MEMORANDUM

DATE: 10/17/84

SUBJECT: Meeting with DuPont on DPX-T6376

FROM: Emil Regelman
Chemist

TO: Files

Met with Dave Schleider and Phil Schneider (DuPont) and Vickie Walters (RD) in Room 245, CM II. Issue concerned environmental fate of the triazine moiety of DPX-T6376 in soil under (aerobic) field conditions.

In the review of 7/12/84 (§3.3), EAB noted that data describing the degradation of the triazine moiety appeared to be unreliable ($r^2=0.32$). At the meeting, it was agreed that the data suggest persistence of that compound, once a level of about 10% of applied is reached.

It was further agreed that, in lieu of additional studies, EAB would defer to RCB and TB on the significance of the triazine moiety remaining in soil at these levels.

In addition, the 7/12/84 review (§3.2) noted that several outstanding issues had not yet been addressed by the registrant. EAB has agreed to allow DuPont to withdraw this study without prejudice, and to rely on other data to support the data requirement.

CC: S. Creeger
* Denotes position of the radiolabel.

a. Summary of AMR-134-83. \([\text{phenyl}(U)-^{14}C]\)Metsulfuron methyl decomposed in anaerobic aquatic systems with half-lives ranging from 5 to 20 weeks. Saccharin, 2-aminosulfonylbenzoic acid and methyl 2-aminosulfonyl benzoate were the major degradation products.
b. Summary of AMR-38-81. [Triazine(2)-$^{14}$C]Chlorsulfuron decomposed in anaerobic aquatic systems with half-lives ranging from 5-22 weeks. [$^{14}$C(2)]4-methoxy-6-methyl-1,3,5-triazine-2-amine was the major degradation product. NOTE: CHLORSULFURON CONTAINS THE SAME HYDROLYTICALLY UNSTABLE UREA BRIDGE AND THE SAME HETEROCYCLE (TRIAZINEAMINE) AS METSULFURON METHYL.

Additional Note: An anaerobic aquatic study using [triazine(2)-$^{14}$C] metsulfuron methyl is in progress.
AEROBIC SOIL METABOLISM OF METSULFURON METHYL (DPX-T6376)
AMR-75-82 (Supporting Data AMR-32-81 and AMR 408-85)

Metsulfuron Methyl

1st t\textsubscript{1/2}
2-3 weeks

Chlorsulfuron
AMR-32-81\textsuperscript{b}

1st t\textsubscript{1/2}
1-2 weeks

Methyl 2-aminosulfonyl benzoic acid

4-methoxy-6-methyl-
1,3,5-triazine-2-amine

AMR-75-82\textsuperscript{a}

1st t\textsubscript{1/2}
5 months

Saccharin

2-aminosulfonyl benzoic acid

\textsuperscript{14}CO\textsubscript{2} + Bound Residue +
Polar Breakdown Products

\textsuperscript{14}CO\textsubscript{2}

\textsuperscript{a} Denotes position of the radiolabel.

\textit{a.} Summary of AMR-75-82. [phenyl(U)-\textsuperscript{14}C]Metsulfuron methyl decomposed (half-life from 2 to 3 weeks) to \textsuperscript{14}Cmethyl 2-aminosulfonylbenzoate, \textsuperscript{14}Csaccharin, \textsuperscript{14}C2-aminosulfonylbenzoic acid and \textsuperscript{14}CO\textsubscript{2} when applied to Keyport silt loam at a concentration of 0.1 ppm. After 24 weeks of incubation, the levels of these metabolites remaining on soil (or trapped) were respectively 4\%, 13\%, < 1\% and 36\% of the radiolabel originally applied to the soil. Less than 1\% of the originally applied metsulfuron methyl remained after this time.
b. Summary of AMR-32-81. [Triazine\(2^{14}\)C]Chlorsulfuron decomposed (half-life of 1 to 2 weeks) to \([14\text{C}]4\)-methoxy-6-methyl-1,3,5-triazine-2-amine(triazineamine) and \(14\text{CO}_2\) when applied to Keyport silt loam at a concentration of 0.1 ppm. After 6 months incubation, 41% of the applied radioactivity was recovered as triazineamine and 23% as \(14\text{CO}_2\). 

