

Vegetative Buffer Types and Sizes for Controlling Fairway Runoff

John Stier and Wayne Kussow

University of Wisconsin

Objectives:

1. To determine the relative efficacy of two types of vegetation, turfgrass and prairie.
2. To determine the effect of buffer strip to fairway ratio in controlling fairway runoff, particularly during the first couple years of establishment.

Start Date: 2003

Project Duration: three years

Total Funding: \$36,145

Prairie vegetation is often touted as a preferred buffer strip, but its long establishment time and low plant density compared to turf may reduce its effectiveness as a buffer vegetation compared to turf. In addition, several states have, or are considering, mandated buffer strips around managed turf areas to prevent runoff contaminants from reaching surface waters. Information on the size, particularly the ratio, of vegetated buffer strips is needed. The project objectives are to 1) determine the relative efficacy of two types of vegetation, turfgrass and prairie, and 2) buffer strip to fairway ratio to control fairway runoff, particularly during the first couple years of establishment.

Tod Blankenship, superintendent of Wisconsin River Golf Club in Stevens Point, WI, has decided to seek other



Galvanized steel runoff collection flumes (1 m) were installed.

employment. Although currently still employed at WRGC, he has dropped out of graduate school and is no longer able to devote the time to the project as initially conceived. Subsequently, we have hired a UW-Stevens Point student, Roberta Dettmering, to assist with plot maintenance and sample collection. She is very conscientious and has been performing above expectations.

Plots were dormant-seeded in 2003 and sample collection began winter of 2004. Record-setting precipitation caused one of the fairway replications (Fairway 9) to be continually flooded until mid-July; consequently, the seedings failed and will be replanted this fall. Plots established well on Fairways 4 and 8, with fine fescues completely filling in the buffer strip plots by late spring. Annual weeds largely filled in the prairie plots during the summer, though by July germination of some prairie plants could be seen.

The wet spring occasionally caused groundwater to enter the culverts in which runoff collectors were placed and interfere with sample collection. Concrete bases are being placed at the bottom of the culverts in order to prevent the problem next year.

Hundreds of samples have been collected from over 35 dates on which runoff occurred in at least some treatments. Samples have been analyzed from four dates (May - August) which yielded the most complete set of samples. Plots in Fairway 4 had an average of 13 times more runoff than plots on Fairway 10. Total phosphorus, water-soluble phosphorus (orthophosphorus), and biologically active phosphorus differences between the fairways were of a similar magnitude.



Field plots were developed during summer and autumn of 2003 at the Wisconsin River Golf Club.

Biologically active phosphorus is an estimate of the type deemed responsible for algae blooms in ponds and lakes.

Vegetation type did not seem to affect runoff during the establishment year. Buffer strip ratio does seem to have an effect, but more sample analysis is required to determine its importance. The remaining samples from 2004 will be analyzed soon and sample collection will continue during 2005.

Summary Points

- Information on the size, as well as the ratio of buffer width to fairway width, of vegetated buffer strips is needed.
- Prairie seed was obtained from Prairie Nursery which included flowers and grasses. A commercial fine fescue seed mix was obtained from L.L. Olds Seed Co. (Madison, WI) which contained Chewings, creeping red, and hard fescues.
- Plots in Fairway 4 had an average of 13 times more runoff than plots on Fairway 10.
- Vegetation type did not seem to affect runoff during the establishment year. Buffer strip ratio does seem to have an effect, but more sample analysis is required to determine its importance.