UNDATED

002264 44

Hydram

Studies Submitted

Acute Rat Oral (tech)	:	LD_{50} = 720 mg/kg
Acute Rat Oral (6-E)	:	LD_{50} = 584 mg/kg
Acute Mouse Oral (Tech)	:	LD_{50} = 798 mg/kg
Acute Mouse Oral (	:	LD50 = 1260 mg/kg
Acute Rabbit Dermal (Tech)	:	LD_{50} = > 2000 mg/kg
Acute Rabbit Dermal (6-E)	:	LD_{50} = > 10,000 mg/kg
Acute Eye Irritation Rabbits (Tech)	:	Moderate eye irritation
Acute Eye Irritation Rabbits (6-E)	:	Mild to moderate eye irritation
Acute Rat Inhalation (1 hr)	:	No fatalities at 2.1 mg/L; 100% fatal at 202 mg/l
Fish Toxicity	:	LD_{50} = 19 ppm
Subacute Rabbit Dermal (21 day) (6-E)	:	100 mg/kg produced mild irritation; the 1000 mg/kg caused 90% mortality, liver pathology and abnormal blood picture.
Subacute Rat Feeding (13 wks)	:	No effect level = 35 mg/kg
Subacute Dog Feeding (30 days)	:	No effect level = 30 mg/kg

Washington, D. C.

January 22, 1968

002264

Mr. Kenneth Nash
Pesticide Regulation Division
Agricultural Research Service
U. S. Department of Agriculture
Washington, D. C. 20250

Dear Mr. Nash:

The toxicological data on Hydram, (S-Ethyl hexahydro-1-H-azepine-1-carbothioate) received from you on January 11, 1968 per my request of March 2, 1967 has been reviewed.

We have no objection to the registration of this chemical as a herbicide.

Sincerely,

Robert D. Coberly
Biologist
Registration Section
Pesticides Program

cc: Hydram Folder
Mildred Workinger

RDCoberly:dsg

002264

Dr. Robert .. Jasper, Asst. Chief
Staff Officer, PRD, ARS, USDA

January 5, 1967

Medical Officer, Registration Staff
Office of Pesticides

Hydram (Ordram)

The toxicological data on Hydram (Ordram) (S-Ethylhexahydro-1-4-Azepine-1-carbothioate) supplied by you on March 22, 1965 and on April 6, 1965 has been reviewed. The information indicates that the compound can be used without undue hazard to man.

We concur in the registration of this compound for use as a herbicide.

We would like copies of the analytical methods for the compound.

Robert F. Berish, M.D.

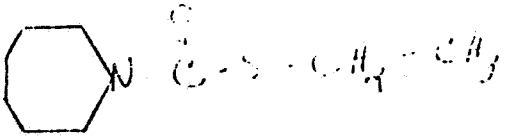
REBOMD:jlc 1/4/67

cc: Hydram Folder

ORDRAM (HYDRAM)

Chemical Name: S-Ethyl hexahydro-1H-azepine-1-carbothioate

Structural formula:



Physical State: Liquid

Specific Gravity: 1.06 g/ml - 20° C

B.P. 137° C

Solubility: Soluble in most organic solvents, practically insoluble in water

Use: Herbicide

Manufacturer: Stauffer Chemical Company

Technical OrdramL Assumed to be pure compound

Ordram - E: 6 lb/gal in kerosene

6 lb/gal = 683.5 g/l

1 gal = 4l

1 lb = 454 g

$$6(454) = \frac{2724 \text{ g/gal}}{3.78 \text{ l gal}} = 719.6 \text{ g/L}$$

Data Needed:

Analytical Method

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RDCoberley:deg
January 29, 1968

Hydram

Acute Rat Oral (Tech)	:	Male LD_{50} = 584 mg/Kg. Depression, asthemia and excessive urination at 464 to 1,000 mg/Kg.
Acute Rat Oral (Tech)	:	Female LD_{50} = 660 mg/Kg. Depression, salivation, labored respiration noted at 600 mg/Kg and higher.
Acute Rat Oral (6-E)	:	Male LD_{50} = 794 mg/Kg. Female LD_{50} = 681 mg/Kg. No effect at 100 and 215 mg/Kg. Depression noted at the 464 mg/Kg level for 24 hours.
Subacute Dog Feeding (13 Weeks) (Tech)	:	Levels tested were 450, 900, and 1,800 ppm (approximately 15, 30, and 60 mg/Kg). Increased thyroid weight at 1,800 ppm. No effect level is approximately 900 ppm.
Subacute Rat Feeding (13 Weeks) (Tech)	:	Levels tested were 8, 16, 32 mg/Kg/day. Moderate weight inhibition and food consumption at 32 mg/Kg. Increase in organ weights at 32 mg/Kg. Ovarian vacuolation at 16 and 32 mg/Kg. No effect level = >8 and<16 mg/Kg/day.

