Citrus Growing in North Central Florida: Perceptions and Change

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The devastating freezes of the 1980s are widely believed to have dealt a severe blow to the citrus growers of north central Florida. Yet the industry has rebounded in many places, but looks irretrievably lost in others. To those concerned with and involved in Florida's agricultural development, the damaging freezes of the 1980's pose several questions: (1) To what extent did these freezes change the livelihood of growers located at the northernmost fringe of the citrus belt in Florida?; (2) Did the freezes impose changes in the strategies of citrus cultivating?; (3) What do growers now think, after the freezes, about foreign competition in the world trade in citrus products, as well as foreign imports of these products; (4) What should be the response of the U.S and Florida governments in helping growers meet this foreign competition;(5) Will this region make a comeback to the citrus producing levels of the pre-freeze years?

The interviews conducted by the senior author on these questions and the results obtained by other researchers who also interviewed citrus growers in different areas of Florida (Miller and Downton 1993; Ferguson and Davies 1994) tend to confirm some pessimistic views but they also reveal that there are grove owners who have positive attitudes toward the future and have developed some interesting strategies to justify their optimism.

The authors focused on the northernmost fringe of citrus cultivation. This is a belt bordered in the north by the limit of economic citrus production and in the south by the beginning of the zone of optimal production. The belt runs from the northern edge of Citrus County across the southern half of Marion County, into the northern section of Lake County, before reaching the Atlantic coast at the

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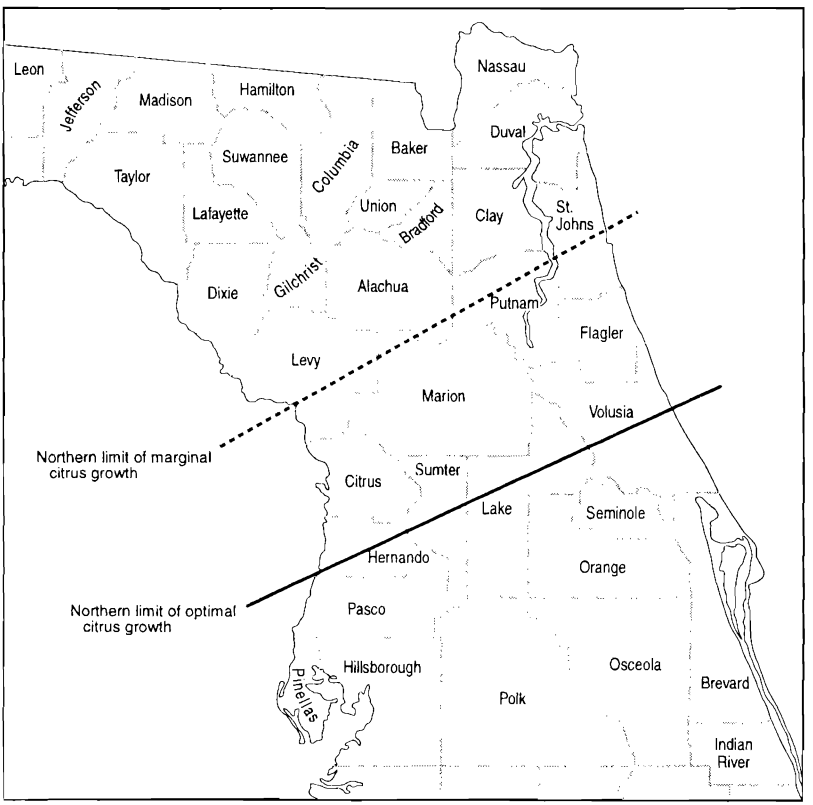
north end of Volusia County (Figure 1). Inside the belt, commercially viable orange and grapefruit groves did very well up until the early 1980s. More remote grove clusters occurred in Alachua, Putnam and St. Johns counties. After the freezes only a few groves returned to production, but at a greatly reduced level than before the freeze. It seems improbable that the northern part of the belt will ever rebuild commercial operations.

Profile of the Growers

A survey questionnaire was filled out by 86 growers in Lake, Marion, Putnam, Volusia, Seminole, and Orange counties. The answers reveal interesting personality traits and varied attitudes of

Figure 1



these private entrepreneurs toward the challenges posed by a changing environment. A profile of the interviewees shows that they are a rather mature population, dominated by males (only 12 percent are women), averaging 59 years of age, and with more than a third in their sixties. These growers are, by no means, poorly educated dirt farmers: 60 percent indicated having a college education and the possession of proper knowledge of the technicalities involved in citrus management. Seventy percent of the growers were sole owners, and 88 percent indicated that the grove was not their only source of income: they either had other full-time or part-time jobs, relied on the salaries made by spouses, received pension payments, or depended on the income generated by other family members. This is quite revealing, since it suggests that citrus growing for these individuals is not so much a livelihood, as it is a hobby supported by outside income. Thus, their attitudes vis-a-vis a collapse of this activity is not as threatening to them as long as their main source of income continues, and the value of land remains high. The growers definitely have deep roots in agriculture: 66 percent stated that they had other family members who were involved in agriculture in Florida, though not necessarily in citrus. Forty-two percent had inherited their groves, which had been in the family for an average of 59 years. While those aged 50 and older had usually inherited their groves, the younger owners were mostly newcomers. A large majority of the growers had been in the citrus business for more than twenty years.

The size of the groves varied greatly, ranging from 5,200 acres to only 3. A decreasing trend in property size over the years was revealed by the survey: from an average size of 300 acres in the 1970s there has been a reduction to 200 acres in the early 1990s. This finding suggests that there already was a contraction in size of groves before the freezes hit, and that the observed decline in citrus cultivation at the northern edge of the belt might have been prompted by other factors than just severe freezes.

Overall, these growers emerge as quite a hardy breed. With citrus in their blood, they persist on producing citrus in this area despite the danger of freezes, although for most the groves do not constitute their prime source of income.

Attitudinal Changes Prompted by the Freezes

An important goal of the investigation was to determine the motives that make some citrus growers persevere despite the

devastating effects of the 1980s freezes. When asked about the severity of these events, 73 percent of the respondents felt that they were more severe than the freezes experienced in previous decades (particularly the freezes of 1962, 1957 or 1940), and while there were differences of opinion as to which freeze was the most memorable, 41 percent agreed that the 1985 freeze was the worst of all. This response is in agreement with the tenet of disaster research that holds that people tend to recall the latest events as the most intense ones.

Questioned about whether they thought that the climate of Central Florida had undergone a permanent change over the last twenty years, and was therefore no longer conducive to citrus growing, answers were evenly divided between "yes, it has changed, "no, it has not," and "I do not know." This ambiguous response may be interpreted as uncertainty among the group about future climate variation, although they seem to appreciate past fluctuations. In fact, 59 percent held the view that the climate of Central Florida had cooled, but not to the point of making citrus growing too risky an endeavor. Slightly more than one half reported that they felt "confident" the activity would thrive again, while only 21 percent expressed the desire to "try to cut their losses," "move to another location," or simply "give up". These answers are strong indications that, despite the magnitude of the damages sustained from the 1980s freezes, most growers in this climatically vulnerable region have not abandoned their intentions to continue in the business.

Freeze Fighting Alternatives

Next it was asked whether those who persisted in growing citrus would continue to cope with freezes using traditional means and strategies or whether they were prepared to seek alternatives. Similar to the answers given to Ferguson and Davis who surveyed grove owners in South Florida, the growers in the northern belt reported using the preferred protection method of the 1990s, overtree sprinkling. This indicates a drastic change of strategy: in the 1970s only 5 percent used water sprinkling —relying more on heaters and tire-burning—while preference for this new method rose to 92 percent in the early 1990s. Another sign of change that surfaced from the survey — mirroring the findings of Ferguson and Davis — is grower interest in reliable weather information to predict frosts and freezes. In addition to radio and television, some growers

are now employing private weather services to alert them to take preventive actions, something that few did in the past. Nevertheless, unorthodox approaches to early warning were also unveiled by this survey. One grower, who was 81 years of age, stated that he continues to rely heavily on the folk knowledge of his grove workers to predict cold spells.

