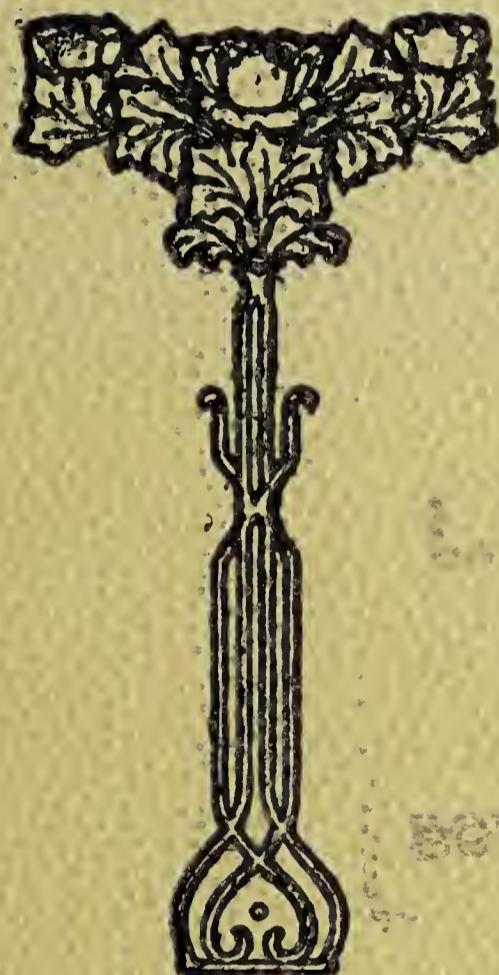


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PROCEEDINGS OF THE
FLORIDA STATE
HORTICULTURAL
SOCIETY *for* 1917

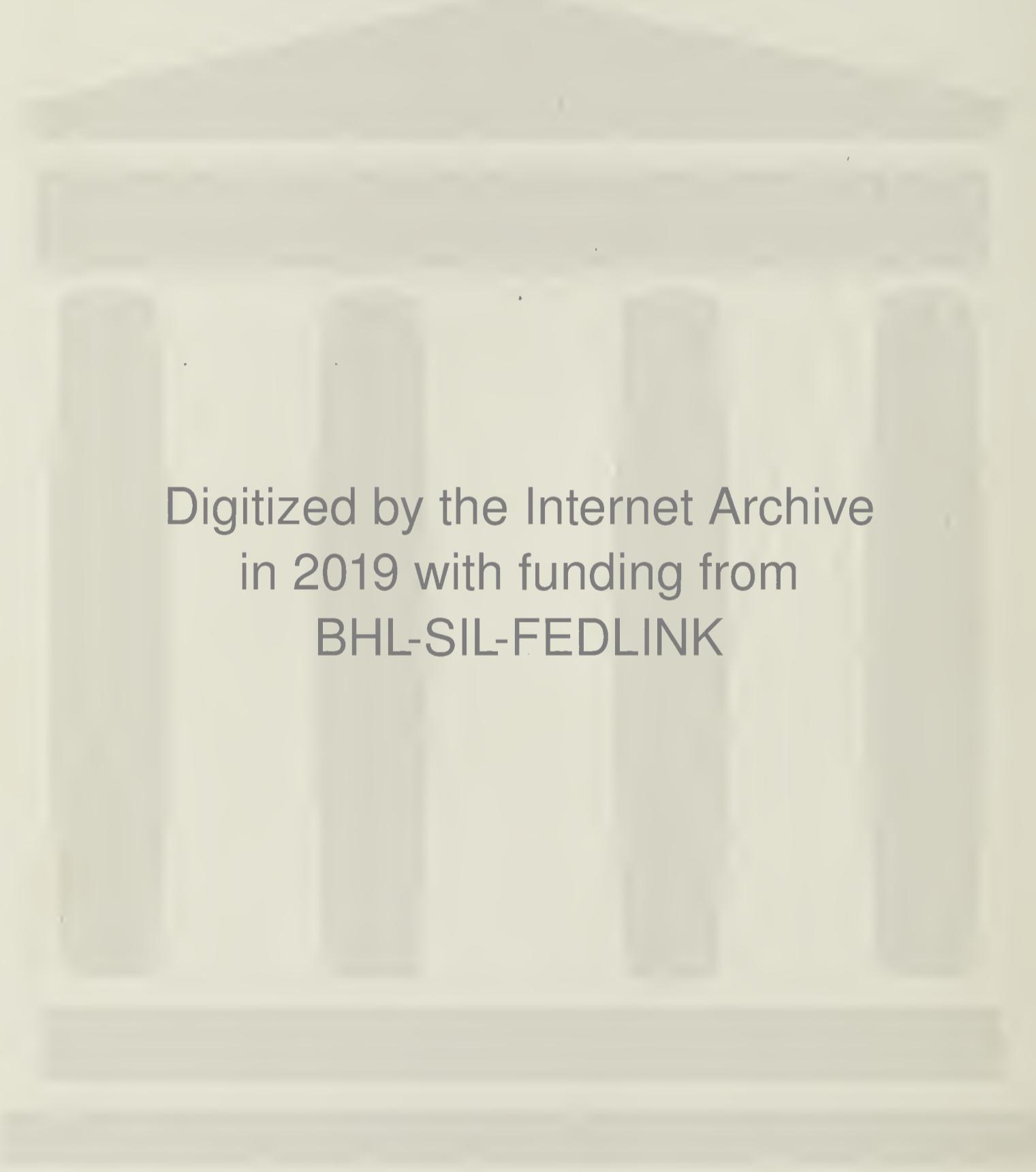


PUBLISHED BY THE SOCIETY



MRS. OKLE PAINTER WILLIAMS
Retiring Secretary Florida State Horticultural Society





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PROCEEDINGS
OF THE
THIRTIETH ANNUAL
MEETING
OF THE
FLORIDA STATE
HORTICULTURAL SOCIETY
HELD AT
ARCADIA, FLA., APRIL 17, 18, 19, 20

1917



COMPILED BY THE SECRETARY
PUBLISHED BY THE SOCIETY

THE E.O. PAINTER PRINTING CO., DE LAND, FLA. NO. 11812

CONSTITUTION

ARTICLE 1. This organization shall be known as The Florida State Horticultural Society, and its object shall be the advancement of Horticulture.

ARTICLE 2. Any person may become a member of the Society by subscribing to the Constitution and paying one dollar. Any person may become a Life Member of the Society by subscribing to the Constitution and paying ten dollars.

ARTICLE 3. Its officers shall consist of a President, three Vice-Presidents, Secretary, Treasurer, and Executive Committee of three, who shall be elected by ballot each annual meeting. After the first election their term of office shall begin on the first day of January following their election.

ARTICLE 4. The regular annual meeting of this Society shall be held on the second Tuesday in April, except when otherwise ordered by the Executive Committee.

ARTICLE 5. The duties of the President, Vice-President, Secretary and Treasurer shall be such as usually devolve on those officers. The President, Secretary and Treasurer shall be ex-officio members of the Executive Committee.

ARTICLE 6. The Executive Committee shall have authority to act for the Society between annual meetings.

ARTICLE 7. The Constitution may be amended by a vote of two-thirds of the members present.

BY-LAWS

1. The Society year shall be co-extensive with the calendar year, and the annual dues of members shall be one dollar.

2. All bills authorized by the Society or its Executive Committee, for its legitimate expenses, shall be paid by the Secretary's draft on the Treasurer, O. K.'d by the President.

3. The meetings of the Society shall be devoted only to Horticultural topics, from scientific and practical standpoints, and the Presiding Officer shall rule out of order all motions, resolutions and discussions tending to commit the Society to partisan politics or mercantile ventures.

Florida State Horticultural Society

OFFICERS ELECT FOR 1918

PRESIDENT:

H. HAROLD HUME, Glen St. Mary.

VICE-PRESIDENTS:

L. B. SKINNER,
Dunedin.

W. J. KROME,
Homestead.

S. F. POOLE,
Winter Haven.

SECRETARY:

BAYARD F. FLOYD, Gainesville.

TREASURER:

W. S. HART, Hawks Park.

EXECUTIVE COMMITTEE:

P. H. ROLFS, Gainesville; E. S. HUBBARD, Federal Point; LLOYD S. TENNY.

President, Secretary and Treasurer, ex-officio.

Standing Committees

Avocados.—Lloyd S. Tenny, Miami, Fla.; L. D. Niles, Lucerne Park, Fla.; W. F. Purdy, Sarasota, Fla.

Canning and Preserving.—Mrs. Lloyd S. Tenny, Miami, Fla.; Mrs. C. H. Thompson, Winter Haven, Fla.; Mrs. Dora Russel Barnes, Lakeland, Fla.

Sapodillas, Guavas and Pineapples.—Edward Simmons, Miami, Fla.; E. C. Brown, Punta Gorda, Fla.; Alfred Warren, Ft. Pierce, Fla.

The Flower Garden.—Mrs. T. Ralph Robinson, Terra Ceia, Fla.; Mrs. R. D. Hoyt, Clearwater, Fla.; Dr. H. Nehrling, Gotha, Fla.; Theodore L. Meade, Oviedo, Fla.

The Citrus Grove: (a) Rebuilding the Grove Injured by Cold.—G. M. Wakelin, Tavares, Fla.; John R. Bukoutz, Labelle, Fla.; William Edwards, Zellwood, Fla.; H. B. Stevens, DeLand, Fla.; (b) *Pruning in the Grove.*—Wm. L. Drew, Winter Haven, Fla.; C. W. Smith, Safety Harbor, Fla.; Geo. T. Clark, Fruitland Park, Fla.; (c) *Protection from Cold.*—A. B. O'Hara, Cocoa, Fla.; A. M. Tilden, Winter Haven, Fla.; (d) *Labor in the Grove and Packing House.*—E. J. Kaufman, Lakeland, Fla.; Ed Scott, Arcadia, Fla.; Hugh Matheson, Cocoanut Grove, Fla.; (e) *Machinery in the Grove, Its*

Use and Care.—H. E. Cornell, Winter Haven, Fla.; R. C. Ricker, Bradenton, Fla.

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 Klemm, R. Arthur, Winter Haven, Fla.
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 Kroome, W. J., Homestead, Fla.
- Lafon, N., Paisley, Fla.
 Laird, J. M., Micco, Fla.
 Lamont, A., White City, Fla.
 Lake Garfield Merc. Co., Winter Haven, Fla.
 Lainhart, G. W., West Palm Beach, Fla.
 Lane, E. B., Auburndale, Fla.
 LaRoche, D. J., Courtney, Fla.
 LaRoche, R. J., Courtney, Fla.
 Lawley, W. R., West Palm Beach, Fla.
 Lenfest, R. E., DeLand, Fla.
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 Lewis, A. A., Kathlene, Fla.
 Lewis, H. F., 107 S. Newport Ave., Tampa, Fla.
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 Lewis, F. G., West Palm Beach, Fla.
 Lewis, Fred J., Ormond, Fla.
 Lindner, C. W., Martin, Fla.
 Lyman, W. I., Box 187, Jacksonville, Fla.
 Lytle, E. B., Stanton, Fla.
 Lytle, Mrs. E. B., Stanton, Fla.
- Mabbott, H. B., West Palm Beach, Fla.
 Mangum, A. W., Waller, Fla.
 Martin, A. O., Sanford, Fla.
 Martin, Geo., Sebastian, Fla.
 Marcnski, Frank, Box 719, West Palm Beach, Fla.
 Mathams, G. C., West Palm Beach, Fla.
 Mathis, W. B., Glen St. Mary's, Fla.
 Mathis, J. D., West Palm Beach, Fla.
 Maxfield, B. A., West Palm Beach, Fla.
 Mays, E. D., 204 West Bay St., Jacksonville, Fla.
 Meade, Mrs. Theo. L. Oviedo, Fla.
 Mendell, Geo. E., Hawks Park, Fla.
 Mendell, Mrs. G. E., Hawks Park, Fla.
 Merrill, B. E., St. Petersburg, Fla.
 Miller, F. W., West Palm Beach, Fla.
 Miller, C. H., Goulds, Fla.
 Miller, G. A., Box 352, New Augustine, Fla.
 Miller, J. A., Clearwater, Fla.
 Miller, W. F., Valrico, Fla.
 Mitchell, A. B., Wabasso, Fla.
 Moore, John L., Haines City, Fla.
- Moore, Mrs. J. L., Haines City, Fla.
 Moore, Miss Emma H., Georgetown, Ky.
 Moorehead, W. E., West Palm Beach, Fla.
 Morley, John, Lake Alfred, Fla.
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 Morton, Miss G. P., Orlando, Fla., Box 704.
 Martensen, C. B., Tyler, Minn.
 Moses, W. R., West Palm Beach, Fla.
 Moses, Mrs. C. M., West Palm Beach, Fla.
 Moss, I. E., Lakeland, Fla.
 Myers, E. W., St. Joseph, Mo., 1402 S. 17th St.
 Munyon, J. M., West Palm Beach, Fla.
- McAdams, R. P., Larkins, Fla.
 McAdow, Mrs. Marion, Punta Gorda, Fla.
 McCarden, R. L., West Palm Beach, Fla.
 McComb, Jas. Jr., Jacksonville, Fla.
 McCord, F. E., Stuart, Fla.
 McCord, Wilbur, Jacksonville, Fla.
 McCord, L. P., West Palm Beach, Fla.
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 McIntyre, A. H., Dunedin, Fla.
 McLaughlin, C. E., Fort Myers, Fla.
 McLendon, H. S., Fort Pierce, Fla.
 McQuarrie, C. K., Gainesville, Fla.
- Newell, Wilmon, Gainesville, Fla.
 Nichols, V. L., Winter Haven, Fla.
 Nichols, S. E., West Palm Beach, Fla.
 Nielson, Alfred R., Melbourne, Fla.
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 Osteen, J. W., Altamonte Springs, Fla.
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- Paddison, R. P., West Palm Beach, Fla.
 Painter, Mrs. C. A., Lyons, N. Y.
 Palmer, Mrs. Potter, Osprey, Fla.
 Parketon, John S. Thonotosassa, Fla.
 Pattillo, Miss Edna, Oak Hill, Fla.
 Pattillo, Mrs. J. E., Oak Hill, Fla.
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 Pearce, Eugene L., Clearwater, Fla.

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 Pool, S. F., Winter Haven, Fla.
 Pool, Mrs. S. F., Winter Haven, Fla.
 Pond, F. S., Tampa, Fla., care Fla. Citrus Exchange.
 Porter, R. W., West Palm Beach, Fla.
 Potter, G. W., West Palm Beach, Fla.
 Potter, Mrs. G. W., West Palm Beach, Fla.
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 Radcliffe-Cadman Bros., Narcoossee, Fla.
 Ransom, Kenneth M., Oakhurst, Fla.
 Ray, Alex., Jacksonville, Fla.
 Reasoner, E. N., Oneco, Fla.
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 Ricker, R. C., Bradenton, Fla.
 Riddle, R. O., Eustis, Fla.
 Ringdahl, G., White City, Fla.
 Robinson, T. R., Terra Ceia, Fla.
 Roode, E. B., Bradenton, Fla.
 Rose, A. T., West Palm Beach, Fla.
 Ross, J. H., Winter Haven, Fla.
 Ross, Mrs. J. H., Winter Haven, Fla.
 Rose, Capt. R. E., Tallahassee, Fla.
 Rose, Mrs. R. E., Tallahassee, Fla.
 Rou, S. F., Lowell, Fla.
 Rou, Mrs. S. F., Lowell, Fla.

 Sadler, W. G., Nashville, Tenn.
 Sadler, Dr. O. W., Mt. Dora, Fla.
 Sampson, F. G., Quincy, Fla.
 Sampson, Mrs. F. G., Quincy, Fla.
 Sammons, W. W., Corn Exchange Natl. Bank Bldg., Chicago.
 Sams, Theo. L., Courtney, Fla.
 Sanders, E. R., Winter Haven, Fla.
 Sanderson, G. W., West Palm Beach, Fla.
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 Scarlett, J. A., DeLand, Fla.
 Schabinger, J. J., Delray, Fla.
 Schaufelberger, F. J., Hastings, Neb.
 Schober, Dr. W. B., Cocoanut Grove, Fla.
 Schub, Henry S., Princeton, Fla.
 Schubert, W. J., Jacksonville, Fla., care Armour & Co.
 Schweinitz de Alan, Winter Haven, Fla.
 Schumaker, E., Sharps, Fla.
 Scott, Ed., Arcadia, Fla.
 Scott, J. Bernard, Winter Haven, Fla.
 Scott, J. Winfield, Glen St. Mary's, Fla.
 Scoville, E. M., Dade City, Fla.

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 Shooter, C. C., Earleton, Fla.
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 Simmons, N. P., Jacksonville, Fla.
 Simpson, Jas. Mt. Dora, Fla.
 Sirken, Harry, Jr., West Palm Beach, Fla.
 Skinner, B. C., Dunedin, Fla.
 Skinner, Elizabeth, Dunedin, Fla.
 Skinner, F. L., Dunedin, Fla.
 Skinner, L. B., Dunedin, Fla.
 Skinner, Mrs. Mary E., Dunedin, Fla.
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 Soar, J. J., Little River, Fla.
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 Solee, Wm., Jacksonville, Fla.
 Spencer, Louis P., Palm Beach, Fla.
 Spicer, E. E., Groton, Conn.
 Stall, B. E., Tampa, Fla., R. F. D. No. 1.
 Stanley, F. W., DeLand, Fla.
 Stebbins, Dr. H. H., Thonotosassa, Fla.
 Stelwagon, Weightman, Miami, Fla., R. F. D. A.
 Stevens, E. B., DeLand, Fla.
 Stevens, H. B., DeLand, Fla.
 Stevens, J. A., DeLand, Fla.
 Stevens, H. E., Gainesville, Fla.
 Stewart, C. E., Tampa, Fla.
 Stewart, I. A., DeLand, Fla.
 Stillman, Fred A., Daytona, Fla.
 Stowers, J. C., West Palm Beach, Fla.
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 Talbott, W. O., Goulds, Fla.
 Tallis, W. H., Fellsmere, Fla.
 Taylor, J. T., Moorhaven via LaBelle, Fla.
 Taylor, J. A., Oak Hill, Fla.
 Taylor, Mrs. W. H., Rood, Fla.
 Taylor, Mrs. B. W., Jupiter, Fla.
 Tenny, L. S., Miami, Fla.

- Tenny, Mrs. L. S., Miami, Fla.
 Thompson, C. H., Winter Haven, Fla.
 Thompson, Mrs. C. H., Winter Haven, Fla.
 Thompson, Ralph P., Winter Haven, Fla.
 Thompson, W. J., Frostproof, Fla.
 Thompson, F. C., Frostproof, Fla.
 Tilford, F. V., Miami, Fla.
 Tillinghast, B. I., Crescent City, Fla.
 Tillinghast, Mrs. B. I., Crescent City, Fla.
 Tillinghast, Miss Helen, Crescent City, Fla.
 Tilden, A. M., Winter Haven, Fla.
 Tippin, Geo. T., Vero, Fla.
 Tonner, W. E., Citra, Fla.
 Tourtelletto, L. E., Limona, Fla.
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 Tucker, Miss H. S., Merritt, Fla.
 Tucker, R. M., Orange City, Fla.
 Turner, Huger, Roseland, Fla.
 Tyler, A., Glen St. Mary's, Fla.
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 Wakelin, G. M., Tavares, Fla.
 Wallace, G. R., West Palm Beach, Fla.
 Waldron, Max, Lake Alfred, Fla.
 Waldron, D. W., Ormond, Fla.
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 Walsh, C. A., Davie, Fla.
 Ward, J. Walker, Orlando, Fla.
 Warnell Lumber & Veneer Co., Plant City, Fla.
 Warren, Alfred, Fort Pierce, Fla.
 Warner, S. C., Palatka, Fla.
 Watson, J. R., Gainesville, Fla.
 Watts, Chas., West Palm Beach, Fla.
 Werner, Robert, Davie, Fla.
 Wheeler, H. J., 92 State St., Boston, Mass.
 Whitley, R. M., R. F. D. A-226, Miami, Fla.
 Whitley, Mrs. R. M., R. F. D. A-226, Miami, Fla.
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 Whitney, L. A., St. Petersburg, Fla.
 White, H. G., Putney, Ga.
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 Wilcox, Clarence, West Palm Beach, Fla.
 Wilkinson, Miss Madge, Jacksonville, Fla.
 Wilkinson, S. F., Jacksonville, Fla.
 Wilmhurst, H. J., DeLand, Fla.
 Will, T. E., Fort Lauderdale, Fla.
 Williams, S. F., Jacksonville, Fla.
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 Wilson, R. N., West Palm Beach, Fla.
 Wilson, P., West Palm Beach, Fla.
 Winston, J. R., Orlando, Fla.
 Wirt, R. D., Crooked Lake, Fla.
 Wolfe, R. L., Glen St. Mary's, Fla.
 Woodruff, Hamilton, Box 686, Jacksonville, Fla.
 Wright, Edgar A., Tampa, Fla.
 Wyman, Dr. W. E. A., St. Petersburg, Fla.
 Yothers, W. W., Orlando, Fla.
 Young, Chas., Bayshore Blvd., Tampa, Fla.
 Young, Geo. F. McKinley, Isle of Pines.
 Zachar, Jerome, Myakka City, Fla.

Proceedings of the Thirtieth Annual Meeting of the Florida State Horticultural Society

The proceedings of the Thirtieth Annual Session of The Florida State Horticultural Society are presented herewith in our Year Book, and the members will find the papers read at this session and the discussions following of more than usual interest.

The compiler with the ever present cry of economy before her, while attempting to preserve the germane portion of the many interesting discussions, was compelled to eliminate some of the items discussed, and these omissions from the proceedings were necessary chiefly to economize space.

The papers read and the discussions covered a wide range of subjects of the utmost interest and importance to our membership, and these papers and discussions are made matters of permanent record in our Year book, as it is the idea of the Society that a complete series of this publication will constitute in itself a library of Florida Horticulture invaluable to the owner.

Before we closed our session in 1916 at

Arcadia where we had received so much hospitality at the hands of the good people there, Mr. Biggers, the genial secretary of the West Palm Beach Board of Trade, told us that when we came to his city we would have just as good a time as we had had at Arcadia.

We all left for the West Palm Beach meeting full of expectations and we were not disappointed. Those of us who passed through the country just north of West Palm Beach in the day time felt when we drove into the city limits of this fair city that Jack Frost had heard that we were coming and did not want to make us feel gloomy by seeing the effects of his icy fingers on every hand, so he skipped by West Palm Beach and went on with his deadly work further south, leaving even the most tropical growth practically uninjured.

