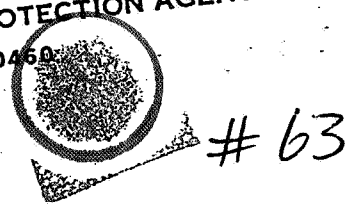


US EPA ARCHIVE DOCUMENT

Atrazine/Review # 36/2-11-81/8 pages

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



Date: February 11, 1981

Subject: EPA File Symbol: 7969-LJ
LADDOK: Caswell # 509 C + 63

From: Deloris F. Graham *RGD 2/14/81*
FHB/TSS *E 2/20/81*

To: Robert Taylor
Product Manager (25)

Applicant: BASF Wyandotte Corporation
Agricultural Chemical Division
100 Cherry Hill Road
Parsippany, New Jersey

Active Ingredients:

Sodium salt of bentazon (3-Isopropyl-1H-2,1), 3-benzothiadiazin-4(3H)-one,2,2-dioxide.....	21.8%
Atrazine (2-chloro-4-ethylamino-6-isopropylamino- s-triazine.....)	20.0%
Inert Ingredients.....	58.2%

Background: Submitted Acute Oral, Acute Dermal, Acute Inhalation, Eye Irritation and Skin Irritation studies. These studies were conducted by BASF. These data are under accession number 244920. Method of support not indicated.

Recommendations:

(1) FAB/TSS finds these studies acceptable to support the conditional registration of this product. However, for future submissions please note:

- a. In the Acute Oral Study, LD50 and 95% confidence limits must be submitted individually for males and females.
- b. In the Acute Dermal Study, irritation scores must be reported individually for each animal.
- c. In the Acute Inhalation Study, chamber temperature and humidity must be reported.

- d. In the Eye Irritation Study, 9 animals (6 animals with treated unwashed eyes and 3 animals with treated washed eyes) must be used.
 - e. In the Dermal Irritation Study, 4 skin sites (2 abraded and 2 intact) must be used.
3. As determined by the Eye Irritation Study, the appropriate signal word is DANGER.

Label:

- 1. The signal word DANGER must appear on center front panel.
- 2. The preferred placement of the statement "Keep Out of Reach of Children" is on the center front panel preceding the signal word.
- 3. The precautionary statements must be revised to read:
 - "Corrosive, causes eye damage and skin irritation. Do not get in eyes, on skin or on clothing. Wear goggles or face shield and rubber gloves when handling. Harmful if swallowed."
 - "If in Eyes, immediately flush eyes with plenty of water. Get medical attention. If on Skin, immediately flush skin with plenty of water. Get medical attention if irritation persists."
- 4. The statement "Keep out of lakes, ponds or streams" must be revised to read "Do not apply directly to lakes, ponds or streams."
- 5. The Environmental Hazard statements preceding the Storage and Disposal statements must be deleted.
- 6. Please see enclosed copy of labeling procedures and formats.

Review:

- 1. The Acute Oral Toxicity Study: BASF, December 13, 1979.
Procedure: 6 groups, each consisting of 5M and 5F Sprague-Dawley rats received one of the following doses: 1000, 1470, 2150, 3160, 3830 and 5000 mg/kg of the test material. Observations were made daily for 14 days. Necropsies were performed on all animals.

Results: At 3160 mg/kg, 3/10 animals died; at 3830 mg/kg, 9/10 animals died and at 5000 mg/kg, 10/10 animals died. Symptoms observed included dyspnea, apathy, abnormal position, staggering, trembling, twitching, spastic gait, piloerection, erythema, cyanosis, exsiccosis, salivation, lacrimation, poor general condition. Necropsy of animals which died during study revealed acute dilatation of the atria; acute congestive hyperemia of the heart; clay-colored periphery involving about half of the area of the acinus of the liver; hemorrhagic ulcerations in the glandular stomach, content mixed with blood in intestines. Sacrificed animals showed no abnormalities at necropsy. LD50 for males and females was 3341 mg/kg with confidence limits between 2959-3639 mg/kg.

Study Classification: Core Minimum Data. Must submit LD50 and confidence limits individually for males and females.

Toxicity Category: III - CAUTION

2. Acute Dermal Toxicity Study: BASF; November 8, 1979.

Procedure: 2 groups, each consisting of 5M and 5F Sprague-Dawley rats received one of the following doses: 2000 and 5000 mg/kg at shavened skin sites. The treated skin sites were placed under occlusive wrap for a 24-hour exposure period. Observations were made at 1, 24 and 48 hours and 7 and 14 days. Necropsies were performed on all animals.

