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

R.F.

JUN 28 1991

OFFICE OF  
PESTICIDES AND TOXIC SUBSTANCES

MEMORANDUM:

SUBJECT: Addendum to 91-WA-11. Proposed Section 18 exemption for the use of the soil fungicide, Pentachloronitrobenzene (Terraclor<sup>®</sup> EC, EPA Reg. No. 400-400; and, Terraclor<sup>®</sup> 10G, EPA Reg. No. 400-402) on potatoes.  
[MRID Nos:NA;DEB#:NA]

FROM: Dennis McNeilly, Chemist *Dennis McNeilly*  
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THRU: Francis B. Suhre, Section Head *Lee Cheng for*  
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TO: Susan Stanton, PMT-41  
Emergency Response and Minor Use Branch  
Registration Division [H7505C]  
and  
Toxicology Branch I  
Health Effects Division [H7509C]

Registration Division requested CBRS to estimate HCB residues in or on potatoes and in meat and milk resulting from treating plants with PCNB contaminated with HCB (a manufacturing impurity). RD specified that they did not want CBRS to include residues of pentachlorobenzene (PCB), also a manufacturing impurity in PCNB. This review also includes data submitted by Amvac Chemical Corp. that was not available at the time of the initial review. The data submitted by Amvac chemical Corp. was to support the reregistration of PCNB for use on potatoes.

Two companies are supporting the reregistration of PCNB, Uniroyal Chemical Company and Amvac Chemical Company. The two companies are independently supporting the reregistration of PCNB on potatoes, each company has submitted residue data supporting the use of PCNB on potatoes.

CBRS previously conducted a review that included an estimate of the maximum expected residues for hexachlorobenzene (HCB) and pentachlorobenzene (PCB) (see D. McNeilly, 4/23/91). This addendum to that initial review considers only residues of HCB as requested by RD. The intent is to provide an estimate of the maximum expected residue for HCB only, and also an anticipated or average residue for HCB in or on potatoes, meat, milk, and eggs resulting from PCNB use.

The Uniroyal residue data package has now received a preliminary review by HED's contractor, but has not undergone secondary review by CBRS. The residue data submitted by Amvac was received Jun 14 and is currently being reviewed by CBRS.

#### UNIROYAL RESIDUE DATA

The Uniroyal PCNB reregistration submission for potatoes included data for twelve separate residue trials conducted in eight different states, including the state of Washington which requested the Section 18 exemption. Potatoes were planted in soil treated with Terraclor 2EC. Terraclor 2EC has 24% active ingredient (PCNB). The test material used in the residue trials contained approximately 0.5% HCB in the technical grade product. Residue data for two different application methods were submitted, broadcast applications using 25 lbs ai/A, and row (in furrow) application at a rate of 10 lbs ai/A.

The Uniroyal data consisted of 48 assays (not including controls and spikes). The residue data are summarized in the following table. It should be noted that the samples from the ME test site remained unfrozen for 27 days, no explanation was provided.

Location	Sample #	PHI	lbs A.I. per Acre	GPA	HCB Residue in ppm
F1	A-87-239	135	25	50	0.0074
	A-87-240	125	25	50	0.0076
	A-87-241	125	10	50	0.0029
	A-87-242	125	10	50	0.0021

Location	Sample #	PHI	lbs A.I. per Acre	GPA	HCB Residue in ppm
OR	L-87-45	125	25	25	0.0048
	L-87-46	125	25	25	0.0034
	L-87-47	105	11.7	25	0.0112
	L-87-48	105	11.7	25	<0.002
MI	W-87-76 (1)	102	25	50	0.0102
	W-87-76 (2)	102	25	50	0.0108
	W-87-77	102	10	35	0.0185
ME	B-87-272	140	25	25	0.0073
	B-87-274	140	25	25	0.01
	B-87-275	140	10	5	0.0131
	B-87-276	140	10	11	0.0134
MN	I-87-007A	132	25	30	<0.002
	I-87-007B	132	25	30	<0.002
	I-87-008A	131	10	30	0.0066
	I-87-008B	131	10	30	0.0047
WA	L-87-183	121	24	25	0.0052
	L-87-187	121	24	25	0.0045
	L-87-189	121	24	25	0.0030
CA	PAL-73534	114	25	25	0.0244
	PAL-73534 D	114	25	25	0.0176
	PAL-23535	114	10	20	<u>0.0325</u>
	PAL-23535 D	114	10	20	0.0216
MI	W-87-16	109	25	25	<0.002
	W-87-17	109	10	25	0.0031
ID	3	135	25	20	0.0042

