METHOMYL

Task 4: Exposure Profile

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Exposure Profile - Methomyl

Introduction

Methomyl is an insecticide registered for control of a variety of pests, including many lepidopteran larvae. Approximately 70-80% of methomyl is used on soybeans, peanuts, cotton, and tobacco, although other registered sites include certain vegetables, fruits, field crops, and commercial ornamentals.

A water-soluble powder (90% ai) and water-soluble liquids (1.8 and 2.4 lb ai/gal) are the predominant formulations. Other registered formulations include dusts (1.25-2.5% ai), granulars (1-5% ai), and baits. The pesticide is applied as a foliar treatment with aircraft (fixed-wing and helicopters) and ground equipment, including airblast sprayers, and hydraulic sprayers with a single wand (gun) or boom. The specific type of equipment is determined by the site and equipment availability.

All Formulations

The use of airblast machines (which direct the spray upward) and aircraft increases the potential for exposure via spray drift to humans, livestock, or wildlife outside the application site. The potential for human exposure via ground water contamination cannot be assessed due to the lack of soil mobility data. Similarly, the absence of octanol:water partition coefficients and bioassay data prevents an assessment of the bioaccumulation potential for methomyl.

One exposure study was reviewed and found valid.

Respiratory exposure levels during mixing and loading operations using a closed-transfer system were nondetectable except on the occasion when a water-soluble package of methomyl broke, which caused a high respiratory exposure level of 1,332 $\mu g/m^3$. During methomyl application from a rearmounted tractor boom, respiratory exposure levels ranged from 0 to 7.5 $\mu g/m^3$ (Knaak et al., no MRID).

A safe reentry interval of 2 days has been set in California for grapes, citrus, peaches, and nectarines (California Administrative Code, 1979). Data for corn, cabbage, and beans showed that foliar surface methomyl levels declined 71-93% within 12 hours after an application of water-soluble methomyl at 0.5 lb ai/A (Pease, 00007684). On mint, dislodgeable foliar residues were 0.33 and 0.63 $\mu g/cm^2$, 48 hours after applications of 0.9 and 1.8 lb ai/A, respectively (Kiigemagi, 05018583). On cotton leaves it was shown that an aqueous solution of methomyl dissipated rapidly from leaf surfaces, whereas an application of a 5% dust dissipated much more slowly; i.e., 81% of the applied methomyl remained on leaf surfaces 2 days after the dust application (Bull, 05009351).

Water-soluble liquid formulations. The greatest potential for direct exposure is during mixing and loading operations. Dermal and eye exposure from splashing of the concentrate can result during mixing of the soluble liquid formulations.

Water-soluble powder and dust formulations. A potential for respiratory exposure from "puff back" during opening and mixing of these formulations can occur as noted in Knaak et al. (no MRID), when air contamination reached 1,332 $\mu g/m^3$ during an accident while water-soluble methomyl was being mixed.

Granular and bait formulations. Dermal exposure could occur while these formulations are being applied. However, such exposure could be greatly minimized by the use of gloves during application.

References

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