2016-05-555

Improved Wheatgrass Turf for Limited Irrigation Golf Course Roughs

Joseph G. Robins and B. Shaun Bushman

USDA ARS Forage and Range Research, Logan, UT 84322

Project Objective(s):

1) Evaluate performance of elite wheatgrass turfgrass populations for turfgrass quality in monoculture and mixture conditions.
2) Characterize the effect of mowing height and irrigation replacement on wheatgrass turfgrass quality.

Start Date: 2015

Project Duration: 3 years

Total Funding: $40,440

As demand increases for western U.S. water resources, their availability for landscape irrigation, including golf courses, will become more limited. While player expectations and gameplay require high performing turfgrass for playable areas of courses, there remains the possibility of using grass species with lower quality for the less-used areas of the rough and out-of-bounds areas. This would allow superintendents to manage these areas with lower inputs, including minimal to no-irrigation water, depending on the species used.

The wheatgrass species are well-adapted to this type of scheme. The wheatgrasses are native to semi-arid to arid regions of Eurasia and North America. These regions are characterized not only by aridity, but also by extremes in temperature and grazing intensity. Thus, they are species that are potentially well-suited for low-maintenance turfgrass situations. In their natural conditions, the wheatgrasses possess low turfgrass quality and show limited response to inputs of fertilizer and irrigation when managed as turfgrass. However, this may be a plus to golf course management where limitations on fertilization and irrigation may be a positive.

The USDA (Logan, UT) turfgrass breeding program works on four different wheatgrass species. These are crested, intermediate, thickspike, and western wheatgrasses. Crested and intermediate wheatgrass are native to Eurasia, but both possess a long history of use in the western U.S. for site stabilization and forage production on dryland pastures and rangeland. Thickspike and western wheatgrass are native to western North America and are rhizomatous species with the potential to produce loose sods. The USDA breeding efforts for turfgrass in these species has focused on truly low-maintenance situations, such as roadsides and recreational properties, where almost no management will be used. However, these populations may be well-suited for use on less-used areas of golf courses.

In fall 2016, we established plot of experimental turfgrass populations of these four species. Each species was grown either in monoculture, or in two- or three-way mixes with the other wheatgrass species or with other cool-season grasses, Kentucky bluegrass and hard fescue. The plots established

well in 2016 and treatments and data collections began in spring 2017. Aside from wheatgrass populations (mixes), the treatments were a 2 x 2 factorial of mowing height and irrigation level. The mowing heights were 3 inches and 2 inches. The irrigation levels were 50% evapotranspiration replacement and no supplemental irrigation. In 2017, we mowed plots to the corresponding mowing height on a weekly basis. We also applied sufficient irrigation to replace 50% of the evapotranspiration rate on a weekly basis. We collected data weekly by taking digital images of each plot.

We completed data collection for the year in October. We are now processing digital images to convert them to quantitative data. Once finished, we will complete the analysis for the 2017 data. We will take another year of data in 2018. At the completion of the study, we will publish a peer-reviewed scientific journal article and have the information to make recommendations to turfgrass managers for improved wheatgrass turfgrass management.

- Completed year 1 of data collection.
- Preliminary data analysis and results available in the next few months.
- Will complete study in 2018.

Figure 1. The USDA (Logan, UT) turfgrass breeding program works on four different wheatgrass species. These are crested, intermediate, thickspike, and western wheatgrasses.

Figure 2. The USDA breeding efforts for turfgrass in these species has focused on truly low-maintenance situations, such as roadsides and recreational properties, where almost no management will be used. However, these populations may be well-suited for use on less-used areas of golf courses.