



UNIVERSITY OF  
FLORIDA

IFAS EXTENSION

## Irrigated Acreage in Florida <sup>1</sup>

A.G. Smajstrla, D.Z. Haman and F.S. Zazueta<sup>2</sup>

Despite its humid climate and average rainfall of 45 to 60 inches per year, irrigation is a necessary production practice for most crops in Florida. Most Florida crops are irrigated because typical sandy soils and non-uniform rainfall distributions often result in soil moisture below the level required for optimum production. In addition, many high-value specialty crops are grown in Florida, and large economic returns can be obtained by using irrigation to maintain optimum soil moisture levels. Finally, irrigation systems are extensively used for environmental modification, including frost or freeze protection and crop cooling. These practices are required for economic production of many Florida crops.

This publication reports irrigated acreage in Florida by crop and by irrigation system type. It documents growth in irrigated acreage from 1954 through 1996. It also compares Florida's irrigated acreage with that throughout the United States and with the other southeastern states.

The data source for the current irrigated acreage information in this circular is the *Irrigation Journal's* 1996 Irrigation Survey. Historical data from 1954 through 1987 were obtained from the *Census of Agriculture*, U.S. Bureau of the Census.

The *Irrigation Journal's* data were compiled from the Journal's annual survey of irrigated acreage. Their survey is conducted by mailing survey forms to irrigation specialists in each state. In Florida, we compile this information from several sources: 1) the Florida Agricultural Statistics Service annual crop survey data, 2) other IFAS publications, 3) communications with other IFAS faculty, and irrigation and water management specialists in the state, and 4) personal knowledge of Florida irrigated agriculture.

There are four major classifications of agricultural irrigation systems based on the method of water application: sprinkler, micro, surface, and seepage (subirrigation). In the *Irrigation Journal's* surveys, irrigation systems were classified as sprinkler, lowflow (microirrigation), and surface/gravity (including seepage or subirrigation) types. Because surface and seepage irrigation systems were not separately reported, they are listed as gravity-flow systems in this publication.

### U.S. IRRIGATED ACREAGE

Irrigation is extensively practiced in the U.S. In Figure 1, the total U.S. irrigated acreage is estimated

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2. A.G. Smajstrla, Professor; D.Z. Haman, Associate Professor; and F.S. Zazueta, Professor, Agricultural and Biological Engineering Department, Cooperative Extension Service, Institute of Food and Agricultural Sciences, University of Florida, Gainesville, 32611.

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to be 60.9 million acres. Irrigation is more widely used in the arid and semi-arid western U.S. than in the humid east. In Figure 1, the western U.S. is defined as those 17 of the 48 contiguous states located west of the Mississippi River. Alaska and Hawaii acres are included in the eastern states totals. Of the total 60.9 million U.S. irrigated acreage, 77.3% (47.1 million acres) are in the western states, while only 22.7% (13.8 million acres) are in the eastern states.

Figure 1 shows that gravity-flow irrigation systems account for over half (51.7%) of the U.S. irrigated acreage, and that most of this is in the western states. The U.S. total gravity irrigation system acreage is 31.5 million acres, of which 78.9% (24.9 million acres) is in the western states and 21.1 percent (6.6 million acres) is in the eastern states.

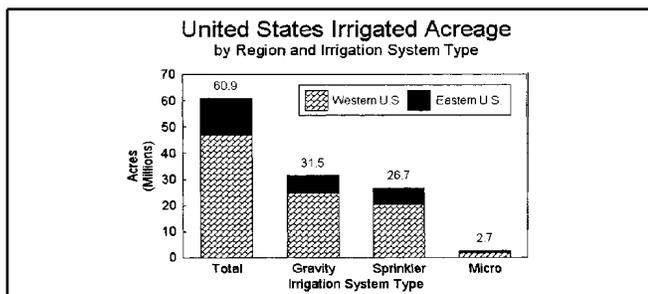


Figure 1 .

Sprinkler irrigation accounts for 43.9% (26.7 million acres) of the U.S. total irrigated acreage. Of these, 76.8% (20.5 million acres) is in the western states and 23.2% (6.2 million acres) is in the eastern states.