The good people themselves were ever ready with their automobiles to take the members of the society to see the surrounding country, and the musical circle delighted us with solos and quartets ev-

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ery evening. On Thursday afternoon we were the guests of the Board of Trade, and they furnished automobiles for all of our members. After riding over the fine roads of Dade county and looking at the truck gardens in that section, we were all taken across Lake Worth to see beautiful Palm Beach and were given the added pleasure of visiting the "Garden of Eden," the home of Mrs. C. I. Cragin. It was a veritable Garden of Eden, filled with tropical trees and plants, many of them very rare and some covered with blooms. As most of the plants and trees bore their names it enabled many of us to associate plant and name together for

the first time. All true lovers of horticulture wished we had hours to spend enjoying the beauties, rather than the few minutes we could spare.

On our return to the city the ladies entertained us with an informal reception in the park, which was enjoyed exceedingly.

Our session this year was doubly interesting, owing to the fact that we had with us the Federal Loan Board, who came down to inspect our State after the cold, and also to take up the question of loans in this State. The full text of this discussion will be found in the report.

Addresses of Welcome and Responses

ADDRESS OF WELCOME ON BE HALF OF THE CITY OF WEST PALM BEACH

W. A. Dutch, Mayor

Mr. President, Ladies and Gentlemen:

It is my good pleasure in behalf of the City to most heartily welcome the State Horticultural Association, as our most worthy guest, whom we delight to honor and have partake of our hospitality.

I greet you in that spirit of freedom of the new day the glimmer of whose dawn is almost apparent. The gates and barriers between nations are fast being removed, and all hail the day when the song of freedom and welcome shall swell every breeze, and the kingdoms of the earth shall be free.

In so greeting you, I am truly glad that we can depart from that rather ancient custom of giving you the keys of the City in order that you may unlock closed doors and gates that stand between you and some coveted pleasure or desire. Friends and guests, I have no key to the City to give you; there is none.

We are glad to present to you a City wherein a united people are ever working to accomplish the greater and broader building thereof, breathing, in every effort, the spirit of freedom and welcome, and it is to the credit of such efforts that makes it possible for me to invite you into the City without gates or walls, whose

way is, and may it ever remain, open and free, to all who pass our way.

Blessed the City that has rolled the stone from its portals, that all may enter with a feeling inspired by the warmth and cheerfulness of its social atmosphere.

We bid you partake of our joys and pleasures, and share with us the great blessings this flower land, abounding in fruits, sweet to the taste, showers so generously upon us.

We greet you with a friendship likened unto the breathing rose, with sweets in every fold. We want you to feel and enjoy that freedom and welcome while here, which our very surroundings suggest, as immeasurable as the depths of our great ocean, as broad as our thousands of acres of rich, fertile land with the bird songs to gladden the heart and the orange-blossomed, sweet-scented zephyrs of the morning to enrapture our very being, making us to feel that

“God’s in his Heaven”

“All’s right with the world.”

Others will tell you of our great and wonderful resources, which make it possible for the most successful cultivation and production of fruits, flowers and shrubbery that you are especially more inter-

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ested in, but I assure you that all these bid you come and welcome you.

Our birds in their songs welcome you.

Our pine trees nod their welcome.

The wings of the morning fan the branches of the palms bending low to whisper their welcome.

Our streams and lakes shall catch up

the glad refrain and bear it on to our great ocean until its roaring waves may greet and ever welcome you.

May your stay in the City afford incidents that will grow into fond memories, such that you can say in one accord it was good to have been there, and with us you shall ever be welcome.

RESPONSE

Lloyd S. Tenny, Miami

Mr. President, Mr. Mayor, Ladies and Gentlemen:

The fruit growers of Florida are glad to accept your hospitality. They fear that you do not know, however, some of the promises that have been made to them. I am going to call your attention to a few of the things that we, as horticulturists, are expecting to see. We are expecting to see them because for two years we have heard about them; they have been described in such glowing terms to us that I think it would be only fair that the Mayor of this City should know what has been told us.

We have been told that this is one of the most beautiful and prosperous cities in the State. We have already seen a little of the outskirts of it and can begin to appreciate the possibilities of your city. We have been told that the Royal Palms, the Royal Poincianas and all other Royal things, grow in such profusion that when we got here we would think we were in the heart of the tropics.

Well, fortunately for you, all of the rest of the state had an unfortunate affair

early in February, but the weather man protected you in such a way that we can come here and see your subtropical foliage in its richness and beauty, and it looks good to us.

We were told your streets were broad and long; that we could ride for a century if we wanted to and never come to the end of the beautiful streets and pavements. Well, we started out early in the day and have been over fine roads and are not at the end of them yet.

We were told your daughters were the fairest of the fair, and we can believe that right now, because we have seen a sample. (Applause.)

Your secretary of the Chamber of Commerce did not tell us, however, that there were any footlights in West Palm Beach. If he had, a few of us never would have voted to come here. (Laughter.) He did not tell us, either, that at the first meal we were to have in West Palm Beach, we would be served with fruit from California. (Laughter.) I am not sure we would have come if he had told us that. There can be but one

thing worse, and that will be to have tomorrow, pineapples from the Hawaiian Islands. (Laughter.)

Seriously, though, we agricultural farm people are glad to come here; we appreciate the possibilities of the East Coast, and we have come, I trust, with our eyes wide open. It is an unfortunate day for any industry when that industry comes to feel that there is nothing more to learn, and it is a good symptom in the life of Florida today that we can see coming

from one section of the state, and another, and another, growing in intensity, the spirit of rivalry, and yet the spirit of being willing to appreciate what the "other fellow" is doing; to find out how he does it, and then going home, determined that, after all, we have a pretty good place, even if there are some other places that have advantages we have not; and that is the feeling we will have when we go home from West Palm Beach.

ON BEHALF OF THE WEST PALM BEACH BOARD OF TRADE.

George Graham Currie

Mr President, Ladies and Gentlemen:

It affords me great pleasure, on behalf of the West Palm Beach Board of Trade, to bid you welcome. While I listened to Mr. Tenny telling what he expected to meet at West Palm Beach, my heart somewhat misgave me. It seemed as though he was expecting a good deal more than we could furnish, but when he finally told us it was our managing secretary who had told you what was here, I felt that we must back up whatever Mr. Biggers has said about West Palm Beach. I believe you will see, before you leave here, all that you were expecting to see, and more.

After all, Palm Beach is a state of mind; you will remember Shakespeare says, "nothing is good or ill but thinking makes it so." If we can make you think and feel that you are welcome, I am sure you will not be disappointed.

This is the second time I have attended a meeting of this Society. Many years

ago I attended a meeting of the State Horticultural Society at Miami. On that occasion there were two people present who were much thought of, who have since passed away. They were very prominent in the meeting. One was your president, Mr. McCarty, of Fort Pierce; the other was Henry M. Flagler, who made a most impressive address on that occasion. He was greatly extolled by the members, for the great good he had done for the east coast of Florida. Mr. Flagler in his usual modest way, when he rose to make his address, said, "You are making a mistake in so praising and flattering me; I have done only the same as many of you have done; you have done your best, at least you ought to have done your best, and I have done mine, and we are both equally worthy of praise."

That has often occurred to me as a most impressive and true statement.

Mr. Flagler, before leaving the plat-

form, told a story that was not quite so impressive, but equally memorable. He said, on one occasion a man had been committed for some minor offense and appeared before the judge. While he was up before the judge, the judge asked him in a brusque manner;

"What is your offence?"

The man, who was a stammerer, got to his feet, and he was so overcome by his predicament, that his stammering was worse than ever, and all he could say was:

"S-s-s-s-pst-pst-ss-s."

"What are you charged with?" the judge again demanded.

Again the man attempted to reply, but could only sputter and stammer worse than before.

Finally the judge turned to the policeman, who was an Irishman, and who had been watching the man's efforts with a great deal of interest, and said,

"Officer, what is this man charged with?"

"I don't know, y'r Honor, but from the sound av him, I t'ink he's charged with sody water."

But enough about that former meeting; we are now talking about this meeting, and I want to tell you that the Board of Trade, for which I am welcoming you, was the prime mover in bringing you here. Our Board of Trade is a bunch of live wires. We are proud of our Board of Trade.

Away back about sixteen or eighteen years ago, it started. At that time we paid only about a dollar a year dues and we had volunteer officers, but we were interested in the upbuilding of the town

and we started out in the good work. We have advanced each subsequent Board of Trade from year to year. In the course of our evolution, the circuit judge of this circuit was at one time our secretary, serving without pay. About four years ago we decided to put off our swaddling clothes and become a stock company, and we sold stock and purchased a lot on which we are now contemplating the erection of a building. The purchasing of the stock made us more generous in other lines, and we began to pay a secretary and get guarantors—people who would pay more than the usual dues and stand behind the Board of Trade, and we are now collecting \$4,000.00, \$5,000.00, \$6,000.00 and \$7,000.00 a year for purposes of building up West Palm Beach. We are expecting \$10,000.00 paid into the Board of Trade in the coming year.

Almost everything that has ever been done for the good of West Palm Beach, for the County of Palm Beach, has emanated from the Board of Trade. We have just succeeded, through the efforts of the Board of Trade, in getting an inlet from the ocean into Lake Worth, and next year if you come, we can have you come to us from the ocean, or we can take you out to the ocean through an inlet of at least twelve feet of water.

We have just succeeded in getting the money for a road to Lake Okechobee, and will carry you out there by auto in a couple of hours when the road is built. The Board of Trade is responsible for these accomplishments, and for the accomplishment of bringing you here. One of the greatest ambitions of West Palm Beach is to become a convention city, and

we are going to interest you to the best of our ability while you are here.

We want you, in your deliberations here, to remember we are one of the youngest counties in the state, but we have perhaps the most magnificent possibilities. We contain more Everglades than any other county, and that 'glade land has been discovered to be wonderful in its fertility.

But we want you to remember that although we are so young we have many things that give us state-wide prominence. We have an orange grove at Jupiter that has taken gold medals wherever it has been exhibited. The owner of that grove says there are 300,000 acres of just such land still remaining in our county, uncultivated. From one station, Delray, we ship more pineapples than from any other station in Florida.

Our truck growers all over the county are prosperous and but for that little unfortunate freeze the gentleman told us about, they would all be a good deal happier now than they unfortunately are. But to prove to you how lucrative truck growing in this county can be, go down to Hypoluxo and you will see the fine homes our truck growers are building and have built from the proceeds of the products of their farms.

Therefore, you will see that we are not altogether back numbers, but keenly alive to the prospects of fixing up those Everglades and the 300,000 acres I spoke of, for the future.

In many ways we have set the pace for Florida; we have a Superintendent of Agriculture and a Canning Club Agent; both of which this Board of Trade has been

instrumental in getting here. We also have a County Fair of which we are justly proud. It has a bonus each year from our County Commissioners, to show that they appreciate our possibilities.

We will, therefore, listen to the words of wisdom that will drop from the lips of your speakers, and we will listen with receptive ears and try to get as much good out of this convention as possible. We want you here on account of the instruction you will give us. We want you here to show you what we have, and we want you here because we feel you will leave here with good will towards us, and speak a good word for us when our name is spoken.

Therefore, I again bid you welcome on behalf of the Board of Trade.

Across the way is Palm Beach; the great Palm Beach; the millionaires' playground, where people come even from Europe to enjoy its advantages, and you, ladies and gentlemen, are here and these advantages are yours. We want you to make the most of them. We want you to go away with kind memories of those advantages.

Palm Beach is the emphasis of the whole State of Florida. We want you to know more about Palm Beach at the same time you are teaching us about the State of Florida.

We want you to feel at home, but not like a friend of mine who once had some guests at his table. In an abrupt manner he said, "Now make yourselves at home. I am at home and wish you all were." We want you to be at home, but in our home. We want you to feel when you come back here again, that you are coming

back home, and that you will want to come back and stay here for good.

In closing my remarks. I am going to read you a poetical invitation to Palm Beach. It may not be entirely appropriate because you are all Floridians. It is entitled:

AN EPISTLE
FROM THE PEOPLE OF PALM BEACH TO
THEIR LESS FAVORED BRETHREN
IN THE NORTH

All you who dread winter, with what it implies,
In the far away realms of Jack Frost;
And you who are stricken when Dame Nature dies,
And would fly from her snows at all cost;
And you, too, who toil, yet are tired of the strife,
And think you've earned leisure to spare;
And you who are seeking a new lease of life
But can find no environment fair;

Oh say, won't you come to our City of Flowers—
To our homes amid greensward and bloom;
Where, while o'er your bleak land the blizzard cloud lowers,
We are basking in bowers of perfume;
Oh say, won't you come where the palms whisper low,
And the tall oleanders wave free;
Where the royal poincianas, in scarlet aglow,
Are bowing and beckoning to thee?

Oh say, won't you come and enjoy, while you may

The enchantment of tropical skies;
And see the famed sunsets that hallow our day,
And the love-storied moonlight we prize;
Oh say, won't you come and breathe zephyrs of health,
In a bourne where youth ceases its flight;
Where the days creep upon us with unperceived stealth,
And we dream away care in a night?

Oh come, and be charmed with our red-bird's bright wing,
With the plumes of the lovely bluejay;
And list to the songs that the mocking-birds sing—
Feel the throb of the whippoorwill's lay.
Oh say, won't you come and be clasped in the brine,
Of the Southland's warm billowy wave,
As it flashes and glints in the merry sunshine,
Or breaks at our feet as we lave?

Won't you come and hook "kings" from our ocean-swept pier?
Won't you troll for lake trout as we sail?
Won't you follow the fawn in our Everglades near;
And encamp on the Seminole's train?
Or come, if you will, and be one at the feast
That we offer of grapefruit and pine;
Of the orange and banana and mango—
nor least,
Of the pear avocado divine.

Oh say, won't you come—or if Fashion's the wile
That must lure you from Boreal Blast;

We can boast in "The Season" society's
smile,
And of "functions" a daily repast.
Then come! Oh, do come! to our City of
Flowers,

And partake of our bliss we beseech!
In the North leave Earth's storms and ex-
change them for showers
Of the Heaven that you'll find at PALM
BEACH.

RESPONSE

S. F. POOLE, Winter Haven.

Mr. President, Ladies and Gentlemen:

I indeed consider this a great privilege and a great honor to be selected to make this response on this auspicious occasion.

As we came into your beautiful town this evening, we admired your broad streets, your beautiful yards and your fine buildings. We realized that you must have some "live wires" behind this town.

We have looked forward with a great deal of anticipation to this event, and I do not believe we are going to be disappointed in the least. We have enjoyed ourselves every minute of the time.

I noticed as I was coming into town this evening, that you had no fences about your yards, and I have been told the reason for this is that people, when they get here, are so anxious to stay here that you do not need any fences to retain them. (Laughter.)

We have in our Winter Haven section, a great many visitors coming to us every year, but we must have fences in order to protect ourselves and keep out a great many of them. (Laughter.)

I am glad to make this response for the Society, because we are in this beau-

tiful place; also because of the Society that is represented here tonight. It is one of the great institutions of the State of Florida; it stands for great things in horticulture. It stands for extensive results. We believe in getting the best that is possible out of our labor, not only getting the greatest quantity but the best quality in our products, and by so doing we aim to make Florida and the products of the State of Florida, known all over this broad country.

We are engaged in a wonderful work, and as we come here this year, we hope to discuss these various phases connected with horticulture, and we hope that we shall all get great benefits from these discussions. The officers conducting the affairs of this Society are the strongest men in the state in their chosen line. They are men, and women as well, who have a national reputation, and this speaks well for the Society. It indicates the great strength it has among our own people and the affairs of our nation.

Florida is a great state; it has wonderful possibilities, and we have only begun to scratch the very outside of our resources. Look at her agricultural possi-

bilities, look at her fruit interests, her trucking interests and other allied interests, and you can see for yourselves what there is in the future for us.

We are farmers, and glad we are farmers, and when the day comes when we can dignify farming by making it a profession, just as medicine and law and surgery are professions none of us will be ashamed of being farmers, for it will require the very best from us in order to carry out the aims in our minds, for if we have the preparation Major Floyd spoke of, it will require an indefinite amount of patience and preparation on our part.

As I listened to the recounting of the possibilities and wonders of this region, I was reminded of an experience of my

own when I was a young fellow and knew more than I do now. I had the temerity to sing in a male quartette in a little town called Paradise. We did not make much of a success, and we left that town rather in disgrace. My hopes for the future received a very rude jolt in Paradise. But as I listened to the alluring promises that have been held out to us by the Board of Trade and your Mayor, I am fain to believe that perhaps my chances, as well as those of the rest of you, have had a wonderful impetus. It seems as though we are *near* Paradise at least, and I am glad on behalf of the Society, to say that we appreciate this opportunity and that we will avail ourselves of it to the utmost, and we shall expect to be near Paradise, at least for a few days. (Applause.)

President's Annual Address

H. Harold Hume

Mr. Chairman, Members of the Horticultural Society, Ladies and Gentlemen:—

Naturally at this time, the thought uppermost in our minds is of war and its influence on us and our surroundings. Some of us may have hung "No War Talk" signs over our desks or in our places of business. If we have, the best thing to do now is to hide them in the cellar or the attic or somewhere among the things which have an ample covering of dust and cobwebs. Some of us may have been pro-German, others pro-Ally a few months or weeks ago, but now we must needs be pro-American not only in our speech but in our activities, in our daily goings and comings, for we are at war that democracy may not perish from the earth.

Being at war at this day and time, is not an abstract thing, not something that concerns a few men in the nation's affairs, the few men who today occupy positions of leadership in Washington or elsewhere in our country. And war today is not something that concerns only those who glide through the air, or sail the seas, or march o'er the land or go down into the depths thereof. Nay, being at war means that you and I, every member of this Society and every man, and every woman and every child in this fair land of ours, is at war. It is a concrete condition which embraces all, irrespective of age, posi-

tion or degree, from the cradle to the grave. The burden is upon all, and if America is to do her part in bringing this condition to a right ending, then it is for every one of us to take up the burden and manfully do our part. It is not that we must shoulder our muskets and march forth to the sound of fife and drum. Were we brave enough and strong enough and irresponsible enough to do that, the cause in which we are enlisted would be lost—a fine example of misdirected effort. But back of the firing line, and away from those who direct our national affairs, back in the town, back in the village, back o'er all the country side, there is a place for all, a place where one hundred per cent effort may count in results at least one hundred per cent. There, somewhere, is a place for all, the place where we, armed with hoe or rake or spade or shovel, or driving the armed cultivator or mighty plow may fight our nation's battles. There may appear to be little in common between a hoe and a sword, a cannon and a disk harrow, but all the common tools and implements of farm and garden must be marshalled and used effectively before the war is won and this world made again a fit place for freemen to dwell in, in happiness and peace.

And having in mind the welfare of our nation, the welfare of our state, and the welfare and happiness of you, the mem-

bers of this Society, let me urge upon you the vital necessity of going forth armed with the tools of tillage to help our Country in the task she has taken up. In a very personal way each of us must go forth to war.

Much has been said about the Agricultural and Horticultural resources and possibilities of our State, and we are agreed that they are both rich and varied. Calamities have been visited upon industries developed on these resources, and yet, how quickly have the effects of these been effaced, and how quickly have we resumed our every day order of existence. Yet with it all we have, in so many ways, fallen short of the full development of these resources, and how far short we have come of that independence which the development of our resources might give us. We are so dependent upon other sections of our country for food stuffs for man and beast that any interruption of our ways of existence may entail suffering upon us. Nay! want may be at our doors. Let me illustrate this point further. Last winter, North Florida was threatened with a salt famine. Not that there was not plenty of salt in the country, but difficulties in transportation had interfered with the forwarding of supplies to such an extent that for a time jobbers in Jacksonville would not agree to furnish more than ten sacks to any one merchant. Now, it is very likely that our railroad facilities for transportation may be taxed to their limits in the near future, coastwise shipping may be affected and what happened in the case of salt may happen with a multitude of things that we use on our tables or feed to our hogs, cattle and mules or

horses. There have always been good and sufficient reasons why we should produce more largely of what we consume but never were these reasons so backed up by the actual necessities of the case. It is indeed a condition by which we are faced and not a theory. It becomes imperative that every piece of cleared and tillable land in country, village, town and city throughout Florida should be utilized to the fullest extent. No spot is too small to be neglected and none too large to be left out of consideration. One crop should succeed another and the land used for high pressure farming. In every way possible we must increase the production of supplies for our own tables, and feeds for our own animals.

Moreover the time has come when we must give consideration to another phase of the problem. Labor has always been fairly easy to secure in Florida. It is so still, but there is a very strong probability that a change may come in this direction. If large numbers of men are withdrawn for service in the Army or in the Navy or in the factory or for construction work, we are bound to be affected and it then becomes necessary for us to take up the burden with our own hands in a way that some have not heretofore done, in some time at least. And in this work the boys and girls, the women and those unfit for field service must do their part. It means the enlistment for service of every available labor force in the country. We must very closely approximate, what has at times been urged as a true basis for social and economic service, "He who does not labor, shall not eat"—every one must become a producer.

While I have emphasized the public-service side of this question, the results to each individual must not be overlooked. In this time of high food cost and having in mind that still higher price levels are likely to be reached it becomes well nigh a necessity for every one on the land to raise everything possible from it, thereby making it possible to live at less cost than if everything consumed has to be purchased. Out of this war pressure some good is bound to come. The lessons learned under the hard hand of necessity will not be forgotten when normal conditions are resumed. We shall live the better for having passed through these trying times, we shall produce more of what we need, we shall be less dependent on other parts of our own country and other parts of the world than we have

heretofore been. And under present conditions the marketing of our surplus at remunerative prices is a very much easier problem than it ever was before. In our production activities, emphasis must be placed on food stuffs and we may legitimately go outside our regular horticultural lines and engage in stock raising, to the betterment of our economic conditions. We may look upon a live pig as nothing but a hog, at four cents a pound, but at sixteen cents a pound, the once despised and plebian animal becomes an aristocrat.

And so let us awake at one and the same time to our necessities and to our opportunities — opportunities for world betterment, opportunities for national service, opportunities for personal independence.

Co-operation

C. E. Stewart, Jr., Mgr. Fla. Citrus Exchange, Tampa, Fla.

Mr. President, Ladies and Gentlemen:

When Prof. Rolfs asked me to speak today, he did not mention to me the subject on which he wished me to prepare an address. I suppose he thought there was no use in giving me a topic to discuss; that there was only one thing any exchange man could talk about, and no matter what subject he might give me to start on, I would wind up by talking about co-operation. We are all so full of the idea of co-operation that we talk about it whether there is occasion for it or not.

There is a principle coming into such common use in the business organizations of this country that many are misled into thinking that it indicates the dawn of a new era. No Trade Paper can be read today without hearing it advocated many times, and we who live in this the most progressive age since the world began, forget that it is the rock upon which all civilization and progress are built. This principle is co-operation.

There are three main factors which are essential to the success of any great enterprise or industry, and these are efficiency, economy and co-operation. The units of a vast army must co-operate as must the various departments of a large corporation for their progress depends on efficiency and economy, which cannot be attained without co-operation.

