

2,4-D/TOX

10



ENVIRONMENTAL PROTECTION AGENCY

Dr. Brkin

REPLY TO
ATTN OF:

Releasable

DATE: February 16, 1972

SUBJECT: Request for negligible residue tolerance for 2,4-dichlorophenoxyacetic acid (2,4-D) of 0.1 ppm on or in potato tubers when applied to vines as directed.

TO:

TO: Mr. Drew M. Baker, Chief
Petitions Control Branch
Pesticides Tolerances Division

Pesticide Petition No. 1E1122

Related Petitions: 162, 272, 414, 6F0459, 6F0477, 7F0589, 8F0670
1E1046.

Current tolerances:

- | | |
|----------------|--|
| 21 CFR 180.142 | 2,4-D and listed residues |
| 5 ppm | apples, citrus fruits, pears, quinces |
| 0.5 ppm | grain of barley, oats, rye, and wheat |
| 20 ppm | forage of barley, oats, rye, and wheat |
| 21 CFR 180.165 | 2,4-D sodium salt |
| 5 ppm | in or on asparagus |

Use: This chemical is to be applied to potato vines after tuber initiation and before the largest tubers are more than 1/2 inch in diameter (second application 10 - 20 days later) to intensify red color and improve skin appearance.

TOXICOLOGICAL REVIEW

No new toxicological data was submitted with this petition. Evaluation of the safety of this growth regulator must be conducted from material submitted and reviewed in previous petitions.

- I. Pesticide Petition No. 162: reviewed by Dr. O. G. Fitzhugh (5/2/58)
Citing no-effect levels of 300 ppm in rats fed 2,4-D for 113 days and 400 ppm in dogs fed for 90 days as well as a Department of Pharmacology study where only minimal changes occurred in the bone marrow of rats fed 1,000 ppm of 2,4-D for 32 weeks, Dr. O. G. Fitzhugh, concluded that a tolerance of 5 ppm of 2,4-D (or its sodium salt) on or in asparagus was safe.

II. Pesticide Petition No. 272 and 414: by Dr. G. E. Whitmore (12/5/63)

Chronic toxicity study - dogs (2,4-D) no-effect level 500 ppm

Oyster shell growth - 2,4-D no-effect at 2 ppm
2,4-D dimethylamine salt no-effect at 2 ppm
2,4-D butoxyethanol 50% growth decrease 3.75 ppm

Juvenile white mullet fish (2,4-D) no kill at 50 ppm

Longnose kill fish - 2,4-D glycol butyl ether $LC_{50} = 4.5$ ppm
2,4-D butoxyethanol $LC_{50} = 5.5$ ppm

Natural phytoplankton communities (4 hr.) -2,4-D no effect at 1 ppm
2,4-D dimethylamine salt no effect at 1 ppm

Mallard ducks (100 days) -2,4-D acetamide no-effect level 500 ppm
2,4-D butoxyethanol no-effect level 500 ppm
2,4-D dimethylamine no-effect level < 500 ppm

Relative toxicity (with DDT = 1) rats 0.2
bobwhites 0.5
pheasants 0.5
mallards 0.5
bluegills 0.1

22-week cattle feeding study (5 doses/week) no-effect at 50 mg/kg

LD_{50} oral rat 2,4-D 300-470 mg/kg
2,4-D sodium salt 610-1060 mg/kg
2,4-D isopropyl ester 570-860 mg/kg
2,4-D mixed butyl esters 320-950 mg/kg
2,4-D mono, bi, tripropylene glycol
butyl ether ester 510-640 mg/kg

Dr. Whitmore concluded that a mammalian reproduction study would be necessary to approve tolerances of 5 ppm in or on Irish and post-harvest use on lemons.

III. Pesticide Petition No. 459: by Dr. O. G. Fitzhugh (3/11/66)
The rat reproduction experiment exhibited no effect levels at 100 and 500 ppm but the 1500 ppm level was very toxic. Dr. Fitzhugh concluded that the proposed tolerance of 0.5 ppm on wheat, barley, rye, and oats is safe.

IV. Pesticide Petition No. 477: by Dr. G. E. Whitmore (12/20/65)
No new toxicological data submitted so the proposed amendment to include pre-harvest use of 2,4-D on citrus fruit was considered to represent no hazard to the public.

V. Pesticide Petition No. 7F0589 by Dr. M. L. Quaife (5/1/67)
No new toxicological data submitted so the tolerance of 2 ppm in or on apricots was judged safe.

VI. Pesticide Petition No. 8F0670

A. Reviewed by Dr. G. E. Whitmore (3/22/68)

Groups of purebred beagles were fed 0, 10, 50, 100, and 500 ppm 2,4-D for 2 years with no effects noted. Twenty-five rats/sex were fed 0, 5, 25, 125, 625, and 1250 ppm 2,4-D for 2 years also with no effect. Dr. Whitmore adjudged the proposed tolerances of 0.5 ppm on flax seed and rice and 0.2 ppm on grapes, blueberries, cranberries, raspberries, strawberries, corn (field, pop, and sweet), sorghum (milo, milo maize), soybeans, sugar cane, potatoes, alfalfa, clover, trefoil, and soybean hay to be safe.

B. Amendment to include a tolerance of 300 ppm in or on rangeland grasses or pasture grasses reviewed by Dr. C. H. Williams (7/15/71). Summary of previously submitted data presented along with reprints of several published articles describing 2,4-D toxicity in cattle, sheep, and chickens. Dr. Williams concluded that the requested tolerances on the berries and grains were safe but that insufficient data relating to the residues present in meat and milk was available to consider the range grass and forage crops safe.

VII. Pesticide Petition No. 1E1046 by Dr. R. Engler (11/22/71)

No new toxicological data was submitted and that previously submitted supported the request tolerances of 1 ppm in or on fish and 1 ppm in or on crop plants (corn, soybeans, sugar beets).

CONCLUSIONS

A 60 kg man could safely tolerate 7.5 mg/day of 2,4-D using the 100-fold safety factor for a 500 ppm no-effect level in a 2 year dog feeding study. A tolerance of 0.1 ppm on potatoes in addition to the tolerances already established under 180.142 would result in the occurrence of 0.55215 mg of 2,4-D in the total daily diet.

Potatoes may be fed to livestock so Chemistry Branch should determine the transfer of residues to meat and milk. Label restrictions exist for the feeding of potato vines.

RECOMMENDATIONS

The proposed negligible residue tolerance of 0.1 ppm of 2,4-dichlorophenoxyacetic acid on or in potato tubers when applied to vines as directed is safe for human consumption.

Page 4 - PP no. 1E1122

We defer to Chemistry Branch regarding the transfer of residues to meat and milk.

William E. Parkin
William E. Parkin, DVM, Dr. Ph.
Toxicology Branch, PTD

cc: OGFitzhugh
JGCummings
PRD/EPA
Atlanta Branch
Perrine Branch
Division Reading File
Branch Reading File
PP#
WEP (reviewer) *✓*

RD;init; CHWilliams: 2/28/72

WEP;lt;2/28/72:init; CHWilliams

*CHW
2/28/72*

OGF 3/3/72