

12-20-89

LIST B INVENTORY - METABOLISM

Chemical: BENFLURALIN

Nature of the Residue - Plants: ADDITIONAL STUDIES ON LETTUCE, PEANUTS AND A NON-GRASS FEED (ALFALFA) ARE NEEDED.

Nature of the Residue - Animals: ADDITIONAL POULTRY AND RUMINANT STUDIES ARE NEEDED

Other Comments: REGISTRANT WILL SUBMIT NEW PLANT & LIVE STOCK STUDIES. NEED BOTH SPECIES AS ABOVE

Secondary Review: RBP Date: 12/20/89

	<u>Initials</u>	<u>Date</u>
Section Head	<u>W/P</u>	<u>12/20/89</u>
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Final Report

BENFLURALIN
List B Inventory. Residue Chemistry.

Contract No. 68-D8-0080

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List B Inventory. Residue Chemistry Data: Benfluralin.

INTRODUCTION

Benfluralin is a selective, soil-incorporated, preemergence herbicide for annual grasses and broadleaf weeds. Tolerances are established for negligible residues (0.05 ppm) in or on the raw agricultural commodities alfalfa, birdsfoot trefoil, clover, lettuce, and peanuts (40 CFR 180.208).

CONCLUSIONS

Qualitative Nature of the Residue in Plants

The qualitative nature of the residue in plants is not adequately understood for the following reasons: (i) nonextractable residues were not adequately characterized in peanut nutmeats, vines, hay or hulls or in alfalfa; (ii) no data were submitted concerning residues in or on lettuce; and (iii) no raw data were submitted to allow verification of the registrant's conclusions.

The data in MRID 00026053 indicate that [¹⁴C]benfluralin is taken up from the soil by peanuts and is translocated to the foliage and seed. Mature peanut plants were harvested 129 days after planting in [¹⁴C]benfluralin-treated soil. Total radioactive residues were 0.158 ppm in the nutmeat, 0.58 ppm in the stem, 0.80 ppm in the leaves, and 3.27 ppm in the roots. Extractable radioactive residues were 0.005 ppm in stems, 0.001 ppm in leaves, 0.154 ppm in roots, 0.037 ppm in hulls and < 1 ppb of benfluralin equivalents in nutmeat. The nonextractable residues included 75% of the stems, 43% of the leaves, 64% of the roots, 14% of the hulls, and 37% of the TRR in nutmeat. Three metabolites, TR-6 (9-39 ppb), TR-20 (2-57 ppb), and TR-7 (8-33 ppb), were present in stems, roots, and hulls. Other metabolites (not identified) were present but occurred in concentrations of less than 2 ppb.

Soil-incorporated [¹⁴C]benfluralin was also taken up by alfalfa plants (MRID 00026053). Total radioactive residues in alfalfa plants harvested 61, 76, 95, 118, 161 and 227 days after planting were 0.5-1.0 ppm of benfluralin equivalents. Sixty-five percent of the radioactivity was extractable from alfalfa foliage. Benfluralin accounted for 0.023 ppm of the extractable residues. Traces of TR-6, TR-7 and TR-20 (values not reported) were also present in the extracts.

An adequate data base on the metabolism of benfluralin in plants would include acceptable studies on lettuce, peanuts, and a non-grass animal feed species (alfalfa, clover, or birdsfoot trefoil). Until an adequate data base on plant metabolism is available, the adequacy of data pertaining to the other residue chemistry topics cannot be determined for benfluralin.

Qualitative Nature of the Residue in Animals

The nature of the residue in animals is not adequately understood for the following reasons: (i) no data were submitted concerning residues in poultry; (ii) the animals were pre-conditioned and radioactive benfluralin was not administered for 3 consecutive days; and (iii) residues were not adequately characterized.

One lactating goat was administered nonradioactive benfluralin for 8 days, then was given a single dose of [^{14}C]benfluralin (ca. 40x the maximum theoretical dietary burden) (MRID 00026053). Most of the administered radioactivity was recovered within 5 days from the urine (10.8%) and feces (89.1%). No radioactivity above the background level was detected in the milk before, during or after administration of the labeled material. The quantity and nature of radioactivity in the tissues were not examined. No information was reported concerning the history of goats (age, weight, feed consumption), test material (label placement, specific activity or purity), or the procedures for the collection and handling of samples. Although much of the radioactivity was recovered in the excreta, residues may accumulate in edible tissues and characterization of these residues must be attempted. Radiolabeled benfluralin must be administered for at least 3 days, and was only administered once in this study. Preconditioning (feeding unlabeled chemical prior to the dosing period) is not acceptable. Raw data were not submitted. In a similar study (MRIDs 00024252 and 00025245), lactating goats were administered benfluralin at 1 ppm in the diet for 23 days. On the ninth day only, ring-labeled [^{14}C]benfluralin was administered. Nondetectable levels of radioactivity were determined in the milk. Approximately 13% of the administered dose was recovered in the urine and 81% in the feces. Residues in muscle, liver, kidney and fat were not Determined.

REFERENCES

- 00024252 Gouwens, D.W. (19??) Study of Carbon-14 Excretion in Lactating Goats Fed a Mixture of 15% Carbon-14 Ring Labeled Benefin and 85% CF:3[^] Labeled Benefin: Experiment AAD-1325. (Unpublished study received Feb 16, 1966 under 1471-55; submitted by Elanco Products Co., Div. of Eli Lilly and Co., Indianapolis, Ind.; CDL:092800-F)
- 00025245 Horn, H.J. (1953) Subacute Inhalation Toxicity: Supplement to Reports Dated September 24, 1949 and November 4, 1952. (Unpublished study received Aug 5, 1955 under PP0037; prepared by Hazleton Laboratories, submitted by American Cyanamid Co., Princeton, N.J.; CDL:090035-I)

00026053 Golab, T.; Herberg, R.J.; Gramlich, J.V.; et al. (1970)
Fate of Benefin in soils, plants, artificial rumen fluid, and the
ruminant animal. Journal of Agricultural and Food Chemistry
18(5):838-844. (Also~In~unpublished submission received Jan 3,
1971 under OF0981; submitted by Shell Chemical Co., Washington,
D.C.; CDL:091687-B)