

Fate of Pesticides and Their Partitioning Among Water, Soil, and Biomass Elements in a Turfgrass Ecosystem

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Objectives:

1. To follow the fate, residence time, and partitioning of turfgrass pesticides among the water, soil, and biomass elements of a golf course ecosystem.

Start Date: 2001

Project Duration: 2 years

Total Funding: \$60,000

The main objectives of this research are to follow the fate, residence time, and partitioning of turfgrass pesticides among the water and soil of a golf course and to investigate the transport of turfgrass pesticide from the site of application and their accumulation in soils and detention ponds. This research is being conducted on Colbert Hills Golf Course, Manhattan, Kansas.

To determine the amount of pesticides transported into the detention pond, we have set up two automated ISCO water samplers to collect water samples from the main stream entering and exiting the pond. Colbert Hill Golf Course presently uses oxadiazon (Ronstar), dithiopyr (Dimension) and 2,4-D (Momentum). Water samples are collected from both inlet and outlet of the detention pond for every rainfall event. We also collected water samples from three fairway drains that are directly connected to the detention pond.

These samples are collected by a special type of glass bottle that seals automatically after filling with runoff water. To deter-



A special type of glass bottle that sealed automatically after filling with runoff was used to detect pesticides.



Colbert Hills Golf Course in Manhattan, KS, serves as the research site to determine pesticide fate.

mine the partitioning of pesticides among water and soil, we collected twenty-one samples from the pond monthly from seven different locations and in each location at three different depth (75%, 50%, and 25% of the total depth of water in the detention pond).

To detect the accumulations of pesticide in soil mass, we collected fifty-four soil samples from fairways that drained into the detention pond. In each direction, three soil samples (1, 2, and 5 meters from fairway drainage grate) were collected. We also collected sediment samples from bottom of the pond.

All water samples collected from input and output to and from detention pond will give the effectiveness of detention pond as pollutant retention and the overall management policy to run the golf course efficiently without deteriorating the downstream water quality standards. Also, partitioning of pesticides between water and soil will be analyzed from the collected

samples of soils, sediments and water. All water, soil, and sediment samples are stored in freezers. Recently some of samples were analyzed.

We are developing methods to test the samples. As soon as we finish methods development, we will analyze the rest of the samples. Similarly we will collect the samples for next year and analyze the fate of transport of the pesticides.

Summary Points

- Water samples were collected from inlet and outlet of the detention pond.
- Runoff water samples were collected from fairway.
- Water samples were collected from different depths of the detention pond.
- Soil samples were collected from fairways.
- Sediment samples collected from bottom of the pond.
- Methods were developed for two selected pesticides.