

Consumptive Water Use of Inland Saltgrass, Seashore Paspalum, and 'Tifway' Bermudagrass in a Semi-arid Climate

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Objectives:

1. To compare the consumptive water use rates (ET) of 'Sea Isle 1' seashore paspalum, 'Tifway' bermudagrass, and A48 and A119 inland saltgrass grown in the semi-arid climate of southern Arizona.

Start Date: 2005

Project Duration: two years

Total Funding: \$5,000

Seashore paspalum is an "exotic grass" which was introduced into the Americas via slave trading as bedding and feed. Its origin is from tropic to semi-tropical locations and is associated with coastal locations. Like native inland saltgrass, seashore paspalum tolerates salty water/salty conditions as long as the salts can be flushed through the rootzone. There are several cultivated varieties of seashore paspalum, but inland saltgrass is under development for use as a turfgrass species.

If these two species are going to be used as turfs in the southwestern US, their water use must be known. The evapotranspiration (ET) rates and consumptive water use of seashore paspalum and inland saltgrass are not known in a semi-arid environment. In addition, it is not known how those ET rates compare to the consumptive water use rate of 'Tifway' bermudagrass.

Lysimeters were made from 6" diameter x 14" deep PVC pipe and were used to measure the water use of four grasses ('Sea Isle I seashore paspalum, A48 and A119 saltgrass, and 'Tifway' bermudagrass). Each lysimeter was filled with calcined clay and each of the four grasses was planted into separate lysimeters, which then fit inside special sleeves in the soil. The four grasses were established in 2004 in 10 x 10 foot plots at the University of Arizona. Each grass appeared eight times in the field, each with a lysimeter located in the middle of each plot.

For the 2005 season (year 1), the differences between grasses was statistically significant on 50 of the 56 ET days, and on 65 of the 80 days in 2006 (year 2). So over two seasons, the grasses showed true differences in ET on 115 of 136 days.



Using weighing lysimeters made from PVC, the consumptive water use rates were determined in 2005 and 2006 for 'Sea Isle 1' seashore paspalum, 'Tifway' bermudagrass, and A48 and A119 inland saltgrass.

In both years, 'Sea Isle 1' seashore paspalum had the highest ET rates, and the highest consumptive water use when summed over the applicable ET days in each month. In both years, seashore paspalum stood alone as having the highest ET and consumptive water use in the dry summer months. This was true in June and July 2005, and for May, June, and July in 2006.

Also during the dry summer months, A48 saltgrass used the least amount of water (June 2005), as well as May and June of 2006). In July of both years, 'Tifway' bermudagrass and both A48 and A119 saltgrass turfs used the same amount of water, which was less than that of seashore paspalum. In late summer, 'Tifway' bermudagrass used the least amount of water (August and half of September 2005, and for half of September 2006). Saltgrass A119 essentially had the same ET and consumptive water use as 'Tifway' bermudagrass, with the exception of September 2005, when 'Tifway' used the least amount of water.

For both years, the total consumptive water use for 136 days was 1,111 mm for seashore paspalum, 1,004 mm for 'Tifway' bermudagrass, 958 mm for saltgrass A48, and 996 mm for saltgrass A119. As a percentage of the consumptive water use of seashore paspalum, 'Tifway' bermudagrass, A48, and A119 used 93%, 89%, and 92%, respectively.

Summary Points

- In both 2005 and 2006, 'Sea Isle 1' seashore paspalum had the highest ET rates, and the highest consumptive water use when summed over the applicable ET days in each month.
- For both years, the total consumptive water use for 136 days was 1,111 mm for seashore paspalum, 1,004 mm for 'Tifway' bermudagrass, 958 mm for saltgrass A48, and 996 mm for saltgrass A119. As a percentage of the consumptive water use of seashore paspalum, 'Tifway' bermudagrass, A48, and A119 used 93%, 89%, and 92%, respectively.