toes, peppers, oranges, lemons, grapefruit, limes, oranges, avocados and others.

We are not getting high quality sweet corn to the consumer from Florida. Some of the faults are poor hydrocooling and lack of refrigeration after it reaches the market.

The problem of decay in citrus fruits from Florida is serious in some crops and at certain times of the year. Tangerines and Temple oranges are particularly susceptible, but the more resistant oranges and grapefruit also sometimes go down with decay after they reach the market. To protect against loss to his customers, one of my friends in the gift package business uses the Dowicide-hexamine treatment, precooling, and refrigerated transport for his shipments of Temple oranges and grapefruit out of Florida and has had no claims for refunds because of decay on deliveries that he makes to various parts of the country.

Poor quality tomatoes are the source of consumer complaint. I am inclined to be-

lieve that poor ripening and handling practices on the market are the chief reasons, but maturity and handling at the packing house and in transit cannot be ignored as possible sources of trouble.

These examples, and we could give more, will indicate there is still work to be done in education and research if we are to improve the marketing of fresh fruits and vegetables.

The fresh fruit and vegetable industry to reach its present size has had to overcome difficulties imposed by distance to market, and the perishable nature of the commodities to be shipped. Advancements in refrigerated transport, precooling, the use of refrigeration at the retail store and wholesale market, the development of improved packaging, and storage and the use of treatments to aid in the control of spoilage organisms have all played important roles in developing the wide distribution of perishables we enjoy today.

SOME PRESENT PROBLEMS AND FUTURE POSSIBILITIES IN FLORIDA'S AGRICULTURE AS THEY RELATE TO THE FACILITIES AND STAFF OF THE FLORIDA AGRICULTURAL EXPERIMENT STATION

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I would emphasize the word "Some" in my title, since I cannot pretend to be in any way complete in a talk of this nature. You will note, too, that I am restricting myself to the state research units. In so doing, I am not belittling the past, present or future research of the U. S. Department of Agriculture, the University of Miami or of other fine research institutions here in Florida. I am only limiting the scope of my talk to our State Stations because I know where we stand in this picture.

While I am beginning to warm up to my topic, I will digress briefly to comment on "duplication" in agricultural research. There has been a considerable to-do about wasteful

features of such duplication in the past several years, both at national and state levels. Distinguished senators have declaimed about it in Appropriations Committee hearings; Legislators have done the same in Tallahassee. So I run a considerable risk in taking the other point of view-I maintain that duplication is more apparent than real in agricultural research. I further maintain that a little competition in research is a wholesome thingespecially when early publication of results is required, and mutual respect exists among personnel. I welcome the programs of the U. S. Department of Agriculture and other agencies in the agricultural research picture here in Florida. I believe that the growers are better served because our programs are mutually stimulating. Many laboratories worked on the polio vaccine; if Dr. Salk had been told to work on chicken pox because another laboratory was working on polio, we might still be having epidemics of polio.

Actually, we have a sort of built-in protection against the possible hazards of unwarranted duplication. Other public research agencies do, too. Each publishes an annual report of research accomplished, for one thing. In addition, all of our research is conducted under formal project statements which must be approved in my office. Copies are then filed as information in the State Experiment Stations Division of the Agricultural Research Service, U. S. Department of Agriculture, in Washington. While these are not made directly available to the USDA research people, personnel in the State Experiment Stations Division office also have access to the USDA project outlines. One of their functions is to inform the State Stations and the USDA if and when apparent duplication develops. In practice, this tends to coordinate programs and to get the researchers together if they have mutual interests. Quite often it results in two or more researchers or research teams attacking the same important problem with two or more research approaches. This is not unwarranted duplication, but exemplifies the stimulating competition previously mentioned.

That has warmed me up, and I might say has in no way detracted from my talk. I am a twenty-minute talker, under instructions to talk no less than thirty minutes, nor more than forty-five. You may therefore categorize the foregoing editorial as "filler."

In getting into my topic, I'm going to talk first about some agricultural possibilities here in Florida. After twenty years here I don't hesitate to say that it is these possibilities that really stimulate me. While I believe that our research people do a very fine job in the problem solving department, the sort of contribution that really "sends" me is the introduction of sweet corn as a major crop here in Florida, or the development of citrus concentrate, or the introduction of White Dutch clover to our pastures, or the introduction of a tomato variety that makes possible our new "pink" tomato deal.

