

Thatch proven important to pesticide fate

By DR. MIKE KENNA

Often overlooked by scientists responsible for predicting the fate of pesticides is the markedly positive effect of thatch in retaining and breaking down organic chemicals.

Four pesticides applied on a Kentucky bluegrass turf during a

joint research study conducted by University of Nebraska at Lincoln (UNL) and Iowa State University (ISU) appeared to break down faster than what is typical when these materials are applied to other agricultural crops.

As part of the United States Golf Association (USGA) Environmental Research Program, the overall goal of this sponsored research project was to determine the effects of golf course cultural practices on the persistence and mobility of selected pesticides in the turfgrass environment. The research sites, with established stands of Kentucky bluegrass, were located at the John



Seaton Anderson Research Facility in Mead, Neb., and at the ISU Horticulture Research Station in Ames, Iowa.

In 1991 and 1992, recommended rates of pendimethalin herbicide, isazophos and chlorpyrifos insecticides, and the fungicide metalaxyl were applied at both study sites. Before and after the pesticides were applied, leaves,

shoots, thatch and soil were evaluated for pesticide residues.

The turfgrass leaves, shoots and thatch intercepted most of the pesticide during application. Over time, the amount of pesticide recovered in leaves and shoots decreased due to irrigation, rainfall and clipping removal.

The thatch layer, which retains pesticide residues and is somewhat unique to turfgrass systems, generally contained the greatest amount of pesticide residue throughout the 16 weeks of monitoring.

Relatively little chlorpyrifos, and very low amounts of pendimethalin

moved through the thatch layer into the underlying soil. Slightly more isazophos was found in the soil, but did not increase beyond the amounts found one day after application, which indicates rapid breakdown and limited mobility of this product in the soil.

With the exception of metalaxyl, soil concentrations of the pesticide were generally highest at soil profile depths of 0 to 2 inches and 2 to 4 inches throughout the study. Metalaxyl moved through the entire 24-inch soil column tested and the concentration increased up to 28 days after treatment applications. However, the reported metalaxyl concentration found below 20 inches within the soil was less than 150 parts per billion (150 micrograms per kilogram).

Overall, the results reported by Drs. Garald Horst and Pat Shea from UNL and Dr. Nick Christians at ISU indicate that all four pesticides appeared to break down or degrade more rapidly in the turfgrass environment than what is typically reported for other agricultural uses of the same products.

The completed research emphasizes the need for an evaluation of current mathematical models used to predict pesticide movement in turfgrass and agricultural systems. Unfortunately for golf, the current prediction models do not adequately estimate the role of turf leaves, shoots, and especially the role of thatch.

USGA research

Continued from previous page media fiction and USGA facts."

Ron Dodson, president of the Audubon Society of New York State, discussed the success of the Audubon Cooperative Sanctuary Program which receives financial support from the USGA. "We felt it was time to stop telling people what they were doing wrong, and start helping them to do what we thought was right," said Dodson. "Golf and much of America have a perception-equals-reality problem. Most non-golfers, through negative media coverage, feel golf is bad or golfers are bad. The Cooperative Sanctuary program has provided golf an opportunity to tell the rest of the world what is good about golf with regard to environmental issues."

"We have a responsibility to educate the general public, regulatory agencies, and environmentalists," said Snow. "We need to learn—and then teach them—about the environmental benefits of golf courses and what is being done within the game to protect the environmental."

"In April, the results of several environmental studies will be presented to the USGA Turfgrass and Environmental Research Committee," said Snow. "We'll develop a variety of ways to get this information out, where it can be used to improve course management and the game. But the final success of our effort will depend on the willingness of golfers to learn and share the good environmental news about golf."



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