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## **Grower Attitudes and Perceptions of Lower Quality Water Problems in Citrus Production <sup>1</sup>**

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### **Introduction**

Irrigating citrus is an important part of maximizing productive fruit yields in Florida. As growers have located citrus groves south of the frost line, they have made what may or may not have been a conscious decision — trading protection from freezes for lower quality irrigation water (LQIW). Citrus growers in coastal areas of Florida, such as Brevard and Indian River Counties, face unique challenges because the water they use to nourish their fruit also has the potential to reduce fruit yield and fruit quality. Where groundwater that contains large amounts of total dissolved solids (TDS), including dissolved salts, is used, irrigation management and overall cropping practices must be adapted, which limit the negative impact of LQIW.

While the interaction between lower quality irrigation water and citrus production is well documented, little effort has been made to evaluate growers' attitudes and perceptions of these problems. Given the importance of water and the significance of citrus to the economic viability of these growing regions, it is vital that growers' attitudes be examined.

### **Focus Group Reports**

In order to gain a better understanding of the use, impact and management of low quality irrigation water on citrus in Brevard and Indian River Counties, researchers from the University of Florida's Department of Food and Resource Economics conducted two independent focus groups. Growers from these key areas were asked to share their insights, attitudes and technical expertise on these topics. Those in attendance at the 1995 meetings represented an average of 5,120 acres in Indian River County (9 growers) and 2,050 acres in Brevard County (4 growers). Growers reported the use of both surface water and groundwater sources for irrigation in growing both fresh and processed fruit.

### **Fruit Quality**

Grower concerns about the effects of LQIW (defined here as water with TDS in excess of 500 ppm) and high salinity levels were wide ranged. While some growers readily volunteered that low quality water can contribute to both reduced yield and fruit quality, others felt that leaf loss and appearance were affected but not fruit yield. It was

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acknowledged that other factors also affect yield and quality, including accumulated salinity of the soil, rainfall, temperature, wind and fertilization practices. Of course, the level of concern expressed could be directly related to the extent to which each owner's/manager's grove is irrigated. While some felt that the level of TDS in irrigation water was not a real problem, most seemed to recognize that the problem has gotten worse over time. Increased agricultural water usage and urban development were mentioned as reasons for the deterioration in water quality.

It is interesting to note that while there is some debate as to the effects of LQIW on fruit quality and quantity, there exists considerable research that suggests that fruit size, quality and crop yield can be reduced when TDS (salt concentration) exceeds a given salinity threshold. In addition to sodium, concentrations of boron, chloride, sulfate and other ions can negatively impact tree physiology.

### **Water Quality Concerns**

Generally speaking, concerns about LQIW were varied. While LQIW is a concern, it has been pointed out that water quality is something that can be controlled on a daily basis, unlike soil condition, temperature and rootstock. Both groups of growers recommended that whenever possible, it is important to blend surface water with groundwater to improve overall water quality. Because water quality fluctuates seasonally with the rainfall, water drainage systems may be more important to a grove's health than water availability, especially in wet years (i.e., 1995). Well depth and quality water needs for pesticides and other water-based sprays were also mentioned by both groups. The biggest, stated concern of growers is the regulatory agencies, which affect water quantity and/or availability.

Participants in Indian River County appear to be much more dependent on irrigation than their counterparts in Brevard County due to the older, average age of the trees and a higher water table. Indian River County growers reported TDS levels as high as 3,500 ppm, and agreed that TDS levels exceeding 1,500 ppm were critical. Participants differed in their opinions as to the level of TDS that

could be safely used (from 400 ppm to 1,400 ppm). Brevard County growers reported TDS levels as high as 1,800 ppm, and felt that water with 700 to 1,800 ppm could be used safely.

While the groups tend to focus on the challenges presented by LQIW management, it is also important for them to discuss citrus irrigation, which is beneficial to the ecosystem. Low quality irrigation water leaves the groves cleaner, with the added benefit of the groves providing a natural filtration system to recycle the water.

### **Long Term Grove Viability and Land Values**

While no questions were specifically posed to the participants regarding long-term grove viability and land values, questions pertaining to the importance of irrigation in citrus production, management practices for adapting to LQIW and the various irrigation systems available were posed. In response to being asked about their most pressing current concerns, both groups cited the lack of economic profitability as the top priority. Each of the characteristics discussed influences the cost of citrus production, fruit quality and quantity and the overall value of the land as a productive asset.

Given these factors, and the differences between the two counties, one might suspect that the two growing regions would "face differing fates." For example, does the greater dependence on lower quality irrigation water, and the problems thus entailed, mean that land values and economic profitability should differ drastically between the two counties?

According to economic data presented by economists John Reynolds and Ron Muraro, this may not be the case. In May 1999, Reynolds reported estimated land values for the region including Indian River County at \$6,956 per acre for mature oranges and \$3,759 for mature grapefruit. Mature orange acreage was estimated at \$6,780 and mature grapefruit at \$3,543 for the region including Brevard County. While these current values differ only slightly, the percentage change in land values from the previous year has changed more dramatically. Mature orange acreage in the Indian River County

region increased 1.1 percent in value from 1998 to 1999, while Brevard County's acreage increased 0.3 percent. Mature grapefruit acres in the Indian River County region increased 23.8 percent over 1998, versus 6.7 percent in the Brevard County region. Budgeting costs and returns reported by Muraro for both counties are virtually identical as both are aggregated into the Indian River Citrus Production area (along with Martin, Palm Beach and St. Lucie Counties).

The determining factor is not necessarily the costs of citrus production, but the value of production. This value is inherent in the land itself, regardless of water quality. As growers actively manage groves in spite of LQIW, they take steps that also influence tree productivity, fruit variety and fruit quality. These factors seem to be the major determinants of profitability and land values in the region.

### Acknowledgments

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