

**Effect of Irrigation Scheduling on Movement of Pesticides to Ground Water in Coarse Soils.
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Abstract

Short-term field studies conducted over several weeks have shown that efficient irrigation scheduling in coarse soils reduces downward movement of pesticides through the soil profile. From a regulatory standpoint, further information over environmentally relevant time scales is required before specific efficient irrigation scheduling practices can be recommended as a mitigation measure to reduce pesticide movement to ground water in coarse soils. Longer-term field studies to obtain this information are difficult to design and conduct due to experimental difficulties and prohibitive cost. As an alternative, this report documents the results of computationally intensive computer simulation techniques that were used to evaluate the effect of duration of postapplication irrigation restrictions on leaching of known California ground water contaminants in coarse soils. Similar to field data, the results indicate that irrigation scheduling based on evapotranspirative water demand is an effective approach for mitigating pesticide movement to ground water in coarse soils. Under the particular scenario and assumptions described herein, model outputs indicate that restriction of irrigation water applications to 133 percent of evapotranspirative demand for a period of six months following herbicide application will provide a greater than 95 per cent probability that currently known California pesticidal ground water contaminants listed in Title 3, California code of regulations, section 6800(a), will not be detected in ground water above current analytical reporting limits of 0.05 $\mu\text{g L}^{-1}$ (parts per billion, ppb). In contrast, model predictions for shorter duration irrigation restrictions following application indicate a greater likelihood of pesticides arriving in ground water at measureable concentrations. As indicated by a discussion of modeling limitations and uncertainties, these probabilities of contamination are best considered as estimates of actual possible outcomes under the different scenarios.