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**Citrus Oral History Project  
Globalization Research Center  
University of South Florida**

**Interview with:** Ron Muraro  
**Interviewed by:** William Mansfield  
**Location:** Lake Alfred, Florida  
**Date:** June 16, 2005  
**Transcribed by:** Wm. Mansfield  
**Edited by:** Wm. Mansfield

[Tape 1, Side A.]

**Bill Mansfield:** I always put a label on the disc by saying; This is Bill Mansfield from the University of South Florida's Globalization Research Center, on the Citrus Oral History Project talking to Dr. Ron Muraro—

**Ron Muraro:** It's just Ron Muraro. I'm not a doctor.

**Muraro:**

**Mansfield:** Okay, Ron Muraro, on June 15, 2005. In the University Florida's Experimental Station in Lake Alfred, Florida. And we always get people to start off by having them state their name and telling us when they were born and where they were born. So, Let her go.

**Muraro:** My name is Ron Muraro. I was born January 3, 1946 in Leesburg, Florida. That's in Lake County.

**Mansfield:** Tell me about your education, if you don't mind.

**Muraro:** I have an Associate of Arts Degree from what is now Lake Sumpter Community College, then a Bachelors' and a Masters' degree, in agricultural economics from the University of Florida.

**Mansfield:** How would you describe your current occupation?

**Muraro:** My current occupation is, I am a professor and Extension economist, working in the area of citrus; where I collect and compile cost information from the grower, production level, harvesting, packinghouse and sometimes processing, for the citrus industry. [I] also do similar comparative costs with some of the other major citrus producing countries.

**Mansfield:** How did you get in to working with citrus?

**Muraro:** I grew up on a small citrus farm. It was interesting for me and I continued on with it as an interest. An opportunity came for me to work back with the University, in extension education, in this area.

**Mansfield:** That must be great, to have grown up with [citrus] and then be able to continue to work with it. I guess with the crisis that citrus is in these days, it's comfortable not to be dependant on the sale of your oranges. I don't know.

But that's what this project is about, the impact of free trade legislation on Florida's citrus industry and the grower's response to that. So tell me, if you can, about the legislation, specifically the Free Trade of the Americas Act and the possibility that the protective tariff will be removed. Talk to me about the Brazilian "orange juice giant" and how that would—

**Muraro:** From what I understand of the proposed legislation, or the tariff is that it will be a trade agreement similar to, I'll refer to NAFTA [North American Free Trade Agreement], now what they're talking about is CAFTA [Central American Free Trade Agreement], for the entire Americas, particularly the countries of South America. They are looking at eliminating the tariffs in most of the trading commodities, or other products which they have between the countries.

**Mansfield:** Now, how is CAFTA related to the Free Trade of the Americas Act?

**Muraro:** I don't exactly know how it's related to it except that it is another free trade agreement. It encompasses the Central American countries and some countries in the Caribbean.

**Mansfield:** Does it contain the same legislation as the Free Trade Americas Act?

**Muraro:** I don't know.

**Mansfield:** Okay.

**Muraro:** I don't know any specifics on it.

**Mansfield:** Okay. I always tell people I rather them say, *I don't know* than try and make something up. That's when we get in trouble.

How has the Brazilian orange juice exports effected Florida's orange juice production?

**Muraro:** Well, this is something, which you may have also been told in discussions with other people. But in the 80's, with multiple freezes we had a reduction in production. Brazil was actually benefited to help us retain out North American market by supplying us juice.

As we recovered in our production and beginning the early 90's, when all of the new plantings from the mid to late 80's started producing fruit. Then a world supply situation came in juice, where historical prices. From the early 80's through—approximately (it depends on a few years there) from 1982 to 1991-92 we were in historical prices.

**Mansfield:** When you say historical prices you mean?

**Muraro:** High. Historically high prices. The two states of San Palo, Brazil and Florida represent about 80%, 85% of the total world's production of orange juice. At that point

the large supply of juice resulted in low to moderate prices. Depending on the season, the Brazilians imported more or less. I forgot what year it was, but one year in the mid-80's, Brazil that Brazil actually supplied 50%, maybe a little bit more of the total juice sold in the US. It dropped back substantially once we got into the 90's and it varied on seasonally at that point and I'm not sure what the percentage was, but it was much less.