Results: No mortalities. Symptoms observed included irregular respiration and apathy. At 24 hours after exposure there were signs of primary irritation which had completely subsided after 7 days. No abnormalities observed at necropsy. LD50 was greater than 5000 mg/kg.

Study Classification: Core Minimum Data Irritation scores must be reported individually for each animal.

Toxicity Category: III-CAUTION

3. Acute Inhalation Toxicity: BASF; February 2, 1980;

Procedure: The vessel containing the test substance was connected to a two-component or a Rhema atomizer, which was additionally supplied with filtered compressed air. When the Pari nebulizer was used, the condensate from the walls was collected and led back into the inhalation system. The nominal concentration was determined gravimetrically. A pressure slightly above atmosphere pressure was maintained in the inhalation system by means of an exhaust air system. The animals were exposed for 6 hours.

Ten male and ten female Sprague-Dawley rats were used for each of the following exposure concentrations; 25.6, 29.5 and 12 mg/l nominal concentrations. The analytical concentrations were 6.09, 3.12 and 1.68 mg/l respectively.

Results: At 25.6 mg/l, 1/10 M died and at 29.5 mg/l, 1/10 F died. Symptoms observed included lid closure, reddened nose, head conglutinated by substance, ruffled fur, dyspnea, tremors, staggering gait with stretched legs, crouching posture, aggressiveness, alopecia. Necropsy revealed reddish brown liver; yellowish-brown marbling of liver; clay-colored periphery involving about half of the area of the acinus of the liver. The IC₅₀ was determined to be greater than 6.1 mg/l.

Study Classification: Core Minimum Data. Chamber temperature and relative humidity must be reported.

Toxicity Category: III - CAUTION

4. Eye Irritation Study: BASF, November 8, 1979.

Procedure: 6F white rabbits received a 0.1 ml dose of the test material in one eye. Observations were made at 24, 48 and 72 hours and 8 and 16 days.

Results: At 24 hours, 6/6 animals had corneal opacity (6/6 = 20); 1/6 iris irritation (1/6 = 5); 6/6 conjunctive redness (6/6 = 2); swelling (6/6 = 2) and discharge (6/6 = 2). Corneal opacity and conjunctive irritation persisted for 16 days.

Study Classification: Core Minimum Data.

Toxicity Category: I - DANGER

5. Dermal Irritation Study: BASF; November 8, 1979.

Procedure: 3M and 3F rabbits were exposed to a 0.5 ml dose of the test material at intact and abraded skin sites under occlusive wrap for a 24 hour exposure period.

Results: At 24 hours, well defined erythema and edema at abraded and intact skin sites on all animals. At day 8, slight erythema and severe eschar formation. Primary irritation index was 3.8.

Study Classification: Core Minimum Data. 4 skin sites (2 abraded and 2 intact) must be used.

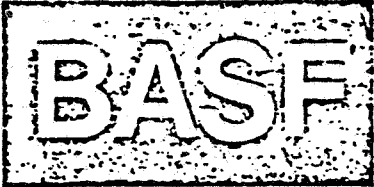
Toxicity Category: III - CAUTION

December 15, 1980

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TABLE



Laddok™

ART 03

POST-EMERGENCE FLOWABLE HERBICIDE

Active Ingredients:

Sodium salt of bentazon*(3-Isopropyl-1H-2,1,4-benzothiadiazin-4(3H)-one, 2,2-dioxide)...	21.8%
atrazine*(2-chloro-4-ethylamino-6-isopropylamino-s-triazine).....	20.0%

Inert Ingredients..... 58.2%

Equivalent to 1.66 pounds per gallon each active ingredient.

EPA REGISTRATION NO. 7969-

CAUTION

KEEP OUT OF REACH OF CHILDREN

Harmful if swallowed. Avoid contact with eyes or skin. In case of contact, immediately flush eyes or skin with plenty of water. Get medical attention if irritation persists.

ENVIRONMENTAL HAZARDS

Keep out of lakes, ponds, or streams. Do not contaminate water by cleaning of equipment or disposal of wastes.

SHAKE WELL BEFORE USING

NET CONTENTS

1/2 Gallons

BASF Wyandotte Corp.
Springfield, N.J. 07054

INSTRUCTIONS FOR USE

violation of Federal law to use this product in a manner inconsistent with its labeling.

Ground equipment: Use a minimum of 20 gals. of water per broadcast acre and a minimum of 40 psi pressure. When crop and weed foliage is dense use up to 50 gals. of water and up to 80 psi pressure. Use standard high pressure pesticide hollow cone or flat fan nozzles spaced 20 inches apart. Do not use flood nozzles.

(measured at the boom - not at the pump or in the line).