NOTE: CHLORSULFURON CONTAINS THE SAME HYDROLYTICALLY UNSTABLE UREA BRIDGE AND THE SAME HETEROCYCLE (TRIAZINEAMINE)AS METSULFURON METHYL.
SOIL COLUMN LEACHING STUDIES WITH $^{14}$C-DPX-T6376

AMR-82-82

The review of AMR-82-82 faulted the study on the following points:

- No acceptable data was submitted regarding the characterization of the aged residues in soil before and after leaching.
- No data was presented addressing the mobility of the triazine moiety in soil.

We feel that the data submitted by Du Pont concerning the leaching behavior of metsulfuron methyl is acceptable for the following reasons:

- When the experimental work for this study was performed, the Pesticide Assessment Guidelines regulating data requirements for environmental fate studies were not in effect. The issue date for these guidelines was October, 1982. Soil column leaching data presented in AMR-82-82 followed a procedure previously used to determine the soil leaching behavior of chlorsulfuron and sulfometuron methyl. The EPA found both these studies acceptable.

- AMR-82-82 describes the leaching behavior of $[^{14}\text{C}}$-phenyl] metsulfuron methyl on unaged soil. However, it also describes the extent of leaching of metsulfuron methyl and degradates in aged soil. Fifty percent of the material found to elute from the aged soil column was found to be $[^{14}\text{C}}$ saccharin, the primary metabolite of [phenyl(\text{U}-^{14}\text{C})] metsulfuron methyl in soil. The remainder of the eluting radioactivity were the soil metabolites, methyl 2-amino sulfonyle benzoate, and parent compound.
Soil mobility data has been obtained for the major soil metabolite expected as a result of decomposition of $^{14}$C-triazine]metsulfuron methyl. This degradation product is 4-methoxy,6-methyl-1,3,5-triazine-2-amine (triazine amine). The mobility of triazine amine was determined on four soil types (AMR-399-85). In these soil thin layer chromatography experiments, triazine amine exhibited a mobility which would characterize it as "immobile" to "intermediate mobility" ($R_f$ values 0.04 to 0.58, dependent on soil type). It is actually less mobile than metsulfuron methyl.

CONCLUSION

The data submitted originally by Du Pont (AMR-82-82) and our most recent work (AMR-399-85) satisfy the purpose of the leaching study guidelines (163-1(a)(1)) to determine "the leaching potential for pesticides and their degradates through the soil profile at terrestrial sites;".
Data Deficiency cited by EPA.

"Phenyl labeled uptake studies required for root crops and leafy vegetables. Triazine labeled studies required for root, small grain, and leafy vegetable crops."

Du Pont Response

Agency Guidelines state "Crops planted in the treated and aged soil should include those expected in the proposed rotational schedule and, where possible, be representative of each of the following crop groupings: root, small grain, and leafy vegetable." The crops selected for the current study, i.e. sugarbeet, rape, oats and soybeans, are the crops expected in the typical rotational schedule for the proposed use. They include a root crop (sugarbeet) and a small grain (oats), as well as two other crops. Leafy vegetables are not expected to be rotational crops under the proposed use.

