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File

Shaughnessy No.:NEW CHEMICAL

Date Out of EAB: 20 MAY 1983

To: Bob Taylor
Product Manager 25
Registration Division (TS-767)

From: Richard V. Moraski, Head (acting)
Review Section 1
Exposure Assessment Branch
Hazard Evaluation Division (TS-769c)

Attached please find the EFB review of...

Reg./File No.: 352-EUP-RRR

Chemical: Methyl 2-[[[[(4-methoxy,6-methyltriazin-2-yl)amino]-carbonyl]amino]sulfonyl]benzoate

Type Product: Herbicide

Product Name: DPX-T6376

Company Name: E.I. DuPont DeNemours & Co.

Submission Purpose: EUP - Use on wheat, barley and reduced tillage fallow.

ZBB Code:other

ACTION CODE: 710

Date In: 3/11/83

EFB #: 3272

Date Completed: 5/20/83

TAIS (level II)	Days
63	4.0

4.0 PHYSICAL AND CHEMICAL PROPERTIES

Attachment 2 contains the complete set of product data sheets.

Discussion: The product data sheets appear to be thorough and complete.

5.0 PROPOSED EXPERIMENTAL PROGRAM

Attachment 3 contains a copy of the proposed experimental program.

In brief, the herbicide will be applied within 6 distinct, small grain growing regions of the U.S., encompassing 34 states. The program will run for 3 years, with a total of 750 lbs. a.i. being used in the program. Total treatment acreage will not exceed 5000, 10000 and 15000 acres for years 1 through 3, respectively.

The largest single use sites and amounts are ND (6000A, 150 oz), WA (2600A, 65 oz), MT (3000A, 75 oz), SD (3000A, 75 oz), KS (3600A, 90 oz), OK (2400A, 60 oz), and TX (2000A, 50 oz).

Point-of-contact in each state are included.

Discussion: The proposed experimental program seems reasonable, considering the geographic latitude of the coverage, especially since the unit application rates are relatively low.

6.0 DATA TO SUPPORT EUP

Current EF data requirements for this use on field crops include hydrolysis, aerobic soil metabolism, accumulation in rotational crops and accumulation in fish (flow-through study).

Discussion: If the label bears either a 2 year rotational crop restriction, or equivalent crop destruct warning, this data requirement may be waived, for purposes of the EUP.

No flow-through fish accumulation study was included with this submission. Due to the apparent long hydrolytic halflife, a waiver of this data requirement does not seem likely.

6.2 Friedman, P. 1982. Aerobic Soil Metabolism of ^{14}C-phenyl-DPX-T6376. Document No. AMR-75-82. E.I. Du Pont de Nemours and Co. Biochemicals Department. Research Division. Experimental Station. Wilmington, Delaware 19898. (company confidential)

Experimental

A 51 ppm stock solution (in acetone) of DPX-T6376 was prepared, diluted to 5 ppm with acetone. One ml of each of these solutions was added to two 50 gm (dry weight) aliquots of a Keyport silt loam, having the characteristics shown in attachment 4, to simulate 1.0 and 0.1 ppm treatments.

Sterile soil (autoclaved as 15 PSI for 1 hour x 3 days) was similarly treated.

All soils were maintained at 70 % moisture holding capacity throughout the experiment.

Soils wer placed in a 250 ml biometer flask, from which CO_2 was trapped in 0.1 N NaOH. Caustic was changed weekly.

Analysis of the caustic for CO_2 was via $BaCl_2$ precipitation followed by LSC of both precipitate and supernatant.

Analyses of soils was performed for both parent and metabolites at for weeks 0, 1, 2, 4, 8, 16 and 24 by multiple extraction with solvent followed by LSC and HPLC as in the Hydrolysis experiment reviewed earlier.

Results and Discussion

Estimated aerobic soil halflife was 2 to 3 weeks, with the major metabolite (36%) being $^{14}CO_2$ after 24 weeks. Metabolites identified were methyl 2-(aminosulfonyl)benzoate, 2-(aminosulfonyl)-benzoic acid and Saccharin. Structures are shown in attachment 5. Polar degradation products were identified as saccharin and 2-(aminosulfonyl)benzoate.

In the sterile soil, only 3 to 4% of the applied parent was found after 24 weeks. No CO_2 was produced. Major metabolites were methyl 2-(aminosulfonyl)benzoate, 2-(aminosulfonyl)benzoic acid, the reported hydrolytic products.

Conclusions: In recomputing, EAB determined a halflife of 3.7 and 4.0 weeks for the 1.0 and 0.1 ppm experiments, respectively, suggesting that parent DPX-T6376 is moderately persistent under aerobic soil conditions.

This study was reasonably well done. The statistics looked very good. However no monitoring for the triazine fragment of the parent molecule was reported. We cannot accept this study until the fate of this component has been clarified.

