

Ziram Summary

Uses

- **Fungicide and antimicrobial:** Ziram is a dimethyldithiocarbamate fungicide used to control fungal diseases on tree fruits, nut crops, vegetables and ornamentals. It is used to prevent crop damage in the field and is also applied prior to harvesting in order to prevent fruits from deterioration in storage or transport. Additionally ziram is used as a preservative in adhesives, caulks, sealants, wallboard, and interior latex paint (in-can-preservative). It is also registered for residential use as a rabbit repellent on outdoor ornamentals.
- Ziram is general use chemical. It is applied using ground and aerial equipment.
- About 20-26 million pounds of ziram per year are used on approximately 500,000 acres of cropland.

Health Effects

- Ziram is moderately toxic via oral and a severe eye irritant. It is a moderate dermal sensitizer. The mechanism of ziram-induced toxicity has not been fully investigated. The primary target organs of ziram appear to be the nervous system, liver, and thyroid. Ziram is classified as “Likely to be carcinogenic in humans”.

Risks

Dietary Risk The acute dietary risk (food) of ziram is expected to be below the Agency’s level of concern (i.e., less than 100% acute PAD [Population Adjusted Dose] is utilized) for the general U.S. population and all population subgroups, including infants and children at the 99.9 percentile. The most highly exposed subgroup is children 1-6 with 57% of the PAD consumed. The primary risk drivers are frozen blueberries, uncooked blueberries, and uncooked strawberries. The chronic dietary risks are below the level of concern. The estimated cancer dietary risk is 3.8×10^{-6} , which exceeds the Agency’s level of concern.

Residential Risk

- Rabbit repellent applications to outdoor ornamentals are not of concern. Residential ziram-treated paint applied with airless sprayers alone is of concern both for acute exposures and cancer risk.

Aggregate Risk (combined risks from food, water, and residential exposure)

- Although drinking water is expected to account for a small portion of dietary risk, the acute risk from food and water is marginally exceeded for children 1-6.
- Acute aggregate risk was not assessed because risk to residential painters alone is of concern.
- Intermediate and long-term aggregate risks are not of concern.

Worker Risks are potentially high for mixer/loaders.

Agricultural Uses:

- With maximum available PPE, acute and chronic non-cancer risks are of concern for 2 of 25 occupational scenarios.
- Assuming maximum PPE, for the high-exposure activity of hand harvesting, there are unacceptable cancer risks associated with 23 of 25 use scenarios.

Antimicrobial Uses:

- Professional painters are at risk from Ziram-treated paint applied with airless sprayers from both short-term exposures and cancer risk.

Acute Risks to Birds, Fish, and Mammals are high for some scenarios:

- Using a Tier II model for refinement (PRZM/EXAMS), the present assessment suggests potential acute risk to endangered and non-endangered freshwater fish, freshwater invertebrates and estuarine invertebrates. A high acute risk to endangered and non-endangered mammals (other than granivores) from both single and multiple applications was also identified.

How the Risk Picture May Change

- The submission of additional washing studies could help mitigate the dietary cancer risk. The elimination of strawberries would not significantly affect dietary risk.