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

AUG 3 1992

OFFICE OF
PESTICIDES AND TOXIC
SUBSTANCES

MEMORANDUM

SUBJECT: Update on "Preliminary Calculations of Vinclozolin Treated Acreage that Result in Margins of Exposures Exceeding 100".

FROM: Shanaz Bacchus, Chemist
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TO: Bob Rose, PM - 21
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THRU: Steven M. Knott, Acting Section Head
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Please find the update of preliminary calculations of vinclozolin.

DP Barcode: D179516, 178720,

EPA Reg. Nos.: 7969-62, 7969-85

EPA MRID No.: None

Review Time: 1 day

PHED: No

Deferred to TOX for verification of MOE calculations.

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Recently, HED provided a matrix analysis (memo John Tice, June 4, 1992) to demonstrate the amount of Ronilan DF and FL (vinclozolin) which a worker can handle in one day such that the Margin of Exposure (MOE) is greater than 100. This memorandum updates the preliminary calculations of the acreage which can be treated by ground or air with vinclozolin. Surrogate data (see References) are used for these calculations since the vinclozolin study submitted by BASF (6/92) is scheduled for review later in the summer. Until that study is reviewed, the attached chart can be used to estimate worker exposure.

These calculations supersede the memorandum dated June 4, 1992, and take the amended label (3/20/92) for turf use at 11 lb product (5.5 lb ai) per acre into account. The attached matrix was prepared by a team of scientists composed of Dave Anderson (TOX) and myself. Details of the unit exposure derivation are the same as used in the references.

The attached chart and sample calculations provide information on the estimated worker exposures for registered uses and proposed aerial applications for the Section 18 use on snapbeans. Column G shows the maximum number of pounds which a worker can handle for an MOE of 100. As per our earlier discussions, exposure is greatest to the mixer/loader, who cannot handle more than 78 pounds for an MOE of 100. For aerial applications the pilot can treat 9000 acres per day at 1 lb ai/A for an MOE OF 100. However, pilots generally treat 336 acres snapbeans per day according to BEAD's analysis (Paul Lewis, 308-8127).

The assumptions used to generate the table are as follow:

- Products are applied at the maximum permitted label rate under the conditions and with the equipment specified.

- All label instructions for Personal Protective Equipment (PPE) as listed on the label are factored into the estimates of worker exposure.

- For MOE calculations a NOEL OF 60 mg/kg bw/day was used.

This memo has been routed to TOX 1 for verification of the MOE calculations.

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REFERENCES

Abbot, Ian M. et al., 1987. American Industrial Hygiene Association Journal. Vol. 48: 167-175.

Bacchus, Shanaz. OREB/HED. Memorandum to Susan Lewis/Bob Rose, RD. 10/24/91.

Knott, Steven M. OREB/HED. Memorandum to Rebecca Cool, RD. 4/29/90.

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Vinclozolin File
Circulation

Ronilan DF and FL (vinclozolin): Worker exposure to maximum use rates for registered and proposed Section 18 uses

A	B*	C	D	E**	F***	G****	H	I
Crop	Applic. Method		Rate (lb ai/A)	Unit Dermal Exposure (mg ai/lb handled)	Treat No. Acres per day	Handle No. lb per day	Dermal Exposure (mg ai /kg bw/d	MOE (60 mg/kg/d /Exposure
a. Stone Fruit	AB	M/L	2	0.46	39.13	78.26	0.60	100
Raspberry Strawberry	GB	M/L	2	0.46	39.13	78.26	0.60	100
		A	2		34.00	68.00	0.61	98
		M/L/A	2		25	50.00	0.64	94
	AB							
Turf								
	GB	M/L	5.5	0.46	14.23	78.26	0.60	100
		A	5.5		12.36	68.00	0.61	98
		M/L/A	5.5		9.09	50.00	0.64	94
Snapbeans								
WA/OR	Aerial							
		M/L	0.5	0.46	156.52	78.26	0.60	100
		A	0.5		336	168	0.01	5398
		M/L/A	0.5		156.52	78.26	0.60	100
PA		M/L	0.75	0.46	104.35	78.26	0.60	100
		A	0.75		336	252	0.02	3598
		M/L/A	0.75		104.35	78.26	0.60	99
Pilot		A	0.75		12096.00	16128.00	0.60	100
b.	Other Aerial							
		M/L	1	0.46	78.26	78.26	0.60	100
Pilot		A	1		336	336	0.02	2699
		M/L/A	1		78.26	78.26	0.60	99
Pilot		A	1		9000	9000.00	0.60	101

a. Stone fruit is to be deleted from the label (memo B. Kitchens, OREB/HED, 3/18/92).

