Ten weeks after seeding, fertilizer was applied at a rate of 1 lb N/1000 sq. ft. and plots were irrigated to produce runoff. Runoff and lysimeter samples were taken and frozen for analyses of nutrient content during the winter.

The hydrographs for the initial runoff show relatively high peak runoff rates and short time to peak flow. Hydrographs generated after turf establishment and fertilization show an increase in the time to runoff and a lowering of peak flows. Hence, it would appear that even young turfgrass areas can significantly reduce total runoff when compared to the early seedling stage.

Dr. Thomas Watschke

University of Massachusetts

Volatilization and Dislodegeable Residues of Pesticides and Nutrients Applied to Golf Turf

The objective of this study is to determine the gaseous losses and dislodgeable foliar residues of pesticides applied to golf course turf. To date, limited work has shown that volatile loss of some pesticides applied to turf approaches 15 to 25 percent of the total applied.

In the past 9 months, this laboratory has been responsible for the hiring, training (both academic and technical) and quality control for a full-time Ph.D. graduate student (Casey Murphy), a 1/2-time residue chemist (M.W. Brooks) and a 3/4-time work study technician (B. Chase). Relevant literature was reviewed concerning the environmental monitoring of mecoprop, triadimefon and trichlorfon. Procedures for the analysis of these three pesticides, both as airborne volatile and dislodgeable residues, were evaluated, modified, developed and implemented. Detection levels, extraction efficiencies, linearity of standard curves, interference due to environmental contaminants, mass balance recoveries from sampling devices and storage ability have been determined.

Upon method verification for triadimefon and trichlorfon, these materials were applied to turf (8/23/91-triadimefon and 9/28/91-trichlorfon). Airborne residues were assessed using the high-volume/theoretical profile shape method (i.e., high volume suction fan sampling air above the turfgrass area). Dislodgeable residue samples are determined by vigorously wiping cheese cloth over several one-square-foot areas. Volatile and dislodgeable samples were collected over a two week sampling period. Samples were extracted and prepared for storage. Quantification of these samples is now under way at the Massachusetts Pesticide Analysis Laboratory (MPAL).

Evaluation of a new derivatization method to analyze mecoprop is currently being carried out, and method verification for the analysis of isazofos will be initiated in 1992. Once concluded, these two pesticides will be applied to our experimental turf plot during the 1992 growing season.

Dr. Richard Cooper

University of Georgia

Evaluation of the Potential Movement of Pesticides Following Application to a Golf Course

The objectives of our project are to: 1) determine the potential movement of pesticides from treated bermudagrass and bentgrass greens through effluent entry into surface runoff and groundwater, and 2) determine the potential movement of pesticides from treated bermudagrass fairways by surface runoff and leaching.

The initial funding of this project was received during the spring of 1991 and work accomplished includes the development of greenhouse and field lysimeter installations, and laboratory methods for accurately quantifying the pesticides according to Good Laboratory Practice Standards. Analytical methods were developed to accurately determine 2,4-D, mecoprop, and dicamba at levels of 1, 100, and 20 ppb, respectively, in aqueous solution using partition extraction and electron-capture gas-chromatography analysis.

The greenhouse lysimeter facility has been constructed to simulate golf course greens with 'Penncross' bentgrass and 'Tifgreen' bermudagrass turf. Thirty-six individual lysimeters were constructed by mounting a turfgrass growth-box on a PVC column containing a soil profile developed according to USGA specifications. An automatic track-irrigation system was developed for controlling the rates and time for irrigation. The watering nozzles traverse a horizontal track located above the growth boxes at a speed of 10 ft./min. The

flow rate of the water was adjusted to a rate of 0.06 fl. oz./sec at 20 psi. The daily irrigation of 0.25 inch of water and a weekly rain event of 1 inch are controlled by an automatic timer. The coefficients of variation for water distribution were less than 0.08 across the boxes laterally and over the length of the track. The first pesticide treatments were conducted during the last week in October, 1991.

The field lysimeter facility consists of small bermudagrass and bentgrass greens with lysimeters (22 inches diam.) installed below the sod. The 20 lysimeters are plumbed in the bottom for collection of aqueous effluent from the soil profile developed according to USGA specifications. Bentgrass was seeded during the last week in October, 1991 and bermudagrass will be sodded in April, 1992.

Dr. Albert Smith
Dr. David C. Bridges