002264

KDC:berley:deg
January 2[illegible], 1978

Hydram

Acute Rat Oral (Tech)

Five male animals were tested per dosage level of 100, 215, 414, 1,000 mg/Kg.

Results

LD_{50} = 584 mg/Kg. The 100 and 215 mg/kg levels produced no sign of systemic toxicity. The 464 and the 1,000 mg/Kg levels showed death, depression, asthenia, and excessive urination.

Acute Rat Oral (Tech)

Seven female rats were tested per dosage level of 200, 400, 600, 800, 1,000, and 1,200 mg/Kg. The compound was administered as a 10% solution in corn oil. Animals were fasted overnight prior to dosage.

Results

Female LD_{50} = 660 mg/Kg. All animals showed slight depression within one hour following dosage. The 200 and 400 mg/Kg levels exhibited normal appearance and behavior within 24 hours. Depression, salivation, lacrimation, labored respiration, excessive urination and hypothermia were noted in the animals at the higher dosage levels. Gross autopsies performed upon the animals that died revealed slightly congested to hemorrhagic lungs.

Acute Rat Oral (6-D)

Five male and five female rats were tested per dosage level of 100, 215, 464, and 1,000 mg/Kg. The animals were fasted overnight prior to dosage.

Results

Male LD_{50} = 794 mg/Kg. Female [illegible] = 651 mg/Kg. Both male and female animals exhibited normal appearance and behavior at the 100 and 215 mg/Kg dosage levels. At the 464 mg/Kg level both sex appeared depressed within one to three hours following dosage and exhibited slight lacrimation and slight excessive urination. These conditions persisted for 24 hours. Within four hours the animals at the 1,000 mg/Kg level showed general depression, salivation, lacrimation and excessive urination. The surviving male appeared normal within four to five days

Subacute Dog Feeding (13 Weeks) (Tech)

Two dogs were fed the test material daily in the diet, seven days per week, for a period of thirty days. Dog number one received the dosage level of 50 mg/Kg/day for the entire thirty days. Dog number two was started at 100 mg/Kg and reduced to 50 mg/Kg after ten days. This procedure was considered a pilot study to establish a maximum tolerated dosage level. Based on results from this pilot study the following thirteen week study was initiated.

The dosage levels employed were 15, 30, and 60 mg/Kg. Two males and two females were used per dosage level of 15 and 60 mg/Kg.. Due to a mix up three females and one male were started at 30 mg/Kg. This was corrected during the fifth week when a second male was added to this dosage level. Due to various weight changes in this study it is

reported that the actual feeding levels were 450, 900, and 1,800 ppm. Blood pressure and electrocardiograms were obtained at 4, 8, and 13 weeks. Hemograms consisting of hemoglobin, hematocrit, sedimentation rate, and total and differential white cell counts were obtained at 0, 4, 8, and 13 weeks. The BUN, SAP, serum glucose, SGOT, SGPT, qualitative urinalyses, and prothrombin time determinations were conducted at the same intervals as the hemograms.

Sections of the thyroid, heart, lungs, liver, adrenals, kidney, spleen, testes or ovaries, prostate or uterus, brain, pituitary, parotid salivary gland, bone marrow, small intestines, mesenteric lymph node, peripheral nerve, gall bladder, skin, pancreas, large intestines, trachea, spinal cord, eye, stomach, thymus, urinary bladder, skeletal muscle, and esophagus were examined microscopically.