As Florida got larger crops we became more able to actually supply almost all of the North American juice. Therefor Brazil imported less. They focused in the 90's to develop the European market and that's their predominate market. They are trying to expand into the eastern European countries and the Asian markets as well.

**Mansfield:** But aren't they also trying to continue in the North American market?

**Muraro:** Oh yes. They are importing to the North American market. It is sort of an "as need" or seasonal basis when they bring fruit in, juice in, I should say.

**Mansfield:** From everybody I've talked to and what I've read people in Florida feel if that protective tariff is eliminated that Brazil will be able to produce juice for less than it costs in Florida and just flood the Florida and North American market with orange juice.

**Muraro:** Well first of all, the cost of producing citrus in Brazil, compared to Florida is much less. I'm trying to think of the numbers. (I should have them in front of me but I don't.) They are the low cost producer in the world of orange juice. They have developed the delivery system through tanker ships, to deliver juice in a bulk form anywhere in the world, at a low cost. What these newer ships, that Citrosuco and Cutrale have brought on line in the last two years [have made Brazil] even more cost effective in the past two years, because of the larger volume, compared to the cost. The unit cost has gone down substantially. And being able now to be more cost competitive in delivering Not From Concentrate [orange juice] which had been primarily a Florida product.

**Mansfield:** That's the fresh orange juice, right?

**Muraro:** It's pasteurized, but it's not from concentrate. It's ready to serve.

**Mansfield:** And they can ship that these tankers?

**Muraro:** Yes.

**Mansfield:** Do they refrigerate it?

**Muraro:** It's refrigerated, yes. But they're designed to handle NFC [Not From Concentrate] product. But with the tariff, the tariff provides enough of a cushion to offset most of the cost difference of the production, processing, hauling, delivering and delivering to the US.

The major difference in the cost has been with harvesting. And—and—where the last numbers we have (we're trying to up date these) but the cost difference was two dollars a box [for] harvesting in Florida. [It cost] maybe fifty, sixty cents in Brazil.

**Mansfield:** Wow.

**Muraro:** That's delivered to the processing plant. [It includes] removal of the fruit from the trees and put on the trucks and delivering to the processor.

**Mansfield:** That's a pretty significant savings.

**Muraro:** Yes. And the devaluation that occurred, oh five or six years ago in Brazil, of their currency to US dollars also impacted the cost, reducing in dollar terms in the total comparison costs.

**Mansfield:** So it's just that much less expensive for Brazil to produce the juice.

**Muraro:** Yes. And much of that is built into the labor costs.

**Mansfield:** How, I'm trying to think. What has Florida's citrus industry done to keep that tariff in place? I know that the free trade legislation wants to remove it. But [the growers] are trying to keep it there. So how have they organized to keep it in place?

**Muraro:** The major grower organizations, Florida Citrus Mutual, taking the lead, have pulled together to—ah—I want to say to, to provide information to our state legislatures, the President (since it's his program) and the Trade Representatives for the FTAA. [They are pointing out] the reasons why [the tariff] is beneficial to Florida growers [and] US producers of orange juice. What they are focusing on is to have the tariff retained.

**Mansfield:** So it is essentially an education campaign to these people, to make they understand why it's good for Florida?

**Muraro:** Yes.

**Mansfield:** So why would it? What are they telling them?

**Muraro:** What they're telling them is, with out the tariff the cost benefit to the Brazilian juice being imported (and that's what we need to look at) would be—ah—. The cost difference between Florida juice going to the market and Brazilian juice imported, with out the tariff, would make the competitiveness and price and returns much less. The concern is a major contraction in the size of the Florida industry.

**Mansfield:** With out the tariff, Florida citrus would really suffer and a lot of people would go out of business?

**Muraro:** Very likely.

**Mansfield:** Okay. So how does that benefit every one? Oh—I'm not asking question very well. They are telling them; without the tariff Florida citrus growers are going to go under. And I suppose they are telling them, "*If they can't compete, that's what they*

*deserve.*” So what would [the growers] say beyond that? Why beneficial to keep Florida citrus in play?