The proposed use rate for metsulfuron methyl is 0.1 oz/A. The application rate in this confined crop rotation study was 0.22 oz/A, or 2.2x the proposed rate. It is reasonable to expect that crops grown on soil which had received less than one-half the treatment applied here would exhibit lower residues in their tissues than the crops examined in this study. Nevertheless crops grown on this treated soil after 120 days aging exhibited residues of total $^{14}C$ equal to or less than only 10 ppb in the edible portions. This is at most one-half the limit of detection for the residue method for metsulfuron methyl (20 ppb), i.e. residues of this magnitude in rotational crops could not be detected by the 'cold chemistry' method. Only in dry senescent soybean foliage at maturity, foliage which is not used for food by man or animal, were residues higher than 10 ppb found. Because this residue represented the only residue that could possibly be identified, it was examined and found to contain
<0.3 ppb of metsulfuron methyl, a proportion presumably indicative of the other much lower residue levels in other tissues, e.g. soybean seeds. No attempt was made to identify the other components of this residue because they did not occur in an edible tissue.

The requirement for a rotational crop study with the triazine-labeled compound was not anticipated when the subject study was started. As soon as the Agency's initial review was made available a study with triazine labeled T6376 was initiated but has not been completed at the present time because of the time required to age the treated soil and grow the crops. A summary of the findings to date reported by the study director is attached to these comments.

The total residue levels reported in the ongoing crop metabolism study with the triazine labeled metsulfuron methyl (treatment rate again 2x the proposed use rate) are comparable to those reported for the phenyl label, and again fall well below the limit of detection of the residue method.

Study 8 - Crop Rotation Study with 14C-Metsulfuron Methyl in the Field

Data Deficiency Cited by EPA

"Conditional on results of the confined study."

Du Pont Response

Du Pont feels that in view of the demonstrated non-accumulation of residues from metsulfuron methyl treatment in rotational crops that there is no need for a field accumulation study in rotational crops.
November 7, 1985

TO: J. HARVEY, JR.
FROM: B. C. RHODES

A 120-day soil aging greenhouse crop rotation study with DPX-T6376 [triazine-2-$^{14}$C] was initiated on 4/17/85 with treatment of Sassafras sandy loam soil at the rate of 15 g a.i./HA. Garden beets, rape, oats and soybeans were planted in the aged soils on 8/19/85. Combustion analysis of whole-plant samples taken 60 days after planting yielded the following total $^{14}$C residue concentrations, calculated as DPX-T6376 equivalent on a fresh weight basis:

<table>
<thead>
<tr>
<th>Crop</th>
<th>Concentration (ppm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oats</td>
<td>0.015</td>
</tr>
<tr>
<td>Rape</td>
<td>0.007</td>
</tr>
<tr>
<td>Soybeans</td>
<td>0.012</td>
</tr>
<tr>
<td>Beets</td>
<td>not sampled</td>
</tr>
</tbody>
</table>

(T6376 retards the growth of beets, and the plants were still too small to sample.)
FISH ACCUMULATION
(AMR-81-82)

STATUS OF COMPLETION:

- "NO ACCEPTABLE STUDY SUBMITTED"

DUPONT RESPONSE:

- ORIGINAL REPORT WAS REVISED and REISSUED (12-13-84) TO ADDRESS CONCERNS EXPRESSED IN THE 7-12-84 EPA REVIEW.

- STUDY SHOWED NO ACCUMULATION OF RADIOACTIVITY IN BLUEGILL SUNFISH EXPOSED TO 0.01 OR 1.0 PPM [PHENYL(U)-14C] MET-SULFURON METHYL FOR 28 DAYS.

