Mobility and Persistence of Turfgrass Pesticides in a USGA Green

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Goals:

- *Conduct mobility (leaching and dislodgeability) and persistence studies on pesticides not examined in previous work.*
- *Monitor percolate collected on a golf course site for applied pesticides*
- *Quantify volatilization of certain pesticides applied to golf turf.*
- *Develop and document the results of using best management practices (BMPs) for fenamiphos and other pesticides that appear to have appreciable mobility, including evaluation of pesticide-adsorbing amendments.*

The use of reduced irrigation for one week following fenamiphos application was studied as a means of reducing fenamiphos and its metabolites leaching from a USGA green in south Florida. Leaching was reduced during the period of limited irrigation, but total leaching was equivalent for low and high irrigation treatments over a longer period that included plentiful irrigation and rainfall. It appeared that the fenamiphos and its metabolites that were not leached when irrigation was restricted eventually leached when excessive irrigation and rainfall occurred.

The percolate collection system in the USGA green at the Ft. Lauderdale Research and Education Center was expanded to include twelve lysimeters. This will permit greater numbers of replications in studies involving two or more treatments, which is very important for pesticide studies.

During excavation it was noted that 7 cm of topdressing had accumulated on the green since the lysimeters were first installed. This layer appeared to hold more water than the underlying media. It contained somewhat higher percentages of the finer sand sizes. It also had considerably more organic matter than either the original rooting mix or than the topdressing material. No movement of rootzone mix into the coarse sand layer, or of coarse sand into the underlying gravel, was observed during excavation for the newly added lysimeters.

Volatilization of the organophosphate pesticides isazofos, chlorpyrifos, and fenamiphos was measured in two studies

using the Theoretical Profile Shape technique. Volatilization was greatest for chlorpyrifos, and least for fenamiphos. It was less for an application that was followed by rainfall than for one followed by dry weather. Isazofos volatilization amounted to 1 and 9 % of that applied for the two rainfall situations, respectively.

Fenamiphos and fenamiphos metabolite adsorption by a stabilized organic polymer (SOP) was investigated in the laboratory. It was determined that when mixed with sand at the rate of 15 percent by volume, SOP could retain an amount of metabolite equivalent to the recommended rate of fenamiphos. Sufficient SOP has been prepared for field studies on the USGA green.

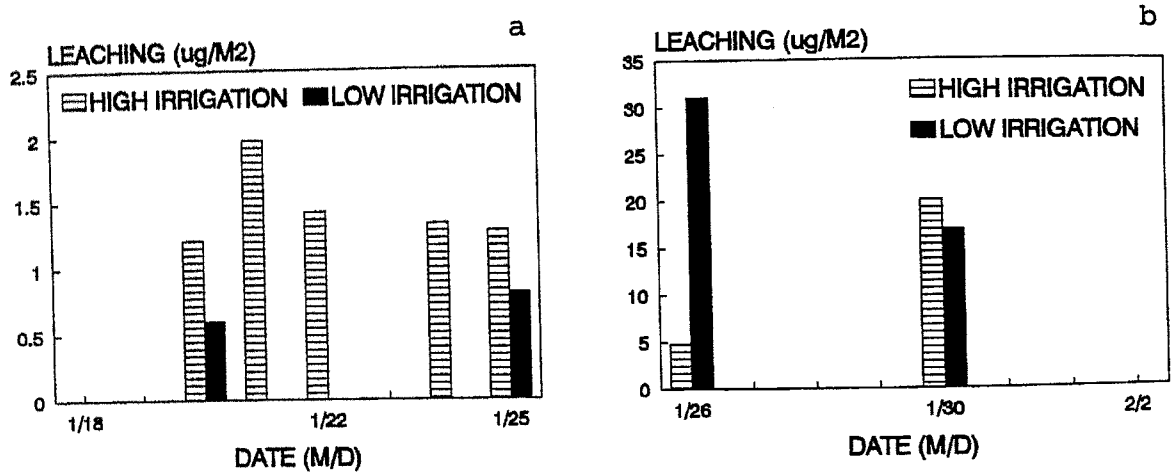

Figure 14. Effect of irrigation on fenamiphos leaching following a fenamiphos application on January 16, 1996 for a) the first week after application, and b) following exposure of all plots to routine irrigation and to rainfall.

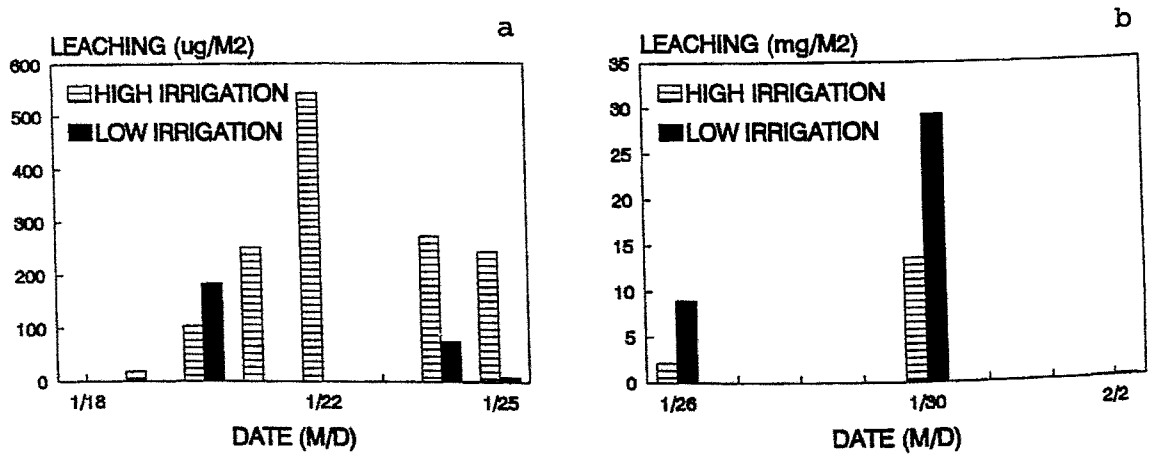

Figure 15. Effect of irrigation on metabolite leaching following fenamiphos application on January 16, 1996 for a) the first week after application, and b) following exposure of all plots to routine irrigation and to rainfall.