UCRTRAC Accumulative Research Summary
Section B: Impact of Turfgrass Chemicals and Fertilizers on the Environment
Project 3

Title: Further Evaluation and Modeling of Pesticide Partitioning Data from the UCR Putting Green Lysimeters.

Note that this project utilizes data from a previous project, "Measurement and Model Prediction of Pesticide Partitioning in Field-Scale Turfgrass Plots," page 33, UCRTRAC 1999 Annual Research Summary.

Objective:

- Measure site-specific critical water flow and pesticide transformation.
- Simulate pesticide fate using measured hydraulic properties and pesticide parameters as model inputs; compare model outcomes of the simulations with measured field data.
- Based on above objectives, summarize modeling predictions and measurements, produce peer-reviewed journal article(s) and a summary report.

Location: University of California, Riverside

Duration: 2 years

Funding Source: United States Golf Association

Findings:

Environmental Fate of Two Fungicides: Metalaxyl (Subdue) and Chlorothalonil (Daconil)

- Under representative putting green conditions, cumulative volatilization loss accounted for 0.10% and 0.02%; clipping removal accounted for 0.11% and 0.13%; and cumulative leaching was 0.71% and 0.002% of applied mass for metalaxyl and chlorothalonil, respectively.
- The two fungicides were mainly found in the top 4 inches of the soil profile due to the high organic carbon content in the thatch and mat layers.
- Dissipation half-life was 1.4 days for metalaxyl and 4.9 days for chlorothalonil on grass, shorter than those found in agriculture fields.

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- Only a small fraction of the applied fungicides left the greens.

- For more information see Pest Management Science 58:335-342.

Environmental Fate of Two Insecticides: Trichlorofon (Dylox) and Chlorpyrifos (Dursban)

- Under representative putting green conditions, trichlorofon volatilization, clipping removal, and leaching loss was insignificant (in the range of 0.0001% to 0.06% of applied mass) both in 1996 and 1997.

- Clipping removal of chlorpyrifos was similar both years (0.15% and 0.19% of applied mass, 1996 and 1997, respectively) but lower cumulative leaching and soil concentration was observed in 1997 than in 1996, which was attributed to higher volatilization loss in 1997 (2.05% and 2.71% of applied mass, 1996 and 1997, respectively).

- For more information, see Journal of Environmental Quality 31:889-895.

Summary Points

- Percent of applied fungicides and insecticides leaving the putting green via volatilization, clipping removal, and leaching was minimal.

- Neither CHAIN_2D nor PRZM-3 simulated field-measured data well, even when measured hydraulic properties and ET_o values were used as model input.

Status: A 2-year study was completed and Progress, Annual, and Final Reports were prepared. Information associated with this study was published in two scientific journal articles.