Microirrigation accounts for only a small portion of the total U.S. irrigated acreage. The total U.S. microirrigated acreage is only 4.4% (2.69 million acres) of the total 60.9 million U.S. irrigated acres. Of these, 65.4% (1.76 million acres) is in the western states, while 34.6% (0.93 million acres) is in the eastern states.

## GROWTH IN IRRIGATED ACREAGE

Florida's irrigated acreage has increased almost five-fold during the last four decades. Figure 2 shows that the total area was 428,000 acres in 1954. By 1996, the total irrigated acreage had increased to 2.11 million acres. The 1954-1987 data are from the U.S. Census of Agriculture reports, while the

1990-1996 data are from the *Irrigation Journal's* annual irrigation survey.

Figure 2 shows a reduction in irrigated acreage from the 1978 to 1982 surveys. This was primarily the result of two factors: 1) severe freezes which killed citrus trees and reduced citrus acreage, and 2) rapidly increasing fuel costs which reduced irrigation of pasture and other low cash value crops. Other than these four years, Florida irrigated acreage has increased with each U.S. Census of Agriculture Survey.

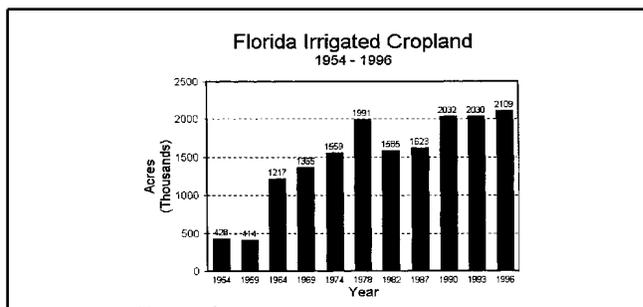


Figure 2 .

## TOTAL IRRIGATED ACREAGE

Florida ranks 10th in total irrigated acreage in the U.S. with 2.11 million acres (Figure 3). Florida's irrigated acreage is 3.5% of the U.S. total irrigated acres and 15.3% of the 13.8 million acres irrigated in the eastern U.S.

Figure 3 shows the top 10 states based on irrigated acreage. Most of the states on this list are located in the western U.S. About 39% of the U.S. total irrigated acreage is located in three western states: California, Nebraska and Texas. Florida (No.10) and Arkansas (No. 5) are the only eastern states that rank in the top 10.

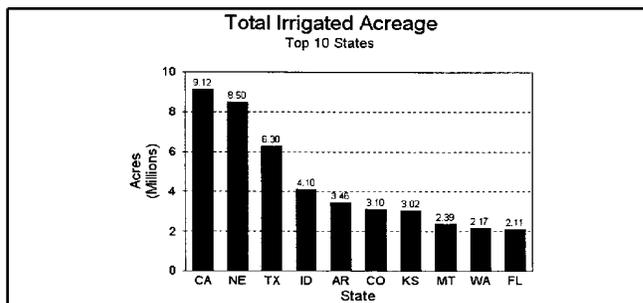


Figure 3 .

## GRAVITY-FLOW ACREAGE

Florida ranks 11th in gravity-flow (surface and seepage) irrigation system acreage in the U.S. with 945,000 acres (Figure 4). This is 3.0% of the 31.5 million U.S. gravity-flow acres and 14.2% of the 6.7 million gravity-flow acres in the eastern U.S.

Figure 4 shows the top 11 gravity-flow irrigated states. Again, most of these are located in the western U.S. Arkansas (No. 4), Mississippi (No. 10), and Florida (No. 11) are the only eastern states that rank in the top 11.

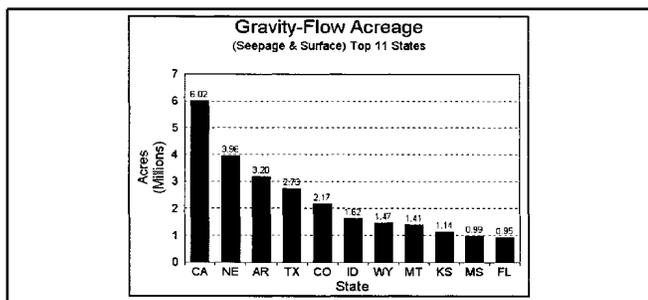


Figure 4 .