To lead off with, we have one foot in the door toward a future important grape industry for Florida. For a commercial grape, our Lake Emerald grape has poor color, and only fair quality. Nonetheless, it foretells the time when we will have high quality purple grapes in profusion, with some red and white ones for variety. Now that we know we can breed varieties resistant to Pierce's disease—which practically eliminated quality grapes from Florida years ago, the horizon is unlimited. Our grape industry can some day expand over almost as much of the state as is now infested with wild grapes. I invite all research agencies and individuals to join in the fun of producing these varieties to-be. I believe that grapes loom large in Florida's future.

Before I move away from fruits, let me mention a few more that *will be here*, and *will be* important. Peaches, blueberries and blackberries are on the way for Central and North Florida. Mangos, lychees, avocados and who knows what additional sub-tropical fruits will fill the future niche in South Florida. All in all, it seems logical to me that the next new agricultural developments in Florida will probably be with fruits other than citrus.

In our important vegetable deal, we have a reasonable mature but high-risk industry, which continues to make solid progress. Our part in this now, and for the foreseeable future, is to carry a research program that keeps chopping away at the "high-risk" factor. We try to carry a balanced program of long-range and short-research. Our short-range research program is largely based on urgent production problems, although we have some utilization research and marketing research going, also. Our long-range program is largely in the area of breeding for disease and/or insect resistance, keeping in mind other important factors such as yield and quality. Each time we make progress in the disease or insect control work, we can place a little stronger emphasis on the breeding work. Over time, we are increasing the proportion of long-range research. In this long-range program we are also doing some work on biological control of some insect pests which have not proven amenable to chemical control measures. Perhaps a way of describing this would be to say that emergency control work has top priority, but that this has eased off slightly in recent years.

Citrus, of course, continues to be the most important agricultural enterprise of the state. Spreading decline continues to be the most urgent problem, and we are working on this from as many angles as seem to have any promise at all. I am sure that up-to-date reports will be given in the Citrus section. Together with the personnel provided by the Citrus Commission, we carry a well-balanced program with citrus, to the best of my knowledge. We certainly intend to keep it so, but are always open to suggestions relative to problems of the industry.

Our program in ornamentals research, including cut flowers and turf establishment and management, has expanded rapidly in recent years. Because of the wide variety of ornamental plant materials - each with separate and distinct problems - I will not and cannot say that our program is adequate to the needs of the several industries involved. It is more nearly adequate now than ever before, and as the problems develop and come to our attention, we will certainly request added help from the Legislature when and if we cannot handle them with present staff. I would expect to see these industries expand greatly in the future.

This being the Horticultural Society, I will just mention briefly our research obligations in the animal and poultry sciences. As you may know, since the close of World War II the several animal industries have progressed by leaps and bounds, particularly the beef cattle development. We have had to expand our program in the areas of nutrition and disease control, and the latter, especially, is a difficult field. There are several overlap areas between the animal and plant sciences such as pasture-vegetable rotations and pesticide residues which relate to our horticultural program.

Finally, we have the field crops and forages, which we consider generally to be agronomic crops. These require almost as much research consideration as do horticultural crops, since they back up the animal sciences. Our program here leans heavily toward the breeding of new and resistant varieties, since the gross per acre value is often too low to justify much expenditure for pesticide control applications. In addition, with our forage crop research, we know that chemical residues may become milk or meat residues, and residue problems are generally complex enough now without getting further involved with these products if it can be avoided. There are times when the application of pesticides to field or forage crops is vital, however, and we do have some continuing research in this area.

Perhaps the above gives a quick picture of our present program responsibilities and of some horticultural possibilities. I know of no present crop or livestock industry of any real importance that will not expand here in Florida in future years. We have the land area, the water resources, the climate and the manpower expectation for such expansion. The public research agencies must meet and answer the problems involved in such expansion. There will be many such problems, since the land not presently in use is largely marginal land, and we must learn how to use it with profit.

One thing which I hope to retain in every research staff member of the Station is the imagination and vision with which every new, young staff member is endowed when he arrives. Since I came to Florida in 1937 I have seen about every new vegetable crop researcher take a crack at growing cantaloupes. We've tested varieties, conducted breeding work, run fertilizer tests, disease and insect control tests and still do not have a cantaloupe industry of consequence. Yet if you were to ask me if I believe that we will some day have an important industry with cantaloupes, I would still answer yes. And when that day comes, the combined research and testing over the years will have paid off. There are probably several in this audience who have tried growing cantaloupes commercially and have had crop failures. There are also some few who have made a little money with them. We are not far from a stable industry. We need new horticultural industries.