- CONSISTENT WITH VERY LOW OCTANOL/WATER PARTITION COEFFICIENT (AMR-68-82): $K_{ow}$
  
  0.014 AT pH 7
  
  1.0 AT pH 5
# METSULFURON METHYL ENVIRONMENTAL FATE STUDIES

<table>
<thead>
<tr>
<th>STUDY</th>
<th>STARTING DATE</th>
<th>FINISHING DATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>HYDROLYSIS (AMR-62-82)</td>
<td>7-27-81</td>
<td>1-14-82</td>
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<tr>
<td>PHOTOLYSIS IN WATER (AMR-102-82)</td>
<td>11-27-81</td>
<td>4-21-82</td>
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<tr>
<td>PHOTOLYSIS ON SOIL (AMR-77-82)</td>
<td>1-11-82</td>
<td>3-25-82</td>
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<tr>
<td>AEROBIC SOIL METABOLISM (AMR-75-82)</td>
<td>9-29-81</td>
<td>3-29-82</td>
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<tr>
<td>ANAEROBIC-AQUATIC METABOLISM (AMR-134-83)</td>
<td>4-7-82</td>
<td>5-26-83</td>
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<tr>
<td>LEACHING (AMR-82-82)</td>
<td>11-11-82</td>
<td>1-18-82</td>
</tr>
<tr>
<td>ADSORPTION (MEMORANDUM OF DATA)</td>
<td>-</td>
<td>8-13-81</td>
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<tr>
<td>FIELD DISSIPATION (AMR-117-83)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NEWARK, DE</td>
<td>7-15-81</td>
<td>~ July 1983</td>
</tr>
<tr>
<td>STONEVILLE, MS</td>
<td>9-22-81</td>
<td>~ October 1983</td>
</tr>
<tr>
<td>FAYETTEVILLE, NC</td>
<td>9-22-81</td>
<td>~ October 1983</td>
</tr>
<tr>
<td>BRADENTON, FL</td>
<td>9-25-81</td>
<td>~ October 1983</td>
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<tr>
<td>ROTATIONAL CROPS - CONFINED (AMR-120-83)</td>
<td>~ November 1982</td>
<td>~ September 1983</td>
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<tr>
<td>ROTATIONAL CROPS - FIELD (AMR-190-84)</td>
<td>5-18-83</td>
<td>12-20-83</td>
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<tr>
<td>FISH ACCUMULATION (AMR-81-82)</td>
<td>11-20-81</td>
<td>~ July 1982 *</td>
</tr>
</tbody>
</table>

* Revision No. 1 issued 12/18/84 in response to EPA review.
IMPORTANT
Injury to or loss of desirable trees or vegetation may result from failure to observe the following: Do not apply, clean, or flush equipment on or near desirable trees or other plants, or on areas where their roots may extend, or in locations where the chemical may be washed or moved into contact with these areas. Do not use on lawns, walks, driveways, tennis courts or similar areas. Prevent drift of spray to undesirable plants. Do not contaminate any body of water, including irrigation water that may be used on other crops.

Carefully observe sprayer cleaning instructions, as spray tank residue may damage crops other than wheat or barley.

NOTICE TO BUYER: Purchase of this material does not confer any rights under patents of countries outside of the United States.

STORAGE AND DISPOSAL

Storage—Store product in original container only, away from other pesticides, fertilizer, food or feed.

Disposal—Do not contaminate water, food, or feed by storage, disposal or cleaning of equipment. Wastes resulting from the use of this product may be disposed of on site or at an approved waste disposal facility. Triple rinse (or equivalent) the container and then offer for recycling or reconditioning or puncture and dispose of in a sanitary landfill or by incineration or, if allowed by state and local authorities by burning. If burned, stay out of smoke.

KEEP OUT OF REACH OF CHILDREN
PRECAUTIONARY STATEMENTS
HAZARDS TO HUMANS
WARNING!
MAY IRRITATE EYES, NOSE, THROAT AND SKIN.
Avoid breathing dust or spray mist. Avoid contact with skin, eyes and clothing.
For medical emergencies involving this product, call toll free 1-800-441-3627.

ENVIRONMENTAL HAZARDS
Keep out of any body of water. Do not contaminate water by cleaning of equipment or disposal of waste.

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AG-850 8095 Made in U.S.A. Printed in U.S.A.
Buckwheat - Apply "Ally" plus surfactant postemergence when weeds are both actively growing and no larger than 2" tall in diameter, and crop canopy will allow thorough coverage of target weeds. Wild buckwheat should not have more than 3 true leaves (not counting the cotyle-
dons). If weeds are actively growing in late summer or early fall, delay treatment until environmental conditions favoring active growth are present. Thorough coverage is important.

