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MEMORANDUM

TO: Karen Morrison, Chief Deputy Director
Department of Pesticide Regulation
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FROM: David C. Edwards, Ph.D., Chief Deputy Director
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DATE: December 13, 2023

SUBJECT: HEALTH-BASED RECOMMENDATIONS TO MITIGATE CANCER RISK
OF OCCUPATIONAL BYSTANDER EXPOSURE TO
1,3-DICHLOROPROPENE

David Edwards

David Edwards (Dec 13, 2023 12:20 PST)

The Office of Environmental Health Hazard Assessment (OEHHA) has prepared health-based recommendations for the Department of Pesticide Regulation (DPR) to address potential cancer risks to occupational bystanders from the use of 1,3-dichloropropene (1,3-D), consistent with the joint and mutual provisions outlined in Food and Agricultural Code sections 12980 and 12981.

The recommendations include several options for mitigating cancer risks to occupational bystanders. We look forward to working in a joint and mutual fashion with DPR to implement these recommendations in the development of the occupational bystander regulations. Further, as this regulatory process progresses, additional analytical work by our departments and input from the public and regulatory entities (e.g., County Agricultural Commissioners and Air Pollution Control Districts¹) may well result in a greater understanding of occupational bystander exposures and other possible mitigation measures, which may warrant the revision of these recommendations.

¹ See Food and Agricultural Code section 14024.

Mitigation of Occupational Bystander Risks from Working in Close Proximity to Fields where 1,3-D is Applied

OEHHA recommends the following methods, separately or in combination, to mitigate occupational bystander risks from working in close proximity to fields to which 1,3-D has been recently applied.

1. Changes to application methods

Several field fumigation methods (FFMs) are associated with occupational bystander exposures at acceptable levels of exposure (see Scientific Basis section). These are shown in Table 2 in the attachment to this memorandum and, among others, include FFMs 1242 and 1243 that utilize totally impermeable film tarps or “TIF” tarps. Any mitigation measures that result in similar near-field average annual concentration levels are assumed to result in bystander exposures at acceptable levels and are consistent with OEHHA recommendations.

2. Restrictions on proximity of occupational bystanders to fields after 1,3-D application

Exposures to occupational bystanders in proximity to recently treated fields can be reduced by limiting the duration of exposure and timing after application when they work in close proximity to the treated area. For example, we estimate that risks to occupational bystanders in inland agricultural counties fall to acceptable levels (see Scientific Basis section) when they stay at least 100 feet away from the field for the first 48 hours after certain non-TIF tarp treatments, i.e., FFMs 1201 and 1206. Several other examples of proximity restrictions for different FFMs estimated to mitigate risks to acceptable levels are provided in the Attachment.

3. Controlled application conditions

For each treatment method, emissions can be reduced by controlling application rates (e.g., pounds per acre), month of application, frequency of application, soil water content and other factors. Any combination of controls that result in similar or lower near-field average annual concentration levels as those for TIF tarp FFMs 1242 and 1243 are assumed to result in bystander exposures associated with risks at acceptable levels (see Scientific Basis section). As noted above these risk mitigation methods address the time occupational bystanders spend in close proximity to treated fields, and where 1,3-D concentrations are the most pronounced.

Mitigation of Occupational Bystander Risk from 1,3-D Background Exposures

The above-recommended mitigation measures do not account for general background exposures (not attributable to close proximity to treated fields) contributing to the occupational bystander's aggregate exposure to 1,3-D during their workday. DPR has indicated to OEHHA that the current township cap will remain in place for the next two years until the occupational bystander regulations for 1,3-D become effective. While background exposures to occupational bystanders are expected to sufficiently decrease once DPR's residential bystander regulations are in place, OEHHA recommends that during this period DPR confirm this is the case by monitoring how the new methods are being implemented, conducting air monitoring to the extent feasible, and further evaluating through modeling ambient 1,3-D concentrations to which occupational bystanders are exposed. If resulting ambient concentrations experienced by occupational bystanders working in the general vicinity of treated fields in high 1,3-D use areas fall significantly above acceptable levels (see Scientific Basis section), DPR should evaluate additional mitigation options for reducing exposure, such as retaining the township cap in areas of high 1,3-D use and emissions or other measures.

Scientific Basis

OEHHA developed the recommendations above to reduce the risk of developing cancer to occupational bystanders to 1 in 100,000 (target risk value). Multiple factors inform the risk of developing cancer. These include the potency of the chemical and the extent of the exposure, including both the duration of the exposure and the concentration of the chemical to which the individual is exposed (exposure concentration). OEHHA assumed a potency value of 0.057 ppm^{-1} , equivalent to an inhalation cancer slope factor of $0.19 \text{ (mg/kg-day)}^{-1}$.² Using this assumption, OEHHA estimated that an occupational bystander exposed five days a week, eight hours per day, for forty years to 0.21 ppb has a risk of cancer of 1 in 100,000. Exposures to higher concentrations with less frequency also can result in an average concentration over the work life of 0.21 ppb, and a risk of 1 in 100,000. OEHHA recommends the measures above to achieve this or a lower average concentration, which would reduce the risk to occupational bystanders to cancer to 1 in 100,000 or below.

The preliminary analyses and further details on the assumptions underlying the risk calculations by OEHHA are provided in the attachment.

These recommendations are at an early stage of the joint and mutual process to develop regulations to protect occupational bystanders from 1,3-D exposure. We look

² OEHHA (2021). Initial Statement of Reasons. Proposed amendment to Section 25705(b). Specific regulatory levels posing no significant risk. 1,3-Dichloropropene (oral and inhalation routes).

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forward to the next steps of this joint and mutual process, and to the additional consultations with other entities under the toxic air contaminant process DPR will be undertaking. As noted above, if during this process refinements to these OEHHA recommendations are needed, an updated recommendation memorandum will be sent, consistent with the process envisioned in Food and Agricultural Code section 12981.

We look forward to continuing to work with you, as part of the joint and mutual process, on regulatory development. If you need additional information or have any questions, please contact Dr. Ouahiba Laribi at Ouahiba.Laribi@oehha.ca.gov.

Attachment

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