**Muraro:** Well, as an economic impact study has shown, Florida citrus contributes around nine billion dollars to the state economy. This particular year, that we just past, was somewhat less because of the impacts of the hurricanes and reduction of production. But prices were somewhat better and there was some cushioning of that. But that’s a value that was generated by the Food and Resource Economics Department at the University of Florida. It has a ripple effect, going through the state economy. Particularly where the more rural counties where much of the citrus is grown. The suppliers, the fertilizer, the chemical suppliers, the equipment suppliers and others associated. Not only with direct employment, within the industry but also the local and particularly smaller rural communities and counties.

How will it impact them? It can impact the economic assessment for the county, the basis of value there. It would—I’m trying to think. Those are the major issues in the concern there. Another thing there is it would also have an impact on the land and grove value.

If prices and returns decrease substantially and you have a major capital investment, which being a tree crop takes fifteen to twenty years. You’re looking at it as an investment. You have an economic value, based on the same way income approach say of valuing a non-ag property of office buildings, a rental building, or something like that. Because the income stream would be reduced it would have a substantial reduction in that value, because of the returns there. This would impact the owners and what the losses they would incur there.

**Mansfield:** And how is that message being received in Washington and I guess, in San Palo?

**Muraro:** How is it being received? I think that’s a question—it’s a political question. Therefore I need to differ you to some of the organizations that work in it. They are—the indication is that—It’s political. In San Palo—ah—Let me from the Florida growers’

situation, they look at it as something that they need to be competitive. In San Palo, many of the growers are looking at it as an opportunity, where they hope they would be able to capture a higher return, per box, on their fruit if [the tariff] were removed. The question is how much would the price actually go down? Along with, how much would the grower in San Palo—ah—receive of that cost savings? If it is just a straight reduction in price of importing, then it may not change their returns.

Because you're going from a dollar, let's say for example [they save] seventy five to eighty cents, by removing the tariff, the playing field at the grower level doesn't change. It's just a lower price, bringing it into the [US]. Now that's over simplified, but we have to see how the market works through that.

**Mansfield:** Have you been in conversation from folks from Brazil?

**Muraro:** Some.

**Mansfield:** What are they saying?

**Muraro:** They are saying, you know, basically what they are saying is that they see it, again, as possibly an opportunity with the tariff removed, that the Brazilians can export more juice to the US which results in a larger return back to them.

**Mansfield:** I guess what I've heard you say is, if they remove the tariff it will hurt the Florida growers and also the equipment suppliers and fertilizer suppliers, the schools and businesses in the communities that are supported by Florida's orange production. But what I've heard you say is what the Brazilian people say is that it will just be a better economic opportunity for them. Do they offer any further explanations about how it would benefit them?

**Muraro:** Only that they would be able to export more juice here. The specifics of that, I haven't gotten from them yet.

**Mansfield:** Who have you talked with in Brazil?

**Muraro:** I've talked to growers and I've talked to some people at the University of San Palo and Pircicava and –ah—some people who are associated with =, or do processed fruit. But that's it.

**Mansfield:** I don't know how to put it, but is there any kind of—adversarial conversation? Or is it a reasoned conversation?

**Muraro:** For the most part it is reasoned. They asked the questions about the status of the discussions and what have you. But that's where it is.

**Mansfield:** I ask that question because from my perspective in Florida, I can see how it would hurt us and it is hard for me to see how it would benefit them.

**Muraro:** It can benefit them. If more juice is flowing here, even if they were producing more. If they are able to produce more and sell it, even at the given price they are receiving now, they'd have a larger cash flow coming in. And if it happens that the price they receive goes up, they'd have a higher cash flow on the given amount of fruit they are already producing.

**Mansfield:** Do you think, if they were to receive more money, larger profits in Brazil, do you feel like it would trickle out into the community there the same way that it does here?