3

Conclusions: In recomputing, EAB determined halflives were 2.4, 3.4 and 2.8 weeks for the Fallsington Sandy Loam, Flanagan Silt Loam and Keyport Silt Loam experiments, respectively. This suggests that parent DPX-T6376 is moderately persistent under greenhouse conditions.

This study was reasonably well done. The statistics looked very good. There were, however, a number of deficiencies which may invalidate the work:

- oo neither sterile nor dark controls were provided.
- oo the intensity of the incident light was not specified.
- oo the temperature at which the experiment was conducted was not specified.
- oo no monitoring was done for the triazine fragment of the parent molecule.
- oo The thermolability of the various degradates appears to invalidate the use of diazotization as an analytical tool relative to the MS portion of the experiment.

Recommendation: The registrant should be requested to respond to the deficiencies noted above.

7.0 EXECUTIVE SUMMARY

The product chemistry summary sheets appear to be complete. The label deficiencies were noted earlier. The experimental program is reasonable, and acceptable to EAB.

Parent DPX-T6376 appears refractory to hydrolysis under neutral and alkaline conditions, but slowly hydrolyses in acidic media with a halflife of up to 101 days under ambient temperature conditions.

Aerobic soil metabolism studies suggest a soil halflife of parent DPX-T6376 of 3.7 to 4 weeks in one study, and for 2.4 to 3.4 weeks in another. Major degradates include methyl-2-(aminosulfonyl) benzoate, saccharin and Methyl 2-[(aminocarbonyl)aminosulfonyl] benzoate.

8.0 CONCLUSIONS

We cannot concur with the proposed EUP at this time due to the numerous deficiencies in the submitted studies as well as the outstanding fish accumulation data requirement.

4

METSULFURON-METHYL

Page_____ is not included in this copy.

Pages 5 through 9 are not included.

The material not included contains the following type of information:

____ Identity of product inert ingredients.

____ Identity of product impurities.

____ Description of the product manufacturing process.

____ Description of quality control procedures.

____ Identity of the source of product ingredients.

____ Sales or other commercial/financial information.

X A draft product label.

____ The product confidential statement of formula.

____ Information about a pending registration action.

____ FIFRA registration data.

____ The document is a duplicate of page(s) _____.

____ The document is not responsive to the request.

The information not included is generally considered confidential by product registrants. If you have any questions, please contact the individual who prepared the response to your request.

ATTACHMENT A1

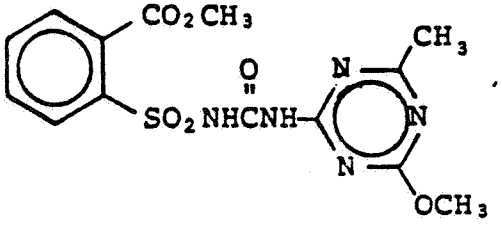
DPX-T6376

TECHNICAL DATA SHEET

CHEMICAL NAME

Methyl 2-[[[[(4-methoxy-6-methyl-1,3,5-triazin-2-yl)amino]-carbonyl]amino]sulfonyl]benzoate

STRUCTURAL FORMULA



CHEMICAL AND PHYSICAL PROPERTIES (TECHNICAL)

- Empirical Formula: $C_{14}H_{15}N_5O_6S$
- Molecular Weight: 381.40
- Physical State: technical - white to pale yellow solid
  60 DF formulation - off-white solid
- Odor: technical - faint, sweet ester-like 60 DF formulation - odorless
- Melting Point: ~ 158°C
- Vapor Pressure at 25°C: 5.8×10^{-5} mm Hg
- Specific Gravity: 1.47 g/cc
- Bulk Density (60 DF): 33.9 lb/ft^3 (0.543 g/ml)

CHEMICAL AND PHYSICAL PROPERTIES (cont'd)

- Explodability: no ingredients in the 60 DF formulation are sensitive to impact. The fine premix powder can be explosive if a high energy spark is present as described below:

Explosive Pressure Δ P, Max. PSI	(dp/dt) Max. PSI/SEC	(ΔP/ΔT) Avg. PSI/SEC	LEL g/L	MOC $\%O_2$	MIE e(joules)
66	647	273	0.356	14.5	0.21

Δ P Max. = maximum explosion pressure
(dp/dt) Max. = maximum rate of explosion pressure development
(ΔP/Δt) Avg. = average rate of pressure rise
LEL = Lower explosive limit
MOC = Minimum oxygen concentration
MIE = Minimum ignition energy

- Stability: stable in air and nitrogen to approximately 140°C (technical and 60 DF formulation).

- Corrosion Characteristics (60 DF): No evidence of corrosivity upon storage in plastic containers.

ASSAY METHOD

Normal-Phase liquid chromatography (NPLC) Assay Method for the determination of DPX-T6376 technical and formulations (unpublished, attached in Section A as Appendix 1).