Results

All animals survived the study. The body weight gains of the test animals were in general comparable to the control values. Direct ophthalmoscopic examinations on eyes of all dogs showed no changes in the vitreous humor, optic disc, tapetum lucidum, tapetum nigrum, or retinal vessels. Electrocardiograms were essentially normal in all dogs. Heart rates, although showing a wide range of values, was significantly decreased for two dogs at each of the 60 and 30 mg/Kg levels. All dogs on the 60 mg/Kg level showed a slight elevation of leucocyte counts. Three of five dogs on the 30 mg/Kg level also showed a slight elevation

of the leucocyte counts. One dog at each level showed a reduction of hemoglobin. Two dogs on the 60 mg/Kg level showed increase in the SGPT value.

Three of the four dogs on the 60 mg/Kg level showed an increased thyroid weight. The thyroids of the remaining dog on this level were smaller than normally seen. An increase in the relative kidney weight was also noted for one dog on the 60 mg/Kg level.

Subacute Rat Feeding (13 Weeks) (Tech)

Fifteen males and fifteen females were tested per dosage level of 8, 16, and 32 mg/Kg (the 8 mg/Kg level had 16 males and 14 females). At thirteen weeks, hemograms consisting of hemoglobin, hematocrit determination, total and differential leucocyte counts, and thrombocyte counts were conducted.

Results

One animal on the 32 mg/Kg level died during the fifth week. The remaining animals in this group showed a moderate body weight inhibition when compared to the control weight gain. The body weight gain of the two lower levels were comparable to the control values. The food consumption values for the 32 mg/Kg level were somewhat less than the controls while those in the two lower test groups were comparable to the controls.

Hemogram values of the test animals were in general comparable to the corresponding control values.

The organ to body weight ratio of the female kidney and adrenal glands showed the test values to be significantly higher than the corresponding control values. The organ to body weight ratio of the high level male adrenal, thyroid, and testis weights were significantly higher than the corresponding control groups.

Histopathological Changes - Foamy vacuolation in ovarian stromal cells of females receiving the 32 or 16 mg/Kg level was noted. An increase in the adrenal cortical cell vacuolation in both males and females of all treated groups was noted. The degree ranged from very slight to moderate.

Neither the adrenal nor the ovarian vacuolation were degenerative in nature, and appeared to represent increased storage of normal lipoid elements.

It appears from the aforementioned data that the no effect level is greater than 8 mg/Kg/day and less than 16 mg/Kg/day.

002264

TECHNICAL HYDRAM

Acute Rat Oral (LD_{50} - 720 mg/kg)

Groups of five Sprague-Dawley males, weighing from 232-299 grams received dosage levels of 225.75, 487, 1050 and 2257.5 mg/kg. Food was withheld from the animals for three to four hours prior to dosage. The no effect level was >225.75 and < 487 mg/kg.

Results: The 226 mg/kg group showed no effect. About ten minutes following intubation, the 487 mg/kg group appeared depressed and exhibited salivation and excessive masticatory movements. After 24 hours they appeared normal. Within several minutes following dosage the 1050 and 2257.5 mg/kg animals appeared depressed and ataxic, exhibited salivation and excessive masticatory movements and lacrimation. The 2257.5 mg/kg animals exhibited these signs until death. The 1050 mg/kg animals which survived the 24-hour observation period appeared extremely weak and depressed, exhibiting ataxia, intermittent tremors, bloody exudate around the eyes, and signs of excessive urination. They also were cold to the touch. These signs persisted until death.

Gross autopsies revealed congested to hemorrhagic lungs. The gastrointestinal tract showed a yellowish discoloration. The surviving animals at autopsy appeared grossly within normal limits.

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Acute Mouse Oral · LD_{50} = 795 mg/kg

Groups of seven male Swiss-Webster mice, weighing between 23-40 grams were dosed at 600, 700, 750, 800, 850, 900, and 1000 mg/kg. All animals were dosed unfasted.

No effect level was 600 mg/kg.

Acute Rabbit Dermal LD_{50} > 2000 mg/kg

Two adult albino rabbits weighing from 2 to 3 kg were dosed per level of 200, 632, and 2000 mg/kg. Exposure time was 24 hours.

Results: All rabbits showed slight to moderate erythema the first and second days after application of the test material but appeared normal on the third day. No edema was observed at any level. No deaths occurred.

Acute Eye Irritation - Rabbits

0.1 ?

1.1 ml of undiluted test material was placed in one eye of each of six rabbits.

Results: "Moderate" irritation, which persisted for 48-72 hours, was produced in all rabbits. The eyes were normal after this period.