Flaxweed and Tansy mustard in Winter Wheat - For best results, apply "Ally" plus surfactant when weeds are actively growing, no larger than 2" tall in diameter, and crop canopy will allow thorough coverage of target weeds. If weeds are not actively growing, delay treatment until environmental conditions favoring active growth are present. Thorough coverage is important.

**SPRAY PREPARATION/TANK MIXTURES:**
Pour the proper amount of "Ally" into the necessary volume of water in the sprayer tank. Use a surfactant to improve wetting and/or spreading. Thorough agitation is required for a uniform suspension and application. "Ally" must be added first to the spray tank followed by any other tank mix chemicals and surfactant.

Use spray preparation of "Ally" within 24 hours of product degradation may occur. If spray preparation is mixed or stored overnight, thoroughly agitate before re-use. Thorough surfactant - Use a surfactant of at least 80% active ingredient to improve wetting and/or spreading. Thorough surfactant mixing is the last ingredient in the spray tank at the rate of 1 to 2 quarts per 100 gallons of spray volume. Antifoaming agents may be needed. Do not use low rates of liquid fertilizers as a substitute for a surfactant.

**Liquid Fertilizer - Shurly "Ally" in water; then thoroughly mix the surfury into the liquid fertilizer. Do not add surfac-
tant to tank mix containing Shurly "Ally" in fertilizer solution. Do not use with fertilizers having a pH of 3.0 or less as rapid product degradation may occur.

Tank Mixes - Tank mix application with a suitable registered weed herbicide, for example 2,4-D, if crop canopy will prevent thorough coverage of target weeds or if weeds are not des-
covered by mechanical harvest. Tank mix applications of flaxweed (Canada thistle, common sunflower, com gromwell, fiddleneck), flaxweed, kochia, lambquarters, Russian thistle, dandelion and mustards (mustard mustard and arable) are larger than "Ally" label guidelines, or if weeds other than those listed for "Ally" are present on the field, tank mix of "Ally" must be in suspension before adding the companion herbicide. Follow the application timing and surfactant recommendations of the companion herbicide.

If application timing of companion herbicide differs from "Ally", apply separately as recommended for each product. DO NOT tank mix with Hoepton 3EC as wild oat control may be reduced.

"Ally" plus Du Pont Gentil® Herbicide - A tank mix of "Ally" plus Gentil® is recommended when crop canopy will prevent thorough coverage of target weeds. Do not exceed 1/10 ounce per acre of "Ally" or 1/2 ounce per acre of Gentil® in tank mixes. Always include a surfactant. Follow tank mix rotational guidelines and pH restrictions on Gentil® label.

**WEED CONTROL IN REDUCED TILLAGE FALLOW**
Reduced tillage fallow applications of "Ally" are made preceding wheat, barley and certain other crops. Determine crop rotation plans according to "Crop Rotation Guidelines".

Use of "Ally" for weed control on fallow ground is primarily as a postemergence herbicide applied either alone or in combination with Landmaster® Roundup® Plus 2,4-D amine, residual volunteer cereal/gray seed herbicides, 2,4-D, or Banvel®. Susceptible weeds should be actively growing at time of application. Always include a surfactant.
**VEGETABLES CONTAINING OR SUPPLEMENTED WITH**

1/10 Ounce Per Acre

**Lacuna diiscal**
Common lettuce
Russian lettuce

**Filoweed**
Tumble mustard (Jim Hill)
Wild buckwheat

**Lambquart**
(Lamb's quarters, similea)
Volunteer sunflower

*Vegetables marked with an asterisk may only be suppressed. Weed suppression is a visual reduction in weed growth or vigor as compared to untreated area. Degree of suppression will vary with size of weed and environmental conditions and following treatment.

**20 acres treated per 8 ounce container.**

**SPRAY PREPARATION/TANK MIXTURES:** Pour the proper amount of "All" into the necessary volume of water in the spray tank. Continual agitation is required for a uniform suspension and application.

