

Vegetative Buffer Types and Sizes for Controlling Fairway Runoff

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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 mandated, or are considering mandating, buffer strips around managed turf areas to prevent runoff contaminants from reaching surface waters.

Information on the size of vegetated buffer strips is needed. The project objectives are 1) to determine the relative efficacy of two types of vegetation, turfgrass and prairie for use as vegetative buffers, and 2) to determine the effect of buffer strip to fairway ratio in controlling fairway runoff, particularly during the first couple years of establishment.

Tod Blankenship, superintendent of Wisconsin River Golf Club in Stevens Point, WI, began his M.S. degree program at the University of Wisconsin-Stevens Point in January, 2003. The runoff project

will be used to meet his thesis requirements for the M.S. degree.

Plot areas originally identified in autumn, 2002 had to be redefined in summer, 2003 at the request of the golf course owner. The plots were developed in the roughs which drain fairways #4, #8, and #9. Each fairway is considered a replicate, using a randomized complete block design. Treatments include 2:1, 4:1, and 8:1 fairway to buffer strip ratios, with one ratio each of prairie or fine fescue mixtures. A seventh treatment in each replicate is a no-buffer strip plot.

Soil samples were collected in spring 2003 for pH and nutrient analyses. Plots were surveyed and found to have a slope range from 1 to 4%. Existing turf was stripped in mid-summer and the soil tilled. No perennial weeds such as quackgrass existed in the plots, so a non-selective herbicide treatment was not necessary. Since soil pH was low (4.88), sufficient lime and basic fertilizer were added to bring the soil pH to 6.0. Phosphorous and potassium was applied in early August to bring soil test levels up to 20 and 60 ppm, respectively. Soil was leveled and smoothed.

Galvanized steel runoff collection flumes (1 m) were installed during August. Each collection flume has a cover to prevent debris deposition. Nalgene jugs were installed in pits below each collection flume to hold runoff water until it can be quantified and sampled.

Heavy-duty plastic landscape edging was used to define the side boundaries of each plot. A 0.3-meter border was added between each experimental unit to further reduce the potential for adjacent plots to influence one another.

A commercial prairie seed mixture 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 were seeded in early November as a dormant seeding.



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

creeping red, and hard fescues. Plots were seeded in early November as a dormant seeding and covered with Futerra blanket to prevent erosion during winter and spring thaws. A weather station with rainfall collection bucket and soil moisture sensors will be placed on-site in November. Data collection will begin during winter 2003-2004.

Summary Points

- Information on the size, as well as the ratio of buffer width to fairway width, of vegetated buffer strips is needed.
- Soil samples were collected in spring 2003 for pH and nutrient analyses.
- Galvanized steel runoff collection flumes (1 m) were installed during August.
- A commercial prairie seed mixture 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 were seeded in early November as a dormant seeding.



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