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

OFFICE OF
PREVENTION, PESTICIDES AND
TOXIC SUBSTANCES

MAR 2 1993

MEMORANDUM

Subject: 2,4-D, 2,4-DB, and 2,4-DP and Their Salts and Esters: Survey of Dibenzo-p-Dioxin and Dibenzofuran Determinations. DP Barcode D188268. CBRS No. 11419.

From: Stephen Funk, Ph.D., Chemist
Special Review Section I
Chemistry Branch II - Reregistration Support
Health Effects Division (H7509C)

Through: Andrew Rathman, Section Head
Special Review Section I
Chemistry Branch II - Reregistration Support
Health Effects Division (H7509C)

To: Jill Bloom
Special Review Branch
Special Review and Reregistration Division (H7508)

In June 1987 a data call-in was issued for information on the polyhalogenated dibenzo-p-dioxin and dibenzofuran contents of certain pesticides. The call-in consisted of two parts. One part requested detailed manufacturing information for those pesticides whose structure or mode of synthesis indicated a potential for dioxin/dibenzofuran contamination. The other part required the actual analysis of certain technical pesticides for 15 chlorinated dibenzo-p-dioxins and dibenzofurans. The latter group of pesticides are manufactured by processes documented to produce dioxin/dibenzofuran contaminants. Included in the list of pesticides that required analysis were 2,4-D, 2,4-DB, 2,4-DP, and the esters and salts of these herbicides.

Several dioxin/dibenzofuran data submissions for 2,4-D and related pesticides were reviewed. Each manufacturer of the registered technical pesticide was requested to randomly select seven samples of the pesticide and to analyze by a gc/ms method capable of quantitation to specified concentration levels, or limits of quantitation (loq), for each dioxin and dibenzofuran of toxicological interest. The resulting submissions were reviewed for compliance with the analytical chemistry requirements of the data call-in and for scientific validity.

Table 1 summarizes the findings for 2,4-D. Only 2,3,7,8-tetrachlorodibenzo-p-dioxin and 1,2,3,7,8-pentachlorodibenzo-p-dioxin were found at or above the EPA loq's. Two of eight technical 2,4-D's contained 2,3,7,8-TCDD slightly above the 0.1 ppb loq. Three of eight technical 2,4-D's contained 1,2,3,7,8-PCDD at concentrations greater than the 0.5 ppb loq. None of the remaining thirteen chlorinated dibenzo-p-dioxins and dibenzofurans were found at or above the EPA loq's in the technical 2,4-D. Data on the 2,4-DB and 2,4-DP acids and derivatives of all three acids are too limited at this time to be useful to the 2,4-D panel.

Table 1: Summary of Results for Chlorinated Dibenzo-p-Dioxins and Dibenzofurans in Technical 2,4-D Herbicides

Analyte	EPA loq[1] (ppb)	2,4-D		
		Total Number of Technicals	Number of Technicals Greater Than loq	Observed Maximum Concentration (ppb)
2,3,7,8-TCDD	0.1	8	2	0.13[2]
1,2,3,7,8-PCDD	0.5	8	3	2.6[3]
1,2,3,4,7,8-HxCDD	2.5	8	0	0.81
1,2,3,6,7,8-HxCDD	2.5	8	0	0.77
1,2,3,7,8,9-HxCDD	2.5	8	0	0.68
1,2,3,4,6,7,8-HpCDD	100	8	0	1.5
2,3,7,8-TCDF	1	8	0	0.27
1,2,3,7,8-PCDF	5	8	0	0.62
2,3,4,7,8-PCDF	5	7	0	0.73
1,2,3,4,7,8-HxCDF	25	8	0	1.6
1,2,3,6,7,8-HxCDF	25	8	0	1.2
1,2,3,7,8,9-HxCDF	25	8	0	1.4
2,3,4,6,7,8-HxCDF	25	8	0	1.1
1,2,3,4,6,7,8-HpCDF	1000	8	0	8.3
1,2,3,4,7,8,9-HpCDF	1000	8	0	1.2

[1] Limit of quantitation required by the Agency and a reflection of the level of toxicological concern.
[2] Average 0.07 ppb, where 50% of demonstrated loq used for analytes not found.
[3] Average 0.63 ppb, where 50% of demonstrated loq used for analytes not found.