Use spray preparation of "All" within 24 hours or product degradation may occur. Spray separation is left standing, thoroughly agitate before re-using.

Surfactant - Unless otherwise noted, use a surfactant of at least 30% active ingredient to prevent postemergence applications to weed seed surfactant as the last ingredient at the rate of 2 to 3 quarts per 100 gallons of spray volume. Antifoaming agent - "All" plus Landmaster or Roundup, or "All" plus Roundup plus 2,4-D Amines - Use for control of broadleaf weeds, volunteer cereals and grassy weeds. For best results, apply with volunteer cereal/grassy (Tall) or tall weeds. Either component should be applied in 3 to 10 GPA's with ground tank equipment or 3 to 5 GPA's by air. Ammonium sulfate (2.5% by weight) may be added when using Landmaster. When using 2,4-D Amines, mix a nonionic surfactant (of at least 50% active ingredient) at 2 quarts per 100 gallons of spray volume.

"All" plus 2,4-D or Banvel - Use for postharvest broadleaf weed control. Actively applying to actively growing weeds. Include a surfactant at 2 quarts per 100 gallons of spray volume. "All" plus Residual Herbicides - For control of volunteer cereals and grassy weeds. Apply with either of the above labeled herbicides such as atrazine, Bladen® or Ignite®. If broadleaf and grassy weed stages or applications of individual products are not appropriate for tank mix application, apply each product sequentially according to respective label timing guidelines.

In tank mixtures, "All" may be suspended before adding the companion herbicides or spray adjuvants. Follow all use instructions, label rates, warnings, precautions and surfactant recommendations of companion herbicides.

**EQUIPMENT - SPRAY VOLUMES**

Apply using a pressurized air or ground equipment. Select a spray volume and delivery system that will insure thorough coverage and a uniform application rate. Avoid spraying over freshly hoeed areas while starting, turning, slowing or stopping, or injury to the crop or following crops may result.

**Sprayer Equipment:** Refer to specific manufacturer's recommendations for additional information on GPA, pressure, speed, nozzle types and arrangements, nozzle heights above the target canopy, etc. for respective application equipment.

Ground Application - For optimum spray distribution and thorough weed control, use a spray volume of 1 gallon per acre (GPA). For 60 to 180 gallon nozzle spacings, use of 10 GPA, 60-inch nozzle spacings, use not less than 20 GPA. 100% overspray of nozzle spray pattern must be covered when spraying.

With "Raindrop" nozzles, do not use less than 30 GPA and insure for 100% overlap of nozzle spray patterns.

Use 50 mesh screens or larger.

**Application:** Use orifice discs, cores, and nozzle types and arrangements that will provide for optimum spray distribution and maximum coverage. Apply as many as 5 GPA.

Do not spray very windy or windy conditions, when weeds are gassy, or when other conditions will favor poor coverage and/or drift.

**Continuous agitation is required to keep "All" in suspension.**

**NOTE:** Do not allow spray to drift onto adjacent crops, or onto agricultural or horticultural crops scheduled by state and federal laws to crops other than wheat as injury to the crop may occur. Extreme care must be taken to prevent drift onto desirable plants or nonagricultural land.

**CROP ROTATION GUIDELINES**

Crop rotation plans are determined by the crop to be planted and a minimum rotation interval. Minimum rotation intervals is the time from the last application of "All" to the anticipated date of planting. For maximum rotational management, follow "All" no less than your wheat, barley or

**FIELD BIOASSAY**

"All" is a useful tool for weed control in wheat or barley and in reduced tillage systems, however, under some conditions small amounts of "All" can remain in the soil and injure crops other than those listed on the "All" label under the following Rotation Guidelines. For more information or application, therefore, before you use "All", you should carefully consider your crop rotation plans during growing treatment.

