeds such as Vulpia myuros, Lolium multiflorum, and Bromus carinatus. Stocks of atrazine, simazine, propham, and chlorpropham produced prior to the label changes which dropped their uses on grasses grown for seed are nearing exhaustion.

Failure to grant emergency registration of oxyfluorfen for the 1989-90 growing season may cause yield losses of up to 50 percent on 116,000 unburned acres, 25 percent on 147,000 burned acres, and loss of certification on 50 percent of all acres, for a total potential loss of $63 million in sales. This estimated loss is relative to past performance with herbicides which are no longer available and with open field burning which is only available on a limited basis. Field testing over the past two years indicates that oxyfluorfen will do a better job of controlling certain weeds in unburned stands than atrazine or simazine could; however, oxyfluorfen causes greater crop injury during the first several months after treatment than atrazine or simazine, and the possibility that it might affect seed yield under some conditions is still under investigation. Results over the past two years indicate that oxyfluorfen would be safe to use on grasses grown for seed at the rates and timings indicated on the proposed label, providing that treated stands are not grazed. Ability of treated grasses to withstand limited, delayed grazing will be investigated in future research. Grazing cannot be considered at the present because of the lack of grass forage residue data indicating whether tolerances for oxyfluorfen in meat, milk, and eggs would be met as well as the possibility of reduced seed yield.

b. Production costs in dollars per acre

Crop	1984	1985	1986	1987	1988
Tall fescue	309	315	322	328	335
Orchardgrass	404	412	421	429	438
Bentgrass	279	284	290	296	302
Kentucky bluegrass	540	551	562	573	585
Average (previous 4-spp.)	374	381	389	397	405
Perennial ryegrass	338	344	351	359	366
Fine fescues	453	462	472	481	491
Average of all species	369	376	384	392	400

c. Seed yields in pounds per acre

Crop	1984	1985	1986	1987	1988
Tall fescue	922	1089	1024	1018	1239
Orchardgrass	802	884	889	882	902
Bentgrass	404	346	370	353	351
Kentucky bluegrass	726	641	635	751	789

Average (previous 4-spp.)	750	839	843	867	1006
Perennial ryegrass	997	984	930	938	1105
Fine fescues	580	647	533	700	717
Average of all species	821	863	830	872	1011

d. Economic value of the crops to Oregon in millions of dollars

Crop	1984	1985	1986	1987	1988
Tall fescue	8.4	13.3	23.5	29.8	54.7
Orchardgrass	7.4	9.5	10.2	14.0	14.4
Bentgrass	2.8	5.7	5.6	7.9	10.3
Kentucky bluegrass	7.0	10.7	14.1	19.9	22.2
Previous 4-spp. total	25.6	39.1	53.4	71.5	101.5
Perennial ryegrass	20.0	27.3	30.5	37.2	52.2
Fine fescues	4.9	8.9	8.6	12.2	16.1
Total of all species	51.4	75.4	92.5	120.9	169.8

e. Price received in dollars per hundred pounds of seed

Crop	1984	1985	1986	1987	1988
Tall fescue	35.9	37.4	51.3	52.4	63.6
Orchardgrass	34.6	40.6	44.4	62.0	62.1
Bentgrass	44.8	141.0	145.5	197.4	260.5
Kentucky bluegrass	53.6	93.7	103.6	103.0	101.1
Average previous 4-spp.	40.0	52.8	61.9	69.6	75.2
Perennial ryegrass	28.9	42.9	48.0	45.5	52.0
Fine fescues	30.7	50.9	59.4	65.4	82.6
Average of all species	33.8	48.5	56.3	61.5	66.6

f. Estimated percent control with registered herbicides 1984-88

Weed Problem	1984	1985	1986	1987	1988
Volunteer perennial ryegrass	90%	90%	90%	90%	80%
Volunteer tall fescue	97%	97%	97%	97%	90%
Volunteer bentgrass	90%	90%	90%	90%	90%
Volunteer orchardgrass	90%	90%	90%	90%	90%
Volunteer Kentucky bluegrass	99%	99%	99%	99%	98%
	95%	95%	95%	95%	95%

Volunteer fine fescues	95%	95%	95%	95%	90%
Vulpia myuros	98%	98%	98%	98%	95%
Poa annua	98%	98%	98%	98%	95%
Poa trivialis	60%	60%	60%	60%	90%
Bromus carinatus	80%	80%	80%	80%	75%
Lolium multiflorum	85%	85%	85%	85%	85%

g. Estimated percent control in 1989-90 cropping year with registered herbicides and with oxyfluorfen averaged across all grass crops.