HYDRAM 6-E (6 lb/gal in kerosene)

Acute Rat Oral - LD_{50} = 584 mg/kg

Groups of five males weighing between 170 and 255 grams were dosed at 215m 464, 1000 and 2150 mg/kg.

Results: The no effect level is < 215 mg/kg but < 464 mg/kg. The rats given doses of 464 mg/kg and greater appeared depressed and exhibited sluggish placement and righting reflexes. The high level animals

showed salivation and unkept fur coats. Surviving animals appeared nor by and after the sixth day.

Acute Mouse Oral LD_{50} = 1260 mg/kg

Groups of five male mice weighing 25-45 grams were tested per dosage le 464, 1000 and 2150 mg/kg.

Results: The no effect level was > 464 mg/kg and · 1000 mg/kg. At 10[illegible] 2150 mg/kg depression, unthriftiness and tremors were observed within or 24 hours following dosage. These symptoms subsided after an additional 24 hours.

Acute Rabbit Dermal LD_{50} > 10 ml/kg

Four groups of four rabbits (sex unspecified) were tested. The sample w assumed (there is no indication of any basis for this assumption) to be 100% pure. The dosage is reported in ml/kg and the specific gravity of solution is not given. Levels given were 1, 2.15, 4.64, and 10 ml/kg. The animals were observed for 15 days. Exposure period was 24 hours.

Results: Four rabbits in the initial series dosed died. The deaths wer attributed to enteritis. These rabbits were replaced by four others and there were no mortalities at at any level tested. No consistent body we change effect was noted.

On the day following application of the test material, the majority of t 4.64 and 10 ml/kg animals appeared depressed and showed diarrhea. One r from the 4.64 ml/kg level showed salivation and nasal discharge. One an

at 10 ml/kg showed salivation, nasal discharge, depressed righting and placement reflexes, tremors and slight ataxia. These signs subsided after an additional one to three days. All of these rabbits (all the 4.64 ml/kg and three of the 10 ml) appeared normal for the rest of the experimer The remaining 10 ml/kg animal showed a progressively more severe diarrhea and emaciation from the ninth through the fifteenth day. Overall weight lc for this rabbit was 402 g. At gross autopsy this rabbit showed moderately congested kidneys, depletion of body fat stores and numerous coccidial cysts in the liver. The majority of the remaining animals showed a similar parasitic infection but there was no other consistent gross pathology.

Acute Eye Irritation - Rabbits

A single application of 0.1 ml of the undiluted material was placed in the right eyes of three albino rabbits.

Results: Within one hour the treated eye of each rabbit showed moderate to marked conjunctivitis. Two animals showed mild iritis. All animals appeared normal by day 4 or 6.

Acute Inhalation (Rats)

Two groups of ten male rats were exposed to concentrations of 2.1 mg/l and 202 mg/l respectively for one hour in an inhalation chamber.

Results: All of the rats exposed to 202 mg/l died within 24 hours after exposure. None of the 2.1 mg/l animals died during a 14 day observation period.

The rats exposed to the higher concentration showed squinting, excessive preening, salivation, excessive masticatory movements, praid shallow respiration, prostration and damp fur. At the end of the exposure period the animals showed ataxia, sprawling of the limbs, depressed or absent placement reflexes and gasping.

Gross autopsies showed hemorrhagic lungs, stomachs distended with gas, urinary bladders distended with normal appearing urine, slight or marked congestion of the kidneys and slight congestion of the adrenals.

ORDRAM 6-E (6 lb/gal in kerosene)

Subacute Dermal Toxicity (Rabbits)

A total of 50 albino rabbits were employed as follows:

Dose levels were 0.1 ml/kg/day and 1 ml/kg/day.

Dosage Level	*Abraded Skin		Intact Skin	
mg/kg/day	Males	Females	Males	Female
0 (Control)	-	-	5	5
0.068	5	5	5	5
0.6835	5	5	5	5

*Minor abrasions, not sufficient to cause bleeding, were induced with a glass rod.

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A total of fifteen daily doses of undiluted Ordram 6-E were applied during a 21 day interval. Following treatment the treated areas (abdominal) were covere to prevent ingestion of the material. The exposure periods were approximately 20 hours. Between exposures the treated areas were washed to remove any residue. The treated skin of surviving animals was observed for two weeks after the last dermal treatment.

