

US EPA ARCHIVE DOCUMENT

DISCUSSION OF STRENGTHS AND WEAKNESSES OF THE INORGANIC ARSENIC EXPOSURE DATA BASE

Unit exposure values used to make worker exposure assessments for uses of inorganic arsenic pesticides were taken from OREB's surrogate data base or from previous exposure assessments. None of the values was taken from the Pesticide Handler Exposure Data-base (PHED) which is currently being developed under OREB direction. The PHED, supported by a joint effort of the EPA Office of Pesticide Programs (OPP), Health and Welfare Department of Canada and the National Agricultural Chemical Association (NACA), will be a comprehensive, high quality exposure data base which can be used as a foundation for consistent and uniform exposure assessments that will be acceptable for regulatory purposes. Exposure data used for the PHED may originate in the open scientific literature or be taken from exposure data generated by pesticide registrants, government agencies or other institutions. It is of interest to compare unit exposure values (tentative) taken from PHED with those actually used in the worker exposure assessments for inorganic arsenic pesticides.

PHED Pesticide Handler Exposure Data-base (Tentative). This data base is still under development and has not been finally approved. Values presented are the best available at present time.

NON-PHED These values are taken from those used in previous reviews and from the OREB surrogate data base. Data were insufficient to calculate a geometric mean.

UNIT EXPOSURES*

	<u>MIXER/LOADER</u>	
	<u>Open pour Inhalation</u>	<u>Closed System Inhalation</u>
PHED		
Geometric mean	15 µg/hr (145 obs.)	1.4 µg/hr (13 obs.)
Arithmetic mean	518 µg/hr (145 obs.)	4.9 µg/hr (13 obs.)
NON-PHED (Arithmetic)	45 µg/hr (44 obs.)	45 µg/hr (44 obs.)

APPLICATOR

	<u>Ground-Boom** Inhalation</u>	<u>Aerial Inhalation</u>
	PHED	
Geometric mean	3.3 µg/hr (67 obs.)	1.6 µg/hr (23 obs.)
Arithmetic mean	16 µg/hr (67 obs.)	73 µg/hr (23 obs.)
NON-PHED	84 µg/hr (26 obs.)	18 µg/hr (28 obs.)

* All unit exposure values are normalized to an application rate of 1.0 lb a.i./acre.

** PHED data for ground-boom did not distinguish between open and closed cab.

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PHED

Strengths- Values are being carefully reviewed for quality by contractor (Versar) for OREB before entry into this data base. The current open-pour loading value is based on 145 observations.

Weaknesses- The data base is considered incomplete at this time and the values presented above are considered tentative and may change as more are added.

The PHED has not been finally approved and accepted by OREB; and current values may change as the data base is developed. The closed system loading value is based on only 13 observations.

NON-PHED

Strengths-Some of the values (e.g., inhalation exposure to applicators) were taken from the traditional OREB surrogate data base. These values have been used to support the mancozeb and amitrole special reviews. The value used for mixer/loader inhalation exposure ($45 \mu\text{g/hr}$) was the best available estimate to the present time and is based on 44 replicates. It is not known for certain whether open or closed system loading was used for these studies. This value was used to support exposure assessments for paraquat.

Weaknesses-The values used were taken directly from the open literature and quality control data were not always included or available. The value used for inhalation exposure to mixer/loaders ($45 \mu\text{g/hr}$) was a composite taken from four studies, and it was not known for certain whether open pour or closed system loading was used. Therefore, use of this value may cause overestimation of exposure to workers using a closed loading system and underestimation of exposure to workers who open pour the pesticide.

All values given above are based on μg of a.i./hour of exposure. Unit exposures based on time of exposure are considered less comparable than those based on pounds of active ingredient handled. This is because accurate measurement of exposure time is more difficult and subject to more variation than measurement of pounds of active ingredient handled.

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