Location	Sample #	PHI	lbs A.I. per Acre	GPA	HCB Residue in ppm
	4	135	25	20	0.0037
	5	135	12.5	20	0.0069
	6	135	12.5	20	0.0032
	9	135	25	20	0.0029
	10	135	25	20	<0.002
	11	135	12.5	20	0.0023
	12	135	12.5	20	0.0056
ND	I-87-002A	119	10	25.06	0.0034
	I-87-002B	119	10	25.06	0.0029
	I-87-001A	119	25	24.92	0.0042
	I-87-001b	119	25	24.92	0.0022
WI	22-87-46	*	*	*	0.0033
	22-87-46 DUP	*	*	*	0.0033
	22-87-47	*	*	*	0.0036
	22-87-47 DUP	*	*	*	0.0038
OR	L-87-50	127	25	19.6	<0.002
	L-87-51	127	25	19.6	<0.002
	L-87-52	103	11.4	19.6	0.0088
	L-87-53	103	11.4	19.6	0.0057

\* - The registrant has reported a sample identification switch, hence this information is not stated for these samples.

Table 1. Residue data submitted by Uniroyal Chemical.

The data summarized in the Table above have a maximum residue of HCB in or on potatoes of 0.0325 ppm, while the average residue is 0.007 ppm.

**AMVAC RESIDUE DATA**

Amvac has submitted residue data for eight separate residue trials conducted in seven different states, including the State of Washington. Two different formulations were used, i.e., the 2EC and 10G. Both formulations were applied at 25 lbs of active ingredient per acre broadcast and at 11.7 lb ai/A in-furrow at planting. The broadcast application is the same rate as proposed by Uniroyal while the in-furrow application rate is slightly higher than that proposed by Uniroyal (11.7 lbs a.i./A vs 10 lbs a.i./A).

The Amvac Study did not specify the extent of HCB impurity in the technical grade product or the formulated product. Therefore, it is unknown if the data reflects a 0.1% or 0.5% HCB contamination in the technical grade product.

The Amvac Chemical Corp. residue data consisted of 72 assays (not including QC samples). No samples were reported to have detectable levels of HCB (<0.010 ppm).

Therefore, with a reported detection limit of 0.01 ppm, the Amvac data suggest a maximum residue of 0.01 ppm of HCB in or on potatoes. The average or anticipated residue is assumed to be one-half of the detection limit, or 0.005 ppm of HCB in or on potatoes. The following table summarizes the average and anticipated HCB residues from the two submissions.

Registrant	Maximum Expected Residue of HCB in Potatoes	Average Residue of HCB in Potatoes
Uniroyal	0.04 ppm	0.007 ppm
Amvac	0.01 ppm	0.005 ppm

Table 2. Comparison of the maximum and average residue from Uniroyal and Amvac PCNB residue data.

CBRS believes that the residue estimates from the Uniroyal studies are more accurate as they reflect a lower detection limit (0.002 ppm for the Uniroyal vs. 0.01 ppm for the Amvac study). Therefore, CBRS will use the higher Uniroyal residue estimates for calculating the HCB residues in meat, milk, poultry, and eggs.

Meat, Milk, Poultry and Eggs

Cull potatoes are a feed item for cattle and may constitute up to 50% of their diet. Based on an estimated maximum HCB residue of 0.04 ppm and an average HCB residue of 0.007 ppm in cull potatoes, the HCB dietary burden to cattle would be 0.02 ppm and 0.0035 ppm, respectively.

Feeding studies using PCNB technical (containing 1.5% HCB impurity) have been conducted in cattle and results are summarized in the following Table.

