Benchmark Farms Project

1998 Leatherleaf Fern Water Use
Technical Fact Sheet SJ99-FS1

About the Benchmark Farms Project

The Benchmark Farms Project is an agricultural irrigation monitoring project managed by the St. Johns River Water Management District (SJRWMD). SJRWMD monitors the water use at a representative number of sites in a crop area to evaluate crop-specific water use. Rainfall is also monitored at most sites. Grower participation in the project is voluntary. SJRWMD is responsible for the installation and expense of the monitoring equipment and the collection of data. The project is currently limited to monitoring irrigation water use on citrus, commercial ferns (leatherleaf and tree), and potatoes — the three largest agricultural water use crops, respectively, in SJRWMD. The entire Benchmark Farms Project network consists of 180 sites — 63 sites in the potato area, 68 sites in the citrus area, and 49 sites in the fern area.

Leatherleaf fern is the predominate cut foliage crop produced in the United States and the most valuable floricultural crop produced in Florida. Almost all leatherleaf fern grown in Florida is produced in SJRWMD, primarily in Putnam, Volusia, and Lake counties.

In 1998, the monitoring network in the fern-growing area consisted of 40 leatherleaf fern sites; data from these sites were used to produce the results in this fact sheet. The leatherleaf fern site network is located in Putnam, Lake, and Volusia counties, with these counties accounting for 4, 6, and 30 sites, respectively. The network also includes sites producing tree fern; however, these are not included in this fact sheet.

Leatherleaf Fern Water Use in 1998

Leatherleaf fern is a perennial plant, and irrigation is generally required 12 months of the year. The predominate method of irrigation is overhead sprinkler. The irrigation system is also used to apply water for freeze protection because frost is damaging to leatherleaf fern. Irrigation water may also be used for chemigation, but any extra amount used for chemigation is minor compared to the amounts used for irrigation and freeze protection. The water use reported in this fact sheet is total water used, including water used for both irrigation and freeze protection.

During 1998, there were approximately 5,500 acres of irrigated leatherleaf fern in SJRWMD. The average total water use for leatherleaf fern during 1998 was 33.19 inches. The total volume of water used for leatherleaf fern in the tri-county area was 182,545 acre-inches (33.19 inches x 5,500 acres grown), or 4.96 billion gallons for the year.

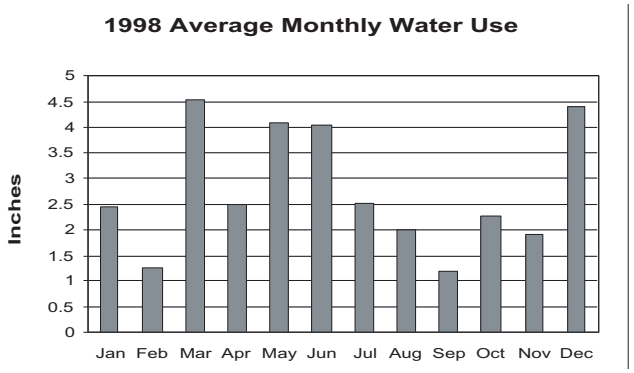

Figure 1

The months of March and December 1998 had the highest irrigation water use (Figure 1), probably due in part to water used for freeze protection during those two months.SJRWMD has not yet identified a reliable method for separating the monitoring of water used for irrigation and the monitoring of water used for freeze protection. However, the water used for irrigation alone can be estimated by calculating the average monthly water use during the seven typically non-freeze months (April through October). In 1998 the monthly average was 2.66 inches. Summing this monthly average would yield an estimated yearly water use for irrigation of 31.92 inches in 1998. The difference between the average total water use of 33.19 inches and the estimated 31.92 inches for irrigation would leave only 1.27 inches for freeze protection. Since the 1998 calendar year experienced very mild temperatures, it's highly possible that the average freeze water use was less than two inches.

Rainfall

The 30-year average yearly rainfall for the fern-growing area was 58.42 inches (NOAA rain gauge at De Land). During 1998, the rainfall totaled 47.45 inches.

Compared to the 30-year monthly average, rainfall for February 1998 was almost three times higher than average, while April through June 1998 was three to eight times lower than average (Figure 2). In turn, the irrigation for these three non-freeze months was high.