**Muraro:** Yes. I think for the most part it would. What's paid in the growing and production area and to the people working the processing and harvesting end is similar to here. You may want to go to some web-sites you can locate. Here at the citrus research center, the Lake Alfred web-site and to other web-sites, [**Ava Citrus?**] [**Fundis Citrus?**]. We also have, and I forgot the name of the economic—but in Pircicava you can go there and pull up some information. They've done similar economic impact and what it means to their state and country.

But, yes [the money] would benefit [the larger Brazilian citrus community.]

**Mansfield:** You said the name of the University in Brazil was?

**Muraro:** It's the University of San Palo, the campus at Pircicava. [spells] P-I-R-C-I-C-A-V-A. I give that to you later.

**Mansfield:** That's okay. That's a better start of spelling it than I would have had on my own.

**Muraro:** It's the major agricultural university in the state of San Palo.

**Mansfield:** As long as the long as the protective tariff stays in place, the Florida growers will remain competitive. But should it be removed, what could the Florida growers do to stay competitive?

**Muraro:** They've been working. And there was the benefit of a price decrease in the early 90's. Because [processed orange juice] growers step backed and looked at what they were doing and found ways to become more—ah—cost effective.

I'll say when they had the high prices they kept the groves [immaculate]. Weed control and everything was, you know, it was like a showpiece, in most cases. Maybe that's not a go description but they were on top of everything, making sure the grass was mowed and everything. Well they turned around and reevaluated, they looked at it and said, "*We don't need to have it that way.*"

When they were making the higher returns that they made in the 80's the extra cost [for grooming] or a spray, just 'cause they felt like the insurance, for a rust mite problem, wasn't that [important]. They were still making a good return. But when the prices went down they started reevaluating all of this. So they went in and started using Roundup as a chemical mower. If they mowed, they would mechanically move less than they did before. That reduced the costs. Using a "wipe" of the Roundup material, which stunted the grass and kept the middles in a less vigorous state, they would use other weed

control chemicals. They approached their pest management program on an “as needed” basis.

They looked at greasy spot and the one disease pest that we have to control in Florida in all citrus. They built their spray program around that. If they didn’t have—I’m talking about processing now—if they didn’t have to have a build-up of rust mite, or they didn’t have a problem with leaf-miner, they could get by with one, most of the people have gone to two sprays. [For] processing [oranges], early summer, and late summer—to control greasy spot. It does have some other benefits of insect control as well.

So that’s the way they way they approached it, which helped to reduce cost. They didn’t change the fertilization much, but [they did change it] some. They looked at the hedging and topping and—what they did—they became much more cost effective.

What can they do to day? They’re still trying to find how they might fine-tune it. They’re working on the use of the application of precision agriculture, particularly with spraying, with electronic sensing. [Some is being developed for fertilization.] Herbicide is being used quite a bit. Particularly where you have a lot of replacement trees, nozzles will be automatically be turned off and on. And as I said before, they went to use a lot more Roundup or [? **glisophate?**] product and less residual—well you still need residual, but looking more and more on a block by block, or grove by grove need for cultural programs.

**Mansfield:** I just want to make sure I understand. Prior to this reassessment the groves were well manicured, just so they’d look neat. After wards they realized that productivity and “neatness” didn’t [coincide]. The groves didn’t have to be that well manicured? Is that the right word to use?

**Muraro:** I don’t know. I used the word manicured. I guess what I’m saying is they did a few extra things, which they didn’t need to do. It wasn’t harming anything. But for processed juice fruit, they didn’t need to do [as much]. When you go to fresh fruit they still need to be concerned about the same things they were before. Ah—the insect and pest pressures. You’re producing a fruit for quality visibility, not just internal quality. And costs there basically for fresh fruit didn’t go down. They’ve tweaked some and done

some, but for the most part, those programs didn't change much. May be they changed more in the weed control than they did in any other.

In respect to processing though, they were growing with looking at how they might be able to get a higher return on the fresh fruit, so they may spray an additional spray out there. But they became more conscious of monitoring in the processed juice blocks.