## SPRINKLER ACREAGE

Florida ranks 11th in sprinkler acreage in the U.S. with 634,000 acres (Figure 5). This is 2.4% of the 26.7 million U.S. sprinkler-irrigated acres and 10.2% of the 6.2 million sprinkler acres in the eastern U.S.

Figure 5 shows the top 11 sprinkler irrigated states. Except Florida (No. 11) and Georgia (No. 7) all of these states are located in the western U.S.

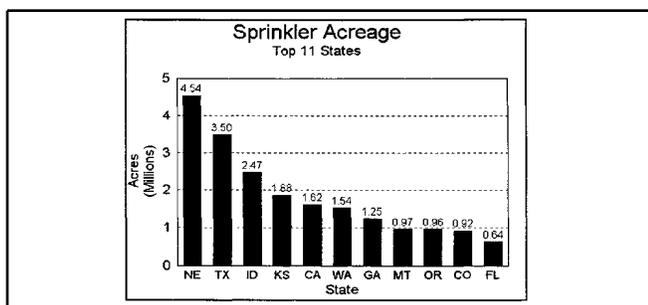


Figure 5 .

## CROPS IRRIGATED IN FLORIDA

A wide variety of crop types is irrigated in Florida. In Figure 8, crop types are classified as fruit crops, field crops, vegetables, grass/hay (pasture and

forage) crops, and ornamentals. Of Florida's 2.11 million irrigated acres, 39.4% (830,400 acres) are fruit crops, 32.7% (690,200 acres) are field crops, 14.2% (299,000 acres) are vegetables, 10.9% (230,000 acres) are pasture and forage crops, and 2.8% (60,000 acres) are ornamental crops.

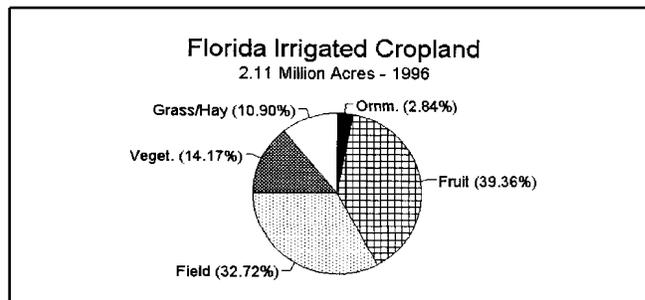


Figure 8 .

Figure 9 shows the distribution of fruit crop acreage by crop type. One crop, citrus, dominates with 812,000 acres, which is almost 98% of the fruit crop acreage.

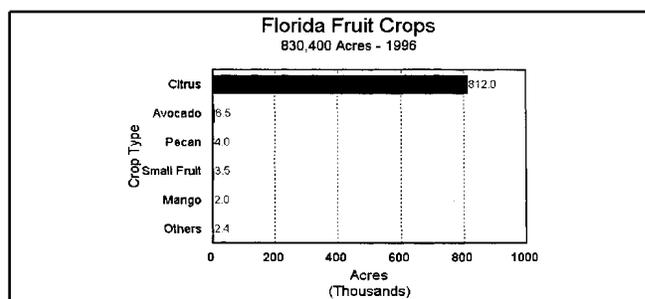


Figure 9 .

Figure 10 shows the distribution of field crop acreage by crop type. Again, most of this acreage is in one crop. With 450,000 acres, sugarcane accounts for 65% of the field crop acreage.

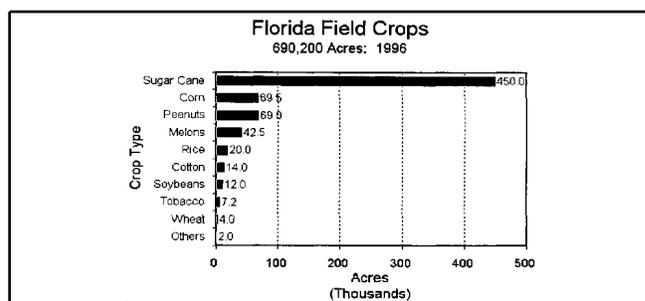


Figure 10 .

