



# Department of Pesticide Regulation



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## MEMORANDUM

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TO: Joseph Frank  
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DATE: September 27, 2002

SUBJECT: EFFECTS OF MITIGATION MEASURES PROPOSED IN METHIDATHION  
IRED ON EXPOSURE ESTIMATES

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The exposure assessment document (EAD) for methidathion is in final draft form (date: April 3, 2002). Exposure estimates in the EAD were based on labeling that is currently in effect. USEPA made a copy of its Interim Reregistration Eligibility Decision (IRED) available to us in April (date on cover letter: March 28, 2002). Mitigation measures proposed in the IRED would change handler and reentry exposure estimates. These changes are summarized in this memo.

Most uses of methidathion are considered eligible for reregistration according to the IRED. USEPA intends to mitigate handler exposures mainly by increasing personal protective equipment (PPE) requirements and engineering controls, and to mitigate reentry exposure by increasing the restricted entry interval (REI) to 3 days for all uses (California's REI regulation (3 CCR 6772) requires an extended REI of 30 days in citrus treated with methidathion).

Table 1 lists the protective clothing and PPE required for handlers according to current labels, and the clothing and PPE proposed in the mitigation measures. Table 2 shows the exposure estimates for handlers and reentry workers if the proposed mitigation measures were finalized.

In Table 2, protection factors (from the draft revised HS-1612) were applied as appropriate. A chemical-resistant apron is assumed to cover chest and the front half of thighs, and has a protection factor of 95% for these areas. Coveralls were assumed to cover all but feet and head, for a protection factor of 95%. Closed systems were already required for M/L of EC products, based on California regulations for toxicity category I liquid products (3 CCR 6746). Mitigation for pilots would require closed cockpits and wearing gloves. The PHED subset used in the EAD contained data from closed cockpit only, and from pilots not wearing gloves. California's PPE regulation (3 CCR 6738) allows pilots to omit gloves, but for the new exposure estimate the proposed mitigation measures requiring gloves were assumed to supercede this regulation.

Denise Webster contacted Gowan Company at my request, to see if Gowan is making label changes in response to the IRED. Rebecca from Gowan told Denise that new methidathion labels, incorporating changes required by the IRED, are due to USEPA in December. Gowan is in the process of revising labels, and anticipates meeting that deadline.



**Table 1. Handler Clothing and Personal Protective Equipment Listed on Existing Methidathion Labels and in Mitigation Measures Proposed in the Interim Reregistration Eligibility Decision <sup>a/</sup>**

	Existing Labels	Proposed in IRED
<u>Supracide 25WP</u> <sup>b/</sup>	Long-sleeved shirt and long pants	<u>Airblast</u>
	Waterproof gloves	Coveralls over long-sleeved shirt and pants
	Shoes and socks	Chemical-resistant gloves
	Respirator	Chemical-resistant footwear and socks
		Chemical-resistant headgear
		Respirator
		<u>M/L and all other applicators</u> <sup>c/</sup>
		Long-sleeved shirt and long pants
		Chemical-resistant gloves
		Shoes and socks
		Protective eyewear
		Respirator
		Chemical-resistant apron for M/L
<u>Supracide 2E</u>	Long-sleeved shirt and long pants	<u>Airblast</u>
	Chemical-resistant gloves	Coveralls over long-sleeved shirt and pants
	Shoes and socks	Chemical-resistant gloves
	Protective eyewear	Chemical-resistant footwear and socks
	Respirator	Chemical-resistant headgear
		Respirator
		<u>M/L and all other applicators</u> <sup>d/</sup>
		Long-sleeved shirt and long pants
		Chemical-resistant gloves
		Shoes and socks
		Protective eyewear
		Respirator
		Chemical-resistant apron for M/L

<sup>a/</sup> From Table 16, pp. 41-42 in IRED. No changes were proposed for M/L/A using backpack or handwand.

<sup>b/</sup> All WP products must be in WSP packaging (considered closed system for M/L).

<sup>c/</sup> Aerial applications of wettable powder products would be prohibited.

<sup>d/</sup> M/L in support of aerial applications are required to wear PPE and used closed system. Closed cockpit is required for pilots. Use of human flaggers is prohibited

**Table 2. Estimates of Pesticide Handler and Reentry Exposure to Methidathion Based on Mitigation Measures Proposed in the Interim Reregistration Eligibility Decision <sup>a/</sup>**