Percent weed control without open field burning (44% of retained acreage was not field burned in 1988)

Weed Problem	Registered Herbicides Only	Oxyfluorfen Added
Volunteer perennial ryegrass	25%	80%
Volunteer tall fescue	60%	95%
Volunteer bentgrass	90%	100%
Volunteer orchardgrass	75%	99%
Volunteer Kentucky bluegrass	75%	95%
Volunteer fine fescues	60%	99%
Vulpia myuros	75%	100%
Poa annua	75%	98%
Poa trivialis	75%	90%
Bromus carinatus	25%	85%
Lolium multiflorum	50%	90%

Percent weed control following an open field burn (56% of retained acreage was field burned in 1988)

Weed Problem	Registered Herbicides Only	Oxyfluorfen Added
Volunteer perennial ryegrass	70%	95%
Volunteer tall fescue	90%	99%
Volunteer bentgrass	90%	100%
Volunteer orchardgrass	95%	100%
Volunteer Kentucky bluegrass	95%	99%
Volunteer fine fescues	90%	100%
Vulpia myuros	90%	100%
Poa annua	90%	99%
Poa trivialis	85%	98%
Bromus carinatus	70%	90%
Lolium Multiflorum	85%	95%

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75 percent of volunteer crop is required for seed certification.

10. Information about oxyfluorfen:

Oxyfluorfen is registered for use on artichokes, broccoli, cabbage, cauliflower, nonbearing citrus, coffee, conifer, cotton, field corn, guava, mint, nuts, onions, ornamentals, grapes, and tree fruits. Information on fate in the environment, toxicology, metabolism, and residues in other crops is a matter of public record. Based on mode of action, metabolism, and translocation within plants, it is reasonable to assume that oxyfluorfen content will have greatly decreased by the time that treated grasses resume vigorous growth. Indeed, it is even possible that little or no detectable residues will be found in grass seed screenings and straw harvested at reproductive maturity. Private data from samples taken at harvest in 1988 in demonstration strips known to have been treated with oxyfluorfen showed no detectable levels of oxyfluorfen at 0.05 ppm mdl. Additional residue testing is being conducted by the manufacturer in cooperation with the Oregon State University, Agricultural Chemistry Department, and should be available in August 1989. An IR-4 project to obtain full registration of oxyfluorfen for grasses grown for seed has been initiated by Dr. George W. Mueller-Warrant, USDA-ARS, Corvallis, Oregon.

11. Rohm and Haas Company is aware of this request.

12. Knowledgeable experts:

Dr. George W. Mueller-Warrant
Research Agronomist, USDA-ARS
National Forage Seed Production
Research Center
3450 SW Campus Way
Corvallis, Oregon 97331-7102
Telephone: 503/757-4502
FTS: 420-4502

Dr. Larry Burrill
Extension Agronomist, Weed Control
Crop Science Department
Oregon State University
Corvallis, Oregon
Telephone: 503/754-2771

Sincerely,

B. C. Wright

Bill Wright, Administrator
Plant Division
(503) 378-3776

PL/180-192#4
Enclosures
cc: George Mueller-Warrant-USDA-ARS
Larry Burrill-OSU
Thomas J. Neidlinger-R & H
Jay Holmdal-R & H
Files

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Exhibit 1

Seed Certification

Oregon State University

Crop Science Building 31
Corvallis, OR 97331-3003

(503) 754-4513

April 4, 1989

File A-9

Mr. Larry Burril
Extension Weed Control Specialist
Crop Science 127
Corvallis, OR 97331

Dear Larry:

This winter and spring and similar conditions last year, our inspectors have noted excessive amounts of perennial ryegrass volunteer seedlings from the previous same crop. These seedlings are considered second or successive generation plants. In a genetic purity limited generation certification program these volunteers must be kept to a minimum when growing the same variety on a field year after year. This problem of volunteers would be true whether reworking and replanting, or taking the next crop without reworking.

With the loss of Atrazine and the limited burning being done, the volunteer problem seems to be on the increase. The volunteer problem exists on 65,000 acres of Certified perennial ryegrass. Volunteers are also a problem in bentgrass, bluegrass, fine fescue, tall fescue and orchardgrass certified crops. These later crops amount to 106,570 acres certified.

Our office has refused more fields for certified because of volunteers these past two years than experienced in the past. Quite often the difference between certified and uncertified can be an average of ten cents per pound. Perennial ryegrass will produce 1200 pounds of clean seed per acre. Fields that are refused certification because of volunteers would lose $120.00 per acre.

