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To: R. Mountfort
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From: Joseph C. Reinert
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Attached please find the EAB review of:

Reg./File No.: 359-TNI

Chemical: Acifluorfen

Type Product: H

Product name: Tackle

Company name: Rhone-Poulenc

Submission Purposes: Exposure during application to soybeans

ZBB Code: other

Action Code 166

Data In: 3/1/84

EFB #: 4225

Date Completed: 6/7/84

TAIS (Level II) Days

61 4

Deferrals To:

 Ecological Effects Branch

 Residue Chemistry Branch

✓ Toxicology Branch

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98

DATA EVALUATION RECORD

Chemical: Acifluorfen

Citation: Assessment of Exposure to Tackle Herbicide During Application to Soybeans (12/15/83) Submitted by Rhone Poulenc Inc. Agrichemical Division. (Accession no. 252140)

Type of Application: Ground spray equipment.

Type of Formulation: Emulsifiable concentrate.

Reviewed/Prepared by:

Anne R. Keller
Chemist
Exposure Assessment Branch, HED

Signature Anne R. Keller
Date 6/7/84

Approved by:

Joseph C. Reinert
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Date 6/7/84

Topic: Exposure to Tackle during Application to Soybeans.

Conclusions: This study is not valid because it was run with only one replicate (one person sampled). There also seemed to be variation in the samples included in the different calculations. However, enough samples were taken to determine an exposure level for this one person, and when the values are compared, they are consistent with lower limit values obtained in studies reviewed by EAB over the past few years which match this chemical in application rate, clothing, formulation, equipment, type of use, method of application, and hours worked. The study finds inhalation exposure negligible compared to dermal, and 95% of dermal exposure is to the hands.

Methods and Materials:

Borrison Laboratories, Inc. was contracted by Rhone-Poulenc to:

- ° Design a field study to monitor application of Tackle to a field crop under conditions which would represent a typical "worst case" for exposure of applicator to product under proposed directions for use.

- Measure exposure of the user during the discreet tasks of pesticide application; mixing/loading; spraying; and, if possible, clean-up.
 - Collect sufficient samples to allow estimation of the efficacy of protective clothing in reducing exposure.
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The product was applied to soybeans for post emergence weed control by ground-boom during a 12 hour day (from 8:40 am to 8:20 pm with a lunch break), by one applicator who performed all tasks, spent his lunch hour near the treated field and operated a tractor with an open cab. Application rate was 0.75 #ai/A; 30 gal/A, mixed from a formulation of 2#ai/gal, aqueous. The fields treated were sites near Rhone-Poulenc's mid Atlantic Research facility in Columbus, New Jersey.

The applicator was assumed to wear no protective clothing, and calculation of exposure of body other than hands included total body surface. Sampling media included dermal pads as well as sampling of the worker's clothing at the end of the workday, alcohol rinses of hands and a personal air monitor with impinger placed near the worker's breathing zone; rate, 1 l/min.

The dermal pads were layered with two kinds of cloth and alpha-cellulose paper to estimate both dermal exposure and the efficacy of various layers of protective clothing, and they were backed with glassine paper and waterproof vinyl plastic to assure no residues were lost from the pad. Normal procedures were used to assure that pads were residue-free to begin with.

Samples included full period sets and partial period sets of gauze and cloth dermal pads, 2 half-full period hand washes and full period consecutive respiratory samples with impingers. Samples were collected during the day in labelled Zip loc bags and stored in a cooler. They were stored in a freezer at the end of the day and packed with dry ice for shipment to Borriston by Federal Express.

No cleanup operation was sampled.

Results:

Average Daily Exposure:

<u>Mixer/Loader:</u>	<u>mg/11cycles</u>	<u>mg/hr</u>
Hands	68	51
Body	0.97	0.72

Application:

Hands	24	4.5
Body	3.5	0.60

(all tasks) :

	<u>Full Period Samples (all tasks)</u> <u>mg/day</u>	<u>Partial Period Samples</u> <u>mg/day</u>
Hands	21	74
Body	4.3	4.4

Calculated per total work hours:

	<u>Sum:</u>	<u>M/L</u>	<u>Spray</u>
Hands	100	74	26
Body	6.6	3.1	3.5

Comparable Studies:

<u>Liquid formulation:</u>	<u>mean</u> <u>mg/hr</u>	<u>range</u>
<u>Mixer/loaders:</u>		
total dermal	7800	26-32000
Hand	7800	26-32000
<u>Applicators (Ground boom)</u>		
total	18.5	0.96-69
hand	18.3	0.96-69

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Limits of detection: 0.5 ug/pad
0.05 ug/15 ml sample (impinger)
0.35 ug/ml handwash water

% Recovery: range 89 - 119 @ 0.5 ug
106 - 126 @ 5 ug
119 - 125 @ 500 ug
104 - 145 @ 5000 ug

[Sample was certified as slightly over-formulated]

Discussion:

The recoveries are characterized as acceptable, with a "high degree of reproducibility"; therefore recovery values were not adjusted.

It is difficult to follow the calculations from the tables and discussion in the report. The values were derived by converting from ug/103cm² gauze patch to ug/body part (based on Davis). Calculation of mg/hr is not explained: there is no sample calculation, the samples selected for this calculation are not stated (one set of patches during one hour's work?) and the actual number of hours in the workday are not stated. The value reported clearly is not derived from the value for 11 cycles divided by number of hours perday, nor is it derived from the full period samples.

I would question the extrapolation of values below the detection limit to the detection limit for conversion to total body area and summation. However this does give a worst-case exposure, particularly when it is assumed the total body surface is exposed. EPA finds that since hand exposure constitutes 95% of the exposure in this case, it is immaterial where the dermal patches are placed.