

FORÉWORD

Conceived as the second program in an ongoing series of Short Courses on basic concepts of citrus production, this course explores climatic, cultural, biotic and transportation and marketing impacts on the quality of both fresh and processed fruit. Broad conceptual discussions are complemented by detailed comments on specific cultural factors and production practices. Building on basic horticultural concepts, our goal is the application of current research to improve our competitive productivity and efficiency.

Our next Short Course "Citrus Water Relations" is tentatively scheduled for April, 1990, and will emphasize applications of the basic physiology of water uptake and use by citrus.

I hope you find these proceedings useful and informative. I have inserted a list of available proceedings of previous short courses organized by the Fruit Crops Department along with the appropriate mailing address for purchase.

Suggestions for future short courses or topics within the course on water relations will be greatly appreciated.

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Welcome and Introductory Remarks

Larry K. Jackson, Chairman
IFAS Fruit Crops Department
University of Florida, Gainesville

It is my pleasure to welcome you to this Short Course on "Factors Affecting Fruit Quality." This Short Course is one of a continuing series. Two years ago one was held on flowering and fruit set. This year, we're conducting one on fruit quality. Two years hence, one is planned on the subject of water relations. These are literally "graduate level" courses designed to meet the educational needs of a highly sophisticated citrus industry. They represent the highest level of training ever offered in our spectrum of Extension activities.

This activity is one of many put together by the Extension faculty of the Fruit Crops Department -- others include: The Florida Citrus Growers' Institute, the Indian River Citrus Seminar, Citrus Packinghouse Day, and, in conjunction with local agents, literally hundreds of other meetings such as "O-J's", Round Tables, Schools, Clinics and similar grower meetings.

Programs of the Fruit Crops Department include not only the Extension efforts which are obvious here today but also wide-ranging research efforts in your behalf not only in Gainesville and Lake Alfred but several other research centers strategically located throughout the industry. The close working relationship of the faculty from Gainesville with the faculty at centers is obvious here today and at other educational endeavors elsewhere in the state.

A third and very important role of the Fruit Crops Department is the education of students. Through our undergraduate and graduate programs, future leaders of the industry and new Extension and research faculty are trained. Since all our teaching faculty have split appointments, classes are taught by researchers and extension specialists who have extensive experience in their respective endeavors.

I am concerned that our programs in research, teaching and extension are relevant to the needs of our industry. We work with surveys, advisory committees and personal contact to assure this. Obviously, we can't be everything to everybody, but within the limits of funds and personnel, we want to do our very best and your inputs are needed and appreciated.

There are those who feel that relevancy can be assured by reductions in funding. In fact, there are moves afoot within the legislature to cut funding to IFAS this year. We've already lost considerable ground over the past several years to the rest of the university and other state agencies. While I understand that competition for state funds is intense, agriculture is not becoming any less complex and reductions in funding simply means we will be able to do less than before.

There are also friendly forces at work who are trying to help provide more funds. Considerable effort has gone into investigating a "check-off" system whereby citrus producers could tax themselves to provide funds for IFAS efforts. Many states have similar programs for other crops and several commodity groups in Florida already have such programs in place.

We appreciate the continuing strong support of our citrus industry by our legislators. We also appreciate your interest and involvement in our programs such as this one held today. Very best wishes for a successful and educational experience here the next two days.

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INTRODUCTORY REMARKS

Dr. Walter J. Kender
Director
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Welcome to the campus of the Citrus Research and Education Center (CREC). It is most fitting that this Short Course on "Factors Affecting Fruit Quality" is being held at Lake Alfred. We have a comprehensive research program involving citrus quality, which is an integral part of our total mission.

CREC is charged with conducting research for the welfare of Florida's citrus industry. The sixty scientists and Extension faculty at Lake Alfred from both IFAS and the Florida Department of Citrus address the major problem areas facing the industry. General research thrust areas are covered by the following five working groups:

1. Horticulture/Harvesting
2. Citrus Pathology
3. Entomology/Nematology
4. Post Harvest Handling
5. Citrus Processing

Most of the thirty formal CRIS research projects at CREC directly have fruit quality or product quality as objectives. In fact, enhancement of quality is a primary goal of the total research effort at Lake Alfred. Cultural practices and fruit handling and processing procedures are studied with the aim of evaluating and improving quality. As a result, the quality of citrus available to the consumer today is considerably higher because of the accomplishments made through research.

EXAMPLES OF CREC RESEARCH PROJECTS INVOLVING CITRUS FRUIT QUALITY

A. Grove Management:

1. Cultivar improvement -- development of new scion varieties and rootstocks; comparison of rootstocks.
2. Planting density and tree size control.
3. Biological and chemical control of insects and mites.
4. Irrigation.
5. Environmental stresses on fruit quality.
6. Spray application technology.
7. Quarantine treatments for fruit fly control.
8. Growth regulators on fruit quality.
9. Mineral nutrition.
10. Fungal diseases of citrus.

B. Citrus Fruit Utilization: (CREC's utilization research program is cooperative between IFAS and DOC).

1. Post Harvest Handling
 - a. Evaluation of processes for handling and marketing of fresh citrus.
 - b. Multiple sensing for automatic grading.
 - c. Biochemistry and physiology of citrus fruit affecting quality.
 - d. Reducing decay losses.
 - e. Fruit quality during maturation, handling and storage.

- f. Fruit color and flavor studies
- g. Fuller's Rose Beetle.

2. Citrus Processing

- a. Quality of aseptically processed citrus juices.
- b. Quality of new processing technologies.
- c. Citrus by-products technology.
- d. Citrus processing engineering.
- e. Enzymes related to citrus juice processing.
- f. Molecular biology of microorganisms associated with citrus products.
- g. Packaging systems and food oxidation.

Past, present and future contributions from these projects and those from other research agencies have and will continue to keep Florida's citrus industry vital and competitive. This Short Course plays an important role in informing the industry of the technical advances and the principles which influence fruit and citrus product quality.

IFAS is in somewhat of a transition at this time, with a search for a new Vice President for Agricultural Affairs in progress, the IFAS budget being reviewed in Tallahassee, and developments in other areas.

Over the past few years, IFAS has had several reviews and evaluations by various groups, including the Legislature, the Board of Regents, etc. The most recent was by a BOR/Legislative Study Committee in the fall of 1987. It dealt with the effectiveness of the transfer of information from research faculty to extension faculty and, ultimately, to the public. The final report entitled "The Relationship Between Research and the Cooperative Extension Service" received recently is interesting reading. Many people, including researchers, extension personnel and the users of IFAS information were surveyed and/or interviewed as a part of the study process.

For the most part, it was a very positive report in that users were satisfied with IFAS. For example, 60-70% of those surveyed thought that research results were usually made available in a timely fashion and in a clear and understandable way. Over 75% thought that research results were helpful to them and over 80% felt that the Research Center/County Office structure worked well in getting research information out.

Overall, the study group found that the IFAS structure has many strong points and allows for a great deal of interaction between extension and research. We in the system certainly feel this is true, although we know that there is always room for improvement. It is through conferences such as this that the benefits of IFAS are demonstrated. IFAS is a large and complex operation and there will always be certain inherent problems, but they are small in comparison to the contributions it makes to Florida agriculture and, especially, to the citrus industry. There is none better in the United States. We hope you appreciate what we are trying to accomplish.

Again, I welcome you to the CREC and I hope you have a productive conference