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

DEC 2 1985

OFFICE OF
PESTICIDES AND TOXIC SUBSTANCES

MEMORANDUM

SUBJECT: EPA Reg. No. 279-3014: Permethrin (Pounce®); Amended Registration to Permit ULV Application to Range Grass. Access. No. 258653. RCB No. 305

FROM: J. Garbus, Chemist
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Hazard Evaluation Division (TS-769)

THRU: A. R. Rathman, Section Head
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TO: G. LaRocca / C. Dively, PM-15
Registration Division (TS-767c)

The Agricultural Chemical Group of the FMC Corporation, Philadelphia, PA, has applied for an amended registration for its pesticide Pounce® (permethrin) to allow for ULV application to range grass.

Pounce® 3.2 EC is FMC's designation for its 3.2 lbs per gallon emulsifiable concentrate of the insecticide permethrin [(3-phenoxyphenyl) methyl (±)cis-trans 3-(2,2-dichloroethenyl)-2,2-dimethylcyclopropanecarboxylate]. Its use on range grass is to control the range caterpillar.

A tolerance of 15 ppm on range grass is established for the combined residues of permethrin, 3-(2,2-dichloroethenyl)2,2dimethylcyclopropanecarboxylic acid (DCVA), and [(3-phenoxyphenyl) methanol (3-PBA). (40CFR 180.378) The petition for this use and tolerance, (PP#3E2911), was submitted by IR-4 on behalf of the Agricultural Experimental Station of New Mexico. The value of 15 ppm for the tolerance was not based on residue data but was arrived at by assuming an application rate of 0.01 lbs a.i./A and a yield of 750 lbs of dried grass per acre for range grass in New Mexico. This computes as a maximum possible residue level of 13.33 ppm (0.01 lbs/750 lbs). The petition states that residue levels therefore are dependent upon the moisture content of the grass. It should be realized that the value can vary with the degree of the dessication of the grass by season, climactic condition, geographical area and variety.

Petition 3#E2911 includes a residue trial consisting of a single application of permethrin to range grass in New Mexico at the proposed rate (0.01 lbs a.i./A). The results indicated that

residues of permethrin in or on dried grass would not result in residues exceeding the calculated tolerance of 15 ppm. The actual residues were 3.3 ppm at 1 day and 4.4 ppm at 3 days on a dry weight basis.

The current label directions for the use of Pounce® 3.2 EC on range grass are identical to those given in PP#32911 for permethrin formulated as Ambush®. These call for the application of 0.01 lb a.i./A by ground equipment with sufficient volume to obtain uniform coverage. Application is not to be made more than once a year. Cattle may be present during application. Hay is not to be harvested or feed to livestock.

The proposed usage directions of the current request permit the ground or aerial application of 0.01 lb a.i./A (0.4 ounces). Sufficient diluent should be used to obtain uniform coverage and proper atomization. For ground sprays the minimum finished spray volume should be 2.5 oz. per acre with refined vegetable oil or sufficient water to ensure adequate coverage. For aerial sprays, the minimum volume should be 1 pint per acre with vegetable oil as diluent or 1 gallon per acre with water. Cattle may present during spraying. Do not harvest or feed hay to livestock.

We note that the current seasonal restriction of 1 application per year is not retained in the proposed directions. We also note the extremely low volume proposed for ground application, i.e. 2.5 ounces per acre. We question the technical feasibility of applying such an extreme ULV, accurately and repeatedly at the current state of the art.

The metabolism of permethrin on or by plants is sufficiently understood to indicate that permithrin, DCVA, and 3-PBA are the residue of concern. (See reviews of PP#7G1891, A. Rathman, 3/10/77; PP#0F2389, J. Onley, 4/10/81; and PP#5F3271, N. Dodd, 8/14/85.) This is reflected in the tolerance expression for range grass that incorporates the parent compound and these metabolites.

We note that the metabolism of synthetic pyrethroid compounds is currently under review by RCB. As a result of that study it may be decided whether specific pyrethroids on specific crops need to be regulated in terms of the parent compound only, parent and metabolites, or additional metabolites identified through further metabolic studies. However, the tolerance expressions of 40 CFR 180.378 are considered appropriate at this time.

The method of analysis used for the residue data of this submission determines only the parent material. Range grass samples are blended with hexane/propanol and filtered. The residue in the filtrate is partitioned into water, repartitioned into hexane, and an aliquot is cleaned up on a Florisil column. The isomers of permethrin are determined by GLC with an EC detector. Method sensitivity is given as 1.0 ppm with recoveries of 92 and 93% for the cis and trans isomers, respectively, from spiked treated samples.

