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## **Improved Estimation of Nutrient and Pesticide Runoff Losses from Golf Courses and Residential Lawns in the South Atlantic-Gulf Region**

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Turfgrass is the most intensively managed biological system in metropolitan areas. Currently, over 40 million acres of turf are estimated to be growing in the U.S. Following the national trend, turf acreage in Mississippi is expanding at a steady pace. Mississippi currently has an estimated 800,000 residential lawns comprising 300,000 acres and over 2,500 athletic fields. These figures do not include turf maintained at city parks, schools, churches, cemeteries, airports and industrial/commercial sites. An estimated 170 golf courses (ca. 15,000 A) are also in operation in MS. In addition, about 2 million A of highway roadsides are maintained in Mississippi, a significant portion of which are treated with one or more herbicides each year. In terms of residential lawns, homeowners tend to apply more chemical than is necessary for effective pest control. As a result, the use of pesticides by homeowners may be as high as 5 to 10 lbs. per acre, almost ten times more chemical per acre than is used by farmers. The intensity of pesticide and nutrient use, coupled with the anticipated continued growth in turf acreage, suggests that concerns over the impacts of turf chemicals on surface water quality will likely increase over time. Unfortunately, current models used to estimate runoff from managed turf are not accurate, making it difficult to allocate between agricultural and urban sources of contamination and to assess overall turf impacts on water quality. This project is designed to improve the estimation of turf chemical runoff from warm-season turf managed according to conditions found on golf course fairways and residential lawns. Runoff plots planted in Bermudagrass and Zoysiagrass are being established at MSU's Blackbelt Experiment Station and will be used to study the effects of grass species and management regime on turf chemical runoff using simulated rainfall. Laboratory studies are being conducted to assess the role of thatch on pesticide runoff. This research is part of a larger study that includes Maryland, Oklahoma, and Minnesota that is designed to determine regional differences in turf chemical runoff. Each study site will use the same EPA-approved field protocol that involves the application of 2,4-D herbicide, flutolanil fungicide, and chlorpyrifos insecticide.