

# Office of Environmental Health Hazard Assessment

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Arnold Schwarzenegger  
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## MEMORANDUM

**TO:** Gary Patterson, Ph.D., Chief  
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**FROM:** Anna M. Fan, Ph.D., Chief  
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**DATE:** January 16, 2004

**SUBJECT:** COMMENTS ON THE DRAFT RISK CHARACTERIZATION DOCUMENT  
FOR THE ACTIVE INGREDIENT METHAMIDOPHOS PREPARED BY THE  
DEPARTMENT OF PESTICIDE REGULATION

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Thank you for the opportunity to review the draft risk characterization document (RCD) for methamidophos prepared by the Department of Pesticide Regulation (DPR). The Office of Environmental Health Hazard Assessment (OEHHA) reviews risk assessments prepared by DPR under the general authority of the Health and Safety Code, Section 59004, and also under the Food and Agricultural Code (FAC), Section 13129, in which OEHHA has the authority to provide advice, consultation, and recommendations to DPR concerning the risks to human health associated with exposure to pesticide active ingredients.

Methamidophos is an organophosphate insecticide/acaricide used for the control of various pests on cotton, potatoes and tomatoes. Approximately 47,000 pounds of methamidophos was applied in California in 2001. DPR initiated this risk assessment based upon methamidophos' high acute toxicity and because of documented illnesses following occupational exposure. This RCD evaluates occupational, dietary and combined occupational and dietary exposures for acute, subchronic and chronic durations.

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California Environmental Protection Agency

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OEHHA comments on the RCD for methamidophos are as follows:

1. OEHHA agrees with DPR's choices of critical studies, toxicological endpoints and NOAELs used in the RCD for methamidophos. We find the section of the RCD comparing DPR's selection of critical values to those used by the United States Environmental Protection Agency (U.S. EPA) particularly informative and useful in our evaluation.
2. The U.S. EPA applied an additional uncertainty factor of 3x due to concerns of organophosphate-induced delayed neuropathy (OPIDN). OPIDN-like symptoms were observed in hens and there are reports in the literature of the syndrome occurring in humans after extremely high-dose exposures (Johnson and Lotti, 1989). Based on our evaluation of the RCD and the completion of the developmental neurotoxicity study, OEHHA agrees with DPR's assessment that occupational and dietary exposures occur at levels considerably less than those associated with OPIDN, therefore, no additional uncertainty factor is necessary for the purposes of this RCD.
3. Of particular concern, OEHHA notes that DPR's calculations found that for all occupational tasks evaluated for all exposure durations, margins of exposure (MOEs) were less than 100. Indeed, for mixers, loaders, applicators and flaggers, the majority of MOEs were less than 10, indicating a substantial potential risk for these workers. OEHHA urges DPR to expedite mitigation measures to reduce occupational exposures to methamidophos.
4. All dietary exposure scenarios evaluated resulted in MOEs greater than 100. OEHHA notes that this result is consistent with a similar recent evaluation by U.S. EPA (U.S. EPA, 2000), however, we recognize this evaluation is limited to dietary methamidophos exposure as result of methamidophos applications and does not consider cumulative exposure to other sources of the chemical. See item number 7 below for additional discussion.
5. DPR's tolerance assessment for the commodity tomatoes resulted in MOEs ranging from 26 to 76 depending upon the particular subpopulation under consideration. In discussing these values, it is stated in the RCD: "...USEPA should review the current tolerance of 1 ppm since the MOEs for all population subgroups are below 100." We also note (as mentioned in the RCD) that the U.S. EPA has recently increased the methamidophos tolerance for tomatoes. Considering the results of the tolerance assessment and the recent increase in the tomato tolerance by U.S. EPA, OEHHA urges DPR to engage U.S. EPA in discussions directed at reviewing the current federal tolerance for methamidophos on this commodity.

6. Per the RCD, methamidophos has not been found in groundwater in California. The chemical possesses physio/chemical characteristics (high water solubility, weak soil adsorption) that suggests a high potential for leaching, however. Indeed, methamidophos has been detected in groundwater in other areas of the country (U.S. EPA, 2000). OEHHA recommends that DPR continue to monitor groundwater for methamidophos in high-use areas for possible contamination.
7. The methamidophos RCD does not include exposure to methamidophos residues as a result of acephate applications (methamidophos is a major degradate of acephate). OEHHA notes that in the recent U.S. EPA risk assessment for methamidophos (U.S. EPA, 2000) dietary exposures with and without acephate contributions were evaluated. When acephate was considered, U.S. EPA concluded that at the 99.9<sup>th</sup> percentile exposure, dietary risks were of toxicological concern to the subpopulation of children 1-6 years old and that tomato consumption was the most significant contributor to the overall risk. OEHHA recommends that DPR conduct and/or complete an exposure assessment for acephate in order to assess cumulative risks from exposure to methamidophos.

Again, thank you for the opportunity to review this document and we hope that you find our comments useful. Should you have any questions regarding OEHHA's review of this RCD, please contact Dr. David Rice at (916) 324-1277 (primary reviewer), Mr. Robert Schlag at (916) 323-2624, or me at (510) 622-3165.

cc: Val F. Siebal  
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#### References

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