

JAN 7 1981

PP/DE1394 Trifluralin in/on Rape Seed and Straw
Evaluation of Analytical Method and Residue Data.

P.V. Errico, Chemist
Residue Chemistry Branch, RSD (TS-769)

Clinton Fletcher
Registration Division (TS-767)
and
Toxicology Branch (TS-769)
Hazard Evaluation Division

THRU: Robert S. Quick, Section Head
Petition Evaluation Section
Residue Chemistry Branch, RSD (TS-769)

Richard D. Schmitt, Deputy Chief
Residue Chemistry Branch, RSD (TS-769)

Charles Trichilo, Chief
Residue Chemistry Branch, RSD (TS-769)

Dr. H.E. Burt, Assistant Coordinator, and Dr. R.H. Kaplan, National Director, State Agricultural Experiment Station, Rutgers University, New Brunswick, New Jersey, 08903, on behalf of the IR-4 Technical Committee and the Agricultural Experiment Stations of Alaska and North Dakota have submitted a request to establish tolerances of 0.05 ppm for trifluralin in/on rape seed and straw.

Presently there are established tolerances of 0.05 to 2 ppm trifluralin in a number of raw agricultural commodities. These include 0.05 ppm tolerances in/on cottonseed, safflower seed, and sunflower seed. No tolerances have been established in/on meat, milk, poultry and eggs.

Conclusions:

1. The residue of concern is the parent compound, trifluralin.
2. Adequate analytical methods are available for enforcement of the requested tolerance.
3. No detectable residues of trifluralin were reported in rape seed at a 5X exaggerated application rate. We do not expect residues to concentrate in rape seed oil or meal.
4. The proposed use falls into section 180.6(a) category 3 with respect to secondary residues in meat, milk, poultry and eggs.

2224
2175
2172
2159
etc

Recommendation:

TOX and EFB permitting, we can recommend for the requested tolerance of 0.05 ppm in/on rape seed and straw. This favorable recommendation is contingent upon the receipt of a feeding and grazing restriction for rape forage.

Detailed Considerations

Formulation:

The Treflan E.C. formulation for this proposed use is an emulsifiable concentrate containing 4 lb a.i./gal of 44.5% technical trifluralin and 55.5% inert ingredients. The inert ingredients are cleared under Section 180.1001.

Information on the manufacturing process for trifluralin has been submitted to Registration Division (letter of December 8, 1976 by Dr. G.W. Probst, Elanco Products Company).

Proposed Use:

For broadleaf and grassy weed control in rape, apply and incorporate Treflan E.C. at a broadcast rate of 3/4 to 1 lb active ingredient per acre. The lower rate is recommended in lighter soils (less than 6% organic matter) and the higher rate is recommended on soils with 6-15% organic matter. After applying the broadcast spray in late fall or early spring, incorporate to a depth of 3 to 4 inches within 8 hours after application.

Apply only one application per crop. Do not seed wheat or barley for 12 months after a spring application.

A label restriction against feeding and grazing of rape forage is to be submitted by the petitioner (Telecon: P. Errico, RCB-C. Fletcher, RD).

Inert Ingredients:

All inert ingredients are cleared for use under Section 180.1001.

Nature of the Residue:

The metabolism of trifluralin in plants and animals has been adequately discussed in previous reviews by T. Woodward (PP#7G0533, 10/31/66), R. Arnold and J. Wolff (PP#7F0555, 5/24/67), R. Beyak (PP#4E1509, 10/17/74), and A. Smith (PP#9F0851, 9/9/69).

In summary trifluralin is absorbed and translocated in plants. Using radioactive tracer studies ($^{14}\text{CF}_3$) on carrots, peanuts, soybeans, sweet potatoes and cotton, it is indicated that degradation includes, a stepwise dealkylation of the aniline group, reduction of the nitro groups, and, to a lesser extent, carboxylation of the trifluoromethyl group.

Radiometric assays of milk and tissues from a lactating cow and goat (memo by J. Wolff, PP#7F0365, 5/29/67) indicated no residues (<0.01 ppm) in milk samples or goat tissues. In the cow study no residue (0.01 ppm) of trifluralin was found in lean meat, heart, liver and kidney, while trace residues of 0.03 - 0.04 ppm were found in fat and lung tissue. Additional animal feeding studies also indicated that trifluralin is rapidly metabolized and excreted with no significant storage of residues.

No metabolism studies were submitted for rape plants, but we believe the above studies are adequate to consider the metabolism of trifluralin in plants and animals adequately delineated.

Analytical Method:

The method used in this petition is similar to the enforcement method in PAM II.

A 25 g sample is blended for 5 minutes in 200 ml of methanol, filtered through Whitman #1 filter paper, then partitioned with 500 ml of a 5% sodium chloride solution and 50 ml of methylene chloride. The partitioning is repeated twice, then the methylene chloride is drained through sodium sulfate. The methylene chloride is evaporated on a 50°C water bath, the residue is dissolved in 5 ml of n-hexane, and the solution transferred to a Florisil column for fractionation. After the residue fraction was collected, it was evaporated to dryness and redissolved in 2 ml of benzene. The quantity of parent compound was determined using gas chromatography with an electron capture detector.

For crops containing interfering BHC, Ethion and/or Zineb, a thin layer chromatography method is available for initial cleanup. Sensitivity of the method is 0.01 ppm.

The eluant from the thin layer chromatography cleanup is then assayed using gas chromatography.

Fortified samples of rape seed and straw were spiked with 0.05 - 0.25 ppm trifluralin. Recoveries were reported as 70-120%. An adequate enforcement method is available.

Residue Data:

Residue data on rape seed and straw were submitted from North Dakota and Alaska. No residue of trifluralin was detected in/on rape straw or seed at application rates of 0.75-4 lbs active ingredient/acre.

The proposed use and residue data will support the requested tolerance of 0.05 ppm in/on rape seed and straw. This is the same tolerance presently established in/on cottonseed, safflower seed and sunflower seed.

No detectable residues of trifluralin were reported in rape seed even at the 5.3X application rate. Therefore, we do not expect any problems with residues concentrating in rape seed oil or meal.

Meat, Milk, Poultry and Eggs:

As discussed by J. Wolff (PP#7F0565, 5/29/67), feeding cows and goats a diet containing up to 10 ppm trifluralin resulted in no detectable residues in meat and milk (<0.01 ppm). We conclude that feeding of rapeseed, meal and straw would not lead to trifluralin residues in meat, milk, poultry and eggs, a section 180.6(a) 3 situation.

TS-769:RCB:P. Errico:gs:CM#2, RM810:12/29/80
cc: RF, Circ., Errico, Watts, TOX, EEB, EFB, FDA, PP#OE2394
RDI:R.S. Quick:12/15/80

INTERNATIONAL RESIDUE LIMIT STATUS

CHEMICAL Trifluralin

PETITION NO OE2394

CCPR NO. _____

Codex Status _____

☐ No Codex Proposal
Step 6 or above

Proposed U. S. Tolerances

Residue (if Step 9): _____

Residue: Trifluralin

Crop(s) Limit (mg/kg)

Crop(s) Tol. (ppm)

rape seed 0.05
rape straw 0.05

CANADIAN LIMIT

Residue: _____

Trifluralin

Crop Limit (ppm)

negligible residue of 0.1 ppm
on rapeseed

MEXICAN TOLERANCIA

Residue: _____

Trifluralin

Crop Tolerancia (ppm)

none on these commodities

Notes: