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Florida's Citrus Industry Uses Sustainable Production Practices¹

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Florida's citrus industry — 103 million trees on 853,742 acres — produced 117,780 tons of fruit during the 1993-94 season, totalling \$7 billion toward Florida's economy, according to University of Florida agricultural economists. Florida's citrus growers — clearly, the leading citrus producer within the United States and second only to Brazil on the world market — practice sustainable agriculture: producing a valued international commodity while enhancing environmental quality, natural resources, and the quality of life for farmers and society as a whole.

Florida citrus growers help preserve environmental quality by:

1. Utilizing fertilization and irrigation technologies that reduce nutrient inputs, thereby reducing potential leaching of nutrients into groundwater;
2. Recycling treated municipal wastes and animal manures in citrus fertilization programs;
3. Using integrated pest management strategies including disease-resistant cultivars, biological pest control, reduced pesticide use, and cultural practices to reduce the incidence and severity of pests and diseases.

WATER AND NUTRIENT MANAGEMENT

Most Florida citrus is grown on sandy soils which are low in natural fertility and which retain only a small amount of applied nutrients that are needed for plant growth and crop production. In the past, large amounts of readily soluble fertilizer were applied regularly to insure adequate nutrient availability against the leaching action of irrigation and rainfall. The introduction and widespread use of controlled or slow-release fertilizers has reduced the amount of nitrogen fertilizer applied from 25 to 80%, depending on tree age. Controlled release fertilizers are applied only one to two times per year, further reducing labor and energy inputs, compared with readily soluble fertilizers which were applied three to six times per year.

Technological advances in the production of plastic irrigation tubing has ushered in the age of low-volume drip and microsprinkler irrigation. These systems efficiently deliver both irrigation water and liquid fertilizers (fertigation) exactly where and when they are needed. Small amounts of fertilizer can be applied frequently and efficiently through miles of plastic irrigation lines controlled by computers that monitor soil moisture, rainfall and evaporation, thereby reducing nutrient leaching. In a 1992 study, approximately 80% of surveyed growers irrigated their groves with microsprinklers or drip systems, and 60%

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of those systems were designed for fertigation. Citrus growers have also learned that fertilizer rates can be reduced even further for young and mature citrus trees that have sustained moderate to severe cold damage.

WASTE MANAGEMENT

In the past, sewage and animal manures were considered "wastes" to be disposed of. Now, cities and counties throughout Florida pump treated wastewater onto thousands of acres of citrus groves — recycling effluents, providing irrigation water and nutrients, and reducing agricultural demands on Florida aquifers and, in fact, recharging those aquifers. High-quality processed sludge, or biosolids, as well as chicken and cow manure, are being applied in citrus fertilization programs, thereby utilizing a renewable "resource" that might otherwise present a disposal problem. Leaf and soil analysis, frequently used by growers to monitor and improve their fertilization programs, provides an additional barometer of nutrient input.

PEST MANAGEMENT

Florida's sub-tropical climate, with high rainfall and humidity, provides an ideal environment for citrus diseases, pests, and weeds. Fortunately, since about 90% of Florida's orange crop and 50% of its grapefruit crop is processed into juice and other products, chemical control of insects and diseases that affect the cosmetic quality of fruit is largely unnecessary, as compared with other fresh market fruit crops.

Florida citrus growers rank pest management as their most important information need; however, 91% of growers indicated in a recent statewide survey that they believed pesticide-use restrictions would increase during the next ten years. Growers, therefore, depend more and more on other pest-management strategies. As a perennial tree crop, citrus groves establish stable ecosystems that can support a variety of biological control agents, including a host of "friendly fungi" and insects that prey on citrus pests. When pests and diseases reduce fresh fruit quality and reduce tree vigor or yield, integrated pest management depends on grove scouting to determine the need and timing for pesticide applications as well as modification of cultural practices to minimize damage. As with other crops, growers use disease-resistant cultivars as the mainstay of plant-protection measures, drawing upon traditional breeding methods and the new approaches of biotechnology.

Perennial tree crops such as citrus provide habitats for a range of birds, mammals, and beneficial insects. Water-retention ponds, frequently required in large groves by water-management districts, create habitats for wading birds, alligators, and other species. Wildlife management concepts are also integrated into citrus production programs, especially within the range of the Florida panther and other native species.

The Florida citrus industry encompasses a wide range of production philosophies and practices, all focused on obtaining a fair market return while maintaining and improving the quality of our natural resources. This marriage of economic viability with environmental stewardship — sustainability — creates a challenging opportunity for all segments of society: farmers, homeowners, and industry.