

Effects of agronomic and geologic factors on pesticide movement in soil: comparison of two ground water basins in California. Welling, R., J. Troiano, R. Maykoski and G. Loughner. In Proceedings of the Agricultural Impact on Ground Water - National Water Well Association. pp 666-685. 1986.

Abstract

This paper describes the preliminary results of a study conducted by the California Department of Food and Agriculture which compares the soil distribution of herbicides in two ground water basins in the state. In a previous study, residues of several agricultural chemicals were detected in numerous wells in two inland ground water basins, while only one contaminated well was found in two coastal basins. The present study was designed to provide further information on the effects of cultural practices, climatic conditions, and soil and geologic factors in each basin on pesticide mobility.

Soil cores were collected in two citrus-growing regions, one in the San Joaquin Valley, and one on the south coast. Information on agricultural practices and climatic conditions for four years (1981-1984) was obtained from growers and other sources. In order to maximize detection of pesticides in deeper soil layers, sites for soil coring were chosen at locations where the same procedures for application of herbicides had been practiced annually over the same four-year period. Cores were collected in the spring after herbicide application and again in the fall after most of the irrigation water had been applied. Soil samples were analyzed for moisture content, organic carbon content, particle size distribution, and concentrations of three commonly used citrus herbicides, simazine, bromacil and diuron. Where possible, ground water samples were also collected and analyzed. Downward movement of simazine was monitored in both basins. Within basins we examined the effects of irrigation method on herbicides movement.

In the spring, at the inland sites, simazine was found in soil and ground water samples at 28 feet. At the coastal sites, no simazine was detected deeper than 8 feet below the soil surface, and diuron and bromacil residues occurred only near the surface. Differences between the two basins may be explained in part by the lower organic matter content and higher percentage of sand in the central valley soil. Irrigation method and amount of water applied appeared to have less influence on pesticide movement than soil factors or pesticide chemistry.