PCNB Feeding Level	10 ppm	1 ppm	0.1 ppm
HCB Feeding Level	0.15 ppm	0.015 ppm	0.0015 ppm
Tissue			
Milk	0.014 ppm	0.002 ppm	0.013 ppm
Beef Fat	0.78 ppm	0.10 ppm	0.013 ppm
Beef Muscle	0.052 ppm	0.006 ppm	<0.001 ppm
Beef Liver	0.060 ppm	0.004 ppm	<0.001 ppm
Beef Kidney	0.039 ppm	0.002 ppm	<0.001 ppm

Table 3. Average HCB Residues in Dairy Cattle tissues and Milk at Several Feeding Levels (see S. Hummel Memorandum, 12/4/86).

Using the feeding study data presented in the Table above, CBRS performed a linear regression analysis to estimate the resulting HCB residues in the tissue from 0.02 ppm and 0.0035 ppm feeding levels. The estimate of tissue and milk residues resulting from PCNB contaminated with HCB are summarized in the following table.

Tissue	Residue Estimate from Average Dietary Burden of 0.0035 ppm HCB	Residue Estimate from Maximum Expected Dietary Burden of 0.02 ppm HCB
Milk	0.0008 ppm	0.0023 ppm
Beef Fat	0.048 ppm	0.13 ppm
Beef Muscle	0.0016 ppm	0.0073 ppm
Meat By-Products (based on liver data)	0.0004 ppm	0.007 ppm

Table 4. Anticipated and maximum residues of HCB (only) in beef tissue and milk based on 0.02 ppm maximum dietary burden and a 0.0035 ppm anticipated dietary burden.

### Poultry

Cull potatoes may be fed up to 20% in the poultry diet, which corresponds to a maximum dietary burden of 0.008 ppm HCB (0.04 ppm X 20%) and a anticipated dietary burden of 0.0014 ppm HCB (0.007 ppm X 20%). Feeding studies using PCNB technical (containing 1.5% HCB impurity) have also been conducted in poultry and are summarized in the following Table.

PCNB Feeding Level	0.05 ppm	1 ppm	5 ppm	15 ppm
HCB Feeding Level	0.0075 ppm	0.015 ppm	0.075 ppm	0.23 ppm
Tissue				
Poultry Liver	0.007 ppm	0.022 ppm	0.1 ppm	0.161 ppm
Poultry Fat	0.048 ppm	0.061 ppm	0.364 ppm	1.43 ppm
Poultry Breast	<0.001 ppm	<0.001 ppm	<0.001 ppm	<0.001 ppm
Egg Yolk	0.003 ppm	0.012 ppm	0.078 ppm	0.359 ppm
Egg White	<0.001 ppm	<0.001 ppm	<0.001 ppm	<0.001 ppm

Table 5. Average HCB Residues in Poultry tissues at Several Feeding Levels (see S. Hummel Memorandum, 12/4/86).

Using the feeding study data presented in the Table above and a maximum dietary burden of 0.008 ppm, CBRS estimate the maximum HCB residue expected in tissue, see Table 6.



Tissue	Maximum HCB Residue Expected
Poultry Liver	0.007 ppm
Poultry Fat	0.048 ppm
Poultry Meat	<0.001 ppm
Egg Yolk	0.003 ppm
Egg White	<0.001 ppm

Table 6. Maximum residues of HCB (only) in poultry tissue based on 0.008 ppm maximum dietary burden.

### CONCLUSIONS

1. Residues of HCB are not expected to exceed 0.04 ppm in or on potatoes as a result of the proposed Section 18 use.
2. Residues of HCB are not expected to exceed 0.8 ppb (note ppb) in milk, 0.048 ppm in fat, 0.0016 ppm in muscle, and 0.4 ppb (note ppb) in mbyp of cattle as a result of this Section 18 use.
3. Residues of HCB are not expected to exceed 0.048 ppm in fat, 0.001 ppm in muscle, 0.0014 ppm in eggs (an egg without a shell is 36.5% yolk and 63.5% white), and 0.007 ppm in mbyp of poultry as a result of this Section 18 use.

CIRC: D.McNeilly(CBRS);RF;SF;Section 18 File;  
E.Saito(DRES);PIB(C.Furlow).  
RDI: FBS, 06/27/91;EZ,06/27/91.  
H7509C: DMM;dmm;CM-2;Rm 800D;X557-0934;06/27/91