In the past Atrazine took care of the second generation volunteers. Goal has shown promise in controlling volunteers. Having Goal available to the seed grower as a management tool would be extremely important to the certified seed grower. Should you need more information lease give me a call.

Sincerely,

Oscar Gutbrod
Seed Certification Assistant

oc
enclosure

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CERTIFICATION CHAFF
1-10-89

Growers lists have been printed and are available. The acreage comparisons are as follows:

	1985 Acres	1986 Acres	1987 Acres	1988 Acres
Astoria Bentgrass	99	99	99	112
Highland Bentgrass	3,326	3,397	3,505	3,368
Seaside Bentgrass	307	574	874	1,024
OECD & Private Varieties	2,353	2,640	3,260	4,290
TOTAL	6,085	6,710	7,738	8,794
Newport Bluegrass	875	871	849	749
Merion Bluegrass	100	100	100	---
Park Bluegrass	569	574	574	515
OECD & Private Varieties	6,688	9,195	9,996	11,912
TOTAL	8,232	10,740	11,519	13,176
Cascade Chewings Fescue	2,192	2,367	2,184	2,478
Illahee Red Fescue	372	269	345	433
Pennlawn Red Fescue	1,240	1,247	678	411
Rainer Red Fescue	128	160	213	250
OECD & Private Varieties	13,130	11,081	11,892	12,064
TOTAL	17,062	15,124	15,312	15,636
Alta Tall Fescue	679	650	644	512
Fawn Tall Fescue	4,376	4,774	4,910	5,324
Kenhy Tall Fescue	895	806	814	627
Kentucky 31 Tall Fescue	324	489	584	155
OECD & Private Varieties	23,476	33,304	41,129	49,074
TOTAL	29,750	40,032	48,081	55,692
Boone Orchardgrass	161	81	65	65
Latar Orchardgrass	210	211	201	119
Paiute Orchardgrass	70	79	339	659
Pennlate Orchardgrass	474	338	410	307
Potomac Orchardgrass	7,946	7,368	6,896	6,511
Sterling Orchardgrass	107	67	48	74
OECD & Private Varieties	7,332	6,609	5,084	5,537
TOTAL	16,300	14,803	13,043	13,272
Gulf Annual Ryegrass	285	206	265	120
Florida Rust Resistant Annual Ryegrass	---	85	85	---
Wimmera 62 Rigidum Annual Ryegrass	---	20	---	24
OECD & Private Annual Varieties	10,585	6,815	4,416	4,552
Linn Perennial Ryegrass	13,340	14,906	16,932	16,509
OECD & Private Perennial Ryegrass	21,451	27,176	39,137	48,306
OECD & Private Intermediate Ryegrass	---	682	628	375
TOTAL	45,661	48,890	61,463	69,886

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CERTIFICATION CHAFF CONTINUED

	1985 Acres	1986 Acres	1987 Acres	1988 Acres
Alfalfas: Public, Private & OECD Varieties	5,733	5,798	7,302	7,783
Clovers: Crimson, White, Red, Public, Private & OECD Varieties	8,273	7,936	8,100	4,917
Barley	384	955	1,165	1,288
Oats	1,711	1,461	1,046	1,184
Wheat	6,466	6,371	5,884	6,682
Miscellaneous Crops (Beans, Beets, Timothy, etc.)	4,651	8,318	5,011	3,721
GRAND TOTAL	150,308	168,038	185,664	202,211

We have currently printed OECD tags for 600 seed lots from the 1988 production; Since July 1, 1988 we have printed 184,950 OECD regular blue tags.

Since July 1, 1988 we have received into Oregon, 87 OECD Basic or Pre-Basic seed lots for planting purposes. For the full year before July 1, 1988, there were a total of 210 such lots cleared for planting in Oregon.

Exhibit 2

***** **PROPOSED SECTION 18 LABEL** *****
DIRECTIONS FOR USE

Ground only

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

Read complete use directions and precautions on this label before using.

This Supplemental Label and the labeling supplied with the container must be in the possession of the user at the time of application.

Do not use this product through any type of irrigation equipment.