When it comes to the protection of young trees, soil banking emerged as the preferred alternative. There is a difference in attitude, however, between the growers of the northern and southern part of the belt. Those in the north seem to be losing interest in banking, while those in the south have been expressing an increased interest in this technique. The use of tree wraps as a form of cold protection has also grown. In the 1970s only 7 percent used this approach while in the 1990s 48 percent did so.

Scientific cultivating practices to deter freeze damage suggested by Ferguson and Davis, as well as scientists working for the Institute for Food and Agricultural Systems (IFAS), Gainesville, have been adopted by many of the growers. Many are now using root watering with micro-sprinklers, dripping pipes, applications of supplementary minerals — such as magnesium — to reduce cold damage, and are more concerned than in the past about the health of their trees (Jackson 1991). Even though a large percentage of growers felt that healthy trees in themselves constituted a plausible cold protection, most heeded Yelenosky's advice (1994) not to ignore any freeze protection device if they wanted to reduce the damaging impact of freezes.

Adaptive Strategies of Citrus Growers

During the last three decades citrus cultivation in Florida has experienced a technological revolution that, among other things has contributed greatly to the expansion of groves south of the northern belt, but also has contributed to the survival of groves in the northern belt. This "revolution" has entailed innovations in both citrus management and biological engineering. Among these innovations are the utilization of orange, grapefruit, and tangerine species genetically manipulated to withstand cold temperatures, resist diseases and pests, and produce higher yields (Tucker, Hearn and Youtsey 1995). The desired results are reached when a resistant rootstock (the root system and lower trunk of a citrus) is grafted onto a productive scion (the superstructure of a tree), since the resulting specimen combines the advantages of both tree elements.

When the northern growers who participated in the survey were asked to name all the rootstocks utilized, 70 percent preferred the sour orange as a cold hardy rootstock in new trees, followed by rough lemon with 53 percent (a soft cold hardy but fast growing rootstock), Swingle citrumelo (47 percent), Cleopatra mandarin (30 percent), and Trifoliate orange (9 percent).

The scions used today by growers are very different from those used before the 1980s freezes. They not only reflect changes in consumer taste but changes in cultivation practices. Scions today must have qualities previously regarded of little importance. Early maturing Hamlins are now enjoying great popularity and are preferred by 82 percent of the growers, followed by Navel (69 percent), the late maturing Valencia (57 percent), Parson Browns (47 percent),and Ambersweet oranges (29 percent). For grapefruit, the growers interviewed indicated preference for Red Marsh (74 percent), while White Marsh — a preferred variety in pre-freeze years — has decreased to 56 percent, followed by Duncan with 24 percent. Changes in popularity of varieties of citrus reflect a great increase in consumer demand for seedless varieties. Growers in the northern belt prefer early maturing varieties, since the harvest is more likely to have been completed before the grove experiences a freeze.

Looking into the Future

The survey revealed that growers are optimistic about the continuation of citrus cultivation in the northern belt. Forty-four percent thought that selected oranges and grapefruits would continue to be grown in the area for at least another 30 years. Close to 30 percent were pessimistic about the future of citrus growing in the belt, while the rest did not express an opinion. Those who have an optimistic outlook are trying to protect their investments by planting improved varieties of oranges and grapefruits capable of resisting cold outbreaks and producing early-ripening fruit, or have shifted to the late-ripening Valencia oranges which can be harvested for concentrate even if damaged by freezes. J.D. Carter (1998) in a survey of packaging plants in the northern belt that are processing the production, albeit not large, of small independent growers, also identified a sense of optimism among her informants.

Beside freezes, other uncertainties were mentioned as equally serious for the future of the industry. Competition from foreign sources of orange juice concentrates (cited by 44 percent of the interviewees) and a stable internal market within the United States

(36 percent) were two. Although, as a group the growers showed both entrepreneurial initiative and highly independent spirit, 57 percent of the respondents mentioned that government involvement is necessary to assure the survival of the industry, and 62 percent were in favor of imposing tariffs on foreign concentrates to curtail the flow of imports.