Work Task	Acute ADD (mg/kg/day)	SADD (mg/kg/day)	AADD (mg/kg/day)	LADD (mg/kg/day)
<u>Aerial</u>				
M/L <sup>b/</sup>	0.844/ <b>0.736</b>	0.422/ <b>0.368</b>	0.141/ <b>0.123</b>	0.075/ <b>0.065</b>
Applicator <sup>c/</sup>	0.488/ <b>0.145</b>	0.244/ <b>0.073</b>	0.081/ <b>0.024</b>	0.043/ <b>0.013</b>
Flagger <sup>d/</sup>	0.638/NA	0.319/NA	0.106/NA	0.057/NA
<u>Airblast</u>				
M/L <sup>b/</sup>	0.096/ <b>0.084</b>	0.042/ <b>0.036</b>	0.021/ <b>0.018</b>	0.011/ <b>0.010</b>
Applicator <sup>e/</sup>	3.61/ <b>3.19</b>	1.57/ <b>1.38</b>	0.783/ <b>0.691</b>	0.418/ <b>0.369</b>
<u>Groundboom</u>				
M/L <sup>b/</sup>	0.116/ <b>0.101</b>	0.050/ <b>0.044</b>	0.025/ <b>0.022</b>	0.013/ <b>0.012</b>
Applicator <sup>f/</sup>	0.106	0.046	0.023	0.012
<u>Backpack sprayer</u>				
M/L/A <sup>f/</sup>	0.128	0.048	0.016	0.009
<u>Low-pressure handwand</u>				
M/L/A <sup>f/</sup>	0.0023	0.0009	0.0003	0.0002
<u>Reentry</u>				
Cotton Scout <sup>g/</sup>	0.119/ <b>0.093</b>	0.0567/ <b>0.044</b>	0.0142/ <b>0.011</b>	0.0076/ <b>0.0059</b>
Citrus Harvest/Thin <sup>f/</sup>	0.0069	0.0037	0.0018	0.0010
Artichoke Thinning <sup>g/</sup>	0.059/ <b>0.046</b>	0.0284/ <b>0.022</b>	0.0142/ <b>0.011</b>	0.0076/ <b>0.0059</b>
<sup>a/</sup> New estimates in bold: old/new. Not all scenarios were affected by proposed mitigation measures. <sup>b/</sup> Mixer/Loader (M/L): Chemical apron would be required. <sup>c/</sup> Closed cockpit and gloves would be required. Previous PHED subset contained data from closed cockpit only, but no gloves. CA law allows pilots in closed cockpit to omit gloves; new label assumed to superseded this and gloves factored into exposure estimate (otherwise, no change to estimate). <sup>d/</sup> The use of human flaggers would be prohibited. <sup>e/</sup> Coveralls and chemical apron would be required (major exposure is to head, however). <sup>f/</sup> No change based on proposed mitigation measures. <sup>g/</sup> REI changed from 2 days to 3 days.				

**Conclusions:** Examination of Table 2 shows the following:

**1. Exposure estimates for all M/L and airblast applicators were decreased by less than 15%.** In the case of M/L handling liquids with a closed system, the major dermal exposure according to PHED is to the hands. Chemical-resistant gloves are required by existing product labels, so hand exposure didn't change. The proposed mitigation measures requiring use of a closed system (California regulations already require this) and a chemical-resistant apron had little effect on our exposure estimate. With airblast applicators, the major dermal exposure according to PHED is to the head. Addition of coveralls and a chemical apron had little effect to the exposure estimate. It should be noted that in the IRED USEPA assumed half the acres/workday for airblast operators that DPR assumes, 20 acres rather than 40 acres. This was a change from their earlier exposure estimate, when they assumed 40 acres/day.

**2. The exposure estimates for aerial applicators decreased by 70%, due to the addition of gloves.** As mentioned previously in this memo, California has a regulation (3 CCR 6738) that allows pilots to omit gloves, but for the new exposure estimate the proposed mitigation measures (requiring gloves) were assumed to supercede this regulation. If this is untrue, then the exposure estimate would actually be unchanged from the EAD, because of an artifact in the PHED database: all high-dermal grade pilot studies assumed closed cab. Thus, closed cab was already factored into the EAD exposure estimates.

**3. Exposure estimates for groundboom applicators and M/L/A using backpack sprayers or low-pressure handwand were unchanged.** No mitigation measures were considered to be needed for these scenarios. USEPA estimated lower exposures for these scenarios, mostly because they use the geometric mean and we use the arithmetic mean in PHED (our use of multipliers on PHED also makes a difference, though less so because the multipliers were all  $\leq 4$ ). The differences in dermal exposure between arithmetic and geometric means are shown below for each of the scenarios. Units are  $\mu\text{g}/\text{lb}$  AI handled:

- Groundboom:                      0.066 (arithmetic); 0.015 (geometric)                      ratio: 4.4
- Backpack:                              22.1 (arithmetic); 2.5 (geometric)                              ratio: 8.8
- Low-pressure handwand:      1.58 (arithmetic); 0.253 (geometric)                      ratio: 6.2

**4. Exposure estimates for reentry workers in cotton and artichoke decreased about 20% by extending the REI from 2 days to 3.** Exposure estimates for reentry workers in citrus were unchanged, because California already requires an extended REI of 30 days.