Results: The lower level (0.068 mg/kg) was well tolerated by male and female albino rabbits. The compound caused mild irritation to both intact and abraded skin. Signs of irritation subsided during a two week post treatment observation period.

The 0.68 mg/kg level caused 90% (18/20) mortality. Typical of the response were severe skin irritation with secondary infection, anorexia, diarrhea and weight loss. Apparent liver pathology and an abnormal blood picture accompanied several animals.

Comment: The liver pathology and mortality may have been accelerated by the presence of kerosene in the formulation. This appears to establish the need for chronic rodent studies and human field use data.

Ordram (99.5%) Subacute Feeding Study - Rats

Rats were given the compound in the diet for 13 weeks.

Dose level mg/kg/day	No. of Animals	Sex
Control	15	Male
"	15	Female
140	15	Male
	15	Female
70	15	Male
	15	Female
35	15	Male
	15	Female

Weanling albino rats were used. Food and water were available ad libitum

Results: See below

One male at 140 mg/kg died during the third week, possibly from a respiratory infection. Body weight gain was low for all the test groups and was suppressed for the high and middle level animals from the start of the study.

SUMMARY AND CONCLUSIONS: Male and female albino rats were given R-4572 in the diet at levels equivalent to 140, 70, and 35 mg/kg/day for all 13 weeks. Controls were maintained simultaneously.

At intervals, hemograms were obtained on representative rats of various groups, and prothrobin times were measured at termination on representatives of two groups.

At sacrifice, autopsies were performed. A number of organs were weighed, and portions of a total of about 17 tissues per rat were saved for possible microscopic examination.

Salient over-all findings were:

MORTALITY: One male (140 mg/kg) died at week 3 - probably of respiratory infection.

WEIGHT GAIN: High-level males, 55 per cent of controls; females, 63 per cent. Middle-level males, 81 per cent; females, 89 per cent. Low level, 92 per cent for both sexes.

FOOD INTAKE: Definite suppression at high level, some in middle.

HEMOGRAMS: Some decrease in hemoglobin and hematocrit values at 8 weeks in males receiving 140 mg/kg, and slight decrease in 70 mg/kg males. At 13 weeks values comparable to control.

ORGAN WEIGHTS: Increased liver, kidney, adrenal, and thyroid organ-to-body-weight ratios at high level, and sometimes at middle level also.

Decreased testis-and ovary-body-weight ratios.

HISTOLOGICAL: Changes in liver, kidney, adrenal, testis and ovary in high level (not always in both sexes); and in some cases at midlle level also.

It is concluded on the basis of the foregoing data that 35 mg of R-4572 per kg body weight presents relatively little toxicity hazard, but that levels of 70 mg/kg or above definitely produce pathological changes.

Ordram Chronic Feeding Study - Dogs

Pilot Study

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Technical Ordram (99.5%) was administered in the diet to two mongrel dogs daily in the diet for 30 days. Dosage initially was 100 mg/kg/day. After 10 days the level for female dog was reduced to 50 mg/kg/day because of a decline in food intake to about one fourth of her daily ration. A resumption of appetite and alert benaviro occurred after reduction of the dose.

PROCEDURE: Seventeen purebred beagles, immunized against distemper, hepatitis, rabies, and leptospirosis, were obtained from three sources: Stonecraft Beagles, Herndon, Virginia; Animals for Research, Inc., Lorton, Virginia, and the Richard E. Saunders Corporation, Richmond, Virginia. During a four-week acclimation period in our laboratory, the animals were treated with appropriate anthelmintics and grouped for study as follows:

Group	Dog No.		Dosage Level mg/kg
	Male	Female	
I	3393 3466	3431 3447	Control
II	3467 3467	3435 3438	60
III	3388 3449*	3440 3446 3464	30
IV	3445 3448	3442 3450	15

*Insofar as three females and one male were inadvertently started on Group III, an additional male, dog No. 3449, was added to the group five weeks after the start of the study.

Dose Level mg/kg/day	Actual PPM in Diet by Dry Weight
60	1800
30	900
15	450

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These calculations were made upon the assumption that a 6.0 kilogram dog would consume 200 grams of diet by dry weight daily.