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Air equipment: Use a minimum of 5 gals. of water per acre and a maximum of 40 psi pressure. Use only diaphragm-type nozzles producing cone or fan spray patterns.

General Information

Laddok selective herbicide is intended for the post-emergence control of a broad spectrum of broadleaf weeds.

USES. Laddok DOES NOT CONTROL weeds. Laddok is effective mainly through contact, therefore, weeds must be thoroughly covered by spray. Large crop-and-weed-leaf canopies shelter weeds and prevent adequate spray coverage.

Corn is tolerant to Laddok at all stages of growth, but very slight leaf speckling may occur. Corn generally outgrow this condition within 10 days.

Always add oil concentrate according to the label on entitled "Mixing and Application".

Aerial Application-Special Directions

To obtain uniform coverage and to avoid drift hazards, the following application equipment and practices should be used:

Nozzle height: maximum of 10 feet above crop.

Nozzle orientation: nozzles must be oriented so as to discharge straight back with the air stream (opposite the direction of travel of the aircraft) or at some angle between straight back and straight down.

Nozzles must not be located further out than three fourths the distance from the center of the aircraft to the end of the wing or rotor.

Timing of Applications

Apply Laddok early post-emergence when weeds are small and actively growing and before weeds reach maximum size listed in the LADDOK APPLICATION RATE TABLE FOR CORN. Such applications generally correspond to the corn growth stages of one to five leaves.

Early application to weeds produces the most beneficial results on weed control.

allows use of the lower rate (depending on weed species), and makes it easier to obtain thorough coverage. Delay in application which permits weeds to exceed the maximum size stated will result in inadequate control.

Do not cultivate within 5 days before or after Laddok application in the following states: AZ, CA, CO, CT, IL, IN, IA, KS, KY, ME, MA, MI, MN, MO, MT, NB, NH, NJ, NY, ND, OH, OR, PA, RI, SD, UT, VT, WA, WI, WY. A cultivation 5 or more days after application may be necessary if all weeds are not controlled or if a second flush of weeds occurs.

Water volume and spray pressure: see above-Air application equipment.

Do not apply Laddok by aircraft when wind is blowing at a velocity of 5 mph or greater. Coarse sprays (larger droplets) are less likely to drift.

Water Volume and Spray Pressure
Use the recommended rates of Laddok as follows:

PART 02
PART 03

Environmental Hazards

Keep out of lakes, streams, or ponds. Do not contaminate water by cleaning of equipment or disposal of wastes.

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Do not apply when weather conditions favor drift from target area.

Storage And Disposal

Do not allow product to freeze.

Do not contaminate water, food or feed by storage or disposal. Open dumping prohibited. Do not reuse empty container.

Pesticide, spray mixture or rinsate that cannot be used or chemically reprocessed should be disposed of in a landfill approved for pesticides or buried in a safe place away from water supplies.

Triple rinse container and dispose of in an incinerator or landfill approved for pesticide containers, or bury in a safe place.

Consult federal, state or local disposal authorities for approved alternative procedures such as limited open burning.

Conditions of Sale And Warranty

The Directions for Use of this product reflect the opinion of experts based on field use and tests. The directions are believed to be reliable and should be followed carefully. However, it is impossible to eliminate all risks inherently associated with use of this product. Crop injury, ineffectiveness or other unintended consequences may result because of such factors as weather conditions, presence of other materials, or use of the product in a manner inconsistent with its labeling, all of which are beyond the control of BASF WYANDOTTE CORPORATION ("BWC") or the Seller. All such risks shall be assumed by the Buyer.

BWC warrants that this product conforms to the chemical description on the label and is reasonably fit for the purposes referred to in the Directions for Use, subject to the inherent risks referred to above. BWC MAKES NO OTHER EXPRESS OR IMPLIED WARRANTY OF FITNESS OR MERCHANTABILITY OR ANY OTHER EXPRESS OR IMPLIED WARRANTY. In no case shall BWC or the Seller be liable for consequential, special or indirect damages resulting from the use or handling of this product. BWC and the Seller offer this product, and the Buyer and user accept it, subject to the foregoing Conditions of Sale and Warranty which may be varied only by agreement in writing signed by a duly authorized representative of BWC.

Bayer logo trademark of BASF AG

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REF

PART 03

Do not apply Laddok by air within 200 feet of or sensitive non-target crops such as cotton, sunflowers or okra.

Do not apply Laddok if crop shows injury (leaf phytotoxicity and or plant stunting) produced by any other prior herbicide applications, because this injury may be enhanced and or prolonged.

must follow the most restrictive use cautions to hazards, including those found in this labeling and applicable state and local regulations and laws.