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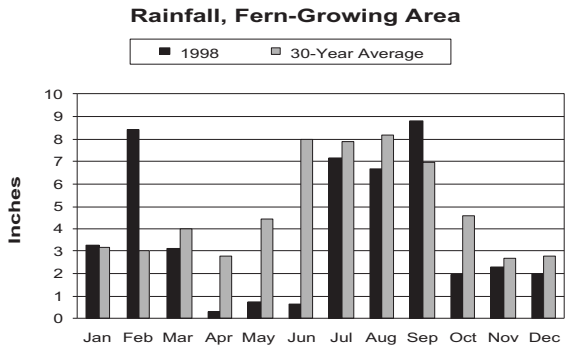

Figure 2

Variation in Use for 1998

Site-to-site variation: Fern water use varies considerably among sites due primarily to differences in soil types, localized rainfall patterns and freeze events, and fernery management. During 1998, the site water use ranged from a minimum of 11.73 inches to a maximum of 71.57 inches. The average use was 33.19 inches, with a standard deviation of 12.14 inches. Approximately 30 percent of the growers used a total of between 20 and 29.99 inches and another 30 percent used between 30 and 39.99 inches (Figure 3). Approximately 70 percent of all growers used less than 40 inches.

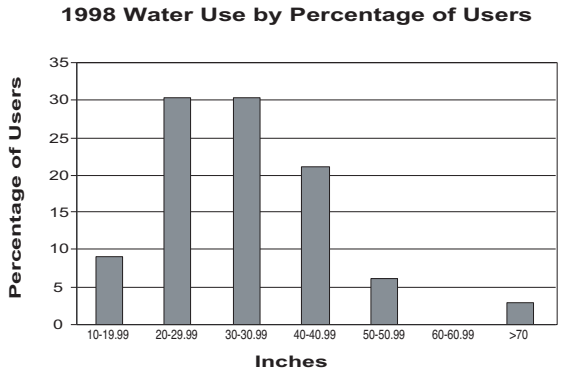

Figure 3

Seasonal Variation

Environmental conditions — predominately freezing weather — can cause annual water use to vary from one season to another. During the 9-year period of 1990 through 1998, 60 percent of all growers used less than 40 inches of water per year (Figure 4).

The average water use during the 1990 through 1998 period was 37.91 inches with a standard deviation of 15.31 inches. Average annual water use ranged from a low of 27.04 inches in 1994 to a high of 49.16 inches in 1995 (Figure 5).

Future water use is expected to vary, depending upon weather patterns, management practices, and technological advances.

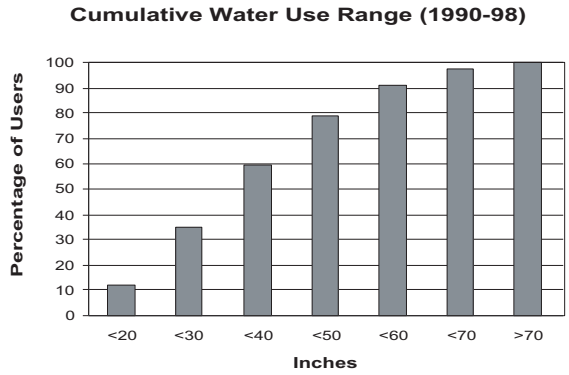

Figure 4

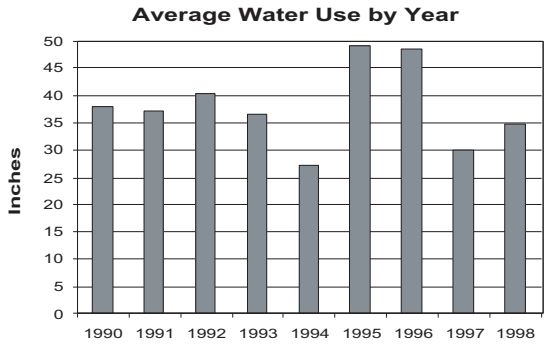

Figure 5

Project Accomplishments

The project has improved the water supply planning process by providing accurate assessments of agricultural water use. The project has also given staff the flexibility to adjust permit allocations to reflect realistic agricultural water use. The Benchmark Farms Project has benefited the district, the agricultural community, and the public by providing data, information exchange, district contact, and stakeholder involvement.

SJRWMD would like to thank all the farm cooperators, without whom none of this research would have been possible.

For More Information

The St. Johns River Water Management District is one of five water management districts in Florida. The District's mission is to manage water resources to ensure their continued availability while maximizing environmental and economic benefits.

To receive water use information on potatoes or citrus, or to receive additional information on leatherleaf fern, please direct inquiries to John Fitzgerald at the address listed on the front, by telephone at (386) 329-4876, or by e-mail at *jfitzger@sjrwmd.com*.