SUMMARY AND CONCLUSIONS: On the basis of the dietary feeding of Ordram (R-4572) to groups of 4 dogs each (5 dogs in one group) at levels of 1800, 900, 450, and 0 PPM by dry weight in the diet for 13 weeks (these levels designated as 60, 30, 15, and 0 mg/kg/day, respectively) and using as criteria:

Survival, weight gain, food consumption, behavior physical examinations including ophthalmoscopic examination, electrocardiograms, blood pressure, and heart rates

Hemograms consisting of hemoglobin, hematocrit sedimentation rate, total and differential white cell counts, and platelet counts.

Clinical chemistry consisting of blood urea nitrogen serum alkaline phosphatase, serum glucose, serum glutamic oxalacetic transaminase, serum glutamic pyruvic transaminase, prothrobin time, and qualitative urinalyses.

Gross necropsy observations, organ weights

Histopathological examination.

It is concluded that:

(1) Ordram (R-4572) produced no measureable changes at 900 and 450 ppm.

(2) At 1800 ppm, the only significant change detected were restricted to a slight increase in blood urea nitrogen in one of four dogs; slightly increased thyroid weights in three of four.

It should be noted that in the pilot experiment a dose level of 100 mg/kg/day was not tolerated by the dog and that the high dose in the 13-week experiment was approximately half that.

002264

INTERDEPARTMENTAL COORDINATION
OF
ACTIVITIES RELATING TO PESTICIDES

Referral of Application for Registration under the Federal Insecticide, Fungicide, and Rodenticide Act

002264

1. APPLICANT
Stauffer Chemical Co.
636 California Street
San Francisco, California

2. PRODUCT
ORTHAM 5 GRANULAR

476-1370
(PETITION NO. PP7F0616)

3. DATE OF REFERRAL
1-11 wk of 1-12-68

4. COMMENTS OF COORDINATING AGENCY

BEST AVAILABLE COPY

BY

6. DATE

7. NAME OF AGENCY

ej

FORM 9-230
DEC 1964

23

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FORMULATION FOR USE

ORDRAM 6E

Active Ingredient:

S-ethyl hexahydro-1H-azepine-1-carbothioate..... 71.0%

Inert Ingredients: [redacted] 29.0%

100.0%

ORDRAM 5 GRANULAR

Active Ingredient:

S-ethyl hexahydro-1H-azepine-1-carbothioate..... 5.0%

Inert Ingredient:

[redacted]..... 95.0%

100.0%

ORDRAM 10 GRANULAR

Active Ingredient:

S-ethyl hexahydro-1H-azepine-1-carbothioate..... 10.0%

Inert Ingredient:

[redacted]..... 90.0%

100.0%

[redacted] INFORMATION IS NOT INCLUDED

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GDN:/aed MERE INGREDIENT INFORMATION IS NOT INCLUDED May 16, 1967

CONFIDENTIAL

002264

(STAUFFER 1009)

ORDRAM® 5 GRANULAR

A Selective Herbicide

ACTIVE INGREDIENT:

S-ethyl hexahydro-1H-azepine-1-carbothioate	5.0%
INERT INGREDIENTS	95.0%
	100.0%

U. S. Patent No. 3,198,786

CAUTION (18 pt. type)

May be harmful if swallowed.
Avoid contact with skin, eyes and clothing. Wash with soap and water after use.
Avoid breathing dust.
Avoid contamination of feed and foodstuffs.

KEEP OUT OF REACH OF CHILDREN (12 pt. type)

Net Contents _____ Pounds

READ ALL DIRECTIONS BEFORE USING

Made in U.S.A. by

Stauffer Chemical Company

(Addresses)

002264

WEEDS CONTROLLED

See Regional Label Supplements -- Section I

GENERAL USE PRECAUTIONS

READ ALL LABEL INSTRUCTIONS BEFORE USING. ORDRAM should be used only for recommended purposes and at recommended rates. ORDRAM may cause crop injury under extreme soil or climatic conditions or if directions are not followed.

Do not apply any other herbicide in conjunction with ORDRAM as injury may occur.
Do not mix with fertilizer.
Do not store near seeds or fertilizer.
Do not contaminate water used for domestic purposes.
Keep container closed when not in use.
Recommended rates and methods of application have not harmed fish present in rice field drainage waters. Care should be taken not to contaminate lakes or ponds where cold-water fish species are present.