It is an old and familiar word used now

in a new sense. It has a different meaning from "co-operation" as defined in the dictionaries. The term is defined there as "United action for the increase of mechanical power, as when several men join in moving a log or boulder because one alone could not stir it." But industrial co-operation is a union for the purpose of obtaining the proper profit of a transaction and distributing it equitably among those who do the work. It delivers the public from the conspiracy of capitalists, jobbers and manufacturers who make the laborer work for the least, the customer pay the utmost for whatever he needs of money, machines or merchandise.

Co-operation is a word to conjure with. It escaped frenzied finance and speculation by owning its ordinary interest values, it builds up its trade and membership by giving them the profit which they have contributed. Mr. Carnegie believes that the future of the nation and the sound, healthy growth of our industries lie along the lines of mutual understanding and co-operation between employer and employee, producer and consumer.

During the dark days of ruinous competition, common sense and business courage evolved the scheme of industrial co-operation to bring the workman and consumer into partnership for their mutual benefit. It is organized self-help and its principle is a definite thing. As John

Stewart Mills said, "it is not co-operation where a few persons join for the purpose of making a profit from cheap purchases by which a portion of them receive benefit. Co-operation is where the whole produce is divided. What is wanted is that the whole of the working class should partake of the profits of labor."

Co-operation is not a noisy or conspicuous affair; it asks no laws in its favor; it makes no appeal for aid or endowment from individuals or from the state; it disturbs no interests; attacks nobody's fortune; but stands apart, clears its own ground, and gathers its own harvest.

Industry owes respect to hundreds of co-operators who have preceded today. Heroditus mentions one hundred and Aristotle one hundred and twenty forms of community life, all differing but all communal in some respect and all succeeding in their day.

Industrial co-operation had its inception before this country was born. In Rockdale, England, seventy-odd years ago was laid the foundation of the wonderful co-operative stores today. Some followers of a man named Robert Owen first saw the value of combining, and gathered together under the name of the Equitable Pioneer Society. This Society hired a little room, and after a year or two of struggle they raised fourteen hundred dollars and began the first co-operative store in England. That was the beginning. Today the Co-operative Wholesale Society has three million members, is growing at the rate of seventy thousand a year; and does a yearly business of five hundred and fifty million dollars which is increasing at the rate of one million dollars annu-

ally. It has buyers and warehouses in the United States, Canada, Australia, Spain, Denmark and Sweden and owns steamers plying between continental and English ports. How's that for co-operation? Some time ago a working man of this society was asked how he liked to work for the company, "I don't work for any company," he replied, "I work for us." In Rockdale was fired the first shot from the gun of industrial co-operation that was heard around the world, and in every nation on this globe today this principle is being practiced. Four fifths of the population of Denmark alone belong to co-operative associations and in the United States there have been filed the names and addresses of over ten thousand marketing organizations, selling a combined agricultural product of over a billion dollars. Fifteen years ago a prediction was made to Lloyds in London that co-operation once started in the United States would reach a far greater development than in England and from these statistics it seems that this prediction is in a fair way to be fulfilled.

The handling and marketing of crops through co-operative associations is more highly developed in fruit growing than in any other agricultural industry in America. These organizations are formed to purchase the supplies used in the production and marketing of the crops, to standardize the harvesting, hauling, grading and packing of the fruit, and to develop a selling organization giving proper distribution, keeping the products of the various members from competition one with the other, and working to stabilize the market by judicious shipments.

We citrus growers of Florida must co-operate for the very life of our industry. The products of our labor have been exploited to an extent that few of us seem to realize. Consider for a moment the number of men that were in the state this year gambling and wild catting in oranges! And the grower who deals with these people for the sake of immediate profit is often undermining this business at its very foundation. Is it not by the advancement of this industry as a whole that you will reap the greatest individual profit?

The citrus crop of Florida brings into the state an enormous amount of money each year and if growers could realize the power that the disposal of such crops puts in their hands, they would not waste a day in combining. Imagine the combined purchasing power of an organization buying all materials needed by the growers of this state; consider the saving in transportation alone of large quantities of supplies! It is a matter of record of the Department of Agriculture that a co-operative association saved one thousand dollars in the purchase of only thirty-four spraying machines. There is an instance of the benefits of co-operative buying.

Do you realize that a co-operative organization formed to handle the product of your grove has nothing in common with any independent company; that it is essentially a non-profit-making corporation; that every cent that the fruit brings is returned to the growers, deduction being made only for transportation and legitimate handling? Do you realize that it is your own business and that through the proper channel every one of you has a

voice in its every operation? Do you realize that your troubles are the troubles of every other grower, that your problems are the same, that your interests are identical and that you are in business solely for the purpose of making orange trees pay? I think you do. Then why not help each other, why not throw aside petty differences and by giving and taking a little, combine and intrench yourselves in a position attainable in no other way. The grove owners of Florida have been thinking of co-operation for a long time. There is hardly a man connected with the citrus industry who has not considered its feasibility, and many have promised themselves that some day they would co-operate with their fellow growers. And that reminds me of a story.

An old negro living down south decided to get married. He went up and told his master about it, "Well, sah, I'se gwine to git married." His master congratulated him on his decision, and thought no more about it. A month or two later, he saw the old colored man out in the field and remembered that he had recently become a benedict, and said, "Well, Lucium, how do you like married life?" "Well, sah, married life is all very well, but I don't like dis heah all de time fifty cents."

"What do you mean, all the time fifty cents?"

"De fust t'ing when I gits up in de mawnin', it's 'Lucium, gimme fifty cents'. Den at noon when my 'ooman bring my lunch to me in de fiel', it's 'Lucium, gimme fifty cents'. Den at night, when I goes home, de fust t'ing I hear is 'Lucium, gimme fifty cents'."

"What does she do with all those half dollars?" asked the master.

"Lawdy, massa, I ain't never give her none yit."

Now Florida is the wife asking for co-operation and the growers are the husband putting her off.

The benefits of co-operation in this citrus industry would be farther reaching than the immediate profit from the main crop. The waste that goes on in all our groves is fully realized and it will take concerted action on all our parts to turn this loss into an asset. This is proved by the call for co-operation from various companies formed in the state which

manufacture their product from this class of fruit. So it is to co-operative growth that we must look for the general development among us of those principles of thrift that perhaps our bitterest lessons have yet been insufficient to teach us; for the acceptance of a standard which shall regard care for small savings as an honor and not a disgrace, and which shall recognize as one of the most important teachings of the gospel, that wonderful lesson in economy, when after the manifestation of overflowing bounty its ministers were admonished to "gather up the few fragments that remain that nothing may be lost."

Address

B. L. Hamner

Mr. Hume: One of the fortunate things about this Society is that we always have something in reserve.

I am going to ask Mr. B. L. Hamner to come up and talk to us a while. Mr. Hamner needs no introduction, I am sure.

Mr. Hamner: In attending the Horticultural Society meetings from year to year, I have always noticed that Mr. Hume touches upon a very important and timely subject. I think his message this year should be greatly emphasized.

If a person were to start the "wolf" cry at this time to alarm the public, it would be tantamount to treason, in that it might make the public more insensible to the real call. But it is no "wolf" cry to state that our grain crop last year was a billion bushels short of the year before, and it is no "wolf" cry to state that our wheat alone was fifty million bushels short of that disastrously short crop of the year before. It is no wolf cry to state that we are at war, nor is it a wolf cry that the people in Europe are engaged in a battle for civilization. Nor is the great amount of matter you see in the papers calling for increased production, a wolf cry.

Coming down to Florida is rather refreshing and restful. In all of the northern cities on street corners, there are army tents and recruiting soldiers. Every

bridge we have is guarded day and night by soldiers against trouble from within, and in the very atmosphere in the north there is a military feeling, and we begin to appreciate that we are at war.

But if I read history right, the battle line always waits on the bread line, and the farmer who increases the production of food products at this time is doing as much or more than he could do by shouldering a gun.

This should come home to the people in Florida. We claim to the north and to the world that we have a country where we can produce crops the year around, and they are going to be needed.

If I could show you the records of our road, and show you the food products you buy in Florida, and show you the great volume of food products imported from other states, you would not boast that you are a self-supporting people.

All of the lines have been called upon to take care of increased traffic along the Atlantic seaboard. They are going to release all vessels suitable for trans-Atlantic work from the coastwise trade, and the railroads in this country are being called upon, not only to handle the products they have been handling, but to handle this coastwise trade.

Unfortunately, we have been going through for the last several years, a de-

structive period, in that railroads have been attacked from every quarter, and there is today a complete breakdown of the railroads throughout the United States..

You are not going to get your food products from the north and west because we could not haul it if we would, but our business now is going to be regulated by the government, and the government is going to say to us that we must haul lumber with which to make these vessels, we must haul certain products to be forwarded to the allies, and they are going to control, perhaps not the movement, but the things that shall be moved, the food products which shall be moved, all throughout this country.

In the months to come you are not go-

ing to have those things to which you are accustomed, unless you produce them yourselves. Cowpeas are going to be substituted in the army and navy for other varieties of beans, and there is nothing you can raise in the way of food products that will not help your country. The United States government is calling upon the railroads to do everything they can to stimulate the food production. They are drafting my department to the work of the government.

I hope that every man here who has an available acre of land, will plant upon it some food crop. It will not only be a patriotic act but good business judgment, for before very long every food product will be high in price.

I thank you. (Applause.)

Methods of Handling Citrus Groves

J. A. Stevens, DeLand

Mr. President, Ladies and Gentlemen:

When our President notified me a few days ago that I had been placed on the committee to report on "Methods of Handling Citrus Groves," I began to wonder what I could say that would be of interest to members of the society; and as I pondered the matter, I was struck by the similarity between "Methods of Handling Citrus Groves" and the "Negro Problem," as expressed by a northern lady who had come to live in the South. After she had spent several years trying to train colored servants to work according to her ideas, a friend came to visit her who had been a classmate in a northern college where they had often exchanged views on the weighty problems that are considered at such times. After this friend had been in the South for a few days, she asked her hostess: "What do you think now of the negro problem?" To which the hostess replied: "Which problem? There are as many problems as there are negroes." There seems to be as many methods of handling citrus groves as there are growers.

At each meeting of the society, some phase of the subject has been discussed, and I do not know that I can present any new ideas, but will try briefly to make some comparisons between groves on low hammock lands in the northern part of

the citrus belt, and those grown on higher soils.

Citrus fruits are grown in Florida on various types of soils. By far the greater percentage of groves are on pine land, of which there are several kinds, as shown by the soil maps. A much smaller percentage of groves are on hammock lands, where the palmetto and hardwoods grow.

The type of grove which I wish to discuss is the kind that is planted on low, or cabbage hammock, so-called because of the abundance of cabbage palmetto trees. In this latter type, apparently successful methods differ—in certain respects, quite materially from methods practiced in other types of soil.

In the first place, when preparing ground to plant citrus trees, instead of clearing off all the timber, it seems best to leave quite a little standing timber, especially palmettos, but also some live-oaks, hickories, red bays and occasionally magnolias and sweetgums, but these two last named are not considered as favorably as the others, since their roots are thought in some cases to rob the citrus trees more than the others. The object in leaving standing timber is to afford frost protection and to give partial shade. This protection is of little or no benefit in the case of a freeze with high wind, but on still nights with falling frost, the standing

timber is a great protection and the shade of these trees on the morning after a cold night is very advantageous, because it enables the citrus trees to thaw out before the sun strikes them.

The sour orange is frequently found growing wild in these hammocks, surrounded by more or less dense jungle growth, and the fruit on such sour trees is usually of deep color, smooth and very bright and pretty. This condition seems to be the natural home of the orange, and for that reason, also, it is thought unwise to remove all the timber, but on the contrary that enough should be left to make conditions as nearly like Nature provided for the wild trees as practicable.

In low hammocks, citrus trees are usually planted much closer together than is the custom on pine lands generally and one hundred trees to the acre is about the standard. The native wild sour stock is almost universally used.

Very little, if any, cultivation is practiced, especially if marl happens to be found outcropping or near the surface. Because of the standing timber, it is difficult to use implements for cultivating, and hoeing is generally resorted to for whatever cultivation is deemed advisable.

Under these conditions, the root-system is not as extensive and trees do not grow as large, nor bear as much fruit per tree, as trees of the same age on higher and more open soils; but the fruit, especially the orange, is of better quality, flavor and texture and usually sells for enough more to make up the difference in yield, and it is quite probable that an acre of low hammock grove nets the grower quite as much on an average, or

perhaps more, than an acre of grove on higher land, when comparison is made between trees of the same age.

Rust mites are seldom found in low hammock groves which are shaded and it is usually not necessary to spray for bright fruit; but, on the other hand, white-flies seem to thrive fully as well, if not better, in low hammock groves than elsewhere. The usually more moist conditions prevailing in low hammock-shaded groves greatly assist the growth of fungus parasites of whitefly.

The same moist conditions referred to not infrequently assist the development of fungus diseases, such as withertip and stem-end rot, and consequently necessitate more pruning than would perhaps be necessary in groves which are more open and on higher, better drained soil.

Fertilizing a low hammock grove is a matter which requires careful thought. Ordinarily, low hammock citrus trees will do best with a little less ammonia than is usually given to groves on other types of soil, but the grower is sometimes tempted to try and force his trees to see if he cannot make them bear more fruit, and in such cases it not infrequently happens that injudicious or over-feeding is apt to result disastrously, because trees on this type of soil are apparently quite susceptible to the dieback disease. However, if not over-fed the danger of dieback is not great.

When it comes to packing, the low hammock fruit is very tender and has to be handled very carefully. This fruit is easily bruised and if the greatest care is not exercised may reach market in a rotting condition; but when properly put up, and

arriving sound, the prices received are usually very gratifying and compensate for many of the disadvantages encountered in production.

* * * * *

Perhaps it would not be out of place right here to mention an experience which was had this spring in what was, to us at least, an unusual method of grafting. We had occasion to move quite a lot of sour orange seedlings that would caliper from an inch to an inch and a half just above the ground. We wished to have these sour seedlings worked over to sweet orange trees as quickly as possible, and so, after receiving permission from the Nursery Inspector, we took them up, hauled them forty miles, and on February first and second (just before the recent freeze) cleft-grafted and then planted seven hundred ninety-seven of them. The process was accomplished by first sawing the sour tree off about an inch above the collar, then splitting the stump with a cold chisel and inserting one sprig graft having three or four eyes which had been beveled on two sides, care being taken to see that the cambium of the sprig was placed so as to unite with the cambium of the stump. The cold chisel was then removed and the stump gripped the graft quite firmly. The grafted stump was then carried away and planted, using plenty of water to pack the roots firmly. Then a bank of sand was drawn up all around, until only the tip of the graft protruded above the bank—but on receipt of the freeze warning, the grafts were then completely covered with sand. After the cold was over, enough of the soil was removed to allow one or two eyes of the graft to be exposed.

On April 12th, examination showed that of the 797 grafted stumps which were planted just before the freeze, 210 grafts, or 26% had died; 261 grafts, or 33% were alive but had not started; 326 grafts, or 41% had made growth and several of them had grown more than thirteen inches. Nearly every growing graft had put out anywhere from one to a dozen bloom, and one graft in particular had over a dozen open bloom at one time. In many cases, after bloom petals had dropped, young fruit had set and grown as large as a pea. It is not expected, however, that any of these young fruits will last to maturity; but the instance is mentioned here as indicating that grafts cut from bearing trees may be expected to bear reasonably early.

DISCUSSION

Mr. Lamont: In regard to the discussion of handling citrus groves, I would like to learn the best method of handling a grove that is in solid Bermuda grass to get the full benefit of the fertilizer. The grass is so dense that you cannot use a disc harrow.

Mr. J. A. Stevens: We had some patches of Bermuda grass, but never worried much about it. In cases of severe drought the trees seemed to do a little worse, but not much. We put on the fertilizer as usual, perhaps a little more of it. The grass probably took up some of it. I never tried to get rid of it, because, as Mr. Painter used to say, the best way to get rid of Bermuda grass is to move away from it.

Mr. Brown: That is one of the least of my troubles. I would say that where we have a heavy sod in Bermuda grass in our grove, if we can give it plenty of water and plenty of fertilizer, we have the best fruit in those spots. We put the fertilizer on and let the rains take care of it.

Mr. H. B. Stevens: We have a grove like that and just mow the grass and it stands the drought better than any grove we have. But if we try to plow it, we

find we have the most trouble.

Mr. Mead: I would like to ask if anybody has ever tried checking it by using kudzu vine.

Mr. _____: Which is the worse?
(Laughter.)

Mr. Felt: Natal hay will drive it out.

Mr. Hume: I have had kudzu on a ditch bank put in seven or eight years ago and tried to dig it out. It is there yet. (Laughter.)

Treatment of Frosted Groves

Mr. Skinner: I know there are a good many people here who seem to be too timid to speak, who came here with the distinct purpose of learning how to take care of their frosted groves. I am not particularly interested, personally.

(Laughter.)

I think it would be very interesting to discuss this matter, and I would like to have those who have had some experience with it, discuss it. Suppose we start out by asking the president to tell us something of what to do.

Mr. Hume: My advice in a case of this kind is summed up by saying, "do nothing." I have seen more time and energy wasted over too early efforts, those efforts counting for little or nothing. As I look at it, the main thing to be done is to wait—now I am talking about when you are really frosted—is to wait until you know the extent of the damage. Many of the growers, particularly among those who have had their first experience, want to go in their groves the morning after the freeze and do something. At that time you don't know what to do, so at that stage there is nothing to do but wait until growth begins and shoots starts out so that you know just where you are. Then you are ready to begin to clean out the dead wood.

But there is something you can do with the handling of a grove as a whole, and that is, if you are sure there is something

left in the grove is to begin cultivation and fertilization that will start the growth. That is along the right line. Get the new growth started, then clean up your trees and get them in shape to make up what may have been lost by the freeze.

Mr. Skinner: How much fertilizer, and what kind would be safe to use?

Mr. Hume: I would advise a fertilizer pretty moderately rich in ammonia. In many cases it is wise to reduce the amount of ammonia, but the ammonia is what the tree calls for first in making its new growth.

As to the amount, I would say off-hand, that it should be one-third to one-half of what the trees had originally been receiving. I think there is more at that stage in the cultivation, in the loosening up and opening up the soil and allowing it to warm up, than there is in the fertilizer to be applied. If water is available, put it on. That has been one of the serious things in many sections of the state, and that is the lack of moisture at the time of year when the frosts occur. But cultivation will help a long way to counteract this disadvantage.

Now I am going to call on Mr. Hart, because he has had more experience than I have had.

Mr. Hart: I have been through the two freezes of '94-95. All the orange growers of the state, pretty nearly, suffered at that time. A year or two after then,

Mr. C. A. Baker at Ormond before one of the meetings, thought it would be a pretty good idea to make a record of our experiences in handling our groves and have them recorded in the reports, that it might be of use to thousands in later years who might have the same experience.

The experience of this last winter was nothing so severe as that we had then. Through the larger part of the state last February's freeze was such that in a couple of years you will hardly know anything of the kind ever happened.

The question that has come to me—in fact, I was asked the morning after the freeze, "How shall I cut my trees back; how much shall I cut them back?"

I agree with Mr. Hume and say, "Don't hurry." You do not know how badly you are hurt until after the June growth starts. That is a strong, vigorous growth and will open up the scars that have not shown before and you may find that some trees may be dead at the bud and still have a fine growth at the top.

I remember in DeLand one time, Judge Stewart took me out to a grove and said "Look at those. Aren't they fine trees?" I said, "I don't know yet; let me look at them." I examined the trees and found every one girdled at the bottom and they had to cut the whole bunch back to the ground. The cold gets into old wounds just as it gets into the wounds of a soldier, and while it may appear alive and vigorous outside, it may be dead inside. Insects may appear to be burrowing into the live wood, while they are in reality working into the dead wood.

I reiterate the advice not to cut too soon.

I also agree with Mr. Hume in regard to the fertilization of the grove. He has said exactly what I would say in regard to it.

I would recommend you go back to that annual report that gives the result of the experiments tried at that trying time—possibly it was 1897, or it may have been even later than that.

Where the limbs are cut back to the trunk, I think it would be well, where the sprouts put out two or three or four feet long, and tender, to fasten them together in some way for a time, because they will bear fruit and they will all be on the outside so that the strain will be on the trunk and it is a heavy strain. But if you guard against that, the sprouts will eventually strengthen and make you a good, symmetrical tree.

In budding, if you cut away the bud, do not cut away the sound wood; cut it partly off and lop it down. It will be in the way for a year or two but it pays to keep it. Let the root system have the benefit of those leaves, which are the lungs of the tree; then later, after the sweet bud is well started, cut away the other growth. The sap naturally flows to the highest bud, and if you keep your sour wood down and keep the sweet buds at the top, the growth will go there.

I think more groves were killed by pruning and wrong handling after that big freeze than by any other cause. Hardly an old grove was killed by the cold, that is, the root system, but by pruning they ruined many groves throughout the state. Those who followed the policy of keeping everything they could keep, were those who got into the market first and got almost any price they wanted. It was

surprising, the profits of orange growing after that freeze. That means that no one should be discouraged because they are cut back. Get your growth just as soon as you can so as to get your share in the high prices and market conditions that will follow for those who were fortunate enough to escape serious injury.

Mr. Dade: Nitrate of soda will stimulate a tree just as a drink of whiskey will stimulate a man. It makes a tree cheerful and makes it feel good. I think it should be applied first. That should be followed by some organic fertilizer; bone is one of the best things you can use. That should be applied when there is considerable moisture in the soil.

Mr. Dade: I agree with Mr. Hart in his idea of waiting for the June growth, but I don't think he mentioned how far to cut back. That should be watched closely. You should cut back to green wood, and then cut back at least two good eyes in the green wood, and be sure you get all the dead wood cut out.

But I think a general stimulation should be urged, and then something to keep the tree moving.

Mr. Skinner: I would like to hear from Mr. Sampson.

Mr. Sampson: I can say nothing, except that I agree with Mr. Hart. Don't touch your trees now. You don't know where to prune.

Mr. Poole: My experience has been with small trees. What the gentlemen have been talking about is in regard to large, bearing trees. I agree that it is not wise to cut out anything until you are sure where the life line is going to settle. But on small trees the damage has shown up

quite plainly in a short time. I have found trees cut down to the banks are the trees coming back with the best and most healthy tops.

Mr. Stevens: I have listened with a good deal of interest to these experiences. At the meeting after the '95 freeze, I remember Mr. Adams was in the chair. He showed us a picture of the buds he put in as soon as he could get them. He put them in and had pictures to show us at our meeting.

I thought I would copy after him, but was unable to get the buds.

So many people want to know what to do with the sprouts that come out of the top of the tree. I say, let them alone. They will take care of themselves after awhile. If you take off any, you are going to find out later that you took off the one you should have let remain there.

I am like Mr. Dade; I believe in cutting back into the living wood. Do not leave a piece of dead wood to breed wither-tip. I cut back into live wood and then paint it with Bordeaux paste. It seems to be a tonic and stays on as well as coal tar. I have tried both and find it better and cheaper to handle.

I had a singular experience with banking trees I never had before. After the freeze in '95 I had some young buds come along; a little cool spell hit us and I had not banked these buds, so I banked them afterwards. The bark all came off and we lost every bud. Last year I did the same thing, and we lost them all.