TRADE SECRET

ATTACHMENT A3

TECHNICAL DPX-T6376 IMPURITY PROFILE

Compound	Weight %
2-[[[[(4-Methoxy-6-methyl-1,3,5-triazin-2-yl)amino]-carbonyl]amino]sulfonyl]benzoic acid, methyl ester (DPX-T6376)	>93.0
[redacted]	

IDENTITY OF PRODUCT IMPURITIES NOT INCLUDED

12

METSULFURON-METHYL

Page 13 is not included in this copy.

Pages _____ through _____ are not included.

The material not included contains the following type of information:

____ Identity of product inert ingredients.

____ Identity of product impurities.

X Description of the product manufacturing process.

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PROPOSED EXPERIMENTAL PROGRAM
DPX-T6376 ON WHEAT, BARLEY, AND REDUCED TILLAGE FALLOW

The purpose of the proposed experimental program is to acquire information supporting an application for a full registration in the six distinct, small grain-growing region of the U.S.* Such information includes:

- Large plot data.
- Use with commercial equipment for air and ground application.
- Refine rates for individual common weed species and certain problem species which do not occur uniformly enough for small plot testing.
- Application techniques.
- Yield data.
- Residue samples for establishment of a tolerance.
- Crop rotation.
- Effect of adverse weather conditions.
- Effect of soil pH, soil type, varying soil moisture and soil temperature.
- Disease.
- Variety.
- Time of application.
- Application with surfactants or fertilizer solutions.
- Fallow.

We propose testing DPX-T6376 in AZ, CA, CO, ID, KS, MN, MT, NE, ND, OK, OR, NM, VA, NC, SC, GA, AL, FL, TN, MS, AR, LA, MO, IL, IN, OH, MI, MD, DE, SD, TX, UT, WA, and WY at the rates and schedules on the proposed temporary label. Plot size will vary with the length of the field, width of the sprayer, and size and flexibility of harvesting equipment but generally will be in excess of one acre but less than 100 acres. Replicates will vary according to availability of land suitable for large scale research testing. We propose that the permit cover a period of three years to permit testing in at least three non-fallow crop cycles and two fallow cycles.

DPX T-6376
EXPERIMENTAL USE PERMIT

State, Pounds, Acres Over Three-Year Period	Personnel & Address	Years Service with Du Pont
WA 65 ounces 2,600 acres	Dr. G. E. Cook Biochemicals Department E. I. Du Pont de Nemours & Co. South 303 Barker Road Greenacres, WA 99016 (509) 922-1656	7 years
OR 36 ounces 1,440 acres	Dr. David McAuliffe Biochemicals Department E. I. Du Pont de Nemours & Co. 3005 N.W. Taft Avenue Corvallis, OR 97330 (503) 754-8280	1 year
ID 30 ounces 1, 200 acres	Mr. Danny T. Ferguson Biochemicals Department E. I. Du Pont de Nemours & Co. 976 Mills Street Escondido, CA 92027 (619) 743-5826	3 years
UT 3.0 ounces 120 acres	Mr. Danny T. Ferguson Biochemicals Department E. I. Du Pont de Nemours & Co. 976 Mills Street Escondido, CA 92027 (619) 743-5826	3 years
CA 9.0 ounces 360 acres	Mr. Fred Marmor Biochemicals Department E. I. Du Pont de Nemours & Co. 47 Burgan Clovis, CA 93612 (209) 297-0297	4 years
AZ 2.5 ounces 100 acres	Mr. Alvin A. Baber Biochemicals Department E. I. Du Pont de Nemours & Co. 673 Rosecrans Street San Diego, CA 92106 (619) 225-8938	20 years
MT 75.0 ounces 3,000 acres	Dr. Keith D. Johnson Biochemicals Department E. I. Du Pont de Nemours & Co. P. O. Box 2558 Bismarck, ND 58502 (701) 258-7178	2 years