You know, you mow your yard every week during the summer, because it looks good and the weeds are getting up close to your ankles. So [you mow] so you don't look like the oddball down the street. [Well the growers] would make sure everything was mown like that. They started looking at how they could manage similarly and really if it got a little stubble growing, they could manage it by using Roundup to have a stunting effect. Mechanical mowing is much more expensive than putting a little bit of [?glyphosate?] out. These are things that they tweaked. They looked at their spray program and through close monitoring found that they didn't need to spray as often as they did. In some cases they may have sprayed more, but that might have been on a seasonal basis, Then they could come back. And over all they reduced the cost of their spraying.

They brought this [cost] down, I'm not sure how much more they can reduce, become more cost effective.

**Mansfield:** What about harvesting? I've heard people talk about mechanical harvesting and if that were to happen it would really cut costs and make it much more efficient. So tell me about research and development of mechanical harvesters for citrus.

**Muraro:** Okay. I would want to refer you to Dr. Fritz Roka in Immokalee. He's taken the lead and done most of the work in this area, looking at the cost benefits of it. But the mechanical harvesting program was set up and operated by the Department of Citrus. They had someone who over saw the program. He evaluated equipment and—and private [investors] came in and developed equipment. [See Fritz Roka's interview with Bill Mansfield, 6-22-05.]

There are two types of shakers that are being used out there. One is a canopy shaker, which rotates a drum, with “fingers” as it goes down the side of a tree. The other is a trunk shaker. There are two companies that are very efficient in the use of those. They are primarily being used in the south.

The plantings in the southern area, since the mid 80’s they’ve had to—ah—retrain or prune their trees, so they are adaptable to the catch frames that go underneath. They are most cost effective for harvesting. But for the amount they can reduce, you need to talk to Dr. Roka. They have not—the opportunity there is expand their use. They will become more cost effective because these machines are very expensive. They need to operate to bring down their capital overhead costs. But they have proven themselves, that they can harvest the fruit.

The growers that are using them, most of the growers are contracting them. They’re reducing their costs and the costs they are reducing is the fruit removal and delivery to the transport truck. From the transport truck they can go on to the processor. That cost has not changed because it is the same process.

We were talking [of saving] a dollar-fifty, a dollar-sixty per box. What we call “road-siding,” taking the fruit from the grove and putting it on a transport truck on the roadside with conventional harvesting. And I think it’s a dollar-thirty at this time, Dr. Roka can give you more specifics. But the potential is to increase [mechanical harvesting] and decrease that cost further as more acreage is [mechanically harvested] and more efficient use of that capital investment is spread out.

**Mansfield:** Who has looked at the effect [of mechanical harvesting] on the people who harvest the fruit? Mechanical harvesters will save the growers money, but then there is the economic impact on the people who have been picking it.

**Muraro:** You need to talk to Dr. Roka about that. He’s involved in all that.

**Mansfield:** I’ve had some people tell me that the mechanical harvesters work, but they leave so much fruit on the trees that they still have to go back and do a hand picking afterwards.

**Muraro:** If I recall what Fritz Roka has said, they can remove at least 90% of the fruit on the tree and get it into the transport trailer. The growers still want all of the fruit removed from the tree. So they do have a gleaning crew. That adds a cost to the harvesting, but that is built into the cost savings.

Perhaps the growers will look sometime and see what is the cost benefit removing the additional fruit and leaving it on the tree and just selling what they've mechanically harvested. The other thing is there is people are working on developing an abscission chemical, which will help the fruit—lessening the pull force needed to remove the fruit from the tree.

**Mansfield:** So the fruit will drop from the tree more easily?

**Muraro:** Yes. The advantages there are—ah—that you could go a little faster down the row. You'd have a little less force of shaking and less shake time, going from tree to tree. The Fruit would come off easier and maybe remove all of the fruit. The problem they are having with the abscission chemical is that it works well for early oranges, but when you come to the late variety of oranges—

The reason it works for the early oranges, it works for the late oranges too. But the early oranges, when they're harvested, do not have the next year's crop on the tree. The late oranges the Valencia's we have the new crop coming on when most of the Valencia's are being harvested. So developing an abscission chemical that will leave the green fruit, the small green fruit, and just let the mature ripe, yellow or orange fruit come off the tree is what they are working on.