A bioassay involves growing test strips of the crop or crops you plan to grow the following year in fields previously treated with "All". Crop response will indicate whether or not to rotate the crop(s) grown in the test strips.

"All" breaks down more rapidly in soils that have high microbial populations. Factors that favor microbial activity include rainfall of 10" or more and having long growing seasons with warm soil temperatures. Factors that reduce microbial activity, hence slow the disappearance of "All" in soils, are low rainfall and prolonged periods of soil temperatures less than 40°F. Microbial activity, soil temperature, and to a large degree soil moisture, can vary greatly from year-to-year, and from area-to-area. Consequently, it is not always possible to accurately predict whether or not to rotate to crops other than those listed on the label.

A biological assay of your "All" treated field is the only sure way of determining when crops other than those listed on the label can be grown and is conducted as follows:

1. The accuracy and reliability of any field bioassay is largely dependent on the number of test strips and plantings. Be sure to select areas for the field bioassay sample that are representative of the area. Include in the field bioassay several factors such as field size, soil texture, drainage, time, area, around areas, eroded belts and alkali pans and soils when selecting the site(s) to be most representative of the soil conditions in the field.

Even in small fields, more than one test strip is required to accurately predict whether or not it is safe to rotate to a noncereal crop. On large fields, several test strips will be needed in order to obtain reliable results based on the field condition being studied. A large test strip area is more reliable than a small one.

Suggested size is 1/4 to 1/2 acre per site.

2. Use standard tillage and seeding equipment to plant the test strips.

3. Prepare a seed bed and plant the crops and varieties you want to grow the following year. Remember to use the same planting time, conditions, techniques and cultural practices you normally use to plant and grow the bioassay crop(s). If possible, plant into an adjacent area not treated with "All" to use as a comparison.

4. Do not spray the test strips with herbicides that may damage the bioassay crop(s).

5. If the crop(s) in the test strips grow to maturity with a normal harvest, the assay is positive and you may now rotate to the new crop. If the crop(s) die or fail to yield a normal harvest, the assay is negative and you should not rotate to the new crop(s). Run the assay until positive results are obtained before rotating to the new crop(s).

7. If the bioassay indicates that "All" residues are still present, do not rotate to crop(s) other than those listed on the label and results indicate that the assay crops are growing normally.

**STORAGE AND DISPOSAL**

Storage: Store product in original container only. Store out of reach of children.

Disposal: Do not contaminate water, food or feed by storage, disposal, or cleaning of equipment. Wastes resulting from the use of this product may be disposed of on site or at an approved waste disposal facility. Do not apply while weather conditions exist which are not conducive to rapid evaporation. Wastes do not offer for recycling or reconditioning. The material may be disposed of in a sanitary landfill. It is not to be disposed of in incineration or, if prohibited by state or local authorities, by burning. It must be drained away from surface water.

**NOTICE TO BUYER:** Purchase of this material does not confer any rights under patents of countries outside the United States.

1. Registered trademark of American Hoosier Corporation.
2. Registered trademark of Velsicol Chemical Corporation.
3. Registered trademark of Ciba-Geigy Corporation.

Made in U.S.A.
HYDROLYSIS (DUPONT DOCUMENT NUMBER AMR-62-82) AND
SOLUBILITY (DUPONT DOCUMENT NUMBER AMR-86-82)

STATUS OF HYDROLYSIS STUDY:

- "HYDROLYSIS DATA REQUIREMENT HAS BEEN SATISFIED"

RESULTS OF STUDIES:

<table>
<thead>
<tr>
<th>HYDROLYSIS HALF-LIFE AT 25 C</th>
<th>SOLUBILITY AT 25 C</th>
</tr>
</thead>
<tbody>
<tr>
<td>21 DAYS AT pH 5</td>
<td>270 PPM AT pH 4.6</td>
</tr>
<tr>
<td>&gt; 30 DAYS AT pH 7</td>
<td>1750 PPM AT pH 5.4</td>
</tr>
<tr>
<td>&gt; 30 DAYS AT pH 9</td>
<td>9500 PPM AT pH 6.1</td>
</tr>
</tbody>
</table>