DPX T-6376
EXPERIMENTAL USE PERMIT

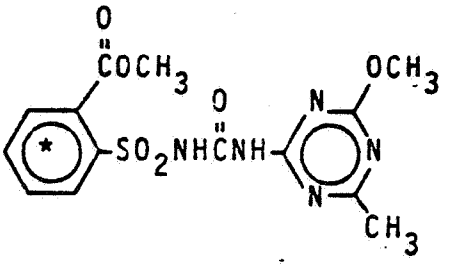
State, Pounds, Acres Over Three-Year Period	Personnel & Address	Years Service with Du Pont
IA 2.0 ounces 80 acres	Mr. Matthew A. Renkoski Biochemicals Department E. I. Du Pont de Nemours & Co. 8504 Winston Urbandale, IA 50322 (515) 278-9566	5 years
IL 2.5 ounces 100 acres	Dr. R. Michael Gorrell Biochemicals Department E. I. Du Pont de Nemours & Co. P. O. Box 595 St. Peters, MO 63376 (314) 441-0480	4 years
AL 4.0 ounces 160 acres	Dr. Glenn G. Hammes Biochemicals Department E. I. Du Pont de Nemours & Co. 1116 Beauford Drive Opelika, AL 36801 (205) 745-5379	7 years
GA 5.0 ounces 200 acres	Dr. Scotty H. Crowder Biochemicals Department E. I. Du Pont de Nemours & Co. 1606-E Post Oak Drive Clarkston, GA 30021 (404) 493-4429	1 year
NC 4.0 ounces 160 acres	Mr. Harry H. Harder Biochemicals Department E. I. Du Pont de Nemours & Co. 322 Howland Avenue Cary, NC 27511 (919) 469-2189	9 years
SC 2.5 ounces 100 acres	Dr. Scotty H. Crowder Biochemicals Department E. I. Du Pont de Nemours & Co. 1606-E Post Oak Drive Clarkston, GA 30021 (404) 493-4429	1 year
DE 2.0 ounces 80 acres	Mr. Carl P. Davis Biochemicals Department E. I. Du Pont de Nemours & Co. P. O. Box 177 Chesapeake City, MD 21915 (301) 885-2464	9 years

DPX T-6376
EXPERIMENTAL USE PERMIT

State, Pounds, Acres Over Three-Year Period	Personnel & Address	Years Service with Du Pont
NE 25 ounces 1,000 acres	Dr. John S. Beitler Biochemicals Department E. I. Du Pont de Nemours & Co. 6300 Eastshore Drive Lincoln, NE 68516 (402) 423-9132	2 1/2 years
KS 90 ounces 3,600 acres	Dr. John S. Beitler Biochemicals Department E. I. Du Pont de Nemours & Co. 6300 Eastshore Drive Lincoln, NE 68516 (402) 423-9132	2 1/2 years
OK 60 ounces 2,400 acres	Mr. Robert N. Rupp Biochemicals Department E. I. Du Pont de Nemours & Co. 813 N.W. 115th Okla. City, OK 73114 (405) 755-6087	4 years
TX 50 ounces 2,000 acres	Mr. Robert N. Rupp Biochemicals Department E. I. Du Pont de Nemours & Co. 813 N.W. 115th Okla. City, OK 73114 (405) 755-6087	4 years
NM 2 ounces 80 acres	Mr. Robert N. Rupp Biochemicals Department E. I. Du Pont de Nemours & Co. 813 N.W. 115th Okla. City, OK 73114 (405) 755-6087	4 years
AR 2 ounces 80 acres	Mr. Keith A. Patterson Biochemicals Department E. I. Du Pont de Nemours & Co. 157 Meadowick Jacksonville, AR 72076 (501) 835-4521	2 years
LA 2 ounces 80 acres	Mr. Michael T. Edwards Biochemicals Department E. I. Du Pont de Nemours & Co. 914 Shadowcreek Drive Gonzales, LA 70737 (504) 622-4625	3 years

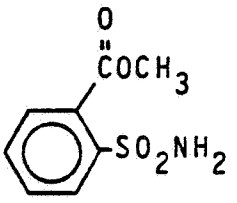
Figure 1

Structures of DPX-T6376 and Metabolites

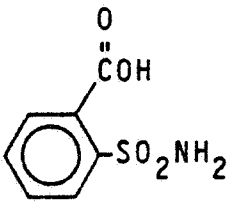


DPX-T6376

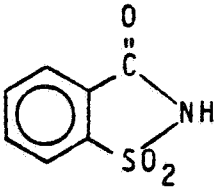
Methyl 2-[[[[(4-methoxy, 6-methyltriazin-2-yl)amino]-carbonyl]amino]sulfonyl]benzoate



Methyl 2-(aminosulfonyl)benzoate



2-(aminosulfonyl)benzoic acid



Saccharin

* Denotes location of ^{14}C-label

TABLE I

Characteristics of Soil Types[a]

Component	Fallsington Sandy Loam (Glasgow, Delaware)	Flanagan Silt Loam (Rochelle, Illinois)	Keyport Silt Loam (Newark, Delaware)
Mechanical Analysis			
Sand, % (2.0-0.05 mm)	56	5	21
Silt, % (0.05-0.0002 mm)	29	64	62
Clay, % (<0.0002 mm)	15	31	17
Organic Matter, %	1.40	4.02	2.75
Total Nitrogen, %	0.085	0.282	0.097
pH	5.6	6.7	6.4
Cation Exchange Capacity, meq/100 g (1N, pH 7, ammonium acetate)	4.8	23.4	8.2

[a]Soil analyses were performed by the College of Agricultural Sciences, University of Delaware, Newark, Delaware.