**Mansfield:** That would be bad to have this year's fruit fall off with next year's fruit.

What do you see as the future of Florida's citrus industry?

**Muraro:** We're going to be here. It's possible that we may be a little bit smaller industry. There are some things impacting that—ah—the—the—development. The rapid development that's going on around the state now is impacting citrus, particularly on the

coastal areas and coming inward, across the I-4 corridor. But there will still be an industry here.

When the freezes came in the 80's and they removed all of the—about two hundred thousand acres were lost north of I-4. They said, “*Well that can just be developed.*” It may be developed, but two hundred thousand acres or even half of that is a lot of land to put houses on, with the support and what have you. It took probably fifteen years before major development started moving westward from Orlando into those regions and going on the west side of [highway] 27 and down 27. It took a long time for that to be developed. And likewise, what I'm trying to say is you'll see and there are some properties, particularly on the east coast, Indian River, St. Lucie counties, that been sold for development. Most of those were grapefruit groves. And some other properties have been purchased around, but it's a long slow process. There will be some point where we may get smaller, but we'll still be a viable industry.

I don't even want to speculate what [size it will be]. At the last census we had 744,000 acres of citrus in Florida, including all varieties.

**Mansfield:** I've had a lot of people tell me, basically the same answer. “*We'll still be here. But there will be a contraction in citrus production.*” And that the small grower is an endangered species. How would you respond to that?

**Muraro:** I think the smaller grower is—will likely be—ah—be more likely to leave the production of citrus, either in selling for development, or when he becomes non-cost effective to get out of the business entirely. It may be some of our largest producers now may not be as large as they are, because of where they have spread their investments around, it may be (and I'm looking at the best returns for the use of that capital) to sell it for development, when that approaches. So they may actually become smaller.

It's a little difficult—I think the smaller will probably be impacted most. But the larger ones could very likely be impacted as well.

**Mansfield:** What do you think will—should the small growers be removed from the scene, what will be lost with that? We'll still have oranges but—

**Muraro:** Well—if the smaller growers move out—

[End Tape 1, Side A. Begin Tape 1, Side B.]

**Muraro:** I guess it would be similar to a lot of—let me step back. If the smaller growers are lost, I guess the idea of ownership of a citrus grove—

[Many] of the smaller growers contract out most of their grove care operations now. They may even have the care taking or management company over seeing their grove operation, help market the fruit. Or it maybe in a co-op. We have some, [where the fruit is managed and marketed through the co-op]. But –ah—ah—his idea of ownership and having a smaller citrus grove in the rural area.

The other thing that concerns me is that—ah—citrus other than an income investment adds greenery and open space to the state of Florida. I'm concerned that the quality of life that we had five, ten, fifteen years ago in Florida, is less today. Because you have more people. We have more vehicles. We have more pavement. Some of the best recharge areas for the Florida aquifer are along the Lake County, Orange County area. This area [along highway] 27 is being covered up with houses, [which interferes with] the recharge area of our aquifer and water.

Once you cover something up with concert—the people may go away, but the concert remains. If you leave open area among the concert and pavement for greenery, it can help grow and maintain a more refreshing life style and environment.

**Mansfield:** I interviewed Mr. Frank Bouis, I don't know if you know him or not.

**Muraro:** Yes.

**Mansfield:** He talked about how orange groves just smell better than shopping centers and housing developments. James Griffiths talked about how the aquifer was threatened, if development continued unchecked it could really hurt Florida's water.

**Muraro:** There is a small book, if you want to look up an author, Henry Swanson, out of Orlando, Orange County, was the extension director of Orange County. He was an

advocate of retaining west Orange county and also east Lake County, as open [areas] for recharge purposes. I think it's called the Blue Law or something like that, in the state statutes. The idea was if you retain your property in high recharge areas, you could get it credit so you would pay less taxes on it. But you would keep it as some open area, whether it was citrus, pasture, some agriculture, or just open forest, as a recharge area. It might be interesting to follow up on that. I've forgotten what the name of his book was, but Henry Swanson [is the author].

