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

From: Richard V. Moraski, Head (acting)  
Review Section I  
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 half-life, a waiver of this data requirement does not seem likely.

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 were placed in a 250 ml biometer flask, from which CO2 was trapped in 0.1 N NaOH. Caustic was changed weekly.

Analysis of the caustic for CO2 was via BaCl2 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 half-life was 2 to 3 weeks, with the major metabolite (36%) being 14CO2 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 CO2 was produced. Major metabolites were methyl 2-(aminosulfonyl)benzoate, 2-(aminosulfonyl)benzoic acid, the reported hydrolytic products.

Conclusions: In recomputing, EAB determined a half-life 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.
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:

- neither sterile nor dark controls were provided.
- the intensity of the incident light was not specified.
- the temperature at which the experiment was conducted was not specified.
- no monitoring was done for the triazine fragment of the parent molecule.
- 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)amino sulfonyl] 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.
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.
___ 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 Structure Image]

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: $5.8 \times 10^{-5}$ 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:

<table>
<thead>
<tr>
<th>Explosive Pressure (ΔP, Max. PSI)</th>
<th>(dp/dt) Max. PSI/SEC</th>
<th>(ΔP/ΔT) Avg. PSI/SEC</th>
<th>LEL g/L</th>
<th>MOC %O₂</th>
<th>MIE e(joules)</th>
</tr>
</thead>
<tbody>
<tr>
<td>66</td>
<td>647</td>
<td>273</td>
<td>0.356</td>
<td>14.5</td>
<td>0.21</td>
</tr>
</tbody>
</table>

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).
## TECHNICAL DPX-T6376 IMPURITY PROFILE

<table>
<thead>
<tr>
<th>Compound</th>
<th>Weight %</th>
</tr>
</thead>
<tbody>
<tr>
<td>2-[[[4-Methoxy-6-methyl-1,3,5-triazin-2-yl]amino]carbonyl]amino]sulfonyl]benzoic acid, methyl ester (DPX-T6376)</td>
<td>&gt;93.0</td>
</tr>
</tbody>
</table>

IDENTITY OF PRODUCT IMPURITIES NOT INCLUDED
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.