GENERAL INFORMATION: GOAL 1.6E Herbicide is recommended for late preemergence through early postemergence control of annual broadleaf weeds, annual grasses, and the seedling stage of perennial grasses, including volunteer crops, in established perennial grasses grown for seed. A minimum of 12 months of good growing conditions is required from time of planting new stands of perennial grasses until they are sufficiently well established to be treated with GOAL Herbicide. Apply the recommended amount of GOAL Herbicide as a broadcast spray at a minimum pressure of 30 psi. Apply in 20 or more gallons per acre total spray volume in the fall when seedling grasses have begun to germinate and before they exceed the 2-leaf growth stage. Ample soil moisture soon after application is required for optimum performance against seedling grasses. Early treatment is vital for control of seedling grasses, particularly volunteer perennial ryegrass and tall fescue. Treatments applied at the onset of grass seed germination during the initial fall rains (late preemergence) or at the 1-leaf growth stage (early postemergence) may provide somewhat better control of volunteer crop seedlings than applications at the 2-leaf stage. Use of a crop oil concentrate or non-ionic surfactant at 1/8 to 1/2% of spray volume may improve control of emerged seedlings.

GOAL Herbicide will not control established perennial grasses or seedlings of most annual and perennial grasses beyond the 6-leaf growth stage, and is erratic on seedlings between the 2-leaf and 6-leaf growth stages, varying with species. Single applications made to seedlings between the 2 and 6-leaf growth stages will cause injury and stunting, but are unlikely to kill them, and regrowth will generally occur. If seedlings have not died within 3 to 4 weeks after treatment with GOAL Herbicide and healthy, green regrowth is visible, a second application may be needed, preferably in combination with another registered herbicide. Total amount of GOAL Herbicide applied yearly should not exceed the maximum rate listed for each specific crop. Tank mixes with Karmex (diuron) and Sinbar should be applied only to healthy, vigorous stands of perennial grasses in which those herbicides are registered.

Severe chlorosis (yellowing) of established perennial grasses will occur within 1 to 2 weeks after treatment with GOAL Herbicide, and some symptoms of injury may be present for as long as 3 months. Use of GOAL Herbicide to control weeds will substantially reduce vegetative growth by perennial grasses during the winter. Chlorosis and stunting of vegetative growth is normal, and seed yield of healthy, vigorous perennial grasses has not been affected by fall application of GOAL Herbicide. Conditions under which seed yield may be reduced are not fully understood. DO NOT GRAZE after applying Goal Herbicide, as illegal residues may be present in the vegetative forage. Grazing may also magnify crop injury and reduce the seed yield.

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Crop tolerance to GOAL Herbicide can be improved by limiting the amount of leaf tissue present on the established plants at time of application by such methods as propane flaming, intensive mechanical clipping (crew cutting), prior livestock grazing, or open field burning. Substantially complete removal and uniform dispersion of crop and weed residue (chaff, leaves, seeds, and stems) following seed harvest is vital for optimal performance of GOAL Herbicide against seedling grasses.

Weeds and volunteer crops controlled or suppressed by GOAL Herbicide applied between the onset of germination and the 2-leaf seedling growth stage:

Common name	Scientific name
tall fescue*	Festuca arundinacea
perennial ryegrass*	Lolium perenne
Italian ryegrass	Lolium multiflorum
orchardgrass	Dactylis glomerata
fine fescue (creeping red and chewings)	Festuca rubra
hard fescue	Festuca longifolia
bentgrass	Agrostis tenuis
Kentucky bluegrass	Poa pratensis
annual bluegrass	Poa annua
roughstalk bluegrass	Poa trivialis
California (mountain) brome*	Bromus carinatus
rattail fescue	Vulpia myuros

Goal Herbicide will also control or suppress many annual broadleaf weeds.

* These species are suppressed but not fully controlled by Goal Herbicide.

RATE OF APPLICATION BY CROP:

Kentucky bluegrass, tall fescue, orchardgrass, and bentgrass

One or more applications of 5 to 30 ounces per acre (1/16 to 3/8 lbs/acre) not to exceed 30 ounces total in one growing season are recommended. Make first application before new grass seedlings exceed the 2-leaf growth stage, no later than December 15. Make final application before January 15.

Perennial ryegrass

One or more applications of 5 to 20 ounces per acre (1/16 to 1/4 lbs/acre) not to exceed 20 ounces total in one growing season are recommended. Make first application before new grass seedlings exceed the 2-leaf growth stage, no later than December 15. Make final application before January 15.

Fine fescues (Chewings, creeping red, and hard types)

Single application of 5 to 10 ounces per acre (1/16 to 1/8 lbs/acre) is recommended. Apply before new grass seedlings exceed the 2-leaf growth stage, no later than December 15.