This year I had some buds I was anxious to save, and when we learned the cold spell was coming, I sent down and had them banked a day or two before the cold

wave struck us, and strange to say, all of those that were banked before the freeze are just as bad as those that were not banked. Why that was, I don't know. It may have been because the earth had not had time to settle around them.

Mr. Hart: Did you open the bank up after the freeze?

Mr. Stevens: No. They were banked a day or two before the freeze and the dirt had not settled around them.

Mr. Hart: I think it is advisable to open up and let them warm up.

Mr. Sheppard: One of the troubles we have on these frosted trees on the young leaves, is the mellanose fungus.

I have already seen it coming and about in May I think it wise to apply ammonia-ted fertilizer. In '95 there was a visita-
tion of the mellanose. This was greatly
benefited in its after effects by about a
five per cent of ammonia in the fertilizer.
It decreased after then and was not seen
in the fruit.

Mr. Hume: One of the things we will naturally look for following the freeze is a greater development of die-back than we have seen in the state for some time. We have been hearing less of it, but unless I miss my prophesy very badly, we will have more of it within the next few months.

CONTROL OF ROOT KNOT BY CALCIUM CYANAMIDE

J. R. Watson

PREFACE

In November, 1914, the attention of the writer was called to the poisonous properties of the commercial compound called "cyanamid." It occurred to him that the substance might have some value against pests inhabiting the soil, and nematodes at once came to mind. Some preliminary tests, tried out on radishes in infested soil, were so encouraging that during the spring of 1915 more extensive tests were undertaken, and in July of that year the matter was taken up as a regular project for investigation. We have had variable results as we varied the dosage, the manner of application, and the soil. We will not here go into the details of these experiments, but will give only the

essential results and such details as are essential to the trucker and gardener in applying the material.

"CYANAMID"

"Cyanamid" is a trade name for a mixture consisting chiefly of the chemical compound calcium cyanide (about 45%), hydrated lime (27%), carbon (13%), calcium carbonate (4%), calcium sulphide (2%). It is a black powder, the color being due to the carbon. It is a concentrated nitrogenous fertilizer which analyzes from 15 to 24 per cent. of ammonia. At present prices it is the cheapest source of ammonia available among commercial fertilizers. It contains no potash or acid phosphate, and is therefore, not a complete fertilizer.

The valuable ingredient of "cyanamid" is the calcium cyanamide (CaCN_2). It is this component that kills the nematodes and adds the plant food to the soil. When moderate doses are mixed with soil, calcium cyanamide quickly disintegrates, probably changing first to urea and then to ammonia, and then to nitrates. In large doses, however, some of it may go into a polymeric form called "dicyanamide." This disintegrates more slowly and has a very harmful effect on any crop that is planted too soon after the application of the cyanamid. This scorching is much more pronounced when the soil is dry. Too large an amount of cyanamide will have the same effect even if no dicyanamide is formed. As stated above, our first experiments were with radishes. On November 30, 1914, six small plots, each containing three square yards, were treated with cyanamid in quantities varying from three tons to 200 pounds per acre. The cyanamid was applied as a top dressing, and hoed in. Four similar plots were used as checks. These plots were on land known to be heavily infested with nematodes. On December 4, radishes were planted on these plots but a very poor stand was obtained and the plots were replanted on December 13. On March 18 and April 20 the radishes were gathered.

This experiment seemed to indicate that:

- (1) Cyanamid used at the rate of 1600 pounds or more per acre markedly reduced the number of nematodes present.
- (2) If used too strong or applied too near the time of planting it inhibits

growth or entirely kills the young seedlings.

In March, 1915, we started experiments with cowpeas on plots containing a hundredth of an acre each. The larger size of the plots were intended to reduce the danger of the results being obscured by the migration of the worms into the plots from the sides. To prevent the nematodes from being washed over the plots from the surrounding land, the plots were ridged so that they were slightly higher in the middle. The cyanamid was applied as a top dressing and worked into the soil with a disk harrow. The dosage varied from 300 pounds to a ton per acre.

Cowpeas were planted three weeks after the application of the cyanamid. They did well until dry weather set in when all of those on plots that had received 600 pounds or more per acre showed signs of scorching. On those plots that had received 1500 pounds or more per acre the cowpeas were not as good as on the check plots that had received nothing. On those plots that had received 1500 pounds or more per acre, there were at first, few knots on the roots that did not extend to a depth of more than six inches, while on the check plots the roots were knotted to the very crown. Three months later the nematodes had worked up so that on the treated plots there began to be knots nearer the surface. Evidently we had failed to get the material down to a sufficient depth. However, the plots that had received but 300 pounds per acre showed fewer knots than the checks.

EXPERIMENTS IN GREENHOUSE

A bench in the Station greenhouse was filled with infested soil and then divided

into seven compartments of approximately a square yard each. The soil in this bench was five inches deep. It was possible here to control conditions better than in the field and especially to eliminate the migration of nematodes into the treated soil.

Section 1 was treated with cyanamid at the rate of 4 tons per acre. It was mixed with the dry soil and then wet down. At this date, March 29, 1915, the importance of a thorough mixing of the material with the soil was not properly appreciated and the mixing was not as thorough as it should have been.

Section 2 was treated at the rate of $2\frac{1}{2}$ tons per acre. This was dissolved in water but the wet soil was thoroughly stirred.

Section 3 was treated with the same dosage and also in water but the soil was not stirred. The water was depended upon to distribute the cyanamid throughout the bed.

Section 4 was not treated with cyanamid but left as a check. It was thoroughly wet down.

Section 5 was treated with cyanamid at the rate of 2 tons per acre, applied as in section 2.

Section 6 was treated at the rate of 1440 pounds per acre, stirred in dry and then wet down.

Section 7 received the same dose but it was added in solution.

On April 8 these plots were planted with tomatoes, cabbages, peppers, and lettuce. On the three plots that had received the heaviest doses, very few seedlings appeared. On the three receiving the weaker doses they appeared but quickly died. Section 6 was almost sterile on

May 21, there being very few weed seed even. On the check, Section 4, there was a vigorous germination of both weeds and tomato seeds, the latter were heavily infested with nematodes and quickly died.

Owing to unsatisfactory temperature conditions, the bench was abandoned during the summer, not even being watered except by rain water which leaked through the roof.

On September 11, the bench was again planted to lettuce, celery, carrots, cucumbers and tomatoes. To our surprise some of these plants also died on sections 1, 2 and 3. Evidently the fact that the plots were dry during the summer prevented the decomposition of the cyanamid. A few cabbages in one plot only, Section 1, lived. Replanting in this section showed scorching of tomatoes as late as January, 1916. These recovered, however, and made good growth. Up to the present time all plants grown in this section have been free of nematodes except those grown in the small portion where the September planting of cabbages was not killed. Apparently in the insufficient mixing, this portion failed to receive its share of cyanamid.

Section 2 has remained entirely free of nematodes. Evidently a dose of $2\frac{1}{2}$ tons per acre on shallow soil will kill all nematodes. Of the seeds planted in November, celery was not scorched at all; cabbage showed some scorching; lettuce considerable; cucumbers and tomatoes quite badly.

On Section 3 the effects were about the same as far as scorching was concerned, but there were a few nematodes on these

plants. This coincides with other experiments which indicate that one does not get as good results when the cyanamid is added in water. The top layer of the soil seems to absorb the material.

Section 5 showed one corner next to the check to be heavily infested, the remainder free. This distribution led to the suspicion that the partition between may have worked loose; a suspicion which was verified upon examination. We believe the nematodes were exterminated in this section by a dosage of 2 tons per acre.

Section 6; by May, 1916, there began to be a few knots noticeable on tomatoes. Up to this time there had been none noticed. Probably 1440 pounds per acre is a little too small a dose to do thorough work of eradication, although it greatly reduced the numbers of the nematodes.

Section 7 with the same dosage as 6, but added in solution had some root knot, but markedly less than the check.

In section 4, check, all plants were so heavily infested with nematodes that they made very little growth.

In November, 1915, another series of thirteen plots, each containing a hundredth of an acre, was treated with cyanamid. The dosage ranged from 420 to 3600 pounds per acre. On two of these plots the material was added in solution and two were left untreated, for checks. On the other nine plots about half of each dosage was broadcasted over the surface of the ground which was then deeply plowed. The remainder of the dosages was then applied as a top dressing to the plowed land and thoroughly disked in.

The soil was rather dry at the time of application and it was not irrigated.

Few nematodes were found on the plots that had received 1500 pounds or more per acre. But by June, 1916, a few plants on each of the plots, even on the one that had reached 3600 pounds per acre, showed knots.

Other plots were started on July 1, 1916, using dosages varying from $\frac{1}{2}$ to 3 tons per acre. This was applied as in the previous case. No rain fell for a week after application. Later examination showed that on none of the plots were the nematodes entirely exterminated although there were very few on the plot that had received 3 tons per acre and those on two spots only. Perhaps those spots had not received their proper proportion of the material. On this plot all plants planted three weeks after treatment ultimately showed serious scorching although heavy rain had fallen meanwhile. Cowpeas, corn, okra, and beans were planted. English peas planted on October 21, nearly four months after treatment, showed some scorching on plots that had received 2 tons or more per acre.

These experiments indicate that the application of the material to dry soil is not very satisfactory. The nematodes are not entirely satisfactory. The nematodes are not entirely eradicated with dosages as heavy as three tons per acre, and the scorching effect on the plant is serious and long continued.

EXPERIMENTS ON SEED BEDS AT SANFORD

Some co-operative experiments were started with Mr. C. M. Berry, Agricultural Demonstration Agent for Seminole

County. This is an especially favorable locality for this treatment. The permanent water table is little if any over two feet from the surface so nematodes cannot go very deep into the ground, and the system of sub-irrigation, with which the truck farms are provided, enables the grower to thoroughly saturate the soil at any time he may wish.

The material was used at the rate of a ton per acre. Half of it was plowed under and the other half spread over the land and thoroughly disked in. The material was applied with a fertilizer spreader thus insuring a very uniform distribution. The land was thoroughly irrigated immediately after the disking was completed. Celery and lettuce were planted on these plots about a month later.

The experiments were highly successful. On two of the treated seed beds the nematodes were apparently entirely exterminated. The previous year these had been so severely infested that the owners had decided to abandon them. A careful search at the time the celery and lettuce was being transplanted, failed to reveal a single knot and the plants all looked healthy. Untreated seed beds situated only a few rods away were seriously infested with nematodes.

On a third treated bed, there were a few infested spots. These could readily be detected from the stunted yellow plants they bore. They were all on portions of the bed which were a little higher than the remainder, suggesting that perhaps they were not thoroughly wet after the application of the cyanamid.

A fourth seed bed was treated but not according to directions. Instead of plow-

ing half of the cyanamid under it was all put on after the ground was plowed and disked in. The results paralleled those mentioned above with cowpeas. The roots near the surface were free of knots but some of these that extended to a depth of five inches or more showed some.

CONCLUSION

The results of these representative experiments, in connection with others which showed similar results, but into the details of which it is not necessary to go here, justify the following conclusion. Cyanamid applied at rates of from one to three tons per acre, according to the nature and the depth to which the soil is infected, and thoroughly mixed with the soil, reduces the number of nematodes present to such an extent as to render it possible to grow with profit susceptible plants on land on which, before treatment, it was not possible to do so. The reduction, in some cases, amounted to apparent extermination.

The thoroughness of the control will depend upon several factors. The dosage is, of course, one of the most important. This will depend much upon the depth of the soil or the depth to which the nematodes extend. The character of the soil, apparently, is also important. In one case a dosage of $\frac{1}{2}$ ton per acre on the very light sandy, pineapple soils (old established dunes) about Fort Pierce, seem to have produced as good results as 2 or 3 tons on the Station farm at Gainesville.

The manner of application is a very important factor. Cyanamid does not penetrate the soil to any considerable depth even when it is in solution. It is

quickly absorbed by certain chemical constituents of the soil called colloids. The scarcity of these compounds in the sandy soils of the Fort Pierce section probably accounts for the comparative effectiveness of the small dose mentioned above. It is probably this absorption by these colloids which is responsible for the poor results we have obtained when we applied the material in solution. The top layer of the soil absorbs the material and the nematodes in the deeper layers escape. The same results followed when all of the dosage was applied as a top dressing to the plowed land and then disked in. It is therefore, necessary to mix the material with the soil as thoroughly as is practicable. Under farm conditions it would seem that this is best accomplished by spreading rather more than half of the amount on the surface, plowing it under as deeply as possible, and then adding the remainder and disk it thoroughly. This is the method we have found most successful on our plots. A more uniform distribution can be obtained with a fertilizer spreader, as a uniform distribution is very important. We strongly recommend the use of one. In some cases when we could not get the land plowed as deeply as we wished, we have followed the plow with a bucket of cyanamid and sprinkled it in the bottom of the furrow. On a small garden plot it is practical to have it hoed or spaded in, thus securing a more even distribution. It is best to choose a dry time for the application as the material will mix better with dry earth. In wet ground it tends to form lumps as it absorbs water readily. If stored for some months, particularly during the rainy sea-

son, cyanamid absorbs water from the air and forms hard lumps. These must be broken up before the material can be used. All cyanamid used for this purpose should be sufficiently fine to pass through an 18-mesh wire mosquito screen. Chunks of the material, added to the soil, not only are useless for killing nematodes, but they remain in the soil for a long time before they entirely disintegrate, and have a very harmful effect on subsequent plant growth. When fresh, the material is a very fine powder which works well.

When the material has been thoroughly mixed with the soil, the field should be at once irrigated. Enough water should be used to thoroughly wet the soil to the depth ordinarily reached by nematodes, which is 15 to 18 inches in the usual loose sandy soils of our State, or to ground water. Although the great bulk of the worms are in the first 8 or 9 inches of soil, it is necessary to kill the few below that depth otherwise the latter will in a few weeks, restock the upper layers of soil. This thorough irrigation is very important for at least two reasons. It completes the distribution of the cyanamid commenced by the plow and disk harrow so that more of the nematodes are reached and killed and it hastens the decompositions of the cyanamid, shortening the time that must elapse before the crop can safely be planted. Although a heavy rain immediately after application is equivalent to an irrigation, we do not advise the use of the cyanamid method of dealing with nematodes except on land that can be irrigated. One cannot safely depend upon the weather, and the material is too costly to lose.

TIME BETWEEN TREATMENT AND PLANTING

The length of time which must elapse between the application of the cyanamide and the planting of the crop will, of course, be directly proportional to the dosage. The manner of application also influences the length of time required. Thorough mixing with the soil to as great a depth as is practicable also shortens the time. Lumps of cyanamid may injure plants in their immediate vicinity for months. As stated above, a thorough irrigation immediately after application is a very important factor in lessening the time the land must remain idle. The soil should not be allowed to become dry for weeks after the material is applied. Scorching is always more severe when the soil becomes dry.

The length of time will also vary markedly with the plant that is used. Some plants are much more sensitive to the compound than others. Radishes are the most tolerant of any plant we have tried and tomatoes the least so. We expect later to be able to state more definitely for each crop the minimum length of time that must elapse between treatment and planting. It is important, in order to get the maximum returns from the fertilizer value of the cyanamide, to plant as soon as possible after treatment.

In the present state of our knowledge the following periods would seem to be fairly safe when the dosage is not over one ton per acre, thoroughly mixed with the soil which is at once thoroughly irrigated and kept moist after the seeds are planted.

Radishes may be planted within a week

or ten days. Celery, lettuce, rape, parsnips, cabbage, cauliflower, collards, watermelons, corn, peppers, and beans in about three weeks. For cowpeas, cucumbers, cantaloupes, okra, and Irish potatoes one should wait about a month.

For English peas six months should elapse, and for tomatoes at least two months.

In the case of tomatoes one could treat the land some months in advance of planting time, perhaps in the fall for land intended for the spring crop, and in the meantime grow on the land some short season crop, such as radishes, lettuce, or rape.

The scorching often does not appear immediately upon plants grown or set out too soon on treated land. They may prosper for a week or two and have an unusually deep green color and show scorching only after the elapse of a week or more. If the dosage is much too strong for the time intervening, the plants will, of course, show scorching at once or fail to come up at all. This is especially the case with those having small seeds.

COST.

At the present time cyanamid retails for about \$75.00 per ton. To this must be added the cost of application. This should, however, be but little higher than that for any other fertilizer.

In estimating the cost one must take into consideration the value of the material as a fertilizer.

FERTILIZING VALUE.

As stated above, cyanamid is a very rich nitrogenous fertilizer, analyzing as

high as 24% of ammonia. At the present prices it is, among commercial fertilizers, the cheapest source of nitrogen. It is more slowly available than nitrate of soda, but is more lasting in its effects.

Only in exceptional cases, such as unusually valuable truck crops, should it be necessary to add any additional ammonia to soils treated for nematodes, for several months thereafter.

THE GREEN SOLDIER BUG OR PUMPKIN BUG IN CITRUS GROVES

J. R. Watson

The control of the larger plant bugs presents somewhat of a problem to the grower and the entomologist because the adults are very resistant to any safe insecticide. The writer has used solutions as strong as ten pounds of soap and a pint of Black-leaf 40 in fifty gallons of water without killing any large percentage of adults, although the young were mostly killed. He has seen used the regular whitefly oil emulsions to which not only Black-leaf 40 but also one per cent of carbolinium was added, with like unsatisfactory results. The use of a stronger spray would be decidedly unsafe. The writer has long felt that the mechanical collection was the best means at hand and has so advised. But we have encountered on the part of the growers a marked aversion to mechanical collecting on account of the supposed expense. This aversion has in part been a misunderstanding of the implements employed. When we speak of hand collecting we do not as has often been understood, mean to pick these bugs off of the trees with our fingers one at a time.

Several years ago we had an opportunity to try out the method of collecting

these bugs from a crop of potatoes and to ascertain the actual cost of the operation. The potatoes were severely infested, i. e., there was a colony of bugs on about 20% of the hills. These were mostly the Big-footed Plant-bugs and the damage they inflicted was severe. One entering the field in the afternoon found the infested vines badly wilted. Using a pan with a little kerosene in it into which we knocked the bugs, we found that it required about an hour to collect the bugs from an acre of potatoes.

One of the agreeable surprises was the discovery that the bugs did not move about much. We had rather expected that more would continue to come but this was true to only a limited extent. We found it necessary to go over the potato field but three times.

This experience has been repeated this year on a patch of sunflowers. Once freed the plants do not generally again become severely infested.

Pumpkin bugs were unusually troublesome during the fall of 1916 not only in Florida but in southern Alabama as well. In Alabama they occasioned real alarm and a dread that a permanently dangerous

enemy was invading their state from Florida. My opinion is that the outbreak is one of but temporary nature, and that the insects will soon return to normal numbers. Any insect is liable to exhibit these temporary increases in numbers due often to some weather condition which is particularly favorable to the insect or unfavorable to one or more of its enemies. It is quite possible however that the increased planting of legumes may lead to a permanent increase in the numbers of these insects.

Although they sometimes injure the growth of small trees, their chief damage to citrus is to the fruit in the late fall. They puncture the fruit which turns yellow and drops from the tree if the bugs are sufficiently abundant. These fruits are dry and tasteless, the juices having to a considerable extent been extracted by the bugs. Tangerines are their first choice; oranges come next, while grapefruit is seldom injured. It is to be noticed that the severity of the damage is inversely proportional to the thickness of the rind. Probably it is the thick rind on the grapefruit that makes them less attractive.

Early in November we were given an opportunity to test the actual cost of collecting these bugs on a 200-acre grove and to try out on a large scale several different types of nets. The trees were ten years old set 20x30 ft. and averaged from 30 to 100 bugs per tree. 97% of them were Pumpkin Bugs (*Nezara viridula*.) Most of the remainder were Brown Stink Bugs, but there were a few Cotton Stainers and Leaf-footed Plant-bugs among them.

The method used in collecting these

bugs was suggested by that formerly used in collecting the curculio from plum and peach trees. Large nets were made of muslin. These should be at least three feet in diameter and of equal depth. They have a short handle which extends across the diameter of the net to stiffen the rim which is of telephone wire. We first tried smaller nets but found them to be too small for rapid work.

One man can manipulate this net but two work to better advantage. One holds the net under a limb full of fruit and the other gives the limb a vigorous shake which causes the bugs to drop and roll to the bottom of the net. After the men had finished each tree the tip of the net with the contained bugs was dipped into a bucket of kerosene. This keeps the net constantly wet with kerosene.

In the above mentioned grove it cost between thirty and seventy-five cents per acre to collect the bugs. A pair of men working together covered an acre in from one hour to $2\frac{1}{2}$ hours according to the amount of fruit and the number of bugs present. The men cost \$1.50 per day apiece. This is less than the cost of spraying would have been even had we a safe and effective insecticide. On larger trees with more bugs and fruit the cost would of course be greater but should in few cases cost more than \$2.00 per acre, still much less than the cost of spraying. On large trees that do not have too many limbs touching the ground and are not too close together to allow manipulation, these nets should be made larger. We made some 6x12 ft. These were suspended from a light wooden frame somewhat like those our grandmothers used

for making quilts or stretching curtains. The longitudinal pieces projected out a couple of feet for handles. The nets were made full so that they sagged down two or three feet in the center. The cloth should be close woven canvas so that insecticide oil or kerosene can be placed in the bottom to provide a bath for the bugs. Some cotton waste to absorb the oil and roll around among the bugs is also efficient if remoistened occasionally and will not spill out as readily. It will require two men to manipulate the bag and at least one other to shake the branches. On large trees these will be more economical than the smaller nets strung on wire. The best way to use these large nets will be to work them in pairs, a net on each side of the tree and large enough so that the two together will cover the entire space under a tree. With two men to each net and three or four others to shake the tree the grove should be worked as rapidly as with the smaller nets and smaller trees, i. e., it should not take over two hours to cover an acre of fairly large seedling trees. Allowing 15c per hour for each man and 8 men in the gang, would bring the cost per acre to \$2.40. As stated above, however, these large nets can be used only where the limbs are free of the ground. Moreover they are effective only at a temperature below 70 degrees F. Above that the bugs will take to wing as they drop and before they hit the canvas. The use of these large nets is therefore restricted to very early morning, to moonlight nights and to cold days, while the smaller nets can be used all day although

more effectively when the temperature is low.

But the old adage that an ounce of preventative is worth a pound of cure applies here. The attacks of these bugs are usually brought on either by allowing the cover crop of cowpeas, beggarweed, or velvet beans to remain on the ground too long; by lack of sufficient thoroughness in cutting (as by leaving uncut patches between the trees); or by the wrong method in cutting. The cover crop should be cut by the middle of September and the man with the scythe should precede rather than follow the mowing machine—i. e., the spaces about the trees and between the trees in the row should be cut first, leaving the middles to be cut later. There are but few winged adults at that season but many wingless nymphs which cannot fly nor crawl far. This method of cutting drives these young away from the trees into the middles and when the latter are mown most of the young bugs perish and there will be but few produced before cold weather puts an end to breeding.

Neglect of the cover crop does not by any means always result in an outbreak of the bugs, other factors including enemies may enter to keep the bugs down, but it may so result.

As a result of these tests I am satisfied that, once these bugs get into the trees they can be collected at a comparatively low cost per acre and that this is the most satisfactory method of dealing with them as far as our present knowledge goes.

SOME DISEASE PROBLEMS OF THE SEASON

H. E. Stevens

Mr. President, Ladies and Gentlemen:

Ordinarily the citrus grower has his attention reasonably well occupied in attempting to combat the various pests he finds in his grove. This season, however, his problems will be greater and he will find that his labors have been increased many-fold. Owing to conditions that have come about within the last few weeks, it will be found necessary to give the citrus groves more than ordinary attention through the present season; not only in the matter of fertilizing and cultivating the trees, but in keeping down insects and preventing as far as possible, some of the more common diseases.

In many parts of the State citrus trees were severely injured by the low temperature that occurred in early February. Heavy losses have been reported from some sections of the State and in general citrus trees have been greatly weakened through the effects of the freeze.

Trees in this condition will be more susceptible to the attacks of certain fungi and unless they are given more than ordinary attention still greater losses are possible. A considerable amount of pruning and spraying will be necessary to hold these diseases in check until the trees have recovered their former vigor.

While I can hardly regard the recent freeze as a blessing in disguise, especially as to its ultimate effect on citrus diseases, yet conditions were afforded in many instances whereby insect pests and fungus

diseases could have been completely eradicated with but very little effort. Leaves and fruits affected with diseases and insect pests have been killed by the freezing temperature. Through defoliation and dropping of such fruits a large amount of infectious material has been carried out of the trees. If this has been properly disposed of, either burned or buried, a long step has been taken toward the eradication of such pests.

Again, the low temperatures have given a decided check to the development and spread of certain fungus diseases. This however, is only of a temporary nature. As a rule fungus spores are not killed by freezing and they have withstood the low temperatures much better than the citrus tree. They will rapidly recover from their temporary set-back and they will be in an active state to affect the tree while it is still in a critical condition.

On the other hand the weakened condition of the citrus tree as a result of the low temperatures will leave it more susceptible to fungus attacks. The sudden checking of the growth, the loss of foliage, and the large amount of dead wood and weakened branches, have all tended to make an enormous drain on the vitality of such trees. Unless this vitality is restored as soon as possible, diseases will enter to further complicate matters which may finally result in the destruction of many valuable trees, or in a greatly inferior crop of fruit.

I do not wish to infer that by building up or improving the vigor of the tree that diseases will be entirely avoided by this method. This is only the first step in the campaign of prevention. The coming citrus crop should be one of value and whether it is mainly a crop of culls or bright fruit will depend largely on how well the trees have been cared for and how well diseases have been kept under control.

There are three diseases that should be kept prominently in mind during the present season. They are: Citrus Scab, Melanose and Withertip. These will undoubtedly give more or less trouble in all citrus groves and in many cases we may expect serious injury unless active means are taken for their prevention. Scab may be considered more from the viewpoint of eradication and the major part of this work should have been accomplished sometime ago. In regard to Melanose and Withertip, the chief task will be prevention and this work should not be further delayed.

CITRUS SCAB.

(*Cladosporium citri* Mass.)

Citrus Scab is one of our common and well known fungus diseases. It is widely distributed over the State and frequently causes serious loss to the grapefruit crop. In this connection it has become a serious problem within the last few years. The disease attacks young succulent tissue, such as leaves, stems, and fruits, forming characteristic scab-like masses or warty projections that are easily distinguished from injuries produced by other agencies. In these inju-

ries produced on leaves and stem, the fungus survives from one season to the next and in trees affected with Scab, there is always an abundance of the fungus present to cause a spread of the disease when favorable conditions appear. The age of the tissue and weather conditions have an important bearing on the development of Citrus Scab. Only the young tender growth is affected and then only in the presence of a liberal supply of moisture. Even in groves badly infected with the disease, where new growth develops during periods of dry weather, little or no scab will be observed. Thus the disease is more or less sporadic in its occurrence, becoming very destructive in some seasons and in others giving little or no trouble.

The period in which young growth is susceptible to attacks of scab is rather limited, probably not exceeding over six weeks. Leaves and twigs may become infected from the time they appear until the growth begins to harden. Fruits are probably susceptible from the time the bloom drops until six weeks or two months later. By protecting the foliage and fruits through the critical period with some good fungicide, the injury from scab may be largely avoided.

Probably no more favorable time could be found than the present season for the complete control or eradication of Citrus Scab, especially in those groves where it has been troublesome in seasons past. Where infected trees have been sufficiently injured by the cold to cause complete defoliation, much has already been accomplished in the way of eradication. The fungus has been largely removed from such trees in the fallen leaves and fruits

and if this rubbish has been burned or plowed under a very great source of infection has been eliminated. However, some of the fungus has remained in the infected terminal branches, and as spores on the surface of the bark, which may become a source for infecting the new growth. This will have to be taken care of by pruning out the dead wood and by the use of fungicides.

In many cases where trees were badly affected with the disease, the new growth that has put out since the freeze will be found comparatively free from Scab. This does not indicate a complete absence of the fungus, but rather the effect of the dry conditions under which such growth has developed. In such cases the fungus may remain quiescent or dormant until the rainy season and then attack a later flush of growth or any fruits that may develop from a June bloom. If a sufficient amount of June blossoms develop and it is desired to save the fruit it will be advisable to protect it through the danger period with some fungicide. This will apply particularly to those groves where scab has been troublesome in the past. Probably three sprayings will be sufficient, made at intervals of three weeks apart. The first should be applied about the middle of the blooming period, using the Bordeaux Mixture of 3-3-50 strength. The Ammoniacal Solution of Copper Carbonate may be substituted for the Bordeaux Mixture if it is so desired. The probable increase in scale insects must also be kept in mind and when these are observed to become numerous a contact insecticide will be necessary.

In seasons past, Citrus Scab has caused

much injury to the foliage of young grapefruit trees, those that have not yet come into bearing and those of more recent planting. Where such trees have been completely defoliated and all dead twigs have been removed the disease may be practically eradicated. However, if the new foliage shows evidence of scab it will be well worth the efforts to eradicate the diseases from such groves. This can probably be accomplished by thorough spraying throughout the season. An application of Bordeaux Mixture of 3-3-50 strength, once a month would be advisable in order to protect the new growth that puts out. During the winter season all foliage showing infection should be removed and destroyed. Another thorough application of Bordeaux Mixture would be advisable before the new growth puts out in the spring.

MELANOSE.

(*Phomopsis citri* Fawcett.)

Melanose is another fungus disease that may cause serious trouble during the season. It is probably more widely distributed than any other citrus disease and it is responsible for most of the unsightly fruit that is grown in the State. The disease is found on all varieties of citrus of commercial importance, and it may be easily recognized by the characteristic marking produced on the surfaces of the parts affected. Melanose is too well known to need further description.

The disease causes the greatest loss through injury to citrus fruits. While this injury is entirely superficial and does not affect the quality of such fruits, it

makes them unsightly and greatly lessens their market value.

Melanose is similar to Citrus Scab in several respects, but quite different in general appearance. It attacks only the young growth or succulent tissue and such attacks never occur except when an abundance of moisture is present. Leaves and twigs are subject to attack during a comparatively short time, from the time such growth appears until it begins to harden, which may include a period of six weeks or less. Fruits, however, may be affected from the time the bloom drops until they are nearing maturity. In some of our experiments fruits resulting from a February bloom were affected with Melanose as late as the first of August. The long period of susceptibility of the fruits exposes them to severe attacks through the rainy season and doubtless a large part of the Melanose injury occurs at this time.

The fungus that causes Melanose is found mainly in the dead parts of the citrus tree. Any dead wood in citrus trees from the smallest twigs to the larger branches may harbor and propagate the fungus from one season to the next. Dead fruit spurs and patches of dead bark on the trunks and larger branches are frequently filled with fruiting bodies of the fungus, forming infectious sources that are easily overlooked. The fungus does not grow or fruit in the tissue of the leaves and fruits affected by the disease, and Melanose does not spread from the spots on such material as it is sometimes supposed to do. Melanose injury comes only from the spores of the fungus that are formed in the dead wood in citrus

trees, or indirectly from spores produced on decayed fruits beneath the trees.

In periods of wet weather these spores develop rapidly and very abundantly. They are exuded in masses and are distributed over the foliage by rains and heavy dews. Under such conditions on coming in contact with susceptible tissue, either fruit or leaves, melanose injury results within a period of twenty-four hours. The spots become visible three or four days later.

This production and distribution of spores takes place whenever there are periods of rain, hence the fungus is active at frequent intervals throughout the year. This has an important bearing on the control of Melanose, especially in regard to the protection of the fruit. The foliage injury is of minor importance. Owing to the lengthy period during which fruits are susceptible to attack, it is necessary to protect them for several months in order to entirely avoid injury from Melanose. For this reason it is difficult to outline a system of spraying that would be practicable and at the same time effective in controlling the disease.

I rather doubt if Melanose can be completely controlled or held sufficiently in check by spraying alone, except in a few special cases. To spray for complete protection would require a number of sprayings throughout the season and the cost of such operations would probably make them prohibitive. There are still other factors that would have to be considered. Unless such sprayings were made in time and with sufficient frequency to protect the fruit very little good would be ac-

complshed. Again spraying does not remove the cause of the trouble and so long as the fungus remains in the trees there is a constant source from which the disease may spread at favorable opportunities.

It seems then that the most reasonable way to avoid trouble from Melanose would be to remove the cause as far as possible. By pruning out and destroying the dead wood the fungus may be largely eliminated from citrus trees. If the pruning is continued each season the trees may be kept reasonably free from dead wood at a cost that should not be very great. In our pruning experiments we have obtained from two to four times as much bright fruit from trees in which the dead wood has been kept down to a minimum as was obtained from trees that were not pruned. We have not been able to prevent Melanose entirely even by pruning, but we have increased the percentage of bright fruit and greatly improved the appearance of that which was infected over the fruit obtained from our check trees. It is possible that spraying made in connection with pruning would give more satisfactory results. This will apply more particularly to those groves in which Melanose is abundant. Whether the pruning has been made during the winter or summer season a thorough clean-up spray should be given the trees just before the new growth appears in the spring. Either Bordeaux Mixture 3-3-50 strength, or the Ammoniacal Solution of Copper Carbonate may be used. This spraying will take care of the spores that have lodged on the foliage and on the surface of the bark. Such a program may be satisfactory during any normal season,

but at present conditions are quite different.

The Melanose fungus has probably never been more abundant in citrus trees than we find at this season, especially in localities where it was formerly prevalent. In general all citrus trees contain an unusual amount of dead wood as a result of the freeze, and there has been an enormous development of the fungus in this during the past few weeks. Dead twigs and branches and patches of dead bark on the limbs and trunks are filled with fruiting bodies of the fungus. In fact any dead wood associated with the citrus tree seems to contain a maximum amount of this fungus. Trees that have set fruit will not mature a single bright fruit if allowed to go through the rainy season in this condition. Unless this dead wood is removed and extra precautions are taken, Florida has the prospect this season of producing the largest cull crop in its history. This unusual fungus development indicates trouble ahead and the situation is probably more serious than we realize. The absence of Melanose injury on foliage that has developed since the freeze is no assurance of safety from further trouble, for this is due to weather conditions rather than absence of cause. When injury does become evident it will be too late for remedial measures as far as the present citrus crop is concerned.

As a means of prevention, I can only suggest that such trees be cleaned up as soon as possible. Pruning should be done immediately for a delay now only further endangers the crop and may result in a more weakened condition of the trees. A thorough pruning is necessary to re-

move all dead twigs and branches and any sickly or weakened growth. Large patches of dead bark or inner branches should also be removed as far as it is possible to do so. This rubbish should be removed from the groves and burned as it may prove a source of future infection if allowed to remain under the trees. In many cases a thorough application of Bordeaux Mixture would be advisable, following the pruning especially where trees have set fruit. This should be made as a clean-up spray and the inner branches should be well covered with the fungicide as well as the foliage.

In extreme cases further spraying may be necessary. Trees that have been badly injured may contain many small patches of dead bark on the inner branches which are filled with the fungus and these may become active centers in spreading the disease. Such patches may not be easily detected and they will be difficult to handle under the most favorable circumstances. If the inner branches of such trees can be kept covered with a fungicide during the rainy season the injury from such sources may be largely avoided. This would probably require a thorough application of Bordeaux Mixture 4-4-50 strength, once a month during the rainy season, applied only to the interior of the trees and avoiding the outer twigs and foliage as much as possible. This system of spraying, however, will invite trouble from scale insects and it may be made use of only in extreme cases. There are many groves in which a thorough pruning may keep the disease sufficiently in

check and there are others in which more drastic measures will be necessary.

In general I would suggest that a thorough pruning be made at once to remove all dead wood from the trees and that an application of Bordeaux Mixture should follow immediately as a means of disinfecting the same.

WITHERTIP

(*Colletotrichum gloeosporioides* Penz.)

In conjunction with other troubles, Withertip will also do its share of injury to citrus trees during the present season. This is a fungus disease that kills the twigs and branches and it often causes serious damage when it becomes fully established in the citrus tree. The fungus is a weak parasite and attacks only trees of low vitality or those that have been severely injured. Owing to their weakened condition, citrus trees will be very susceptible to attacks of Withertip for several months and trees that have been severely injured by the cold will require extra care during this period.

By improving the vigor of such trees, much can be done to prevent attacks of Withertip. Where the disease has established itself in the tree a thorough pruning will be necessary to eradicate it following about the same method that has been advised for Melanose. Trees that have been pruned for the disease should be watched through the season and if Withertip becomes active again, further pruning will be necessary.

DISCUSSION

Mr. _____: Does the ammoniated copper carbonate answer the purpose of Bordeaux Mixture in the case mentioned?

Mr. Stevens: The ammoniacal solution of copper carbonate is about as good a fungicide as Bordeaux, but it does not stick so well.

Mr. Hume: Perhaps we had better have Dr. Berger's paper. Knowing about what Dr. Berger's paper is to be, I think it very advisable to have it just at this time.

Dr. Berger: The subject I am going to discuss, and the results of the experiments I have carried on, will perhaps answer a few questions of Professor Stevens' paper.

Prof. Stevens has stated that the inside of a tree, for instance, having melanose, should be kept well covered with a fungicide. To do that with Bordeaux, you have to re-spray every few weeks. What I have found out is this: by mixing a small amount of linseed oil with your

Bordeaux, you will find it will stick very much longer than will the Bordeaux by itself. I used the 5-5-20 Bordeaux; it is a little more than double strength, mixing three per cent. of linseed oil with it, and the Bordeaux would stick for four or five months.

You can see the advantage of that right through in the way of protecting the fruit, also.

Of course, you do not want the Bordeaux to stick forever on the fruit, because you are going to want that fruit to present the best appearance possible when the time comes to sell that fruit. But if you apply Bordeaux to fruit the size of walnuts, apply it, say, in May, you will have June, July, August, September, October, November and December to let it stay there and then bring out your fruit bright, even if you do have to put it through a washing machine. Of course, that is only a suggestion.

The original object of carrying on any experiments was another one. I was looking for something to mix with the Bordeaux to kill insects.

Linseed Oil Bordeaux

E. W. Berger, Entomologist State Plant Board

THE MIXTURE

Mr. President, Ladies and Gentlemen:

In an attempt to solve the problem of a mixture that would serve effectively as a fungicide and insecticide, three per cent raw linseed oil was mixed with strong bordeaux (double strength and stronger). Such a mixture is easily made by simply stirring the oil into the bordeaux, or in case of small quantities shaking them together in a closed vessel.

Linseed oil was used because it was known that some water will mix with paint, which is a mixture of linseed oil and a pigment; and it was found that, inversely, small quantities of oil would mix with bordeaux, this being practically a cold-water paint. The fact that linseed oil is a drying oil, i. e., hardens and forms a dry film over any surface to which it is applied, furthermore suggested the possibility that it might serve as a "sticker" to stick the bordeaux more or less firmly to the plants to which it is applied, and keep it from being so readily removed by the rains.

EXPERIMENTS

Two satsuma orange trees, six rose bushes, two persimmon trees, a fig tree, a grapevine, and the trunks and larger limbs of three peach trees, were sprayed with several strengths of bordeaux, into

which three per cent raw linseed oil had been incorporated as indicated in the preceding paragraphs. This was on August 8, 11 and 12, 1915.

The object of the experiments was to determine what effect the mixture would have on San Jose scale infesting the peach trees, on purple scale and whitefly (*Aleyrodes citri*) infesting the satsumas, and on the foliage of the several trees and bushes sprayed. Its effect on the sooty mold, which always accompanies whitefly, and on a leaf fungus commonly found infecting leaves of fig trees, was also to be determined, as well as the sticking qualities of the mixture.

RESULTS

The effect of the mixture on the insects was not conclusive and it may be necessary to increase the amount of oil or add other oils in order to perfect its insecticidal properties.

The effect of the linseed oil as a "sticker," however, stood out pre-eminently, the bordeaux remaining visible on the leaves and bark for five to six months and longer. That the results with the linseed oil as a sticker were not accidental was shown by several checks (2 rose bushes and a peach tree) that were sprayed at the same time with fresh bordeaux without the addition of the oil. When almost

every trace of bordeaux had vanished from these checks, the other trees treated with the linseed oil bordeaux appeared as if they had been freshly sprayed.

The efficiency of the bordeaux appeared not to have been diminished in the least by the addition of the oil. For instance, the leaves of fig trees generally become diseased by a fungus and shed early, but in this instance the sprayed foliage of the fig tree remained comparatively healthy and on the tree until killed by frost, about the middle of December, by which time all other trees observed in town had lost their foliage, some much earlier. This tree was not sprayed during 1916, when its foliage became diseased and began to drop in September. Again, the two satsuma trees sprayed with the linseed oil bordeaux did not have much whitefly upon them at the time they were sprayed (August, 1915), but became heavily infested during September and October, principally from the swarms of this insect that emanate from the chinaberry trees in town at that time. The leaves of the new growth that had put out after the trees were sprayed became black with the sooty mold, that always accompanies infestation by whitefly, but the older leaves that were covered with the bordeaux never showed more than a trace of it.

Injury to foliage was not noted except on the fig tree, when the drip from leaves above was concentrated on one or several spots of leaves lower down.

MISCELLANEOUS RESULTS AND EXPLANATIONS

The bordeaux used was made fresh each time, except one lot of two gallons

that had been prepared two weeks previously. This old bordeaux was mixed with three per cent linseed oil just before using and was applied as readily as fresh bordeaux and appeared to stick as well. It had a decidedly transparent appearance, however, after drying, as compared with freshly made bordeaux. I am not aware that this fact is of any significance and a repetition of the experiment may show it up differently. The temperature at the time of applying also seemed to influence the appearance of freshly made linseed oil bordeaux on the trees.

Another interesting observation, and probably important, was made with this old bordeaux: about one-half pint of it with three per cent linseed oil was shaken together in a narrow bottle and another one-half pint without oil, was shaken in another bottle of the same kind at the same time.

After allowing five minutes' time for the bordeaux in each bottle to settle, the settled bordeaux in the bottle with oil occupied about $1\frac{1}{3}$ of the depth of the mixture in the bottle, while in the bottle without oil it occupied only $1\frac{1}{6}$, indicating a decided influence of the oil on the settling properties of bordeaux.

Raw linseed oil was used because a supply was at hand, but boiled oil is believed to be just as good, if not better, and should dry quicker, a matter of some importance when it is necessary to make applications of bordeaux between rains. The writer has simply not found time to make tests with boiled oil. Three per cent oil was taken because that quantity appeared sufficient, but less may serve as

a sticker and more will probably be necessary to kill insects.

The bordeaux used was mixed in lots of 2, 3 and 4 gallons at a time.

Several strengths of bordeaux were used but none weaker than about double strength (5-5-20). Other strengths used were 5-5-13.5 (bordeaux 2 weeks old) : 5-5-10; 5-5-15. It is intended to conduct experiments with weaker mixtures as soon as time permits. The stronger mixtures were chosen because it was believed that the oil would more readily mix with them, which is probably the case, and as the mixture of bordeaux is weakened it may be found that a limit will be reached at which little or no oil will mix with it, unless it should prove to be a fact that even pure water will take up some of the oil.

COST

The cost of bordeaux is of course very high now on account of the high cost of copper sulphate. The addition of linseed oil at the rate of three per cent about doubled the cost of 5-5-20 bordeaux when copper sulphate was 10c per lb., and lime 1c. per lb. This doubled cost, however, should be more than offset by the length of time the linseed oil bordeaux will remain on the foliage. With copper sulphate three and four times the cost previously indicated, the proportional increase by the addition of oil is of course less. It is probable, however, that one per cent or 1½ per cent oil can be mixed with regular strength bordeaux (5-5-40 or 5-5-50) which would cheapen the product somewhat, and probably be sufficient as a "sticker."

It should be added here, that in case

sufficient oil should not properly mix with regular strength bordeaux, which would be explained by the lack of sufficient solid material in the mixture necessary to assist in holding the oil in suspension, that additional quantities of lime, perhaps 2 or 3 times as much as is indicated in the formulas for bordeaux, may probably be added to make up this deficiency. Again, less oil may serve quite as well as a sticker, especially on potatoes and other vegetables where it is not necessary to have the bordeaux stick so long, but where it is still necessary to use something to keep it from being washed off by rain.

Finally, in regard to cost, each grower must decide for himself whether the additional cost of the oil is worth while; and whether using the oil as a sticker will save him an additional spraying or two.

USES

The experiments conducted indicate that linseed oil bordeaux can be applied to all kinds of plants without serious injury, though there may be exceptions. It is believed to be especially useful on citrus trees where a long-sticking bordeaux is needed, and on potatoes and other vegetables where a sticker, to keep the rains from washing it off, is desirable. At this time the writer cannot advise whether or not powdered sulphur can also be added to this mixture, but it is his belief that it can. This point can readily be determined by each grower for himself. The addition of about two pounds of powdered sulphur to each 50 gallons of the mixture should serve at the same time to assist in the control of mites, such as rust mite, red spider, purple mite, etc.

The addition of arsenical poisons, where it is necessary to also control leaf-eating insects, is also suggested.

NEED OF A DOUBLE SPRAY

The need of a double spray has long been apparent to the writer, and the preceding account is a brief record of his efforts to solve the problem. By a double spray is meant one that would serve both as an insecticide and a fungicide. Citrus growers especially need to spray more and more with fungicides on account of melanose, scab and withertip, and in doing so frequently have to follow up this spraying with an insecticide in order to control scale insects and whiteflies. If the control of the diseases and insects could be accomplished in one spraying a great saving would result. In this respect the preceding experiments can only be regarded as preliminary, since the results obtained against insects were inconclusive. But a beginning has been made, and the writer hopes that the mixture experimented with can be perfected as an insecticide, especially against scales and whitefly.