___ Description of quality control procedures.

___ Identity of the source of product ingredients.

___ Sales or other commercial/financial information.

___ 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.
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.
<table>
<thead>
<tr>
<th>State</th>
<th>Pounds, Acres Over Three-Year Period</th>
<th>Personnel &amp; Address</th>
<th>Years Service with Du Pont</th>
</tr>
</thead>
<tbody>
<tr>
<td>WA</td>
<td>65 ounces 2,600 acres</td>
<td>Dr. G. E. Cook Biochemicals Department E. I. Du Pont de Nemours &amp; Co. South 303 Barker Road Greenacres, WA 99016 (509) 922-1656</td>
<td>7 years</td>
</tr>
<tr>
<td>OR</td>
<td>36 ounces 1,440 acres</td>
<td>Dr. David McAuliffe Biochemicals Department E. I. Du Pont de Nemours &amp; Co. 3005 N.W. Taft Avenue Corvallis, OR 97330 (503) 754-8280</td>
<td>1 year</td>
</tr>
<tr>
<td>ID</td>
<td>30 ounces 1,200 acres</td>
<td>Mr. Danny T. Ferguson Biochemicals Department E. I. Du Pont de Nemours &amp; Co. 976 Mills Street Escondido, CA 92027 (619) 743-5826</td>
<td>3 years</td>
</tr>
<tr>
<td>UT</td>
<td>3.0 ounces 120 acres</td>
<td>Mr. Danny T. Ferguson Biochemicals Department E. I. Du Pont de Nemours &amp; Co. 976 Mills Street Escondido, CA 92027 (619) 743-5826</td>
<td>3 years</td>
</tr>
<tr>
<td>CA</td>
<td>9.0 ounces 360 acres</td>
<td>Mr. Fred Marmor Biochemicals Department E. I. Du Pont de Nemours &amp; Co. 47 Burgan Clovis, CA 93612 (209) 297-0297</td>
<td>4 years</td>
</tr>
<tr>
<td>AZ</td>
<td>2.5 ounces 100 acres</td>
<td>Mr. Alvin A. Baber Biochemicals Department E. I. Du Pont de Nemours &amp; Co. 673 Rosecrans Street San Diego, CA 92106 (619) 225-8938</td>
<td>20 years</td>
</tr>
<tr>
<td>MT</td>
<td>75.0 ounces 3,000 acres</td>
<td>Dr. Keith D. Johnson Biochemicals Department E. I. Du Pont de Nemours &amp; Co. P. O. Box 2558 Bismarck, ND 58502 (701) 258-7178</td>
<td>2 years</td>
</tr>
<tr>
<td>State</td>
<td>Pounds</td>
<td>Acres</td>
<td>Personnel &amp; Address</td>
</tr>
<tr>
<td>-------</td>
<td>--------</td>
<td>-------</td>
<td>---------------------</td>
</tr>
</tbody>
</table>
| IA    | 2.0    | 80    | 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    | 100   | 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    | 160   | 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    | 200   | 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    | 160   | 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    | 100   | 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    | 80    | 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 |
<table>
<thead>
<tr>
<th>State</th>
<th>Pounds</th>
<th>Acres</th>
<th>Personnel &amp; Address</th>
<th>Years Service with Du Pont</th>
</tr>
</thead>
<tbody>
<tr>
<td>NE</td>
<td>25</td>
<td>1,000</td>
<td>Dr. John S. Beitler Biochemicals Department &lt;br&gt; E. I. Du Pont de Nemours &amp; Co. &lt;br&gt; 6300 Eastshore Drive &lt;br&gt; Lincoln, NE 68516 &lt;br&gt; (402) 423-9132</td>
<td>2 1/2 years</td>
</tr>
<tr>
<td>KS</td>
<td>90</td>
<td>3,600</td>
<td>Dr. John S. Beitler Biochemicals Department &lt;br&gt; E. I. Du Pont de Nemours &amp; Co. &lt;br&gt; 6300 Eastshore Drive &lt;br&gt; Lincoln, NE 68516 &lt;br&gt; (402) 423-9132</td>
<td>2 1/2 years</td>
</tr>
<tr>
<td>OK</td>
<td>60</td>
<td>2,400</td>
<td>Mr. Robert N. Rupp Biochemicals Department &lt;br&gt; E. I. Du Pont de Nemours &amp; Co. &lt;br&gt; 813 N.W. 115th &lt;br&gt; Okla. City, OK 73114 &lt;br&gt; (405) 755-6087</td>
<td>4 years</td>
</tr>
<tr>
<td>TX</td>
<td>50</td>
<td>2,000</td>
<td>Mr. Robert N. Rupp Biochemicals Department &lt;br&gt; E. I. Du Pont de Nemours &amp; Co. &lt;br&gt; 813 N.W. 115th &lt;br&gt; Okla. City, OK 73114 &lt;br&gt; (405) 755-6087</td>
<td>4 years</td>
</tr>
<tr>
<td>NM</td>
<td>2</td>
<td>80</td>
<td>Mr. Robert N. Rupp Biochemicals Department &lt;br&gt; E. I. Du Pont de Nemours &amp; Co. &lt;br&gt; 813 N.W. 115th &lt;br&gt; Okla. City, OK 73114 &lt;br&gt; (405) 755-6087</td>
<td>4 years</td>
</tr>
<tr>
<td>AR</td>
<td>2</td>
<td>80</td>
<td>Mr. Keith A. Patterson Biochemicals Department &lt;br&gt; E. I. Du Pont de Nemours &amp; Co. &lt;br&gt; 157 Meadowick &lt;br&gt; Jacksonville, AR 72076 &lt;br&gt; (501) 835-4521</td>
<td>2 years</td>
</tr>
<tr>
<td>LA</td>
<td>2</td>
<td>80</td>
<td>Mr. Michael T. Edwards Biochemicals Department &lt;br&gt; E. I. Du Pont de Nemours &amp; Co. &lt;br&gt; 914 Shadowcreek Drive &lt;br&gt; Gonzales, LA 70737 &lt;br&gt; (504) 622-4625</td>
<td>3 years</td>
</tr>
</tbody>
</table>
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**

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

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