



# Department of Pesticide Regulation



Edmund G. Brown Jr.  
Governor

## MEMORANDUM

TO: Chris Reardon  
Chief Deputy Director

FROM: Lisa J. Ross, Ph.D.  
Environmental Program Manager I  
Environmental Monitoring Branch  
916-324-4116

*Original signed by*

DATE: August 8, 2011

SUBJECT: HEXAZINONE FINDINGS BY THE SUBCOMMITTEE OF THE PESTICIDE  
REGISTRATION AND EVALUATION COMMITTEE

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Attached are the hexazinone "Findings and Recommendations" prepared by the subcommittee of the Pesticide Registration and Evaluation Committee. These findings were unanimously agreed upon on July 20, 2011, by the subcommittee members; Dr. Syed Ali, Dr. David Ting, and Dr. Lisa Ross, Chair of the Subcommittee.

If you have any questions, please feel free to contact me.

Attachment

cc: Dr. Syed Ali, State Water Resources Control Board (w/Attachment)  
Dr. David Ting, Office of Environmental Health Hazard Assessment (w/Attachment)

SUBCOMMITTEE OF THE  
PESTICIDE REGISTRATION AND EVALUATION COMMITTEE

IMPLEMENTATION OF THE  
PESTICIDE CONTAMINATION PREVENTION ACT

**HEXAZINONE: FINDINGS AND RECOMMENDATIONS**

July 19, 2011

Hexazinone has been found in ground water sampled from domestic wells in California by the Department of Pesticide Regulation (DPR). Between 1993 and 2009, hexazinone residues were detected in 26 wells located in a total of eight counties: Colusa, Fresno, Los Angeles, Merced, San Joaquin, Solano, Stanislaus, and Tulare. Concentrations of hexazinone ranged from 0.05 to 0.27µg/L. Detections in four wells were determined to be from a point source. A legal agricultural use determination was made for three detections in Fresno and two in San Joaquin County, and indicated use of hexazinone containing products on alfalfa was the likely source. The remaining detections were presumed to have resulted either from use on alfalfa or roadsides. Hexazinone is of particular importance in alfalfa production for the control of common groundsel, a weed highly toxic to cattle. Chemical, biological, and non-chemical alternatives to hexazinone provide less control or require additional treatment applications. The economic impacts of the presence of common groundsel in alfalfa hay can be significant.

Pursuant to the "Notice of Hexazinone Residue Detections in California Ground Water and Registrant Opportunity to Request a Hearing" dated November 1, 2010, and the California Notice 2011-02 "Notice of Hearing Pertaining to Hexazinone Detections in Ground Water," this subcommittee held a hearing on May 9, 2011, to review registrant reports, public comments, and other pertinent information regarding the presence of hexazinone in ground water in California. A subsequent public meeting was held June 7, 2011, to receive additional information from state scientists about hexazinone use patterns, label information, toxicology, alternatives, modeled predictions, and mitigation options, to determine if agricultural use of hexazinone should continue, and if so, under what conditions.

After reviewing the information presented, the subcommittee offers the following findings and recommendations to the Director of DPR. These findings were unanimously agreed upon by the subcommittee on July 13, 2011.

**FINDINGS**

Finding One

The subcommittee finds that the presence of hexazinone in the ground waters of the state has not polluted and does not threaten to pollute ground waters, as based on the definition of pollution in law (Food and Agricultural Code section 13142(j)). This law defines pollution as "... the

introduction into the groundwaters of the state of an active ingredient, other specified product, or degradation product of an active ingredient of a pesticide above a level, with an adequate margin of safety, that does not cause adverse health effects.”

The subcommittee evaluated information regarding whether or not hexazinone has polluted the ground waters of the state. All hexazinone levels in ground water detected to date fall considerably below a health-protective drinking water level of 170 µg/L that the Office of Environmental Health Hazard Assessment (OEHHA) derived from the available toxicological information using established approaches, as discussed below. No adverse health effects are expected for individuals consuming measured levels of hexazinone in drinking water. Since the highest detected level is more than 600-fold lower than the health-protective level, the subcommittee concluded that hexazinone has not polluted ground water.