HYDROLYSIS MECHANISM (pH 5):

\[
\begin{align*}
\text{Hydrolysis Product} & \rightarrow \\
\text{Sulfonamide} & + \\
\text{Other Minor Product} &
\end{align*}
\]
AQUEOUS PHOTOLYSIS OF 14C-METSULFURON METHYL
(DUPONT DOCUMENT NUMBER AMR-102-82)

EPA CONCERNS:

- NEED INFORMATION ON THE PHOTOLYSIS (RATE DETERMINATION
  AND PHOTOPRODUCT IDENTIFICATION) OF METSULFURON METHYL
  IN BUFFERED DISTILLED OR DEIONIZED WATER MAINTAINED UNDER
  STERILE CONDITIONS.

- NEED DATA ON THE FATE OF THE TRIAZINE MOIETY.

DUPONT RESPONSE

A NEW STUDY UTILIZING [TRIAZINE-2-14C] METSULFURON METHYL
WAS COMPLETED.

EXPERIMENTAL:

- STUDIED IN STERILIZED AQUEOUS SOLUTIONS BUFFERED AT pH
  5, 7 AND 9.

- TEMPERATURE MAINTAINED AT 25 C.

- EXPOSED TO NATURAL SUNLIGHT FROM 8-13-85 TO 9-17-85.

RESULTS:

- NO PHOTODEGRADATION OCCURRED (I.E. DEGRADATION RATES
  SAME IN EXPOSED AND DARK CONTROLS AT ALL 3 pHs):

  \[ t_{1/2} \sim 17 \text{ DAYS AT pH 5} \]
  \[ \sim 2\% \text{ HYDROLYSIS AT pH 7 AFTER 35 DAYS} \]
  \[ \sim 10\% \text{ HYDROLYSIS AT pH 9 AFTER 35 DAYS} \]

- PRODUCT DISTRIBUTION THE SAME IN THE EXPOSED AND DARK
  CONTROLS.
PHOTODEGRADATION OF 14C-METSLURFON METHYL ON SOIL
(DUPONT DOCUMENT NUMBER AMR-77-82)

EPA CONCERNS:

- NEED INFORMATION ON THE PHOTODEGRADATION OF METSLURFON
  METHYL ON SOIL MAINTAINED AT A CONSTANT TEMPERATURE BETWEEN
  25 AND 30 C.

- NEED DATA ON THE PHOTODEGRADATION OF THE TRIAZINE MOIETY ON
  SOIL.

DUPONT RESPONSE:

A NEW STUDY UTILIZING [TRIAZINE-2-14C] METSLURFON METHYL WAS
CONDUCTED.

EXPERIMENTAL:

- APPLIED TO KEYPORT SILT LOAM (pH = 4.3) ON THIN-LAYER
  SOIL PLATES.

- IRRADIATED SAMPLES EXPOSED TO NATURAL SUNLIGHT FROM
  JUNE 26 – JULY 26, 1985. CONTROLS MAINTAINED IN
  DARKNESS.

- SOIL SURFACE TEMPERATURE MAINTAINED AT 27-28 C FOR
  IRRADIATED SAMPLES VS. 25 C FOR DARK CONTROLS.

RESULTS:

- METSLURFON METHYL FIRST HALF-LIFE WAS THE SAME (I.E.
  4-6 DAYS) IN BOTH THE IRRADIATED AND DARK CONTROL
  SAMPLES.

- ONE MINOR "PHOTOLYSIS" PRODUCT DETECTED IN THE EXPOSED
  SAMPLES BUT NEVER EXCEEDED 5% OF THE TOTAL RADIOACTIV-
  IITY. OTHERWISE, PRODUCT DISTRIBUTIONS WERE THE SAME IN
  THE EXPOSED AND CONTROL SAMPLES.