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

SEP 25 1990

OFFICE OF
PESTICIDES AND TOXIC SUBSTANCES

MEMORANDUM

Subject: EPA ID # 524-UGU: Dithiopyr - Response to Monsanto's Comments to Agency Questions on Acute Inhalation Toxicity Study in Rats with MON 15104 (MRID No. 411300-06).

Tox. Chem. Number: 717C
Project Number: 0-1760
Record Number: 268383

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I. Conclusion:

The Toxicology Branch I concludes that the above acute inhalation study with MON 15104 has been adequately conducted (See section IV, item A). Thus, we are upgrading the study (MRID No. 411300-06, Study No. 89098/MSL-9084) from core-supplementary to core-minimum. This study satisfies the guideline requirement No. 81-3 for an acute inhalation study. This memorandum will serve as a supplement to the DER (HED Document No. 007783, dated February 26, 1990).

II. Requested Action:

The Registration Division requested that the Toxicology Branch determine the adequacy of the Monsanto's comments (dated June 12, 1990) to Agency questions posed in our review of the acute inhalation study with MON 15104 referred to above (MRID No. 411300-06, EPA memorandum, P. Chin to R.Y. Ikeda, Feb. 26, 1990, HED Document No. 007783).

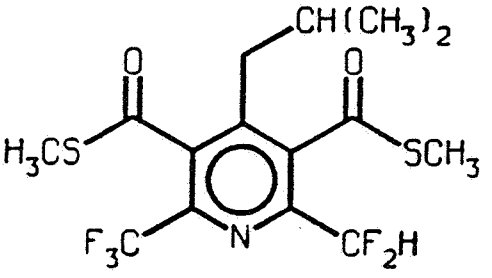
III. Product Information:

MON-15100 technical grade "dithiopyr" active ingredient is a selective herbicide for the preemergence and postemergence control of listed annual grasses and annual broadleaf weeds in established cool and warm season turfgrasses found in lawns and ornamental turf.

MON-15100 and MON-7200 are Monsanto designations for the same ingredient, ie., dithiopyr. Dithiopyr is a 3,5-pyridine dicarbothioic acid diester containing fluoroalkyl groups at the 2 and 6 positions on the ring. The chemical name for dithiopyr is: 3,5-pyridine dicarbothioic acid, 2-(difluoromethyl)-4-(2-methylpropyl)-6-(trifluoromethyl)-S,S-dimethyl ester. MON-15100 and MON-7200 are the designations for the active ingredient for registration in the United States and outside the United States, respectively.

The Agency granted the extension of Experimental Use Permit 524-EUP-69 for both MON-15151 (12.7% a.i.) and MON-15104 (13.6% a.i.) formulations (dithiopyr end-use formulations under the Dimension Turf Herbicide trade name) to control annual grass and broad leaf weeds in turf grass.
The physical and chemical characteristics of dithiopyr are presented below:

Color:	Tan to light brown
Physical state:	Solid
Odor:	Sweet
Melting Range:	51-54 °C
Solubility:	water----- 1.4 ppm at 25 °C
	acetone--- > 33.3 g/100 ml
	ethanol--- > 12.0 g/100 ml
Vapor pressure:	4×10^{-6} at 25 °C, mm Hg
pH:	5.1



Structure for MON 7200 (dithiopyr)

IV. Toxicology Branch Evaluation of Monsanto's Comments:

Questions raised by the Toxicology Branch (Item A) and Monsanto's comments are listed below:

Item A. Acute Inhalation Toxicity Study in Rats (MRID No. 411300-06, Study # 89098/MSL 9084)

Toxicology Branch Request

> This study received the core classification "supplementary" because 25% of the generated particle size was not < 1 um, and lack of raw data to substantiate the results of evaluation of various aerosol generation systems employed for this study. However, the study may be upgraded if required additional information is submitted.

Monsanto Comment

> MON 15104 is an emulsifiable concentrate containing approximately 15% dithiopyr, [redacted] Due to the high content [redacted] in this product its consistency is very oily. The physical-chemical characteristics of MON 15104 made it impossible to generate an atmosphere containing > 25% submicron particles and simultaneously achieve chamber concentrations high enough to induce toxicity and mortality in the test animals. ..... Increases in the absolute number and total mass of small particles is difficult to achieve with these increasing concentrations because of coagulation phenomena.
>
> Evaluations with a variety of generation systems have been performed by Monsanto on a number of test materials which have similar physical properties to those of MON 15104. In all cases it has been observed that certain physical phenomena limit the output characteristics of aerosols from low vapor pressure materials. The attached Table (A) presents particle size data from aerosols tested in our laboratory. These aerosols were generated by the best of some 9 systems that have been evaluated over the past few years by Monsanto. ..... The knowledge gained from these evaluations aided our decision on which generation system to use for the MON 15104 study.
>
> ..... During the pretest phase of the MON 15104 study, 2 generation systems were evaluated: a pressurized tank with nebulizer and a pressurized Laskin-style spraybar/discriminator. ..... The results of the pretest trials are shown below:

Insert information is not included

Generating System	Max. Attainable Conc. mg/L	% Particles <1 um	MMAD um
Pressurized tank with nebulizer	5.5	4.3	2.9
Pressurized Laskin-style spraybar/discriminator	3.8	4.5	2.8

The pretest trials with these generating systems gave comparable results with regard to particle size distribution of MON 15104 aerosols. The pressurized tank with nebulizer was selected for use on the acute inhalation study because of its reliability and more consistent output. .....

Toxicology Branch Response

Monsanto's comments adequately satisfied Toxicology Branch request. Thus, we are upgrading the study (MRID No. 411300-06, Study No. 89098/MSL-9084) from core-supplementary to core-minimum. This study satisfies the guideline requirement No. 81-3 for an acute inhalation study. This memorandum will serve as a supplement to the DER (HED Document No. 007783, dated February 26, 1990).

V. Data Gaps:

The toxicology data base for MON-15100/MON-7200 technical grade dithiopyr supports the registration of dithiopyr for non-food crop use. The only data gap identified is the 90-day feeding study, however, this gap would not delay registration of this pesticide. This study is required in order to be consistent with the current requirements for reregistration under FIFRA 88.