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

OFFICE OF
PREVENTION, PESTICIDES
AND TOXIC SUBSTANCES

TXR. No: **0052466**

MEMORANDUM

DATE: March 9, 2004

SUBJECT: **Trifluralin:** Health Effects Division (HED) Metabolism Assessment Review Committee (MARC) Decision Document. Meeting Date: 4 February 2004. PC Code: 036101

REVIEWER: Sheila Piper, Chemist
Chemistry & Exposure Branch/Health Effects Division (7509C)

THROUGH: Christine Olinger, HED MARC Chair
David Miller, Branch Senior Scientist
Health Effects Division (7509C)

TO: Yan Donovan, HED MARC Executive Secretary (7509C)

Introduction
The MARC met on February 4, 2004 to discuss the trifluralin residues of concern in plants (corn and mustard), livestock, rotational crops and drinking water.

Material Reviewed
A briefing document was prepared by S. Piper (6-January-2004) also included environmental/ water information provided by Santhini Ramasamy, of the Environmental Fate and Effects Division (EFED). Rotational crop information, not a part of the original briefing document, was also provided to the MARC (B. Cropp-Kohlligian, DP Barcode D206342, 7/25/95).

Members Attended
Alberto Protzel, Abdallah Khasawinah, Yan Donovan, Norman Birchfield, Leonard Keifer, Christine Olinger, Leung Cheng, Rick Loranger, Pauline Wagner and Bill Wassell

Members in Absentia
PV Shah and John Doherty

Alternate Members Attended
None

Non Members
Sheila Piper, Richard Griffin, Santhini Ramasamy and Bob Fricke

MARC Decision Table
The recommendations by the MARC for degradates and metabolites to be included in the risk assessment, and the metabolites included in the tolerance expression are summarized in Table 1.

Table 1. Summary of MARC Decision for Trifluralin

Chemical: Trifluralin.		
Date: 04-February-2004		
Residues of Concern		
Matrix	Risk Assessment	Tolerance Expression
Plants	Parent only	Parent only
Livestock	Use TRR from cow metabolism study	No decision
Rotational Crops	Parent only[1]	Parent only[1]
Water	Parent, TR-4, TR-6 and TR-15	N/A
[1] Only if the registrant was to change the plant back interval to equal to or greater than100 days.		

Rationale

Plants: The MARC concluded that for the risk assessment and tolerance expression, parent only is the residue of concern. Metabolism studies conducted on field corn at a 1.5x rate and mustard at a 2.6x rate indicated that parent was the only major residue (>10% TRR). There are no specific toxicity concerns for all other minor metabolites.

Livestock: No decision was made regarding the tolerance expression for livestock. The MARC concluded that a new animal metabolism study with higher dosing levels and better characterization/identification of metabolites is needed for continued registration of the mid-season alfalfa use which produces significantly higher exposure to livestock. The MARC also

recommended that for the time being, the total radioactive residues (%TRR) from livestock tissues and milk should be used in the risk assessment.

The available ruminant metabolism studies in dairy cow (2.8X MTDB) indicated that no major metabolite were found. While the registrant claimed that parent, TR-2, TR-4, TR-5, TR-6, TR-7, TR-14, TR-15, TR-42 and TR-44 are minor metabolites, no quantitative information was provided, such as the %TRR for each. There was no characterization/ identification of metabolites in the hen metabolism study. As a result, the MARC was unable to determine which metabolites the registrant should analyze in any future feeding study.

Rotational Crop: Provided the registrant changes the plant-back interval (PBI) to 100 days or greater, the MARC concluded that the parent is the only residue of concern for the risk assessment and the tolerance expression. However, insufficient characterization of the total radioactive residues was conducted in the existing study for the MARC to make a decision of residues of concern for plant-back intervals, of less than 100 days. Should the registrant want a PBI of less than 100 days, a new study, conducted at a 1x rate, must be conducted with sufficient characterization of the samples at the desired PBI.

The confined rotational crop study conducted at 0.4X rate indicated that TRRs are very low (<0.010 ppm) after 100 days plant back interval (B. Cropp-Kohlligian, D206342, 7/25/95). However, with the 30-day PBI study, the TRRs are as high as 0.09 ppm. Further identification of the 30-day TRR indicated that parent was found as a minor component in turnip root, while other unknown peaks with > 10% TRR were not identified.

Drinking Water: The environmental fate data suggest that trifluralin and degradates (TR-4, TR-6 and TR-15) could be present in drinking water, however, if the risk assessment team finds that the photodegradates and anaerobic soil degradates are insignificant contributors to overall exposure after water modeling; they may choose to remove them from the risk assessment.

Environmental fate studies indicate that parent is moderately persistent in soil. The half life in laboratory aerobic soil metabolism studies was 116 to 201 days and the half life in terrestrial field dissipation studies ranged from 15 to 149 days. Trifluralin is not mobile (binds to soil with high affinity). Therefore it is not likely to leach into groundwater at high levels and more likely to reach surface water bound to eroding soil than in the dissolved phase. Under anaerobic conditions, trifluralin degrades more rapidly in the laboratory with a half-life of 25 to 59 days. Laboratory studies indicate that trifluralin undergoes a rapid degradation by photolysis in aqueous conditions (half-life 8.9 hours). Trifluralin photolyzes more slowly in soil with the half-life of 41 days. Trifluralin is moderately volatile and soil incorporation is recommended, but not mandatory, to reduce losses to volatilization. Soil incorporation would greatly reduce the potential for soil photolysis to occur. Based on the use pattern (pre-plant soil and direct spray), the major route of degradation is expected to be aerobic soil metabolism but under some

conditions aqueous photolysis, soil photolysis, and anaerobic soil metabolism may also be major contributors.

In the aerobic soil metabolism study, no major degradates were formed. Unextractable residues and volatilization accounted for ~50% and ~20% of applied material, respectively. In aqueous photolysis, the major degradates were TR-6 and TR-15. In anaerobic soil metabolism study, the major degradate is TR-4. These degradates range from 13% to 47% of the applied dose. Based on a visual evaluation of the polarity of the degradates and a previously conducted EPIWIN physical property analysis, these degradates are expected to have lower soil binding potential (higher mobility) than trifluralin. The degradates share similar structure as trifluralin and therefore are considered to share similar toxicity as the parent.

Although TR-20 was included as a degradate of concern for benfluralin, the data available for trifluralin suggest that this material forms only very low levels after long periods of time. As a result MARC concluded that it is unlikely to result in significant exposure.

cc: S. Piper (CEB),S.Ramasamy (EFED)
HED Metabolism Committee file (Y. Donovan), RRB3RF
S. Piper, HED, CEB: CM-2: 810F:308-2717:2/24/04