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

JUN 3 1981

OFFICE OF
PESTICIDES AND TOXIC SUBSTANCES

Section 6(a)(2) data for technical picloram. Reg. Nos. 464-320 and 464-323.
Response to RCB review of 7/24/80.

Lynn M. Bradley, Chemist
Residue Chemistry Branch (TS-769)

R. Taylor, PM Team 25
Registration Division (TS-769)

THRU: Charles L. Trichilo, Chief
Residue Chemistry Branch, HED (TS-769)

In their letter of 2/2/81, Dow Chemical Company has responded to our review concerning their submission of 7/2/80, which stated that it had come to their attention that technical picloram contains hexachlorobenzene (HCB) as an impurity, that they have established an internal control system to prevent use of any batch containing ≥200 ppm HCB and that they calculated maximum residue levels of 1.6 ppb which might result in grass. Dow also referred to a published study on accumulation of HCB in sheep which they have now submitted to us.

We requested complete information on the composition of technical picloram, which is now submitted, including the manufacturing process. Picloram is prepared by [redacted] Additionally, technical picloram may contain the impurities listed below:

[redacted]

Minor impurities (<0.1%) which have been identified include [redacted]

MANUFACTURING PROCESS INFORMATION IS NOT INCLUDED

Details on exactly how Dow intends to market only those batches which contain less than 200 ppm HCB were requested also. [redacted]

This information satisfies our requirements concerning the composition of Technical picloram and how Dow intends to market only picloram containing less than 200 pm HCB.

We requested actual residue data for HCB in grasses from the use of picloram containing HCB, since there are no data available to compare the persistence of HCB with picloram. Dow has submitted summaries of planned residue studies for both soil and grass (1981) for both the TORDON 22K (liquid) and TORDON 10K (slow release pellet) formulations. These protocols appear to be acceptable.

Also submitted is an article entitled "Persistence of Aerially Applied Hexachlorobenzene on Grass and Soil" [M. L. Beall, Jr., J. Environ. Qual., 5, 367 (1976)] which describes greenhouse residue decline studies performed on Zoysia grass treated with multiple consecutive applications of HCB in acetone to achieve "the equivalent of 10 ppm HCB in the top 5 cm of soil." Residue levels of HCB were 1060 ppm in the grass at day 1, 15.6 ppm at day 15, 7 ppm at day 29, 1.3 ppm at day 51, <1 ppm at day 65 and declined to <0.08 by 19 months. Residues in the top 2 cm of the soil declined more slowly than did grass residues (5.6 ppm at day 1, 2.5 ppm at day 15, 24.4 ppm at day 29), and residues in the lower portion of the sod (2-4 cm) declined quite slowly (0.11 ppm at day , 0.15 ppm at day 93 and 0.096 ppm at 19 months.). All concentrations are based on "air-dry" weights.

Since only HCB was applied in this experiment, we still have insufficient data to make a valid comparison of the persistence of HCB with picloram. We await the results of the planned residue studies as discussed above.

A residue study entitled "Hexachlorobenzene I. Accumulation and elimanation of HCB in sheep after oral dosing" [Avrahami and Steele, New Zealand Journal of Agricultural Research, 15, 476-81 (1972)] is submitted for review.

Sheep were dosed orally for 18 weeks with HCB at levels of 0.1, 1.0., 10.0 and 100.0 mg HCB/sheep/day (approximately the same values as ppm in diet, based on 1 kg/day food consumption). Blood and omental fat were sampled during the treatment period and up to 42 weeks after treatment ceased. Data are, for the most part, presented only in graphical form. Residue levels in fat increased continuously during the treatment period, reaching maximum values of 7-9x the concentration in feed (0.9, 7.5, 75 and 650 ppm in fat from treatment levels of 0.1, 1.0, 10.0 and 100 ppm in the diet, respectively). After cessation of feeding HCB, residue levels declined more slowly than they had

accumulated, and HCB was eliminated faster from the sheep which received higher dosages. The approximate half-life of HCB in fat in this study was 10-18 weeks. Control sheep which had been grazed in the same pasture as the treated sheep showed residue levels higher than pre-treatment levels, indicating that HCB is excreted unchanged and reingested by animals grazing in the same area.

Residue levels in the blood rose during the treatment period and, after cessation of treatment, declined to apparent "plateau" levels during the post-treatment year.

Due to the lack of actual data values, this study is of limted value as residue data. It does, however, indicate that HCB is both cumulative and persistent in animals as a result of oral ingestion, even at low dose levels e.g., 0.1 ppm in the diet gave 0.9 ppm in the fat, declining to ca. 0.25 ppm after 1 year).

Conclusions and Recommendations

1) Our requirements concerning the composition of technical picloram and how Dow intends to market only picloram containing less than 200 ppm HCB are satisfied.

2) The submitted protocols for collecting residue data for picloram and HCB are acceptable.

3) The published studies concerning HCB in grass and soil and in sheep fat and blood do not satisfy our need for residue data. Until the results of the planned residue studies (see Conclusion 2) are available, we are unable to make a conclusion regarding possible HCB residue levels in r.a.c.'s having picloram tolerances.

We recommend that the planned residue studies be carried out according to the submitted protocols, and the resulting data for both picloram and HCB be submitted for our review.

cc: Reading file
Circu
Reviewer
Subject File
Section 6(a)(2) S.F.

TS-769:Reviewer:LMBradley:LMB:LDT:X77324:CM#2:RM:810:Date:5/27/81
RDI:Section Head: RJH:Date:5/28/81:RDS:Date:5/29/81