The writer is not the first one to attempt the perfection of a double spray, but the products obtained have not come into general use. Thus soap and bor-

deaux have been mixed and used with some degree of success; lime-sulphur solution also has both fungicidal and insecticidal properties, but is useful only against a few fungi and scale insects of the armored group with a waxy covering.

Bordeaux being the standard fungicide, and emulsions of oils the standard insecticides, the difficulty encountered is that these two mixtures cannot be combined because the bordeaux breaks up the soap of the emulsions, resulting in the liberation of free oil. The problem therefore resolved itself into the possibility of combining an oil directly with the bordeaux, as explained.

The results with the linseed oil as a "sticker" for the bordeaux are believed to be important and it is hoped will prove useful.

DISCUSSION

Mr. Hume: I have seen the work which Dr. Berger has been carrying on; in fact, I have been conversant with it for a good many months, and I believe Dr. Berger has found one of the most important things that have come up on the making of spraying mixtures, for a long time. Of course, he has not worked out all of the details, but he has given us the basis for a very great improvement.

Citrus Canker Condition

Frank Stirling

Mr. Hume: We will now take up the regular program for this evening. I am sorry to say that Professor Wilmon Newell, the Plant Commissioner, will be unable to be here this evening. Owing to the crisis in legislative matters, it was necessary for him to remain in Gainesville, so that he might be a little closer to Tallahassee. But he has arranged for another gentleman to fill his place. The man who is to take his place needs no introduction from me.

We are now going to learn something of the general citrus canker condition in the state from Mr. Frank Stirling. (Applause.)

Mr. Stirling: We have been engaged in the work of eradicating this disease from Florida now for almost three years; in fact three years ago next month the work of eradicating the disease was first taken up by the Florida Growers and Shippers League under Mr. Lloyd S. Tenny and Dr. E. W. Berger, at that time the State Inspector of nursery stock.

In May of 1914, it was known that the disease was present in Florida, but not known to what extent. One inspector at that time was employed to make a survey and find out just how far citrus canker had spread. In May, this one inspector found 108 grove trees on eight properties, infected. The next month he found 160;

the next month 275. The number of properties increased, and the number of grove trees increased in proportion.

The growers at that time took the matter up themselves to arrange to employ more men to put on this work, and as a result, in August, 1913 infections were found.

As a result of employing these extra men, the number of infections dropped so that in October only 565 were found.

Now, take each month by itself, and you will find that the cankers found during any one particular year, was about the same in the month of one year that it was in the month of last year, in proportion. For instance, in August, 1914, the largest number of infections was found for that year. The same was true of 1915.

The State Plant Board was created and the Florida Plant Act came into effect in the spring of 1915. By that time the work had reached to such a state that we could get at it with some degree of intelligence learned from our experience. Prior to that time no knowledge of the disease or how to handle it had been reached, but after that time, after the State Plant Board came into existence and the work was handled by that body, the work was carried on with more or less knowledge of how to handle it.

In the winter one year ago, it dropped to a very low mark; 21 in February and March, and 49 in April. These few infections which showed up were not because the canker was not there, but because of the very unfavorable conditions for the disease to develop so that it could be located by the inspectors.

The lowest line reached was February of this year, when only four infections were found in the entire state. (Applause).

On new growth coming out in March, some infections were found. But consider that twenty-two counties of the state have been infected and there have been almost seven thousand acres of citrus groves in Florida that have been infected, and nine grove trees is a very shall number.

There have been 443 groves, or properties having citrus that have been infected one time or another since the work began back in May of 1914.

First, I will state that when a property or a grove in Florida has been infected with citrus canker, that grove is watched continually; it is inspected regularly; in fact, there is hardly a day passes but what one or more inspectors are watching and inspecting that grove. When the disease has been supposedly eradicated in that particular grove to such an extent that the Plant Board of Florida believes the disease is entirely wiped out from that property, the Plant Board removes the quarantine surrounding that property.

I will go back a little further and state that immediately upon the property becoming infected with this disease, a quarantine automatically applies. That quar-

antine has reference to the movement of any nursery stock, not only to that property but from within one mile of that property. It has also a bearing upon how the owners of that property conduct themselves in going from that property to another property; in other words, that quarantine^{*} is meant to prevent the dissemination of the disease from that infected property to a healthy grove, just as a doctor would quarantine a house wherein there is a case of smallpox.

Now, as I told you before, 443 properties have been infected in Florida, scattered throughout twenty-two counties. The Plant Board has removed the quarantine from 306 of those properties. Some months the Plant Board removes the quarantine from a dozen properties; sometimes one or two; sometimes several months will elapse without removing a single quarantine. It depends, of course, upon conditions.

Last month there were but nine infections, and the month previous but four infections. But do not lose sight of the fact that even if there is only one infection found in the whole state of Florida, canker is still a menace to the citrus industry of the state. That one infection would prove that it has not yet been eradicated.

We *believe* we have found all of the canker centers in Florida, but when you stop to consider what an enormous problem it is to inspect every citrus tree in the state of Florida, we do not *know* that we have. There are 300,000 acres of citrus plantings in Florida, at least. It would take an army of 500 men several years to inspect every tree and discover

the canker as it develops. We think we have located all of the canker infections; that is, the centers. Where we are finding canker now is in the old sore spots in the old locations where canker has been present, and we have fought it, and fought it, but once in awhile it breaks out anew. We may think we have it eradicated and inspect it daily or weekly for a year and think it is entirely cleaned out, and then suddenly it will break out.

If we have already eradicated the disease from three-fourths of the properties in Florida; if we have already located the last center of infection; if we still continue the process of eradication for the next two years, making the same record we have in the past two years, it looks as though eradication would be accomplished at the end of another two years. (Applause).

DISCUSSION

Mr. M. E. Gillett: I would like to ask the gentlemen if canker has ever appeared again in any of the groves from which the quarantine has been removed.

Mr. Stirling. Of the 306 properties from which the quarantine has been removed, there have been three properties that have shown infection; but we are not sure that the canker was present in that property at the time the quarantine was removed. One of them, for instance, was very close to another section which was infected and it is very probable that the disease was carried into that property from the diseased grove in proximity. A grove, of course, can be infected again and again.

The other two re-infections were similar.

Report of Citrus Canker Committee

D. Collins Gillett, L. B. Skinner, Dr. J. H. Ross, Lloyd S. Tenny, W. J. Kroom.

Mr. Hume: A little while ago we had some information as to where we had arrived in the citrus canker fight. To carry on this bit of warfare it has been necessary to have funds, and funds in large amounts, and the man who has had the most to do with getting those funds wherewith to save the citrus industry of Florida, is going to speak to us right now.

I am pleased to introduce to you, Mr. Collins Gillett. (Applause).

Mr. Gillett. Mr. President, members of the Florida State Horticultural Society and citizens of West Palm Beach. Owing to my extreme modesty and the great pride I take in my own committee, and as an evidence of your very good judgment, I ask, Mr. President, that the members of the Citrus Canker Committee who are present, come up and be shown.

Mr. Hume: My observation of that Citrus Canker Committee is that the members of it are very backward. (Laughter). Now, Dr. Ross, Mr. Skinner, Mr. Tenney and Mr. Krome, will you please come up? If necessary, we will bring you up. (Laughter and applause).

Mr. Gillett: First, as chairman of the Citrus Canker Committee, I desire to thank the members of this Society and the growers of the State of Florida at large, not only for their unqualified and

undivided support whenever it has been needed, but also for the very generous manner in which funds with which we might carry on this fight, have been furnished.

The subject of citrus canker is one which has been freely discussed before meetings in the past, and there is very little I can add to what you already know, with the exception of what has occurred in the way of appropriations from Congress and those now pending before the State Legislature of Florida.

In 1915, we received from the Federal Government, \$550,000 with which to carry on this fight. In the Agricultural Bill which passed the Senate thirty minutes before it adjourned on March 4th of this year, \$430,000 additional was therein included. \$180,000 of that sum was provided for carrying on the work without State participation until the first of July next, at which time \$250,000 becomes available when the states in which citrus canker is prevalent have appropriated an equal amount. Of the \$250,000 the Department of Agriculture has said that \$150,000 shall be expended in Florida from July 1st next until the following July. They have further stated that when Florida appropriates \$150,000 to meet that sum, they will then in their next

agricultural bill include a like amount, provided Florida meets them; in other words, the Federal Government says, "We will put up \$300,000 for the next two years' fight beginning July 1st, when Florida has appropriated a like sum."

They could very properly say, the Government will not put up any more money with which to carry on this fight until Florida has appropriated what the Government has expended in the past for which no such funds have been available. On the first of next July, there will have been expended in Florida from Government funds, \$740,000. "Now," they say, "We are willing to forget the past; we will simply wipe that off the Board, but from July 1st next, we will travel along horse and horse."

You cannot deny that this is a most liberal policy. It is a policy which has never before been established by the government. In all eradication measures in which they have heretofore participated in the eradication of diseases among animals, and even in the eradication of diseases among men, they have required certain state participation, and those moneys have had to be appropriated and available for expenditure before the treasury of the Government was available for use.

We were met with this problem when we went to Washington a year ago last December, and on every occasion since that time; the one question in the minds of the Federal Government has been, "What has Florida done, and what will she do when her next Legislature meets?" Our representation in Congress have appeared before the Congressional Committee time and time again,

and on every occasion they have made the strongest representation that our Legislature met only on alternate years; that when they last met they appropriated \$125,000, which was all we asked for at that time, and that if the Government in this emergency would step in and take up this fight until our Legislature did meet, then Florida would not be found wanting in doing her full duty.

This is the first time in the history of this country that the eradication of a plant disease has ever been undertaken, and it will be the first time it has ever been successfully accomplished. (Applause).

Just for a moment suppose the same energy and the same amount of money had been expended at the beginning of the infestation of boll weevil in this country, and see that thousands and hundreds of thousands of dollars the growers in this state would have put in their pockets if we had taken the whitefly or any other of the numerous insects and pests which cost us so much money, not to eradicate but to cure and control.

In approaching this subject, there are three definite conclusions which we must accept as final; first, citrus canker can be eradicated. This has been proven beyond controversy. Second, if citrus canker is not eradicated, our properties will be confiscated; third, it will take approximately two years more to accomplish this work, as best we can obtain from those in authority who have knowledge of the situation.

We are asking the Legislature of the State of Florida to appropriate \$150,000 per annum for two years to meet the ob-

ligation which the government is placing upon us to put Florida in a position before this Government which she should occupy in view of the very strong pledges our senators and congressmen have made for us, and which certainly cannot be overlooked.

We have presented this subject to Tallahassee. The members of this Committee were there at the opening of the session. I do not know whether it is fortunate or unfortunate, but we had our bill introduced early and it was the first appropriation measure that came up in the Legislature.

When it came up in the Senate, it passed the second reading without amendment and we rejoiced, as it looked as though the bill would go through without amendment, or molestation in any way.

Upon the following day, when the bill was up for third reading and final passage, there was introduced into the Senate what has been termed the "Safety Valve" resolution, which provides that no bill should be considered or passed providing for appropriation prior to the first day of May.

Unfortunately, the resolution was introduced just after the roll call; many of the senators did not understand it, and it carried. Immediately following, Senator Wells, Chairman of the Appropriation Committee before whom this Committee had appeared, and which Appropriation Committee had reported unanimously in favor of the bill, objected seriously to this resolution, stating that it was unfair to a man who introduced a bill that his measure should be put off until May when oth-

er resolutions and bills calling for appropriation would be put in, and he moved a reconsideration. His motion was lost.

Every day in the Senate until yesterday, for four or five sessions, this matter has been under discussion. Unfortunately, the citrus canker appropriation being up and ready for the third reading, in almost every discussion it has brought out a debate on the merits of the bill. We are unable to do anything about it; the only thing we can say is that every member of the Senate will certainly know everything about it for it is up for debate every day. We have yet to hear one senator raise his voice in opposition to the bill. There are many who voted for a postponement of the consideration of the bill for the purpose of determining the amount of appropriations which would be offered to the Senate and obtain some idea of the revenues, but so far as this Committee is able to judge, our measure in the Senate of this Legislature is in very safe hands.

We have thought it best not to press the measure in the House until we can get action in the Senate, for the reason that if it goes to the House as a Senate measure, having passed that body it would have a certain prestige which we need in the House.

When we presented this subject to the Congress of the Nation, during a time when great questions were being considered, when appropriations of millions of dollars were being asked for preparedness, we had no divided House.

Every item we have secured from Congress but one, has been in a bill subject to a point of order, which means it was not

a majority, but had to be a unanimous vote. If any one member had voted against it, our item would have been lost. Our first \$300,000 was in the Deficiency Bill. It had absolutely no right whatever in that bill. If any member had objected, it would have been thrown out. It passed unanimously. Our item of \$430,000 in the Agricultural Bill; one man could have raised his voice and the item would have been thrown out, and lost.

I wish the members of our Legislature in Tallahassee could have heard such statesmen as Hon. Joseph G. Cannon, or Congressman Mann or McLaughlin, living in states where the citrus tree cannot be grown and never will be, where there was no possible benefit to come to their constituency by supporting this case, and if anybody had a right to object and raise a voice against the measure, it was those men, but as I say, we had no divided house.

Now, here we come down at home, in Florida, among our own people, and a few persons in the Legislature in Tallahassee are raising some opposition to this measure. Not because they are opposed to the citrus growers having it, but opposed to the increased taxation being burdened on their constituency in the non-citrus-producing counties.

They raise the argument that boll weevil has invaded their fields and the cotton crops are gone; that they are a poor county. Well, my friends, if that is not a warning to those people to get busy and protect the biggest industry they have in the State, what more do they need to wake them up? (Applause).

The state of Florida divided into citrus and non-citrus counties, would make a very interesting tabulation for us. It is a fact that of the $6\frac{1}{2}$ millage assessment two years ago, citrus-producing counties paid 76 per cent of that tax. The non-producing counties paid 24 per cent, but still they object to giving us this appropriation from the general treasury of the state.

It would be a unanimous measure if the members of this Committee would agree to an amendment of that Bill providing for a box tax. There is not a member of the House and Senate but would advocate it if we would agree to that. But we have taken this position; the great burden of eradication of citrus canker to date has fallen on the grower. It may surprise you to learn that nearly 3,000,000 grove trees have been destroyed since the fight began, which are worth easily \$1,000,000. Before the fight is over, it is estimated that another million dollars worth of trees must be destroyed. I mean healthy trees; diseased trees have no value.

If we had gone to Tallahassee and asked the Legislature not only to provide the money to carry on this fight, but reimburse us for the value of the property destroyed, then the subject of a box tax might be one for discussion.

The Government is paying one-half of the cost of this eradication. We are asking the state to pay the other half. The grower is taking his medicine and saying nothing.

I submit that as a fair proposition. I submit that the benefit which will accrue to that part of the state in which citrus

has not been grown but which may be grown, more than offsets the 24 per cent or 25 per cent of this amount for which we are asking.

I made a tabulation of what certain counties to the northwest would pay, and I remember one county would pay \$420.00 per year for two years to vote for this appropriation.

The members of this Committee who have been in Tallahassee cannot conceive of the narrowness of some of the members of the Legislature, and with few exceptions we believe that when this subject is presented to them so that when they have an opportunity to consider it from their own view point and from ours, that when the vote is taken, the measure will be passed.

We are not sure, however. We still need help. The growers of this state can do for us what the members of this Committee cannot do. Every member of the House and Senate from South Florida and every citrus county in Florida, are solid to a man on this measure. But letters, telegrams and personal appeals from you, and you, and you, and you, to your delegation there, is what will bring this through. If you will impress upon those members of the House that represent your county, and upon the senators who represent your District, how vital this is, what it means to the State, and do not take it for granted that they know how you feel about it, you can do your part to put this bill through. If you have already told them, tell them again. There is safety in numbers, and the more letters they get, the more telegrams they get, if they are friends of the industry, and you

know they are going to vote for it, it will make them get out and go to work on those who are doubtful, and they are the people WE MUST WIN.

There is no doubt in my mind but that we are going to have that \$300,000; how we are going to get it no man here can tell, but with that, and what it will bring from the Government and with the assistance of our growers, I feel safe in saying that you will soon be relieved of the necessity of coming here every year and hearing citrus canker discussed, for I know it shall be driven from our borders; we have it on the run now. It is only a matter of a little more time and a little more money to complete the work, and then our state will bloom as never before.

Tomorrow morning we are to have with us members of the Farm Loan Board who are coming here for the purpose of trying to determine the valuation they shall place on citrus properties. If citrus canker is driven from our state, I will venture the statement that the day will come when Florida and California will have a monopoly of the citrus industry of the world. The sooner we get it out, the more stable our values and if we do not get it out I do not believe the Farm Loan Board will be seeking loans in Florida much longer.

Look at the great state of California. They were wise enough to surround themselves with adequate laws, which Florida has done, but they took the further precaution to provide the means to enforce those laws, which Florida has not done, and to-day they enjoy an enviable position in this fight. But still the solid California delegation in the House and

Senate at Washington, stood by Florida in this fight for federal funds; not because they loved us, particularly, although I believe they feel kindly toward us, but they knew if citrus canker was not eradicated from Florida and the other Gulf states, that there is no wall they can build high enough around California to keep it out, and it was a precautionary measure looking to the preservation of their own industry.

We have been told there are areas in China much larger than the citrus area in Florida, where citrus has not been grown for fifty years on account of the citrus canker. We are also told it is spreading all over the Orient, and unless adequate laws are made it will finally get into the West Indies, and when that comes to pass if we have accomplished the great task we have undertaken, it will stand out as the first time it has ever been accomplished. It is a preparedness measure.

Look at the British Government; at a time when it is piling up billions and billions of dollars of indebtedness, within the past three months it has found citrus canker in South Africa. It is spending money to eradicate it in South Africa because they know it is an economic question; that they must do it to preserve their industry. But here in Florida, with more than \$2,000,000 of money and property already poured into this fight, with the end in sight, are we going to be halted because a few of our legislators have developed a sectional feeling? Is this feeling going to cause us at this time to fail in the duty that devolves upon Florida to meet the appropriation as prescribed by the government? If we do fail—well,

speaking for the chairman of the Committee, he doubts if he can ever stop in the capitol again, and there are some other members who had better not try it, either.

We feel as though there may be some thought or ideas or suggestions in this body regarding this work, and if so we would like very much to hear from you, because we are almost through, and we must win this fight at Tallahassee. (Applause).

It is my understanding that the Legislative Committee has a resolution to offer.

Mr. Hume: We will call for the report of the Legislative Committee at this time.

Mr. M. E. Gillett: The matter of citrus canker has been talked about so much, I think we are all pretty well saturated with it. I know I am, so much so that whenever I go around a spray wagon, I dodge for fear some fire will come out of it. (Laughter). I will promise not to talk as long as my son has.

It seemed appropriate to the Committee that with the Legislature in session and the discussion of this measure being had from day to day, that a resolution be offered to this Society for its endorsement.

As you have been told by the Chairman of the Committee, the fight is on in Tallahassee. They have had a hearing before both Committees of the House and Senate and the Bill has been passed on favorably. Had this been done in Washington, I am reliably informed that there would be no question about its passage when it came up before the House and Senate, because they have great faith in their Committees. They realize at these

hearings the Committee has a much better opportunity to question the men who appear before it and determine the merit or demerit of the appropriation asked for. Then if it is reported favorably and unanimously it is very rare that the bill is not passed; if it is reported unfavorably, it is very rare that the bill passes.

This has been reported favorably by both these committees, but we have been told, in fact it has been published in the press, that certain people, one man especially, propose to fight it. He says he will fight the fight of his life.

We hope he will survive, because I believe, as the Committee believes, that this Legislature of ours cannot fail to pass a measure of this kind.

They claim that West Florida would receive no benefit, and that does seem to me the most absurd claim a man could advance. When I read that, I thought what a good thing it was a man could not grow to be the size of Florida. If he were to cut off his thumb, his right foot might object to carrying his body in the direction of a physician because it had not been damaged or hurt in any way. But if gangrene set in because of lack of proper attention to the thumb, and the man died, perhaps the right foot might think it was concerned in the injury to the thumb after all.

We feel that a resolution from this Society is distinctly in order. (Reads resolution).

Whereas: The citrus growers of Florida have for the past two years, in conjunction with the Federal Government, been waging a desperate fight with citrus canker—the worst pest and the greatest

menace to the industry ever known in its history, and,

Whereas: the citrus growers of Florida have advanced out of their individual pockets more than \$200,000—have sustained a loss of at least a million dollars in healthy trees destroyed that the balance of their groves and those of their neighbors might be protected, and, before the fight is ended and citrus canker finally exterminated will be called upon for a still further sacrifice of at least a like amount, and

Whereas: The Federal Government, realizing that it was beyond the power of the States in which the disease exists to supply the funds necessary for eradication, did appropriate the sum of \$550,000, to be divided proportionately among said States; said money to be expended by and under the supervision of the Plant Boards, which sum was supplemented by an appropriation by the State of Florida of \$125,000, all of which was expended but the enemy was still unsubdued, and

Whereas: Another pilgrimage was made to Washington by the Committee having this work in charge and another appeal for help was introduced with the result that \$180,000 was secured for immediate use, which would probably carry the work as at present organized until July, and an additional \$300,000 contingent on the Legislature of the State of Florida appropriating a like amount, and,

Whereas, A Bill has been introduced in the Legislature, now in session, asking for State Aid for \$300,000 in order to secure a like amount from the government, which is waiting for us as soon as

we comply with the very reasonable requirements imposed, and

Whereas, The Plant Board believes that with the amount of money this would give them the complete eradication of citrus canker could be established, and,

Whereas, The citrus industry is the largest single industry in the State involving more than \$250,000,000, and

Whereas, The counties in which citrus fruits are grown pay 77 per cent of the taxes of the State of Florida and receive less than 50 per cent of the benefits, therefore,

Be it Resolved, That the Florida Horticultural Society at its annual meeting representing, as it does, the citrus and agricultural interests of a large part of the State, is unanimous in its endorsement of the Bill introduced in both houses of the legislature for the appropriation of \$300,000, as not only this money will be needed, but it is only by making this appropriation that we can secure the like amount from the Federal Government. It is a fact substantiated by the reports of our own men sent there from Washington that a district in China, much larger than the citrus area of Florida, where millions of boxes were formerly grown, is now a desert waste, as far as citrus growing is concerned, and all brought about by the ravages of this terrible disease which we are fighting with the energy of desperation. We, as a society, therefore appeal to the members of the legislature to enlarge your horizon and take a broad-minded view of this situation. What affects one section unquestionably affects the entire state, and if this bill is defeated, it will in all probability mean the wiping

out of an industry which pays a large part of your taxes and which has been in the past and will continue to be in the future a potent factor in the upbuilding of our beloved state.

M. E. GILLETT,
LOYD S. TENNY,
RALPH ROBINSON.

Mr. M. E. Gillett: I move the adoption of the resolution.