* Column B refers to methods of application: AB = airblast; GB = Ground Boom.

** For Units dermal exposure and sample calculations see Page 2.

*** For an MOE = 100 treat the acreage recommended in F at the rate in D.

**** For an MOE = 100 handle the number of pounds recommended in G.

b. For aerial applications where the job function of the mixer/loader is not combined with that of the pilot, the pilot can treat 9000 A/day at 1 lb ai/A. However, aerial treatment of 336 acres of snapbeans per day is feasible (BEAD).

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Explanation of table on page 1. A through H refer to columns.

- **A** (crops) and **D** (application rates) are taken from the registered label.

- **B** (methods of application) AB = airblast; GB = Ground Boom.

- **C** (abbreviations): M/L = mixer/loader; A = Applicator or Pilot; M/L/A = mixer/loader/applicator (combined job function).

- **E** (unit of dermal exposure): 0.46 mg ai/lb ai for M/L; 3.9 mg/hr/lb ai/A for ground boom applicator; 0.58 mg/hr/lb ai/A for pilot. These units are taken from the references.

- **F** = $\frac{\text{Column G}}{\text{Column D}}$

  = $\frac{\text{Volume to be handled (lb ai) to give MOE of 100}}{\text{Rate (lb ai/A)}}$

  = $\frac{78.26 \text{ lb ai}}{0.75 \text{ lb ai/A}}$ (see **G** Mixer/loader below)

  = 104 A

- **G** Calculations to determine volume ai to be handled to give MOE of 100. For MOE = 100 use $\frac{60 \text{ mg/kg/day}}{0.6 \text{ mg/kg/day}}$.

- **H** Calculated dermal exposure using parameters in **D, E, F, G.**

Sample calculations below:

MOE calculations

$$\text{Margin of Exposure (MOE)} = \frac{\text{NOEL}}{\text{Exposure}} = \frac{60 \text{ mg/kg bw/day}}{0.6 \text{ mg/kg bw/day}}$$

$$= 100$$

Mixer/loader

Pounds ai which can be handled to obtain MOE = 100:
Unit exposure (a) x 1/60 kg x Y acres = 0.6 mg ai/kg/day

For example:

$$Y = \frac{(60 \text{ kg bw} \times 0.6 \text{ mg ai/kg bw})}{\text{unit of exposure (mg ai/lb ai)}}$$

$$= \frac{(60 \text{ kg bw} \times 0.6 \text{ mg ai/kg bw})}{0.46 \text{ mg ai/lb ai}}$$

$$= 78.26 \text{ lb ai}$$

Applicator

Pounds ai ground boom applicator can handle to obtain MOE = 100

Applicator Exposure, Aerial, Ronilan DF, ca 104 A/day at 2 lb ai/A

3.9 mg/hr/lb ai/A x 0.75 lb ai/A x 0.46 hr/tank x 1 tank/6.67 A x **Y** A/day x 1/60 kg = 0.6 mg ai/kg bw/day.

$$\textbf{Y} \text{ (lb ai)} = \frac{0.6 \text{ mg ai/kg bw/day} \times 6.67 \text{ A/tank} \times 60 \text{ kg bw}}{3.9 \text{ mg/hr/lb ai/A} \times 2 \text{ lb ai/A} \times 0.46 \text{ hr/1 tank}}$$

$$= 68 \text{ lb ai (see Strawberry)}$$

Aerial

Pilot, aerial application, Commercial application, Ronilan DF, ca 336 A/day at 0.75 lb ai/A:

0.58 mg/hr/lb ai/A x 0.75 lb ai/A x 0.128 hrs/tank x 1 tank/18.7 hrs x 336 A/day x 1/60 kg bw = 0.017 mg ai/kg bw/day