**Mansfield:** I'm sure I can find it.

**Muraro:** This thing about the blue law, I don't know if the blue it referred to is water or whatever, but—

**Mansfield:** We've largely talked about orange production for the orange juice market. But the fresh fruit market, while small is an important part of Florida's citrus crop too. So how has free trade legislation affected the fresh fruit market?

**Muraro:** I'm not sure how much into South America that it will impact the fresh fruit. First of all 5% or less of our oranges are marketed fresh, season, to season, large crop small crop. The—au—and therefore it probably wouldn't have a major impact on the fresh fruit. There are some who say we might move more towards trying to sell more fresh fruit. That may be possible, if lost the orange tariff.

One of the reasons, particularly with the South American countries, they have some disease problems which we don't have here. And there are vital sanitary restrictions that would have to be overcome, before they could import fresh citrus into the US. And—Ah—they'd do the same to us, things with plant material as well. So I'm not sure the FTAA would impact very much. When it comes to our major fresh fruit market is grapefruit and grapefruit for the export—again I'm not sure how that would impact—I think what I would do here on this is I'm going to defer this question to Dr. Tom Spreen, in Gainesville. I'll give you the phone number and all if you don't already have it. And Dr. Mark Brown.

**Mansfield:** I'm familiar with Dr. Spreen but Dr. Brown is new to me.

**Muraro:** He is with the Florida Department of Citrus, their economic research staff. It's in Gainesville as well in the same building as Dr. Spreen. And may be going back to Florida Citrus Mutual and talking to Dr. Robert Barber, their economist.

**Mansfield:** Okay.

**Muraro:** Ask them this question on fresh fruits and particularly specifics of the FTAA and the marketing and impact there. They have done the work, as I mentioned earlier, I work primarily on the growing end, getting the fruit ready to sell. Then they compliment what I do, looking at the trade and marketing policy. We work together, so they would be people you'd probably want to talk to more specifically.

**Mansfield:** Okay. I will consult them about that. But you talked about all the different pieces involved in getting the fruit produced and to the—uh—uh market. So tell me more about that. The different elements of price involved. You mentioned something about labor, fertilizer, and pesticides. So—would that be a fair question to ask? And one you could answer easily?

**Muraro:** Okay. What is the cost of getting—

**Mansfield:** Just the different elements that the citrus grower needs to consider.

**Muraro:** What a citrus grower needs to consider is: the nutrition and fertilization requirements, the pest problems. If it's fresh fruit they probably have more pressures from pests and must be more timely and use more sprays.

As a citrus grower we have to always think as any other businessman, they are looking at the bottom line. As I tried to explain, they may have done an extra spray in a processed grove, when they had very high prices, or mowed the middles of their a little

more often to make sure it looked nice. That was minimum. The thing is, they look at using the least amount of product and the least amount of times they have to spray. (And I'm focusing on the fresh fruit growers now) to maintain a visibly attractive marketable fruit, that the consumer would want to purchase. Then of course there is weed control, both mechanically and using chemical herbicides. Then there is irrigation, water requirements, particularly during the spring months, when it is our driest season. That's when the new fruit is being set on the crop for next year. And the pruning, keeping the tree shaped. We call it hedging or topping a tree. And tree replacement.

As trees, die, either through disease, or some other reason it is removed. You are replacing trees in a citrus grove, so you have a continuation. It costs as much to drive a tractor past an empty space as it does a space with a tree in it. Growers recognize this, so they prefer to put a tree back in, every time they pull one out. They can't always do this, because of the availability of trees, or the budget to purchase all of the trees they need at one time, but that's what they prefer. Because, as I said, it costs as much to drive a tractor past an empty space as it does a space with a tree in it.

Another area which growers are—that takes time and this is complying to mandatory regulations. Whether it's the IRS [Internal Revenue Service], whether it's workman compensation, whether it's minimum wage, particularly at harvesting. Because you have to guarantee that for the time a person's out there, they are paid the minimum wage, whether they harvest enough fruit to cover that. They have to be assured that they get the minimum wage, On the production or growing end of it's not difficult. You have someone there when they are working on an hourly basis. Or if they work all the time, or not, depending--working on an hourly basis or if they work all the time or not, depending if they are just a regular employee or not, like most people are, with any company or institution. But ah—then there is complying with water management requirements, for well permitting, for use of water.