Mr. Hume: This being a resolution offered by one of our regular standing committees, I do not think it will come under the head of the resolutions which are to be referred to the Resolution Committee appointed yesterday. It can be adopted now if it is the will of the Society at this time.

(Motion seconded and resolution adopted).

Mr. D. C. Gillett: In our deliberations and our meetings at the capitol at Washington and at Tallahassee, the members of this Committee have responded with their time, and have made sacrifices which few know or appreciate, to carry on this work.

There is one member of this Committee who has been on the firing line, I believe, as much as the Chairman. He is a man we all know and love, and I would like very much for him to say something on this subject to this representative body here to-night, representing as he does, the largest interest of the industry. I refer to Dr. Ross. (Applause).

Dr. Ross: Mr. Chairman, ladies and gentlemen: I really think enough has been said. The truth has been fully stated; I could not add to the force of what

has been said. I could not add to the impression which you all have now that this disease must be eradicated or we shall suffer immeasurably.

Personally, having spent a good deal of time at Tallahassee, I believe it will pass. There is not a shadow of doubt, if things pursue a normal course, but that it will pass by a large majority. The man who has been opposing it has not been able to say a hopeful thing about his chance of success. The most hopeful thing he has been able to say is that if he could send ten men home from the House, he could beat it. But he can't send those ten men home. (Applause).

The political situation at Tallahassee is one of uncertainty. An unusual thing has been done. The appropriation bills are all going to be bunched practically into one consideration; that may or may not be wise, but it is the will of the Senate and we have no way to interfere with it. But I am sure this Committee has done a wise thing in preparing this explicit resolution, and that you have done a wise thing to pass it unanimously, and when that resolution is read in the two Houses of the Legislature, I am sure it will make an impression most favorable to this cause. (Applause).

Mr. Hume: When your Committee went to Tallahassee two years ago to secure the passage of the Plant Act with all that it means and will mean to Florida, when the Committee secured at that time the funds wherewith to put into operation the work of that Plant Board, and secured additional appropriations with which

to take up the fight, the one thing which strengthened our hands more than anything else, was between 700 and 800 telegrams that went into Tallahassee.

I have seen men stand up in the Senate with a wad of telegrams as thick as this book, and shake them at the men on the other side of the Senate who were opposing it, and say "That is what I got from home, and I do not need them, for I am going to vote for it. But I am here to tell you that *you have got to vote for this bill and every telegram in my hand will tell you so.*"

It strengthened the hands of those men in the fight. We won. (Applause).

Mr. Gillett asked you a few minutes ago to do this very thing over again. Now, if you have any interest in the welfare of this state, if you have any interest in the industry which means so much to it, do not forego those telegrams. Let them begin to get into Tallahassee just about the first of May. Give the Western Union the biggest week's business they ever handled in Tallahassee and do your share in putting this thing over. Don't forget it. Don't think it is not your business; don't leave it to the other fellow to do. Your Committee has done its part; now do yours. (Applause).

Now, then, enough of that for this session. We all hope it will be the last time it will be necessary either for your president or for the Citrus Canker Committee to have to bring this matter before you. I believe if we put it over this time, we are through with it.

Spraying for Citrus Diseases

ITS USEFULNESS AND ITS LIMITATIONS

Prof. R. R. Fulton

Spraying has come to have an established place in combating many fungous diseases of various forms, garden and orchard crops. It is used most generally on crops that have a relatively high value per plant, and against diseases that attack the crops at such times and in such ways as to render the use of spray materials feasible. We are concerned at this time with citrus fruit crops, valuable enough to justify considerable expenditures to insure fruit free from fungous blemishes, to protect it from the more destructive fungous rots, or to maintain the health of the trees in all their parts. Spraying, it must be remembered, is not a cure-all to give relief from all the ills our trees are heir to. It is only one of a number of means for combating diseases, useful in its particular and somewhat limited sphere, and usually most effective when used in conjunction with other defense measures.

It is my purpose tonight to review some of the fundamental principles on which the practice of spraying for fungous diseases is established, and to discuss the relations of these to the citrus crop. I do not enter upon any discussion of the other broad field for spraying, the control of insect pests. If I speak in rather general terms, you will bear with me, remem-

bering that spraying for the diseases of citrus fruits is still in the experimental stages. For various reasons its development has lagged behind spraying for citrus insect pests. You will remember, too, that your speaker is now in the midst of his second season's work on the rather complex problems involved, and is not yet ready to make an extended report on the results of the experiments.

The diseases we deal with are caused by fungi, and fungi are themselves microscopic plants of a low order. Many are parasites attacking some living plant as a host, and, as a rule, these attack most vigorously particular varieties or species and affect other kinds of hosts less vigorously or not at all. Furthermore, the attack is usually restricted to one or more particular organs of the host, and to some special condition of such susceptible parts, such as age, vigor of growth, succulence, etc.

Before the parasite develops in the host plant tissues, the reproductive body of the fungus must come in contact with it, after being transferred from some other place in which it was previously produced by fungus growth of like kind. This law is as absolute and no less mysterious than that every plant of higher order, corn,

or potato, or what not, comes from a seed or cutting that was produced by one of its kind. The recognition of this outside source for the very beginnings of any fungus infection is of first importance in disease control, whether by spraying, or by other measures. Once established, the greater part of the fungus plant is buried below the surface of its host and feeds and grows there well protected from outside agencies. It is practically impossible to get rid of a fungus thus established with anything short of the ax, the pruning saw or the knife, and such implements may mean loss of valuable plant parts. In the case of the less destructive diseases, we may tolerate a certain amount of un prevented infection, and wage warfare against their further spread. Spraying, to be most effective, must begin before the first infections.

Our corn seed, merely in contact with a fertile soil, would not grow into a plant without suitable conditions for growth, mainly moisture and warmth. Similar favoring conditions are needed for any fungus plant to become established. The crop of fungi in any season is influenced by variations in such conditions.

The seeds of higher plants usually sprout while buried in the soil, and a portion of the plant in a few days emerges from it. The spores of fungi usually sprout where they happen to lie on the surface of plant parts, in such chance films of moisture as rains or dews may furnish for a sufficient length of time. Instead of a few days, as for seeds, the time for spore germination is a matter of a few hours, or very seldom of more than one or two days. The fungus, during a few

hours more, may penetrate beneath the surface, either by actively dissolving a way through the plant's protective layer of epidermis, or by entering one of the natural breathing-pore openings, or through some accidental wound. Most of the growth is below the surface. The microscopic parasite must affect a rather extensive area before its presence can be detected with the unaided eye. This takes, as a rule, several days to several weeks, referred to as the incubation period. So when the effects of a fungus are visible in considerable degree, we may feel sure that the start was really made some time before, and there may be as many or more incipient infections already truly established on neighboring parts of the host, certain to become apparent at the end of their incubation period. Once again, the key to success in spraying is protection against the very earliest of these infections. And how? By coating the parts to be protected with a suitable chemical that will either kill fungus spores in contact with it, or prevent them from germinating, or kill the tender growth from the spore before it can penetrate the host tissues. The general effect is the same in any case: the poisonous spray material preventing the fungous growth.

One serious limitation is when the spores are carried safely past a protective spray coating and introduced directly into the deeper plant tissues on the mouthparts of some sucking or biting insect. It is a difficult case of undermining defences, and unfortunately we are not yet able to cope absolutely with all

such cases. Proper insect control is the rational procedure.

Another limitation is the difficulty of securing a perfect coating of fungicide. Any uncovered spot is a break in the defensive armor and with the enemy spores numerous enough there will be a certain number of infections. These spores are so minute that 10,000 of average size can lie side by side in a single layer on the head of a pin. Carefulness in handling the spray rod is the best corrective. Have an engine and pump that will develop 150 to 200 pounds pressure, and keep it there. Use a nozzle that throws a good misty spray, and renew the disc frequently to keep it so. Use a disc with a small enough hole to make a fine spray, and thin enough to throw it in a wide cone. Use angle nozzles, a cluster of two for larger trees. Cover the tree evenly and completely, as though painting a house, trying to hit every part from two directions, which may be done by a slight turn of the angle nozzle. Thrusts and turns in the tree's interior help complete coating. Cover the lower sides of leaves and the upper sides will usually be taken care of. Remember that the uncoated parts will determine the amount of loss, other things being equal.

Still another limitation is the weathering or washing away of spray solution after it is properly applied. The application must be repeated often enough to maintain a good coating at the critical times; and these are determined largely by moisture conditions during the general period when the hosts are in a condition of susceptibility and when the fungus spores are disseminated. Have a mix-

ture of good adhesiveness on when the rains come, rather than afterwards. If unfortunately caught without such protection, spray immediately afterwards. Every hour even may count. The usual procedure is to follow a schedule of applications, intended to afford continuous protection during the danger period, lengthening the intervals somewhat under dry conditions and shortening them under wet. Do not be misled by sediment that may have lost its fungicidal properties. Consideration must also be given to the rapid increase in size of young parts, and the necessity for keeping them covered as they grow.

The spray solution must be chosen with reference to its effectiveness against the fungus in question, its non-injurious effects on the host, together with reasonable cost and ease of preparation. An ineffective material is dear at any saving in money or trouble. There is a natural tendency to unduly magnify differences in cost of materials. Figure them down to the cost per box of fruit and see what they really amount to. Injuriousness includes the matter of direct spray injury which may sometimes be as objectionable as the disease itself; and also the indirect effect of spraying on the insect-destroying fungi, that are to be safeguarded as much as is practicable. Effectiveness depends in the main on killing power for the fungus in question, with a very important consideration of the proper balance between immediate action and extended duration of effect. As a rule, spray coatings that are easily redissolved in atmospheric water have a high initial fungicidal power, with a tendency to-

wards injuring the host tissues, but are, from their very solubility more easily weathered away than the less soluble, and probably slower acting materials. Spreading power as well as sticking power is a desirable quality in the ideal solution.

All sorts of fungicides, good, bad and indifferent, have been devised and recommended for controlling crop diseases. A word of caution must be given against the large-scale use of proprietary preparations made merely to sell, before their worth has been demonstrated in small tests carefully made and checked.

We will confine our attention to three standard mixtures that are in rather general use for citrus diseases. Bordeaux mixture, ammoniacal copper carbonate solution, and lime-sulphur solution.

Bordeaux mixture has good fungicidal value, perhaps more lasting than immediate. It sticks well; the sediment may be objectionable on fruit nearing maturity. There is a certain amount of deepening of leaf color and apparently stimulation of the host plant following its use. Its use may be followed by an increase of scale insects in the grove, and close watch must be kept, and timely measures taken for their control when necessary. To many this effect is a deterrent against any extensive use of Bordeaux mixture. Others find it possible to take advantage of its good qualities by assigning it a proper place along with other sprays in a year-round schedule.

Ammoniacal copper carbonate has fair fungicidal power, but is not very lasting. There is practically no sediment to mar the appearance of ripening fruit, and it

has little tendency to produce increase of scale insects. It may act on the metal of spray machinery, causing it to wear out, probably the consequence of improper mixing of the spray.

Lime sulphur solution does not have a very long record in the control of citrus diseases on which to base conclusions. It has good fungicidal power, more immediate than lasting. It leaves a slight sediment. It tends to reduce certain insect pests, thus combining insecticidal and fungicidal properties. It consists of rather unstable chemical compounds, and there is the possibility of transformations occurring under certain atmospheric conditions that may give rise to spray injury. Temperatures above 85 degrees immediately after spraying seem to be unfavorable for its use on citrus at strengths effective against parasitic fungi. Late afternoon spraying in warm months may escape this danger.

Each one of these solutions must be prepared accurately. Carelessness in mixing or diluting may make the difference between success and failure. Give attention to purity of ingredients, standards of strengths, right methods of mixing and conveniences in mixing.

No one of these solutions meets all the requirements of the ideal, universal spray material. Some day such may be produced; until then we must use what we have to best advantage. A combination schedule, in which more than one spray finds a place, may offset the disadvantages of any spray used alone. Care must be taken to avoid the injury that may be caused by the mixing of different sprays, as the copper and sulphur ones on

the host plant parts when following each other too closely.

The final proving ground for spray materials, to determine which is best adapted for a particular purpose, is in the grove itself. Comparative tests, checked by leaving a small block of unsprayed trees, carried on systematically year after year, will reveal the strong and weak points of the spray materials. It would be a distinct advantage to the industry if more growers would carefully plan and conduct such tests for their own guidance, and information regarding effectiveness of control, cost, and net returns under their own peculiar conditions.

The whole question of whether spraying is a proper means of control depends after all upon the peculiar life habits of the parasitic organism and its relationships to its host. We cannot discuss these in detail at the present time. The three citrus diseases with which the spraying experiments of our office are concerned at the present time are scab, melanose and withertip. All three affect various parts of the plant besides the fruit, but it is towards the protection of the latter that we center effort in spraying.

I will briefly indicate the lines along which we are working in our tests:

Scab infections occur as a rule early in the development of the fruit, from the blossoming period until the fruit is an inch or somewhat more in size. To adequately protect during this period of about two months, requires three or possibly four spray applications, the first being made as soon as enough bloom has

dropped to expose a fair setting of young fruit, the second ten days to two weeks later. Even before these, on the early spring flush of growth, a clean-up application is advantageous in tending to reduce the early spread of the disease on leaves.

The first melanose fruit infections usually occur during the scab danger period, and thorough spraying for scab will tend to reduce melanose. Under severe conditions one or two additional later applications will be needed.

Withertip or anthracnose of grapefruit and orange usually affects the fruit late in the season. The use of sulphur sprays during the summer for insects tends to control it. Where this trouble is severe a special protective application in early fall is advisable.

The cumulative effects of following a sound spraying system throughout the year in reducing the sources of infection for the following season, must not be overlooked. The best results from spraying are usually attained after it has been practiced a year or more.

I wish to emphasize again the importance of eliminating in so far as practicable hold over sources of infection, especially through the removal of dead limbs and twigs that harbor melanose, and withertip organisms. Judicious pruning further adds to the efficiency of spraying by giving a less dense top that allows the spray to penetrate better. The admission of light and air to the interior of the tree tends to eliminate moisture conditions that would prove favorable for fungus infection.

In conclusion I wish to utter a word of

warning against the idea that blindly following a set of rules will always insure success in spraying. Rules, however good, must be used with judgment; and judgment must be based on knowledge of the factors involved,—the peculiarities of host and parasite and spray material, and the surrounding conditions that govern

their interrelationships. To knowledge and judgment must be added a third requisite—skill in manipulation, before one is fully equipped to cope with the threefold problem of spraying,—the use of the right material, at the right time, in the right way.

Irrigation

F. W. Stanley, Irrigation Engineer.

Although there seems to be no official place on this society's program this year for the consideration of irrigation problems, I am very glad to have the privilege of addressing this body on the subject. I admit that I have talked before many of you for several successive years, and have usually discussed the subject in somewhat the same manner. Yet a recent trip along the lower East Coast has led me to believe that irrigation is still a very pressing problem and that there are probably a number of men here today who have not heard me before. On this account I hope that you who have had to listen to me so often before will be very patient for a few moments, for I promise you I will be brief. I would like to say in this connection, however, that this society has been of great help in the work which the irrigation office of the Department of Agriculture has done in this state, both in gathering new data and in becoming acquainted with men who do things. For instance, about 400 acres of grove irrigation has been installed the last three years, or is under construction, which has been put in from plans submitted by our office. These men have done most excellent work and I can say the plants have been successful in all cases. All these irrigation plants use vitrified clay pipe for distributing

water through the grove. Many of the members of this society have received a recent bulletin from our office entitled "Irrigation in Florida" which goes into considerable detail on this style of construction.

But I am here to speak of particular problems that are present on the East Coast. These problems have not been treated in detail in the bulletin mentioned above, nor discussed before this society. The problems are:

1st. Irrigation of the rocky limestone grove lands that lie between the ocean and the glades.

2nd. Irrigation of the muck lands that lie at the edge of or within the glades.

3rd. The irrigation of the sandy lands in most cases adjacent to the glades.

The irrigation of groves (either avocado or citrus, and the irrigation of avocado groves is assuming importance) that lie on the rocky lands cannot be irrigated by the ordinary furrow or flooding methods. Yet this type of soil presents no particular difficulty to the ordinary low-pressure irrigation system that is used in central Florida, if portable or conductor pipe is used to carry water to the individual tree. Probably the best way to illustrate this point is to give a brief description of a grove recently surveyed for irrigation near

Miami. This grove is very rocky and is nearly flat. Water is obtained from a bored well about 40 to 60 feet deep, the water rising within 15 feet of the surface. The distributaries are to be vitrified clay sewer pipe, laid with tightly cemented joints. This has nothing whatever to do with subirrigation, but the terra cotta or sewer pipe is used instead of iron pipe. In this grove 600 feet of 6-inch terra cotta pipe is used instead of 4-inch iron pipe. The 6-inch sewer pipe costs 15 cents a foot delivered and the 4-inch iron 62 cents per foot. This sewer pipe is buried so that the top of the pipe is at least 6 inches below the surface of the ground. This means considerable work in excavation of trenches in rock, but competent engineers in this section tell me that ditching on this class of soil should be done for 10 cents per foot easily. This means a total of 25 cents per foot for the sewer pipe against about 65 for the iron, or allowing 5 cents for laying, a total of 30 cents laid against about 70 for the iron pipe or about 60 per cent saving. If a larger grove was to be irrigated the saving would be very much more. This sewer pipe main, is to be laid down the center of the grove. Special irrigation valves are connected to it at every other tree row, and water is taken from the valves and carried to the trees through 6-inch light-weight galvanized portable pipe.

The detail of irrigation is as follows: One man connects up enough of this light, portable pipe to reach the edge of the grove. In the above case just 330 feet would be needed, or 33 10-ft. joints. The connections are simply made by pushing

the joints together like joints of stove pipe. When all are connected the valve is turned on and water flooded at the roots of the trees, when two trees are flooded, two joints of pipe are disconnected and carried over two rows and there connected, by the time all of the joints are disconnected and carried over two rows the line is all connected and ready to connect to another valve. This operation is continued until irrigation is completed. It will be noticed the design is such that all the water is handled through one outlet, so that one man can do all the work. This plant uses 300 gallons per minute, pumped by No. 3 centrifugal pump and 5 h. p engine. The cost complete for 10 acres is \$450 to \$500 or about \$50 per acre. The same pumping outfit would answer for 20 acres, which would mean an outlay of only 35 dollars per acre for the complete irrigation outfit; except the cost of the well. I must say again what I have so often repeated at these meetings "that ordinary terra cotta pipe is to be used only under low heads, and in all cases suitable relief stands or air vent pipes must be provided, as it is not safe to pump into a closed pipe of this make. There should however, be no grove in this section that could not be easily irrigated by use of sewer pipe mains and portable pipe, if water is obtainable. In fact I think I am safe in saying that there are no groves along the East Coast that I could not guarantee to irrigate by using such a system as described above."

I would like to state for the benefit of orange growers on the sandy soil of central Florida, that we now have six-inch

irrigation valve that is being made at Orlando that can be sold for \$2.00 or less. This valve is connected to a sewer pipe main and can be placed 6 to 8 inches beneath the surface of the ground, so that cultivation can go on with no impediment in the grove. This buried valve or cap, also is safe from being knocked off by teams, etc., which so often causes so much trouble. I would also like to state for the benefit of growers in the hillier country that we have experimented with drain tile or sewer pipe that has been reinforced with wire and concrete so as to stand relatively high pressures. This pipe being laid continuously in the trench, such pipe is much cheaper than iron pipe and will stand very high pressure if sufficiently re-inforced.

Irrigation of muck land adjacent to or within the glades can be accomplished by the methods described above for groves, and can also be used to irrigate many truck crops, but generally speaking the irrigation of this class of lands can be done by simply installing a pump of large capacity and raising the water table. As most of you know muck lands sometimes become very dry when well drained, and truck crops often suffer severely, but if the water table can be raised sufficiently irrigation is accomplished satisfactorily. In the future it may be possible to raise the water table on a large section of the glades by holding the water up in the main canals by means of locks or dams, but until the drainage plans are further advanced it probably will not be safe to try out this plan on a large scale on account of danger from flooding by heavy rains. In the meantime thousands of acres may be in

need of water. It is probable that large capacity pumping plants will be used to supply this want. Many acres somewhat similar to the glades, have been irrigated in California by running water in ditches spaced from 20 to 40 feet apart, and holding the water in until the intervening land is irrigated. This same method is used in the large Hastings potato district of this state, but in this case a hard pan prevents the waste of water. Still the water plane can often be raised without an impervious substratum if enough water is pumped. And enormous amounts of water can be pumped through lifts of 4 or 5 feet with comparatively small engines.

Several hundreds of acres of truck-crops have been irrigated near Ft. Lauderdale on the sandy lands, by running water between the rows of the plants using open ditches for mains. In most of these cases large heads of water have been pumped from the drainage canals by home made pumps. Most of these pumps consist of a square wooden box set on an incline, one end in the canal and the other end upon the bank. Water is forced through this flume by a swiftly revolving boat propeller placed in a short piece of pipe in the end of the flume that sets in the water. An ordinary marine engine is used to operate the propeller, the engine being perched on the dry end of the wooden box. Some of these pumps deliver as much as 2,000 gallons per minute, and will irrigate large tracts of land, even though a high per cent of the water is lost in transit through open ditches. Yet the low lift and large quantities of water available makes the system very satisfactory. Such an outfit costs a few dollars

per acre, and is very easily taken up and moved to another point. It must be remembered though, that such pumps are only available where low lifts are possible, and where large quantities of water are available. There are a large number of pumps on the market similar in general principles to the home made pumps described. These pumps are used in many parts of the south for drainage purposes and in the north in flooding cranberry bogs. The low pressure centrifugal and the Wood impeller pumps are also very good for large quantities of water. Such pumps are likely to be much more efficient than the home-made variety, and would be advisable if a permanent plant is to be installed. If a head of over four feet is to be pumped against in the home made pump it probably would be advisable to put in two propellers instead of one. The shape and number of blades of the propellers can doubtlessly be improved upon, and we hope to be able to experiment with them before long.

Overhead sprinkler systems of various designs have assumed considerable prominence on the east coast during the past few years, many of the systems being designed by local men. These systems

are excellent for close planted crops, and also have the advantage of affording some protection against light frosts. Of course such systems are expensive, especially since the war, on account of the high price of iron pipe. Many such plants will continue to be installed, yet I still insist that if irrigation can be accomplished at less cost it should be done, and in many cases cheap surface methods can be used instead of overhead methods, both for grove or truck patch, and in any case a thorough investigation should be made before a large outlay is made.

Mr. Robinson: I want to emphasize the importance of the citrus irrigation outlined by Mr. Stanley. We have recently put in about ten acres, irrigating with this vitrified tile, six inch size, and are astonished at the amount of water we get through this method of delivery. We can irrigate three times the amount of land we were irrigating with that one well. If we had had this information several year ago, it would have saved thousands of dollars for us.

Vitrified tile is very well described in the bulletin he refers to, and I hope you will investigate it thoroughly before you do any more irrigating.

