TITLE: Mass Balance Assessment of Pesticides and Nutrients Applied to Golf Turf (Runoff Segment)

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Annual Report

MASS BALANCE ASSESSMENT OF PESTICIDES AND NUTRIENTS
APPLIED TO GOLF TURF
(Runoff Segment)

Introduction

This year was dedicated to the establishment and characterization of the runoff plots. Plots were established with creeping bentgrass and perennial ryegrass. Shortly after germination, irrigation was used to produce steady-state runoff, and hydrographs were generated from the runoff data.

Materials and Methods

Glyphosate was applied at 5 lbs ai/A to all six plots in May. After removing the dead turf, soil was applied to localized depressions in the plots and rototilled at a depth of 2" in two directions. The plots were hand raked to final grade and seeded with Penneagle creeping bentgrass with a 30" drop spreader at a rate of 0.6 lbs/1000 sq ft. The three remaining plots were prepared in the same manner on July 19, except they were seeded with a blend of perennial ryegrasses. The blend (33.3% Citation II, 33.3% Commander, 33.3% Omega II) was applied at 4 lbs/1000 sq ft. Triple super phosphate was applied to deliver 1.5 lbs P_2O_5/1000 sq ft. Seedbeds were lightly raked to incorporate the seed and rolled. Straw mulch was applied with a chopper/blower and the seedbeds were irrigated with 0.5" of water.

The plots have been mowed twice a week with a walk-behind reel mower, with the mowing height set at 0.75". The seedbeds received 0.5" of irrigation four times daily for the two days following seeding. Irrigation continued twice daily (0.3" each time) thru August 1. The plots were then irrigated as needed. On August 1, irrigation was used to produce runoff and lysimeter samples for the plots seeded with ryegrass (Fig 1). Plots were irrigated until a maximum peak flow was reached. On August 19, the plots seeded with bentgrass were irrigated the same as plots seeded with ryegrass to produce runoff for hydrologic characterization. The data from these runoff events serve as a "base-line" for these plots.

A natural rainfall on August 20, produced runoff. Subsamples were collected and frozen. No lysimeter samples were collected for this event.

Scotts fertilizer (32-3-10) was applied on October 2, to all plots with a drop spreader at a rate of 1 lb N/1000 sq ft. All plots were irrigated to produce runoff on October 4 (Fig 2). The irrigation provided 9" of water in 90 minutes. Sub-samples

of the runoff were taken throughout the duration of the event, as well as two grab samples at the beginning of the event. A composite 1 litre sample was made from all four lysimeters in each plot.

Natural rainfall has produced lysimeter samples on October 7 and 17. These samples have been frozen for analyses of nutrient content this winter.

Results and Discussion

The hydrographs for the initial runoff show relatively high peak runoff rates (e.g. 15, 16 gpm) and short time to peak flow (Fig 1). The turf at this time (August) was in the early seedling stage. By October (hydrographs generated after fertilization, Fig 2) time to runoff increased and some peak flows had lowered. The amount of vegetative cover had significantly increased since August. Hence, it would appear that even young turfgrass areas can significantly reduce total runoff, when compaired to the early seedling stage.

Executive Summary

MASS BALANCE ASSESSMENT OF PESTICIDES AND NUTRIENTS APPLIED TO GOLF TURF (Runoff Segment)

This year was dedicated to the establishment and characterization of the runoff plots. Plots were established with creeping bentgrass and perennial ryegrass. Shortly after germination, irrigation was used to produce steady-state runoff, and hydrographs were generated from the runoff data.

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 this winter.

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