DIRECTIONS FOR USE

SOIL PREPARATION: Prepare the soil for seeding according to good agricultural practices. All weed growth must be thoroughly worked into the soil before treatment.

APPLICATION: Except as noted, application may be made by either air or ground equipment. Application equipment should be carefully calibrated before use and checked frequently during application to be sure application is uniform. Avoid overlaps that will increase ORDRAM dosage above recommended limits because crop injury may occur. Aerial application should be made only when the wind velocity is low, 0 - 5 MPH.

SOIL INCORPORATION: See Regional Label Supplements -- Section III.

RECOMMENDATIONS

See Regional Label Supplements -- Section II.

NOTICE: STAUFFER CHEMICAL COMPANY MAKES NO WARRANTY, EXPRESS OR IMPLIED, INCLUDING THE WARRANTIES OF MERCHANTABILITY AND/OR FITNESS FOR ANY PARTICULAR PURPOSE, CONCERNING THIS MATERIAL, EXCEPT THOSE WHICH ARE CONTAINED ON STAUFFER'S LABEL.

BURN EMPTY BAG. KEEP OUT OF SMOKE.

Made in U.S.A.
Federal Registration No. 476-1870

ARC 671106

ORDRAM 5 GRANULAR

LABEL SUPPLEMENT FOR SOUTHWEST REGION

0022

SECTION I

WEEDS CONTROLLED

(See SOIL INCORPORATION below)

Barnyardgrass (Watergrass)	(Echinochloa spp
Sprangletop	(Leptochloa spp
Crabgrass	(Digitaria spp.
Brachiaria	(Brachiaria spp
Nutsedge (Nutgrass)	(Cyperus, Spp.)

SECTION II

RECOMMENDATIONS

Crop	When to Apply	RATE Pounds ORDRAM 5G/A	Remarks
RICE (Water-Seeded)	Before flooding and planting	60	Apply and incc Flood the fiel ing immediatel application an flood 4-6 days seeding. For l recommended pr consult agricu experiment sta extension serv specialists.
OR			
RICE	Post-flooding, Post-emergence (Rice should be in the seedling state at the time of application)	40 to 60	For Barnyardgr only. For air only. Watergr (barnyardgrass emerged from t taller than 3 must be submer time of treatm level of water maintained unt watergrass die 4-7 days after

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SECTION III

SOIL INCORPORATION OF APPLICATIONS MADE BEFORE FLOODING AND PLAN

ORDRAM 5 Granular should be incorporated into the soil by discing or harrowing the same day it is applied. The more immediate the corporation, the better the weed control. For control of barnyar (watergrass), crabgrass and sprangletop, incorporation must inclu least one discing and one harrowing. For control of all other we listed, incorporation must include at least two discings and two rowings.

ORDRAM 5G

LABEL SUPPLEMENT FOR WESTERN REGION

002264

SECTION I

WEEDS CONTROLLED

Barnyardgrass (Watergrass) (Echinochloa spp.)
Sprangletop (Leptochloa spp.)

SECTION II

RECOMMENDATIONS

Crop	When to Apply	RATE Pounds ORDRAM 5G/A	Remarks
RICE Water-Seeded	Before Flooding and Planting	60	Apply and incorporate DIRECTIONS FOR USE - INCORPORATION). Floo field and plant rice, locally recommended consult agricultural experiment stations extension service ric specialists.
OR			
RICE	Post-Flooding, Post-emergence (Rice should be in the seedling state at the time of application)	60	For Barnyardgrass cor For air application c Watergrass must be en from the mud, no tall 3 inches but below th face of the water at of treatment. This l water must be maintai until the watergrass usually 4-7 days afte cation.

SECTION III

SOIL INCORPORATION: Before Flooding and Planting applications c ORDRAM 5G must be incorporated into the soil within six hours by mechanical incorporation. Incorporation should be done by at lea one discing and spiketooth harrowing.

ORDRAM 5G applications made to very dry soils under dry climatic ditions require no incorporation so long as conditions remain dry Since moisture will cause ORDRAM to evaporate from the soil surfa applications should be flooded or incorporated as directed above rainfall or dew of any amount is expected.

When ORDRAM 5G is not incorporated, the soil must remain covered water once flooding has been accomplished. When incorporated, OR 5G will provide weed control even if the soil is exposed after fl