## IRRIGATION SYSTEM TYPES IN FLORIDA

Florida's irrigated acreage, classified by irrigation system type is shown in Figure 11. This figure shows that most of the 2.11 million acres in the state are irrigated by gravity-flow (seepage and surface) systems, followed by sprinkler and then micro systems. Approximately 44.8% (945,000 acres) are seepage and surface irrigated, 30.1% (635,000 acres) are sprinkler irrigated, and 25.1% (528,500 acres) are microirrigated.

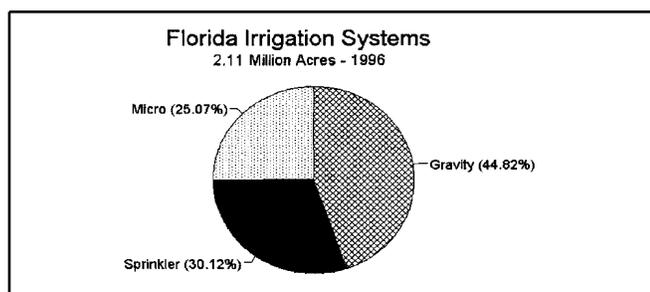


Figure 11 .

### Gravity-Flow Irrigation

Most of the gravity-flow irrigation system acreage in Florida uses the seepage irrigation method. The primary crops irrigated with this method are sugarcane and vegetables on high water table muck soils and vegetables and citrus on poorly-drained sandy soils. Except for flood irrigation of rice and citrus, surface irrigation is rarely used in Florida.

### Microirrigation

Most of the microirrigated acreage in Florida is citrus, using the microsprinkler (or microspray) method for irrigation and freeze protection. Some ornamental crops and other fruit crops are also irrigated with microsprinklers, while some vegetable, citrus, and ornamental crops are drip-irrigated.

### Sprinkler Irrigation

Sprinkler irrigation systems used in Florida can be classified as solid set, center pivot/lateral move, portable, and large gun systems ( Figure 12 ). Solid set sprinklers are primarily permanent systems used to irrigate citrus, other fruits, and ornamental crops. Center pivot and lateral move systems are permanent self-propelled systems primarily used to irrigate field

crops, pasture and other forage crops. Portable sprinkler systems are used for a wide variety of crop types, primarily vegetables, field crops, forage crops, and ornamentals. Large guns are also used for a wide variety of crops, including fruit crops, field crops, vegetables, pasture, and forage crops.

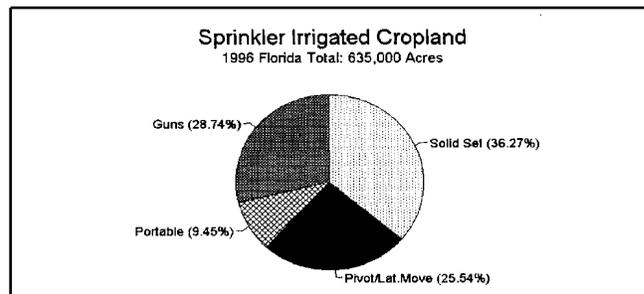


Figure 12 .

The distribution of sprinkler acreage by system type is shown in Figure 12. Of the 635,000 sprinkler irrigated acres in Florida, 36.3% (230,300 acres) are irrigated with solid set systems, 25.5% (162,200 acres) with center pivot and lateral move systems, 9.5% (60,000 acres) with portable systems, and 28.7% (182,500 acres) with portable and traveling guns.

## SUMMARY

Because of low water-holding capacity sandy soils, non-uniform distribution of rainfall, and the sensitivity to water stress of many high cash value crops produced, irrigation is widely used in Florida. Except for a reduction due to crop freeze damage and rising energy costs in the late 1970's and early 1980's, irrigated acreage has increased with each survey from 1954 to 1996.

A wide variety of crops is irrigated in Florida, including fruit crops, field crops, vegetables, ornamentals, pasture and forage crops. Irrigation methods extensively used in Florida include gravity-flow (primarily seepage irrigation), sprinkler, and microirrigation.

Florida is one of the leading states in irrigated acreage, ranking 10th nationally and second in the eastern U.S. in total irrigated acreage. Nationally, Florida ranks 11th in gravity-flow irrigated acreage, 11th in sprinkler irrigated acreage, and 2nd in microirrigated acreage. About 20% of the nation's

microirrigated acreage and 57% of that in the eastern U.S. is in Florida.