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

DEC 27 1984

OFFICE OF
PESTICIDES AND TOXIC SUBSTANCES

MEMORANDUM

SUBJECT: EPA Reg. No. 3125-280. Methamidophos (Monitor®)
on tobacco. Letter dated 10/29/84.

FROM: Richard Loranger, Chemist *R. Loranger*
Residue Chemistry Branch
Hazard Evaluation Division (TS-769)

THRU: Andrew Rathman, Section Head
Residue Chemistry Branch
Hazard Evaluation Division (TS-769)

TO: William Miller, PM 16, IRB,
Registration Division (TS-767)
and
Toxicology Branch, Hazard Evaluation Division (TS-769)

In our previous review (R. Loranger, 8/23/84) concerning the use of the insecticide methamidophos (Monitor®; O,S-dimethyl phosphoramidothioate) on tobacco we requested the storage conditions for fresh and cured leaves prior to analysis in Report 86242. Mobay Chemical Corporation has responded by stating there was no storage prior to GC or radioanalysis since leaves were analyzed immediately after harvest or curing. We can now estimate maximum residues of methamidophos in tobacco leaves from the proposed use (0.5-1.0 lb ai/A, maximum 3 lb ai per season, 21 day preharvest interval).

The field treated tobacco leaves in Report 86242 received four applications of 1 lb ai/A. The level of Monitor per se in cured leaves harvested 21 days after the final application was 11 ppm. For the Kentucky trials involving air cured tobacco (see 8/23/84 memo) the maximum residue of methamidophos 21-23 days after the third 1.0 lb application was 7.88 ppm. The maximum residue in the flue cured leaves (Carolina studies) was 0.94 ppm. Taking into account the 11 ppm and 7.88 ppm values observed above plus the storage stability problems noted in our earlier review, we consider 20 ppm to represent a reasonable maximum level for residues of Monitor in cured tobacco from the proposed use. Therefore, a lg cigarette would contain 20 ug Monitor per se.

The radiolabeled pyrolysis study discussed in our previous review described in detail the products formed upon burning tobacco containing aged residues of methamidophos (therefore, various metabolites were present). Assuming that the Monitor per se

pyrolyzes in similar fashion as the mixture of aged residues, a maximum of about 3 ug intact organophosphates could be formed from one cigarette. This group includes acephate (O,S-dimethyl acetylphosphoramidothioate), Monitor, N-methyl methamidophos, "amidate" (O,O-dimethyl phosphoramidothioate), and N-methyl "amidate". The maximum quantity of the insecticides acephate and methamidophos from the smoke of one cigarette is about 1 ug each. This pyrolysis study also showed that 45-55% of the S-methyl groups would be converted to carbon monoxide or carbon dioxide. The remainder of the residue (20-30%, 4-6 ug) was found as methanethiol or its oxidation products (dimethyl sulfide, dimethyl disulfide, dimethyl sulfoxide, dimethyl sulfone). Only 8-16% of the radiolabel remained in the butt and ashes.

Conclusions and Recommendation

1. Residues of methamidophos per se on cured tobacco could be as high as 20 ppm (or about 20 ug per cigarette) from the proposed use.
2. The distribution of the 20 ug Monitor after burning the tobacco will be as follows (total residue in smoke, based on S-¹⁴C-methyl label):
 - 10-15% (2-3 ug) intact organophosphates-methamidophos, acephate (O,S-dimethyl acetylphosphoramidothioate), N-methyl methamidophos, "amidate" (O,O-dimethyl phosphoramidothioate), and N-methyl amidate
 - 45-55% carbon monoxide plus carbon dioxide
 - 20-30% methanethiol plus its oxidation products-dimethyl sulfide, dimethyl disulfide, dimethyl sulfoxide, and dimethyl sulfone
 - 10-15% butt and ashes

RCB does not require additional data for the requested use. We defer to Toxicology Branch as to the safety of the proposed use of methamidophos on tobacco.

cc: Circu, RF, Methamidophos SF and amended use, Tobacco SF, RAL
RDI:Section Head:LMBradley:12/24/84:RDSchmitt:12/27/84
TS-769:RCB:R.Loranger:557-7324:RAL:CM#2:RM.810>Date:12/27/84