According to FMC, four residue trials were conducted on August 28, 1984 at one site in Fort Stanton, NM. In these trials, side-by-side comparisons were made using ULV ground and aerial application with oil or water as diluent. All applications were made at 0.01 lb a.i./A with one pint/A as finished spray volume for all aerial application and 5.3 oz. finished spray volume with oil or 4.6 oz. with water for ground application. Samples were taken on the same day after application. (RCB does not consider four sets of applications at one site on one day as the equivalent of four trials. We consider these as one trial.)

We note that the finished spray volumes used for ground application were considerably greater than that proposed for the amended label, although still very low.

All residue levels were less than the established tolerance of 15 ppm. The maximum residue that was found was 11.7 ppm from a ULV ground application with water as diluent. In general, all aerial application resulted in much lower residues (1.36 ppm to 2.35 ppm) than ground application (5.07 to 11.7 ppm).

No data are reported for residue levels of the metabolites DCVA and 3-PBA. In explanation, FMC's analytical report states: "As all residues found were well below the existing tolerance of 15 ppm, no metabolite residue data was generated as any realistic contributions of DCVA and MPBAlc residues would have been well below the existing tolerance on range grass."

As mentioned above, previously reported residue data for the permithrin on range grass are found in PP#3E2911. Aerial application was made at the same rate (0.01 lb a.i./A) and samples were taken at 1 day and at 3 days. At 1 day 3.33 ppm were found and at 3 days 4.42 ppm were found. These results were reported on a dry weight basis "because the moisture content of rangeland grass varies with season and maturity." The weather condition of this trial is given as " Normal-no rain".

We note that the description of the method used for the present trial does not include the drying of the sample to determine the moisture content. We, therefore, are unable to determine whether or not the results are reported on a dry weight or wet weight basis. Therefore, we cannot conclude whether these results are comparable to those reported in PP#3E2911. We also cannot conclude whether or not the residues in the ULV ground application will exceed the theoretically based tolernce in the absence of data upon the moisture content of the grass.

No residue data are given for the metabolites DCVA and 3-PBA even though the tolerance expression includes these metabolites. However, the applicant points out that, as the tolerance is equivalent to the total amount applied, the sum of all residues, theoretically cannot exceed this value.

Conclusions:

1. The current seasonal restriction of one application per year is not included in the proposed amended label.

2. The label directions propose the extremely low volume of 2.5 oz. per acre. We question the technical feasibility of applying this extemely small amount of finished spray accurately and repeatedly at the current state of the art. We note that the finished spray volumes used in the residue trial for ground application were considerably greater than that proposed for the amended label.

3. The metabolism of permethrin on or by plants is sufficiently understood. Permithrin, DCVA, and 3-PBA are the residues of concern.

4. Adequate analytical methods are availble for permethrin and its metabolites.

5. The tolerance value of 15 ppm is based upon an average value for the yield of dried grass per acre in New Mexico. As the description of the method does not include the drying of the sample to determine the moisture content, we are unable to determine whether or not the results are reported on a dry weight or wet weight basis. Therefore, we cannot conclude whether these results are comparable to those reported in petition 3E2911 or whether the residues in the ULV ground application will exceed the theoretically based tolerance.

6. No residue data are given for the metabolites DCVA and 3-PBA even though the tolerance expression includes these metabolites.

7. A single residue trial at one site is not sufficient to sustain an appliction for an amendment of a national label. Local conditions are relevant only for the site of trial but may not reflect conditions in other areas. For example, if the yield of dried range grass were 1000 lbs/A in another area, the calculated tolerance would be 10 ppm and would have been exceeded in the present instance.

Recommendation:

We recommend that the proposed amended registration be denied because of conclusions 1, 2, 5, 6, and 7 cited above.

For a favorable recommendation:

1. The applicant should retain the restriction of the current label of only one application per year of permethrin to range grass.

2. The applicant should increase the recommended minimum finished spray volume to at least the volumes used in the residue trial and demonstrate the feasibility of such low volume applications.

3. As the application is for a national label, the applicant is required to conduct residue trials at additional sites representative

of the geographic distribution of range grass.

4. As the tolerance is based on the dry weight of range grass, the applicant is required to express the results of current and future residue trials on a dry weight basis.

5. As the tolerance expression includes the known metabolites of permethrin, the applicant is required to analyze residues for the metabolites DCVA and 3-PBA.

cc: Amended Use F., S.F., R. F., Circ., Reviewer, PMSD/ISB
RDI:ARR:11/29/85:RDS:11/29/85
TS-769C:RCB:JG:jg:557-1864:CM#2:Rm.708:11/29/85