Do not apply Laddok during prolonged periods of drought or during unseasonably cold weather, as unsatisfactory weed control may result.

Rainfall or overhead irrigation soon after application (within 8 hours) may nullify the effectiveness of Laddok.

and Application

concentrate must be added to the spray tank under all conditions. Use a non-phytotoxic oil concentrate commonly referred to as oil concentrate) a blend of 80% paraffin base petroleum oil and an exempt surfactant.

Do not mix or apply Laddok with any other pesticide or with fertilizer except as specifically recommended on this labeling.

and application use oil concentrate at the maximum of 1 quart/acre. For air application use oil concentrate at the maximum rate of 1 pint/acre. In California, additional information under the APPLICATION RATE. Fill tank of a thoroughly clean sprayer 2/3 full with clean water. Start agitation and Laddok, allow to mix thoroughly. Add oil concentrate remaining volume of water. Maintain constant during application.

RATE

Avoid allowing the mixture to stand overnight. Clean sprayer thoroughly immediately after washing the system with water and a strong detergent. Do not allow cleaning water to contaminate any ponds.

Areas: In irrigated areas, it may be necessary to apply Laddok treatment to ensure weeds are growing actively. Weeds growing under drought conditions are not satisfactorily controlled.

Application Rate Table for Corn				
Weeds Controlled	Application Rates for Weed Growth Stages			
	2 3/4 pts / A*		3 1/10 pts / A*	
	Leaf Stage	Max. Height	Leaf Stage	Max. Height
Cocklebur (<i>Xanthium pensylvanicum</i>)	2-6"	4"	6-10	8"
Common Lambsquarters† (<i>Chenopodium album</i>)	4-8	2"	8-12	4"
Common Ragweed (<i>Ambrosia artemisiifolia</i>)	up to 4	2"	4-6	3"
Giant Ragweed (<i>Ambrosia trifida</i>)	up to 4	4"	4-6	6"
Jimsonweed (<i>Datura stramonium</i>)	up to 6	4"	6-10	8"
Ladysthumb (<i>Polygonum persicaria</i>)	up to 6	4"	6-10	8"
Penna. Smartweed (<i>Polygonum pensylvanicum</i>)	up to 6	4"	6-10	8"
Redroot Pigweed (<i>Amaranthus retroflexus</i>)	4-8	2"	8-12	4"
Velvetleaf (<i>Abutilon theophrasti</i>)	up to 4	2"	4-6	5"
Venice Mallow (<i>Hibiscus trionum</i>)	up to 6	2"	6-10	4"
Wild Buckwheat (<i>Polygonum convolvulus</i>)	up to 4	3"	4-6	5"
Wild Mustard (<i>Brassica kaber</i>)	up to 6	4"	6-10	8"
Wild Sunflower (<i>Helianthus annuus</i>)	up to 4	4"	4-6	8"
Beggarticks (<i>Bidens frondosa</i>)	Not Recommended		up to 6	6"
Bristly Starbur (<i>Acanthospermum hispidum</i>)	Not Recommended		up to 4	2"
Dayflower (<i>Commelina</i> spp.)	Not Recommended		up to 6	4"
Prickly Sida or Teaweed (<i>Sida spinosa</i>)	Not Recommended		up to 6	3"
Spurred Anoda (<i>Anoda cristata</i>)	Not Recommended		up to 6	3"

* Always add oil concentrate according to the Mixing and Application Section above. In California, add non-phytotoxic oil (containing emulsifier) to the Laddok water spray solution for application by ground equipment at the rate of 1/2 gallon per acre in coastal valleys and 1 gallon per acre in central valleys. Add non-phytotoxic oil to the spray solution for application by air equipment at the rate of 1% by volume (1 gallon per 100 gallons spray solution). The oil should have an unsulphonated residue rating of 90% or above. † Do not treat earlier than leaf stage shown and do not count cotyledon leaves. ‡ Control may be partial or inconsistent.

Conditions and Limitations: Do not use Laddok when crop is under stress from prolonged cold, wet weather, poor fertility, or other factors or when crop is wet and succulent from recent rainfall as injury may occur.

Corn producers should consult the seed corn company regarding tolerance of seed production inbred lines to Laddok.

Do not make more than one application of Laddok per acre on grazed area or feed treated forage to livestock 21 days following application.

For the control of:
Annual Morningglories (*Ipomoea* spp. and *Jacquemontia tamnifolia*), Canada Thistle (*Cirsium arvense*), Yellow Nutsedge (*Cyperus esculentus*)

Refer to Basagran® Herbicide Label

PART 02