Since freezes are inevitable, the answers from optimistic growers reveal that they are utilizing all the means, information and new technologies available to minimize the effects of freezes on their groves. Within the belt, the citrus groves will probably remain small in size and become very specialized in order to increase efficiency. Few, however, will provide their owners with their only source of income.

When asked to give advice to young and enterprising individuals interested in cultivating citrus, 70 percent of the interviewees replied that they would not recommend entering this business. Interestingly enough, when the same growers were asked what advice they would give to young entrepreneurs insisting on becoming involved with citrus growing, 77 percent recommended setting a totally new grove. This reveals that starting from scratch with new rootstocks, improved scions, and adequate methods of cold protection seems to be still a viable alternative to those willing to take another chance. Only 23 percent suggested entering this activity using an old grove.

How willing were the growers to continue to keep their groves in operation despite such physical and economic environmental uncertainties? Slightly more than half (51 percent) said they were prepared to stay in the area if no other economic alternative opened up, but, they would try different sites for the new groves in order to spread the chances of being hit by freezes. The rest saw the only feasible alternative for success was to move south, out of the reach of freezes.

Conclusions

This investigation revealed several interesting facts about citrus cultivation on the extreme northern edge of Florida's citrus belt. For one, citrus cultivation at a large scale, as is found in the Indian River area and west of Lake Okeechobee, no longer is present in the region. Those growers who remain no longer earn their living from citrus. Most are elderly, have other sources of income, and it is

doubtful if many have heirs who, following their death, will continue to raise citrus.

In those locations where exposure to killing northern winds proved fatal during the severe 1980s advection freezes, groves have vanished completely and the land has been turned into pasture for cattle operations, or to tree farms for pulp production. In the southern counties of the northern belt the picture is somewhat different. In frost-protected locations, as those in the vicinity of ponds and lakes, new groves are thriving again and the industry exhibits all the signs of having returned to the levels of productivity of the pre-freeze years.

This has been achieved through a remarkable revolution in citrus cultivation, which entails biological engineering, but also novel techniques in space utilization. New cold-hardy varieties are less bulky than the traditional ones and the spacing between trees has been reduced. Thus, more trees are planted in the same space, increasing the production per acre. The new species reach production ages very early and are ready for commercial exploitation after five or six years. Total yield per tree may not be as large as it was in the past, but — as indicated above — due to the greater tree density, in many new groves past productivity has even been exceeded.

Traditional frost protection measures have been abandoned. The big wind machines and kerosene burners, that were effective against radiation freezes of the past, are typically found rusting in the middle of abandoned groves. The same has happened to many sprinklers that were mounted on top of tall water pipes in wind-exposed locations. These symbols of a once flourishing citrus landscape in northern Florida are now a reminder of the ineffectiveness of these devices against the severe advection freezes of the 1980s (Weischet and Caviedes 1987).

The absence of damaging freezes for a full decade (1989 to 1999) is shown by the healthy development of new groves, particularly at the southern edge of the belt. In the northern part of this belt only a few healthy groves are found, commonly in locations that offer protection from freezing temperatures. These isolated oases of citrus cultivation do not offer solid proof that citrus is grown here for economic gain. The growers who did not quit after the 1980s freezes are a group of diehard, aged individuals whose numbers are steadily falling. It is unlikely that the decline will be significantly offset by younger, enterprising individuals, who want to enter the business.

The specter of freezes has subsided, and the threat from foreign competition has not proven deleterious to the industry, since the demand for citrus juices has dramatically increased in the 1990s. Under these circumstances the belt under study reveals a particular dichotomy: radical transitions into alternative forms of land utilization and citrus-growing as a hobby at the northern edge of the belt, and revitalization of groves paired with modernization in citrus cultivation at its southern edge. These are signs of radical transformations in the agrarian landscape of North Central Florida, similar to the ones imposed by the freezes of 1897 and 1899, which prompted the abandonment of citrus cultivation along the St. Johns River and its relocation in the Central Highlands.

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