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DYNAMAC CORPORATION

NALED

Task 4: Exposure Profile

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Exposure Profile - Naled

Introduction

Naled is a non-systemic insecticide-acaricide registered for use on field, vegetable, and orchard crops; livestock and poultry and their surroundings; greenhouses; forest and wasteland; agricultural, domestic, medical, and commercial establishments; and urban and rural outdoor areas (mosquito control). Approximately 1.5-2.0 million pounds of active ingredient are produced annually in the United States, of which 250,000 pounds are exported. Of the naled applied in the United States the major use sites are: fruit, nut, vegetable, and field crops (50%); mosquito control (35%); dog flea collars (10%); and livestock (5%).

Naled is formulated into dusts (D; 4 and 6%), impregnated materials (Impr; 10-25%), emulsifiable concentrates (EC; 2-7.2 lb/gal and 6-26%), soluble concentrates/liquid (SC/L; 2.35-14 lb/gal and 11.4 and 20%), and ready-to-use/liquids (RTU/L; 1.26-12.6 lb/gal and 1-15%). Naled is applied by using aircraft and ground equipment including mist sprayers and foggers. The specific type of equipment is determined by site and equipment availability. Applicators need not be certified to apply naled.

All Formulations

Application by fog and mist sprayers, and aircraft increases the potential for exposure of humans and non-target organisms to naled. Human exposure to naled during mixing, handling, application, and reentry operations could be minimized by the use of approved respirators and other protective clothing. However, data are not available to fully assess such exposures. California has established a safe reentry interval for naled of 24 hours for citrus, peaches, nectarines, and grapes. No federal reentry interval has been established. Data on the octanol/water partition coefficient and volatility of naled are not available.

Available data indicate that naled has a low to intermediate mobility in soil while its degradate dichlorvos is intermediately mobile to mobile (00064796). The rapid degradation (half-lives ≤8 hours) of naled and dichlorvos in soil should prevent any contamination of ground water from occurring (00074759). Naled degrades in aqueous solutions (pH 5-9, 21 C) with a half-live of ∿0.25-25 hours (00074691). Therefore, contamination of surface waters as a result of runoff or direct spraying is expected to dissipate rapidly. Neither naled (EC) nor dichlorvos accumulate in fish tissues (00074643). Naled has been reported to cause skin irritation (Mick et al. 1970). Both humans and non-target organisms may be exposed to naled treated vegetation, soil, or contaminated water. However, the rapid degradation of naled in soil and water should tend to mediate such exposures. Additionally, humans may be directly exposed to naled during mosquito spraying operations. However, no data are available to assess such exposures.

Emulsifiable Concentrate, Soluble Concentrate/Liquid, and Ready-To-Use/Liquid Formulations

Filter paper taped over flagmen respirator cartridges contained naled at 26.9-41.9 µg/sample following a 5-minute exposure period during application of naled (Dibrom 14 SC/L at 19.3 oz/A as an undiluted LVC or Dibrom 8 EC at 2 pt/3 gal water/A) at 2 lb/A (GS092008 Temp. MRID). Naled was detected in shoulder and upper arm patches after LVC application at 0.435-2.30 µg/cm^2 and 0.435-7.16 µg/cm^2, respectively. For the EC application the respective values were 0.0153-0.0216 µg/cm^2 and 0.00733-0.01825 µg/cm^2. The flagmen stood 5-10 feet downwind (8 mph wind) of the aircraft as it passed on each swath at 5 feet. Application of the EC formulation (flat fan Tee-Jet nozzles, ∿30-245µ droplets) apparently resulted in greater spray drift than application of the LVC (Mini-Spin nozzles, ∿10-100µ droplets) as determined by analyzing naled levels on glass slides placed downwind of the application site. These data conflict with published literature on spray drift in relation to particle size. Dermal and ocular exposure due to splashing may occur during mixing and handling operations. Exposure during application is expected to be mainly dermal, although use of fog and mist sprayers may increase the potential for inhalation exposures. However, data are not available to fully assess such exposures.

Dust Formulations

The greatest potential for exposure is dermal, during opening and pouring when "puff back" can occur. Application of dust formulations is always associated with a high potential for dermal exposure. However, no data are available to assess such exposures.

Impregnated Material Formulations

The greatest exposure potential for these formulations is expected to be mainly dermal. Such exposure could be greatly minimized by the use of gloves during handling. However, data are not available to quantitate potential exposure levels for these formulations.

References

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