Developing a Database Tool to Guide Environmentally Responsible Pesticide Selection

The goal of this collaborative project is to assist superintendents in their efforts to protect the environment.

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Several projects have been funded by USGA's Turfgrass and Environmental Research Program to assess golf courses' effects on surface and ground water.

OBJECTIVE

To create an electronic resource to help superintendents optimize their environmental stewardship by better understanding the environmental characteristics of golf course pesticides.

Start Date: 2006
Project Duration: Two years
Total Funding: $100,000
($80,000 from the USGA, $20,000 from the GCSAA)

Golf course superintendents consider many factors when selecting a pesticide for a specific use, including cost, efficacy, and turf safety. However, currently it is much more difficult for a superintendent to assess environmental risk and its relevance to the golf course. What is the risk to groundwater supplies when a particular pesticide is applied? What is the risk to surface water, fish, amphibians, or bees?

These are complex questions that require not only data, but also a method to integrate the data into a form that allows meaningful conclusions. The first step of this project is to collect relevant data on environmental fate, toxicology, and environmental endpoints from publicly available databases. To date, we have collected the majority of the data needed.

The second part is to create a model, or software program, that calculates

Careful use of golf course pesticides protects fish and other aquatic populations.

the relative risk to specific environmental features from the application of a specific pesticide active ingredient. Consider a golf course with a stream flowing through the property. The golf course superintendent may want to know the probability that a particular pesticide could reach the stream, and if it does, what is the likelihood that it will cause problems for fish in the stream? A rudimentary risk assessment determines the likely concentration of the pesticide in the stream and whether this concentration is high enough for concern.

Integral to our process of building this resource has been the solicitation of feedback from the following groups:

- End-users of the resource — golf course superintendents.
- EPA staff with expertise in pesticide fate assessment and modeling, regulatory enforcement, and economic impact.
- The scientific community via presentations at scientific meetings.
- Scientists from pesticide manufacturers represented by Crop Life America and Responsible Industry for a Sound Environment.

The challenge of this project is to develop a tool that is easy to use, while retaining a sound scientific basis for estimating potential environmental risks of using a particular pesticide. At this point, several components of the final model have been selected. We expect the model to yield information on risks to groundwater, surface water, birds, and non-target invertebrates for each of the more than 100 pesticide active ingredients in our database. The risk determination will be based on risk ratios and presented in a format that is easy to interpret.

Recommendations for best management practices to minimize environmental risk of an application and maximize environmental stewardship will be provided. The resource will help superintendents make better informed environmental decisions on the pesticides they choose to use.

SUMMARY POINTS

- A database of pesticide properties needed for risk assessment is being compiled.
- The database will serve as a foundation to predict the potential environmental risk of a pesticide active ingredient.
- The result of this research will be a resource for superintendents in making informed decisions about pesticide applications.

RELATED INFORMATION

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