Environmental protections with the record keeping they have to do. Training of employees, to keep them up to date. The posting of information of when pesticides were used and [it is safe to reenter the grove]. Attending meeting to discuss things.

There is a whole list of them and we have worked on a complacence cost survey, just on the production end of it. It had sixty-one items in it. Some of the items are thinks

they have to do in order to comply. The capital cost of putting a spray wash for canker control. But these are items that we've been trying to collect some information on. But you can go to a non-ag business and you'll also see that they have similar regulations that they have to comply with. If you're building a house you have to have this inspection or this improved. If you're building a development you have to have environmental impact thing and on and on and on. You have to do all of these things. Build retention areas because of water run-off. Everyone is impacted by this and it adds time and cost with in an operation.

**Mansfield:** So growing oranges is a whole lot more complicated than people think?

**Muraro:** Yes. I look at it that you have to—I've thought about an educational program and talking to a group of students and asking them—how many would be interested in knowing how to be an accountant—keeping records and all and keeping up with costs. Or policy and law and each time put a different hat on. And then having a chemistry background, having to understand soils, and fertilizers, [and pesticides,] or the relationships between different chemicals, so you don't create a toxic compound or pollute the environment.

Most often, when you go to a citrus grove you'll find more wild life, birds and other critters around there because of the healthy environment [of a citrus grove].

But you take these five or six different hats [that the citrus grower wears] and you end up with a hat that says "farmer" on it. Because the agricultural person has to understand all of this information, weather, computers—how to access things. The technology here, from managing your irrigation requirements.

Weather stations out there, knowing what the information is, knowing if and when to spray, to prevent run off. The benefits of using lower volume for your spray, so you use less material to spray on a tree and having less run off and protect the environment.

**Mansfield:** And that's just getting it ready for the production. That doesn't say anything about the economics.

**Muraro:** Right, then you have your harvesting. With harvesting you have another group of regulations there. One of the major things is maintaining record system to assure all workers are properly paid. And this is subject to auditing. Now most harvesters make way about the minimum wage.

But there is liability insurance and there are fewer companies that are willing to provide liability insurance in agriculture. This cost has gone up. The hauling cost has gone up. Going on to the packinghouse, again another set of information. And training of people so they will understand.

Understanding the marketing, if it is fresh fruit if it is out there. Is it what people are want and where to market it. Again coming through there and making sure everything is clean and sanitary. But the juice products as well. The cost of maintaining and storing it, making sure it's in a safe condition at all times, for when they do ship it out to the market.

**Mansfield:** with all of that to keep in mind, the industrialization of agriculture doesn't seem surprising as it might. But I've been throwing questions at you for the past hour, is there anything you want to tell me about that I haven't asked about?

**Muraro:** I don't believe so. I think I've tried to cover it in this last part here.

**Mansfield:** Okay. Well, let me just thank you for taking the time to talk with me. And I hope my questions haven't been too embarrassing. But as I explained the information you shared with me will be deposited in the University library but I need you're permission for people to use this. So there is a release form I have to ask you to sign. And I've been photographing everybody I've interviewed so do you mind if I take your picture?

**Muraro:** [laughs] I guess not.

**Mansfield:** Okay, thanks so much.

**Muraro:** Let me mention one thing that should be in here, Much of the information that we have you can find it going to the Citrus Research and Education web site, looking under publications or Extension, that sub-heading. And you can find a list of publications, whether it's cost information, comparative costs, growing or growing and processing information. Also the University of Florida IFAS, the Institute of Food and Agricultural Sciences, has an information system called EDIS. From there, by subject matter or author you can locate information from historical land value, market value to production and cultural, from juice production articles that would be available to them.

**Mansfield:** Okay. I will check that. And also, I'm going to ask for some names of other people I can talk to. But let me stop [this recorder].

[End of interview]