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

359-706

APR 19 1985

OFFICE OF  
PESTICIDES AND TOXIC SUBSTANCES

MEMORANDUM

SUBJECT: Risk Assessment Supplement for Field-Workers  
RE: Pineapples and Non-Bearing Citrus - Aliette.  
CAS 12B Reg., No. 259-706, Record No. 139847  
Action Code 316, Accession No. 254-7710

FROM: Bertram Litt, Leader  
Statistics Team  
Mission Support Staff  
Toxicology Branch/HED (TS-769) *Bertram Litt 4/17/85*

TO: Hank Jacoby, Product Manager #21  
Registration Division (TS-767)

THRU: Reto Engler, Ph.D.  
Chief, Mission Support Staff  
Toxicology Branch/HED (TS-769) *Reto Engler 4/17/85*

The subject action references the following OPP internal memoranda:

- A. Barton to J. Ackerman (undated) - preliminary Risk Assessment
- J. Reinert to H. Jacoby (2/1/85) - Pineapple Applicators
- J. Reinert to H. Jacoby (2/1/85) - Non-Bearing Citrus Applicators

The available risk analysis was not fully documented, a hand written note by B. Litt of 6/22/83 indicates that applying Crump's 1982 Global program to control and two lower doses (2,000 and 8,000 ppm adjusted as approximately 50 and 80 mg/kg of human body weight/day) provided an estimate of potency,  $O_1^* = 2.3 \times 10^{-3}$  for male adrenal pheochromocytomas:

<u>Dose</u>	<u>Benign</u>	<u>Malignant</u>	<u>All Adrenal Pheochromocytomas</u>
0	5	1	6/80
200	7	0	7/78
8000	15	1	16/79
40,000/30,000	16	2	18/80

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This finding is considered to be more important by L. Kasza, Toxicology Branch Pathologist, than the bladder tumors because the adrenal tumors were found to occur in significantly elevated proportion in both mid and high dosed groups as opposed to the bladder tumors which occurred at statistically significantly higher incidence only in the high dose group.

Dose (ppm)	Benign	Malignant	All Bladder Tumors
0	0/80	2/80	2/80
2000	1/78	0/78	1/78
8000	1/79	0/79	1/79
40/30,000	8/80	7/80	15/80

The estimates of potency given for the bladder tumors was  $3.6 \times 10^{-4}$ .

The use of a factor of 100 rather than 88 to convert mouse ppm to human mg/kg body weight/day is a factor of 1.14<sup>1</sup> thus, the  $3.1 \times 10^{-3}$  estimates of  $Q_1^*$  may be more accurately express as  $Q_1^* = 4.3 \times 10^{-3}$ , a negligible correction within the bounds of rounding error.

The Reinert to Jacoby, February 1, 1985 Exposure Analysis was Prepared by S. F. Noren. Noren reports that the applicators is a 70 kg individual who should wear protective clothing. For pineapples he reports that the Agency expects 4 applications per year (4/365) with the protected mixer-loader exposed to 440 mg per day and the applicator 17 mg day. The Toxicology Branch (see memo by A. Barton to Jim Ackerman) has assumed a 35/70 year work-life-time for applying Aliette and absorption of 1% of the exposure. It follows that the operator exposure may be computed as:

$$\begin{aligned} \text{On mouse ppm conversion to human mg/kg/day:} & \quad \frac{(\text{Human Weight})^{1/3}}{(\text{Mouse Weight})} \\ 7 \text{ ppm} = 1 \text{ mg/kg/day mouse diet as surface area adjusted} & \quad = \end{aligned}$$

$$\begin{aligned} \text{Therefore, Human Equiv. mg/kg/day} & = \text{ppm in mouse diet} \left( 7 \times \frac{(60000)^{1/3}}{(30)} \right) \\ & = \text{ppm in mouse diet} \times 1/88 \\ & = 2000/88 = 22.7 \\ \text{Original Conversion } 2000/100 & = 20 \\ \text{and } 227/20 & = 1.14 \end{aligned}$$

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$$\text{Mixer-Loader} = \frac{440 \text{ mg}}{70 \text{ kg}} \times \frac{4 \text{ days}}{365} \times \frac{35}{70 \text{ Years}} \times .01 = .00034 \text{ mg/kg/day}$$

$$\text{Applicator} = \frac{17 \text{ mg}}{70 \text{ kg}} \times \frac{4 \text{ days}}{365} \times \frac{35}{70 \text{ Years}} \times .01 = .000013 \text{ mg/kg/day}$$

Multiplying these estimates of average daily lifetime exposures to pineapple workers by the carcinogenicity potency for Aliette,  $Q_1^* = 4.3 \times 10^{-3}$ , estimates the upper 95% bound on the lifetime risks of carcinogenicity associated with these exposures. (Note: Risks are rounded to the appropriate order of magnitude.)

	<u>Worker</u>	<u>Exposure</u>	<u>Q<sub>1</sub>*</u>	<u>Upper 95% Bound Risk</u>
Pineapple	Mixer-loader	.00034	.0043	10 <sup>-6</sup>
Pineapple	Applicator	.000013	.0043	10 <sup>-8</sup> to 10 <sup>-7</sup>

The exposures to applicators on non-bearing citrus was also estimated by S. Noren assuming a 70 kg applicator wearing protective clothing. For non-bearing citrus, Noren indicates that a 10 hour work day is assumed including 1 hour mixing-loading and 9 hours spraying for 210 mg per day. The specimen label indicates that aliette should be used no more than 4 days per year. Thus prorating the exposure to obtain average daily-life-time exposure as done above, for pineapples, indicates:

$$\text{Mixer-Loader - Applicator} = \frac{210 \text{ mg}}{70 \text{ kg}} \times \frac{4 \text{ days}}{365} \times \frac{35}{70 \text{ years}} \times .01 = .00016 \text{ mg/kg/day}$$

	<u>Exposure</u>	<u>Q<sub>1</sub>*</u>	<u>Upper 95% Bound Risk</u>
Non-Bearing Citrus Mixer-Loader Applicator	.00016	.0043	= 10 <sup>-7</sup> to 10 <sup>-6</sup>