

Comparison of Turf Chemical Runoff from Small- and Large-size Plots

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Objectives:

1. Develop and employ a standardized protocol to measure turf chemical runoff in different regions of the United States.
2. Determine the "scalability" of turf runoff events from field plot areas.
3. Examine the relationship between thatch age, thatch organic carbon content, and turf chemical runoff.

Start Date: 2003

Project Duration: three years

Total Funding: \$90,000

Substantial progress has been made in the development of a protocol that will be used to measure turf chemical runoff. Principle investigators from the University of Maryland and Mississippi State University, project collaborators, and pesticide industry risk assessment specialists met twice in the second half of 2002 to develop the initial draft version of the protocol. Additional input into the development of the protocol was received from industry and USEPA risk assessment specialists when the document was placed on the Federal Exposure Modeling Work Group (FEMWG) listserve. Comments were also received following a summary presentation of the protocol at the FEMWG March, 2003 quarterly meeting.

Investigators from the University of Minnesota and Oklahoma State University have agreed to coordinate their respective turfgrass runoff projects with those taking place at the University of Maryland and Mississippi State University. Investigators from all four sites met in early November to finalize development of the protocol.

Data collection associated with



Over the summer, an extensive evaluation of the distribution pattern for the rainfall simulator was performed by conducting several individual sprinkler head audits.

objectives 2 and 3 was initially scheduled to begin in the fall of 2003. Unusually frequent and heavy rainfall in the Mid-Atlantic this year severely impacted the field operations required to create the runoff facility necessary for this project. As a result, data collection pertaining to these two objectives will not commence until 2004.

The native slope of the area selected for the runoff facility initially ranged from 0.5 to 4.5 percent with a cross slope of about 1.5 percent. In mid-July, the area was re-graded to create three small (12 ft by 30 ft), and large (40 ft by 125 ft) size plots, each having a uniform 3.5 % grade with no measurable cross-slope. Care was taken to remove and re-grade only the top soil horizon within each plot area. This resulted in a multi-tier plot configuration.

The entire area was seeded with perennial ryegrass to minimize erosion and to stabilize the newly formed contours. A six-inch mainline, used to supply water to the entire turf farm, was extended to the upslope side of the plot area in August. Three 4-inch lines were connected to the 6-inch line to allow independent simulation of rainfall to each large plot. Use of 4-inch feeder lines will permit rainfall intensities up 2.5 inches per hour.

Significant progress was made in development of the field-scale rainfall simulator that will be used in this project. Over the summer, one of the two simulators required for this project was built. In addition, an extensive evaluation of the rainfall distribution pattern for the simulator was performed by conducting several individual sprinkler head audits. The effect of different sprinkler head spacings and arrangements on the uniformity of application of the simulator was examined using software (SPACE Pro) developed by the Center for Irrigation Technology at California State



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University, Fresno.

Current field efforts are directed at completing installation of the sample collection systems located at the base of each plot. A prototype collection system is currently being installed at the base of one of the large plots. The remaining plot runoff collection systems will be installed once proper operation of prototype collection system has been verified. We anticipate that all plot runoff collection systems will be installed prior to the start of the 2004 growing season. A tentative target date of May 1 has been set for seeding the plots to creeping bentgrass.

Summary Points

- Unusually frequent and heavy rainfall in the Mid-Atlantic in 2003 severely impacted the field operations required to create the runoff facility necessary for this project. As a result, data collection pertaining to these two objectives will not commence until 2004.
- One of the two rainfall simulators required for this project was built. In addition, an extensive evaluation of the rainfall distribution pattern for the simulator was performed by conducting several individual sprinkler head audits.
- All plot runoff collection systems will be installed prior to the start of the 2004 growing season.