Hexazinone has relatively low acute oral toxicity. In oral sub-chronic animal studies, hexazinone mainly caused body weight loss and signs of liver toxicity. Hexazinone is generally negative in genotoxicity studies. The chemical has not been shown to be toxic to the developing fetus at doses lower than those showing maternal toxicity. Based on the limited data available, hexazinone is not known to be a neurotoxicant nor an endocrine disruptor. In two carcinogenicity studies, non-statistically significant increases in thyroid adenoma in male rats and liver tumors in female mice were observed following hexazinone treatment; however, the tumors were not clearly treatment related. The U.S. EPA classified hexazinone as Category D, or “not classifiable as to human carcinogenicity.” OEHHA determined that the available evidence is insufficient to indicate hexazinone as an animal carcinogen.

For the purpose of determining a health-protective drinking water level, OEHHA identified a two-year rat dietary study (Haskell Laboratory for Toxicology and Industrial Medicine, Report #: 353-77; Medical Research Project #: 1833-001, 1977) with a no-observed-adverse-effect level of 10 mg/kg-day as the critical study. At the next higher dose (53 mg/kg-day, male; 68 mg/kg-day, female) rats showed decreases in body weight. OEHHA determined an overall uncertainty factor of 300 -- 10 for interspecies extrapolation, 10 for intraspecies variability, and 3 for the quality of the critical study and the concern that the rat may not be the most sensitive animal species tested. Applying a relative source contribution of 20 percent (a default factor assuming only 20 percent of exposure from drinking water and the rest from other sources) and an upper 95<sup>th</sup> percentile water consumption rate of 0.039 L/kg-day, OEHHA calculated a drinking water level of 170 µg/L.

The subcommittee also considered information presented to determine whether hexazinone threatens to “pollute” the ground water of the state. The first hexazinone products were reported to have been registered by DPR in the early 1980s. Full pesticide use reporting for all products used in California began in 1990. Hexazinone use statewide shows no increasing trend from 1990 through 2009. In addition, there was no increasing trend for use of hexazinone on alfalfa during that same time period. Hexazinone has been detected in ground water intermittently since sampling began in 1993, with no indication of increasing concentrations either spatially, or in individual wells sampled repeatedly over time. Modeled predictions of hexazinone concentrations did not indicate a potential for hexazinone to “pollute” ground water in the most vulnerable leaching soils in California. In addition, a hexazinone field study conducted in a

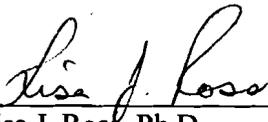
cracking clay soil which generated runoff to a catchment pond showed impacts on shallow ground water (accessed by soil bore holes dug three meters deep adjacent to the field) with a maximum concentration of about 0.5 µg/L. This concentration was believed to be a result of leaching from the pond to shallow ground water. This concentration was well below the 170 µg/L health-protective level calculated by OEHHA. Review of these data led the subcommittee to conclude that there was no evidence indicating hexazinone threatens to "pollute" given the history of use, patterns of detections in ground water, modeled results, and field data.

## RECOMMENDATIONS

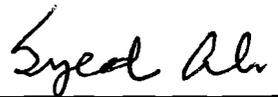
The subcommittee recommends the Director continue to monitor for hexazinone in ground water to ensure that concentrations do not increase. The subcommittee recommends that in the event concentrations of hexazinone reach 17 µg/L, 10 percent of the health-protective level, the Director should immediately take action to regulate this pesticide by placing it on the 6800(a) list in Title 3 of the California Code of Regulations and require management practices that prevent the movement of hexazinone to ground water. In addition, if the detection of hexazinone occurs with increasing frequency, the subcommittee recommends the Director take similar action.

## ACKNOWLEDGEMENTS

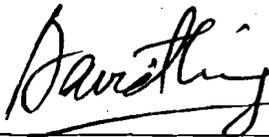
The subcommittee thanks all those who provided information on hexazinone and the alternatives. We also wish to thank those who participated in the preparation for and in the conduct of the hearing and meeting for their time and efforts.



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Lisa J. Ross, Ph.D.  
Chair of the Subcommittee  
Environmental Program Manager I  
California Department of Pesticide Regulation



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Syed M. Ali, Ph.D.  
Staff Toxicologist  
State Water Resources Control Board



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David Ting, Ph.D.  
Senior Toxicologist  
Office of Environmental Health Hazard Assessment