So I am going to continue to encourage and approve research project proposals which show vision and imagination, even though our present knowledge status may seem to indicate that the odds are against any long-range economic benefits. Not to the exclusion of work on urgent problems, but because I believe that the big advances come from some of these long shots. I like to see each research man stimulate himself and his co-workers with at least one such project. If a man is incapable of such vision, he may not be qualified for productive research at all. A productive research man must have both training and vision—either one alone is not enough.

I have talked at some length about the research program of the Station, and about its staff. I am proud of both, and hope that you share in that pride. Now I want to talk briefly about facilities.

The Florida Stations own and farm something over 10,000 acres of land. Without a doubt, we carry the most diversified farming operation on this land of any public or private operator in the state. Perhaps you would be interested in knowing that we sell produce and livestock through regular markets. We average out a gross income of around \$35.00 per acre overall, which doesn't sound too bad, on the face of it. I'm going to resist the temptation of giving you a *net* income figure. This would be a very bright red indeed if we had to exist on these sales, alone. Only by the grace of our appropriations can we erase the red ink.

On these lands we work about a thousand people, in about \$1,500,000 worth of buildings, not counting those used jointly by the College of Agriculture. We operate in 24 different locations, scattered from extreme West Florida, above Pensacola, to Homestead. We operate 120 trucks, and 86 tractors, not including some 24 garden tractors. We have about 3,000 head of beef cattle, over 500 head of swine, about 70 sheep, some cow ponies, a few goats, and some thousands of chickens. I can't give you a count of our citrus or avocado trees, but perhaps you get the picture of the diversity of our program.

In this connection, I might add that it is a very rare day indeed that someone, in some phase of Florida's agriculture, doesn't run into a problem that needs to be called to our attention. A fair number filter through to me; some come direct to me. I keep a philosopher's counsel constantly on my desk for the rougher moments. This philosopher is Leroy Paige, better known in some circles as "Satchel". His soothing words go as follows, in case you have forgotten.

1. "Avoid fried meats which angry up the blood."

- "If your stomach disputes you, lie down and pacify it with cool thoughts." (That's hard to follow, but one of these days I'll try to slip a requisition for a couch through the Business Manager.)
- 3. "Keep the juices flowing by jangling around gently as you move."
- 4. "Go very light on the vices, such as carrying on in society. The social ramble ain't restful."
- 5. "Avoid running at all times."
- 6. "Don't look back. Something might be gaining on you."

Finally, in our many laboratories we have some of the finest scientific equipment that is available. Of this, however, we never have enough. In this electronic age, all such equipment has not only gone electronic, but new yearly models come out, as with automobiles. Even so, such equipment is a "must" in this day and age, and it is a bargain. With it, a chemical analysis that used to take days can be performed in minutes. Without it, we would probably have to drop about half of our program in some areas, or else double our staff. For this reason, such equipment is usually a bargain at about any price.

We are currently constructing a Cobalt-60 facility at Gainesville. The gamma rays from this cobalt isotope can do several important things. They can sterilize meat, vegetables or fruits, and increase the shelf life of these products. They can increase the mutation rate of living things, so that "sports" are produced many times as fast as they would normally occur. We expect to use it in many of our breeding programs, in our food technology research, and in other research areas.

We are also currently planning a sizable plant science research unit, which really amounts to a large piece of scientific equipment. With this facility we fully expect to be able to get answers to many complex agricultural problems that have been difficult or impossible to work on with outdoor plots and standard laboratories. In effect, this will permit studies on plants, plant diseases and insects with complete climate control.

Besides making possible a dependable research program dealing with the direct effects of controlled climatic factors on crop plants and on their insect and disease organism predators, we expect to get answers on complex physiological disorders that have proven difficult to study under field conditions. Gray wall of tomatoes, but rot of gladiolus, and the splitting of fruits are specific examples of a few of the kinds of problems that should fit into this climate-controlled facility. I believe that we have the staff to make it useful to us and to growers; I know that we have the agricultural problems. As all of you know by this time, I have rambled quite a bit in this talk. I presume that your Executive Committee expected that, or they wouldn't have asked for a talk by one who has long since stopped being a researcher and joined the red tape divisions. Whether justified or not, I always maintain that there's a little of my life's blood in all of the research that is done in the Stations. You will notice that it has left me a rather anemic specimen.