Fertilization

L. B. Skinner.

Fertilizer is supreme—"With what measure ye mete it shall be measured to you again." Little fertilizer, little crops, poor fertilizer, poor crops. Liberal fertilizer, liberal crops. Best grade of fertilizer produces best grade of crops.

Stingy fertilizing, small crops, no returns, no profits, lots of debt, lots of waste, lots of faultfinding, lots of failure and disappointment.

Generous, but careful fertilizing, makes generous returns, even extravagant fertilizing gives enormous returns if wisely applied. In these times we are prone to stint the fertilizer, but it can't be done and make money.

The tree or plant will take its maintenance first, enough to support it. If there is any left over it will make profit for you. I know little of farming outside of orange groves, but I judge the same rule to hold true everywhere.

It takes just so much to sustain life and on this there is no profit directly. Beyond this line lies the realm of profit. If you would profit, withhold not your hand, put on all you can afford—double it and apply as much again.

This does not mean that you are to throw a baby tree into an ocean of fertilizer. If you do you will lose both tree and fertilizer. Neither does it mean, if a tree ask bread, for you to give it a stone, or if

it craves nitrogen are you to feed it phosphate rock. Or if it wants potash, to expect lime to do as well. For seventy-five years the best minds have been blazing the way of safety and profit, and putting up danger signs to warn us of dangerous practices.

Heed no one's "Lo, here is something just as good as Soluble Phosphoric Acid, or lo, there is something that will take the place of potash." If the blind lead the blind both will fall into the ditch. Life is short—time is fleeting—you have not time to follow after false gods, follow the laws laid down as the result of half a century of careful experiments, and you and I have little time to experiment. Few of us are fitted for it—we have not the time or the patience, and there is no direct profit in experiments. I can take no interest in following a line of work that I know is going to show why a certain method is a failure if I am satisfied in my mind that the method is a failure. If I don't see success ahead my interest is gone, and so it is with most of us. Some of us eat to live and some live to eat, some work to produce something. Some are satisfied to work a whole lot just for the pleasure of seeing the motions made, and in the end consider the worst failure is success, and they are satisfied—and put up a sign "This road don't get you anywhere, keep

out." But it don't buy potatoes for the starving millions. On the other hand they, the experimenters, have shown the proper main road to follow. They have made it plain it is a straight and narrow road, and there are some that find it.

Let the experimenters try the short cuts, the excursions, let them try the new patent medicine fertilizer and try it on the dog—but let's you and I stay in the middle of the road—experimenters have marked it for us—until the new roads are pronounced safe. We owe much to trained experimenters—we owe all to them and we owe it to them to keep in the middle of the road until they advise going out. Go the limit, but play safe. Many an operation has been pronounced successful by the surgeon, but the patient failed to survive. Many a fertilizer experiment has been successful, but the tree died. If your tree needs nitrogen don't give it Phosphoric Acid and expect the tree to come back—or if it needs Phosphoric acid don't expect it to mature its

crop with nitrogen. And where it has all the nitrogen it can stand and all the phosphoric acid it can assimilate don't believe any one who tells you that you can apply more of these, even together, and expect to fool the tree into thinking it is potash. Trees are never fooled, as man sometimes seems to assume, but they have got to take what is given them even if it kills them, and it often does.

Fertilize when needed. It don't do much good to fertilize for bloom after the bloom period is over. You want to have your lamps trimmed and burning when the time comes. You want to feed the tree what it wants, when it wants it. A great many growers are too late. Too late never caught a train, too late never made a crop, too late always was too late, and always will be. Be on time to apply plenty of the right fertilizer when needed. I call to mind a grove in my County that could be made a wonderful producer, but the owner is always too late, and rarely ever does he get a heavy crop.

A BRIEF REVIEW OF WAR'S EFFECT ON FERTILIZERS

W. J. Driscoll

Mr. President, Ladies and Gentlemen:

I was invited to become a member of this Committee, and as I am so repeatedly asked "Why the high cost of fertilizer," it seemed a good opportunity to prepare a paper along those lines. Whenever we approach a consumer these days in an effort to sell him fertilizer, everything is all right until we get down to prices; then he goes away up in the air. So I have pre-

pared a paper which may enlighten you somewhat as to the cause of this increase.

We must recognize at the outset that supply and price of any commodity cannot be rightly considered without considering demand also, since supply is excessive or deficient only as it applies to demand existing for the commodity under consideration. Briefly reviewing the effect of the war upon demand for fertiliz-

ers, we will all remember that there was a very great demoralization on the outbreak of hostilities. The stock exchanges closed; the money market tightened. This re-acted on general industries, reducing the purchasing power of laborers and employees and resulting in decreased demand for almost all farm products.

The farm product which suffered most severely at this period also is the one which uses more fertilizer in its production than any other crop; namely, cotton, and the 1914 crop was enormous while the central European market was at once entirely cut off. Later, as stock exchanges opened, demand coming from Europe for various supplies such as food stuffs, munitions, etc., created better feeling generally. Industries of the country awakened. More money became available and increased demand for farm products was created not only for domestic consumption but for export. But this phase did not appear in time to bring the cotton growers back to prosperous conditions and the year 1915 saw the close of many fertilizer factories in the cotton section. Good prices obtained for the cotton crop of 1915 re-acted in such a way as to produce far more interest in planting cotton in the spring of 1916, with heavy demand for fertilizers and materials. The high prices being obtained for grain and feeding stuffs also resulted in larger consumption of fertilizers in the north for the growing of this crop than ever before. Unfortunately, disastrous storms and damage from boll weevil created a restricting influence on the cotton crop, but notwithstanding this, demand for fertil-

izer has been greater during the spring of 1917 than for any year since the war started, although not so great as in 1914. Prices obtained during the past year for all kinds of farm produce have been in general such as to make the farmer prosperous and also to make him use every means possible to increase his crop.

We can say, then, that every influence has tended toward an increased consumption of fertilizer except the single one of increased price of fertilizer. This has kept the actual consumption below that of the normal years before the war. We all know that with increasing demand we may normally expect increased prices. This is likewise true where there is a short supply of the commodity. The reasons for the demand are pretty well known to all of us and we will now examine some of the causes leading to shortage in supply or increased cost of certain fertilizer materials.

POTASH

Little need be said regarding potash. The wonderfully rich deposits existing in Germany had for years served practically as the world's supply. The outbreak of war found the United States dependent upon such small stocks of German potash as had been left over from the preceding season, since only a comparatively small amount of the next year's supplies had been delivered. There were, it is true, a limited number of by-products which had always been used, such as ashes and tobacco dust. Practically the only way to handle this situation was by careful conservation of such potash as the country had. Strenuous efforts have been made

to develop and increase other sources of potash supply, but only a very small amount is being produced as compared with the amount of German potash formerly consumed. The principal American sources the brines from certain Nebraska lakes; the Searles Lake district in California which has recently advertised as able to produce 1,200 to 1,500 tons per month; the Giant Kelps off the California coast which have proved a disappointment because of difficulties in extracting and the amount of potash produced; Alunite which is now producing a limited quantity of very high grade sulphate of potash, and Ashes from various materials such as hardwood, cotton bolls, cotton hulls, etc. The last mentioned material, (ashes), is used in a fertilizer way in its crude form. There is, however, a limited amount of carbonate of potash being produced from ashes which is being taken up by the glass makers, soap makers, etc.

It is hardly necessary to comment on reasons for shortage in supply and advanced price of potash.

SULPHURIC ACID

Sulphuric acid is not generally thought of in connection with fertilizer, yet it plays an extremely important part in the manufacture of certain materials; for instance, in changing insoluble and unavailable phosphates into soluble and available forms, such as acid phosphate, dissolved bone, dissolved bone black, etc. It also is essential in the manufacture of sulphate of ammonia.

Many sulphuric acid plants closed down in the fall of 1914 by reason of the antici-

pated greatly decreased demand for fertilizer on account of the cotton situation and general demoralization. When the general outlook began to brighten, large contracts were placed by the Allies with munitions manufacturers who then required large quantities of sulphuric acid and who lacked supplies to care for this sudden and greatly increased demand for explosives. There has been for several years a very considerable quantity of sulphuric acid manufactured by zinc and copper smelters which has gone into the manufacture of acid phosphate. Contracts were made between these large producers and munitions manufacturers. This created the prospect of a large shortage of acid phosphate. Acid plants were immediately opened again and started in full force.

Then there came into play certain elements which have affected the fertilizer materials market generally. Sulphuric acid requires sulphur or sulphur ore, also nitrate of soda, for its manufacture. These materials are imported. The war situation created an extreme shortage of vessels, making it hard to get bottoms to bring these materials to this country. Furthermore, the shortage of vessels and increased risk caused vessel owners to advance their freights as much as 600 per cent to 700 per cent over normal rates. War risk made it necessary to carry excess insurance. Munition manufacturers were willing to pay extremely high prices for sulphuric acid which they simply had to have. Notwithstanding these influences, the prices of acid phosphate did not advance in anything like the proportion that might be expected.

While we are considering sulphuric acid, it may be well to mention that the pyrites or sulphur ore from which the major portion of the sulphuric acid going into the fertilizer industry is manufactured comes from Spain, and it is very possible that we may be almost entirely cut off from this source of supply. The nitrate of soda used in the manufacture of sulphuric acid is also used in large quantities in munitions manufacture, and of course we know its value as a fertilizer material. The high ocean freights have affected the price of this material very seriously, and at certain times an artificial shortage has been created in this country due to heavy buying by munitions manufacturers for their immediate necessities. This material may also be an object of interest to German raiders and U-boats.

SULPHATE OF AMMONIA

We have already mentioned that sulphate of ammonia is dependent on sulphuric acid for its manufacture. It is also a very interesting material for consideration since practically every condition which has affected any fertilizer material has affected sulphate of ammonia.

By far the largest production of sulphate of ammonia is that of steel manufacturers who handle it as a by-product of coke ovens in which they prepare coke for use in the iron industry. As coal is coked in these by-product ovens, it gives off gas containing considerable ammonia. This ammonia is "scrubbed" out of the gas and is absorbed by sulphuric acid.

Prior to the war, the United States produced about two-thirds of its require-

ments of sulphate of ammonia, the balance being imported. For instance, in 1914 we produced 183,000 tons and imported 75,010 tons, making a total of 258,010 tons. The sudden outbreak of the war prevented delivery of a number of import contracts. Ocean freights began to rise and imports became more and more restricted. England finally placed an embargo on exports of sulphate of ammonia on account of needing this material for her own agriculture, and also because of its use in the manufacture of munitions. Meantime, in the fall of 1914, the steel industry in the United States became greatly depressed and production of sulphate of ammonia consequently much curtailed. In the spring of 1915 the steel industry began reviving and the production of sulphate of ammonia began to increase. Then the manufacturers struck a snag in the high price of sulphuric acid. It takes at least a ton of what we call 60° Baume sulphuric acid to make a ton of sulphate of ammonia; and at least one-half the increase in price per ton of sulphuric acid had to be added to the cost per ton of manufacturing sulphate of ammonia. Steel manufacturers have been putting in a great many new by-product plants, but they had to overcome a very considerable handicap in trying to increase production to the point of taking care of the former imports. They have had difficulties in getting their plants completed, had strikes and labor troubles, have been unable to get the coal to their plants as fast as they needed it because of car shortages and railroad conditions, have had to pay high prices for the coal, and, in a number of cases, have not been able to furnish buy-

ers with the quantities of sulphate of ammonia they had contracted to deliver. Furthermore, they have had difficulties in getting box cars in which to ship their finished product, in common with other manufacturers in the north.

The spring of 1917 finds producers unable to make any sales for prompt shipment as all their production is taken up on existing contracts. Demand is ahead of supply and present cost the highest known.

COTTON SEED MEAL

Cotton seed meal has been getting to the point where we must consider it as a feeding material rather than a fertilizer material, but it should be considered in this discussion since it has been so largely used as fertilizer material in the past. The diverting of large quantities of cotton seed meal from fertilizer markets to feeding markets has caused fertilizer demand which formerly went to cotton seed meal to turn to other sources of plant food thus abnormally increasing demand for such other materials. The last two cotton crops have been short, not only on account of the uncertain market and bad credit conditions which caused farmers to decrease acreage in 1915, but also on account of storms, boll weevil conditions, and insufficient fertilization. In addition to the supply being shorter than usual, demand for feeding purposes has been unusually heavy because of high price of other feeding stuffs.

PACKINGHOUSE PRODUCTS

With regard to the packinghouse products, blood and tankage, there has been

a gradual decrease in supply of cattle in the United States for some years. It may interest you to know that only seven pounds of dried blood and twelve pounds of tankage are obtained from each average full grown animal in good practice, hence it takes about three hundred animals to yield a ton of blood, and about 170 animals to yield a ton of tankage. Furthermore, it is only in the larger and better organized packinghouses that these materials are properly saved. In country killing and small slaughterhouses these materials either go to waste or are handled in some other manner. This short supply of food animals is reflected in the high prices which are being paid for hogs and cattle at all centers. Furthermore shortage of other materials, especially sulphate of ammonia and cotton seed meal, has caused an unusually heavy demand to turn to blood and tankage in the face of a supply which is short anyway. Another factor entering into the packinghouse product situation is that there is an increasingly heavy demand for these products for feeding purposes, especially in the Middle West, and materials which might otherwise go into fertilizer production are being carefully selected and put into feeding meal for cattle, hogs, etc.

OTHER FERTILIZER MATERIALS

There are a number of other fertilizer materials which are used to some extent, but their production and also the demand for them is limited, and it is hardly necessary to mention them in an article of this kind.

SUMMARY

To summarize the conditions which are affecting supply and price of fertilizers, there is

First: The impossibility of importing certain materials which were formerly imported, such as potashes, sulphate of ammonia, etc.

Second: Difficulties in importing certain other materials such as pyrites, nitrate of soda, etc., due to shortage of vessels and high ocean freight rates and marine insurance.

Third: Heavily increased demand from other industries for materials which have been going into fertilizers, such as the munitions makers' demand for potashes, nitrate of soda, ammonia salts, and sulphuric acid; also the demand from the feeding trade for such products as feeding tankages and cotton seed meal.

Fourth: Difficulties in railroad transportation due to car shortages.

Fifth: Increased price of coal due to transportation difficulties. Coal for motive power purposes has increased practically 100 per cent.

Sixth: Increase in labor costs, these having advanced from 50 to 100 per cent.

Dr. J. H. Ross.

Dr. Ross: I will say a word or two, in order that there won't be an entire blank for my part of the program.

These two papers we have just heard, are really very suggestive. First of all, Mr. Skinner has pointed out the importance of feeding your trees regularly, promptly, and intelligently, and Mr. Dris-

coll has intimated to us that to do this is going to be somewhat expensive. (Laughter).

If ever there was a time when the grower should refrain from expensive experiments, this is the time. I have a friend down the state who has an orange grove. He has been a good doctor, an excellent doctor, for a good many years. He came to see me some time ago, and said "I have discovered a new way to feed my trees." I said, "How are you going to feed them? How well is your new theory confirmed?" He said, "Well, possibly it is something of an experiment, but I think it is reasonable." I said, "My friend, I used to know you when I thought you were a pretty safe family physician, and I never knew you to try experiments on your patients' children. I think it is an unwise thing to do."

I was traveling across a wheat field in western New York and a man who put in the wheat, drilled it in and with it drilled the fertilizer. Towards the end of the field he ran out of fertilizer, but he went on putting in the wheat. That whole end of the field was put in without fertilizer. You could tell almost to a line where the fertilizer had run out. The field where the fertilizer had been put in stood two or three feet high; where the unfertilized tract was, the wheat was about eight inches high.

Now it will cost the orange grower a fixed sum to prune, and harrow, and spray. That is all an overhead expense you cannot get away from. But every penny of profit you make, is involved in the fertilizer you apply. You might just as well talk about working your mules

from day to day and getting service out of them if you don't feed them. You will get just as much out of the orange tree without feeding it. I don't think you would experiment on feeding your mule and give him every mule food that comes along. You know just the food to give him that can be eaten with relish and profit to the animal; the food that can be assimilated and that will benefit the mule. But the poor, helpless orange tree has to wait for its proper feed and has to take what you give it, regardless whether it is the right food or not.

But you can't fool an orange tree. It has to take what you give it, that is true, but it can and will retaliate in the amount of a crop it gives you in return. The only thing that is being deceived is yourself, when you don't feed your tree properly and regularly.

Now, about this question of regularity. I think that we all know that work animals do much better on the same amount of feed, if they get it at exactly the same time. Their systems become adjusted to the reception of food at certain times, with a certain period in between for assimilating. Their digestive organs adapt themselves to that routine, and there is an uneasiness, to say the least, when that routine is not followed.

In my opinion, you should feed your orange trees as regularly as you feed your mules, and when the set time comes for applying fertilizer, put it on.

Summing up the matter, in Florida the profit of an orange grove is the money you pay for fertilizer.

I suppose in some of this rich land down here towards West Palm Beach,

you have different conditions from those which obtain on the high, light, pine soil over in Polk County which my friend Skinner so delights to deride. But over with us, we preach the gospel of feeding regularly and generously.

But this does not mean over-feeding. You know they say a man will do better with a little less food than he really wants. He will do better with a little less food than with more than is good for him. The thing that attracted my attention and gave me the most work many years ago while practicing medicine, was to keep the people who ate too much, going.

I apprehend that now, with the present prices and difficulty of getting materials and fertilizer, I apprehend it will be rather under-feeding than over-feeding.

A great many people of this state have had a very severe freeze. It was very expensive. Now, these trees are debilitated. They must be nourished, if you expect them to recover within a reasonable time. They have had a shock, and they need help to recover promptly and properly from that shock. It will be a hardship to pay a high price to fertilize trees which have temporarily ceased to produce. But the last word I will say, is that you strain a point, borrow the money, if you must, but feed those trees. Don't let them go hungry while they are trying their best to recover from the freeze.

Fertilizer is an important thing, but the average grower does not know much about it only that he has to buy it. I think he should not try many experiments, especially just now, but should

feed his trees intelligently and generously. (Applause).

DISCUSSION

Mr. Hume: This discussion of the subject by Dr. Ross and Mr. Skinner, and the attitude which perhaps some of us take toward our trees, makes me think about Pat and the pig.

Pat bought a pig for \$6.00; he bought \$9.00 worth of feed, and sold the pig in the spring for \$15.00. His friend met him and asked him:

"How much did you pay for the pig, Pat?"

"\$6.00."

"How much feed did you have to buy for him?"

"\$9.00 worth."

"That does not seem to be a profitable transaction for you, Pat."

"Ah, but shure, I had the use of the pig." (Laughter).

If some of us are not careful about our trees, particularly at this time, we may have the use of the trees.

Is there any further discussion of the topic, or any questions you wish to ask?

Mr. — : I would like to ask if ground phosphate rock or ground limestone rock will injure the trees, when broadcasted.

Mr. Hume: I think Prof. Stevens discussed this matter at the last meeting or possibly the meeting before that. Or was it Maj. Floyd?

Maj. Floyd: Under certain limited conditions, apparently ground limestone used in excessive amounts may prove in-

jurious. We found a few cases where apparently it did. The conditions were a lack of humus in the soil, a light sandy soil, and very dry soil.

Under conditions where there is a moist soil, with plenty of humus, I think you can use an average amount, or more than an average amount of ground limestone, without injurious effects.

Mr. — : The finest, sweetest and best fruit are grown in some localities with fertilizer that would be detrimental on other soils. Then, again, trees that have not been fertilized for thirty years, bear good fruit and an abundance of it. It is well for a grower to mix brains with his fertilizer.

Mr. — : I notice Dr. Ross says to fertilize regularly; I would like to ask what method he would suggest?

Dr. Ross: Get ahead of the growth with a stimulating mixture about January; then another dose about the last of May or first of June; then again early in November.

Mr. — : I would like to ask what amount. We expect to plant this fall several hundred trees; we expect to have a thousand acres within the next two or three years. I would like to ask from those who have had experience, which I have not, what amount the new trees should have, and what time they should have it.

I would also like to ask which would be better to plant as a cover crop; peas or velvet beans?

Dr. Ross: The advice I have given relates to bearing trees.

When I have babies to take care of, I

think they should be fed more than three times a day.

With young trees, it has been my custom to give them fertilizer about every few weeks; not large quantities, possibly a pound to the tree during the first summer, and two pounds every eight weeks, say, during the second summer.

I don't believe the young trees will do well by giving them all they want. You should feed these babies at regular intervals but not too long intervals, and not too much at a time.

I generally put fertilizer in the hole where the tree is planted; just mix it with the sand when I plant the tree, and then wait for them to get leaves at the top for breathing surface before fertilizing more.

Mr. ——: What kind of fertilizer do you use?

Dr. Ross: I can hardly answer that question. Just pay your money and take your choice. (Laughter.)

Mr. ——: What do *you* use in your experience?

Dr. Ross: I don't know whether one should answer that sort of question, either.

Mr. Sample: He means about what analysis.

Dr. Ross: They are very much the same; just pay your money and take your choice. (Laughter.)

Mr. Hume: It is not now so much what you should give your trees, but more a question of what you can get.

Mr. ——: While you are discussing the fertilizer question; I would like to ask something.

Some years ago the fertilizer authori-

ties told us we needed from 5 per cent to 10 per cent to 12 per cent or 14 per cent of potash. Now, since it is next to impossible to get potash, they seem to have changed their minds, and tell us a smaller quantity will do practically as well; that from 1 per cent to 3 per cent will be sufficient.

It is a question in my mind whether orange trees will continue to do as well with a smaller percentage of potash, and it is another question whether we will be able to get it or have the money to buy it with.

Another thing; we have been told many times that the Florida soil is devoid of potash. It will furnish only a bed for the trees to be set in. If this is true, there is nothing for the tree or anything else to live upon. Now, suppose you take the poor land we have in Florida, the white sand that the saw palmetto grows on, and analyze that soil, and find nothing in it of plant food. But you take the growth produced on that land, and burn it while it is green, and it will produce about 20 per cent of potash. Where does that potash come from; how is it manufactured and put into the saw palmetto when there is no potash in the ground? Is it not possible that Nature has a way of producing potash that we do not know anything about?

I believe after awhile you will find that Nature has a way to produce fertilizing elements in the soil and make them available for trees and plants, where we find none of them in an analysis of the soil. I would like to know what research has been made in this direction. It seems to me that there are things in the soil that

are produced by bacterial action, the process of which we have not discovered, and I would like to know something on that line, if possible. (Applause.)

Mr. Hume: Mr. Driscoll, I would like to turn that question over to you.

Mr. Driscoll: I would like to hear from Prof. Rolfs. (Laughter) I am satisfied the Professor has made some very important experiments on that line.

Mr. Hume: Prof. Rolfs does not seem to be here. Can anyone else furnish an answer?

Mr. ——: What is your advice in regard to mixing raw ground lime rock and acid phosphate together?

Maj. Floyd: That would revert a good deal of the available phosphoric acid.

Mr. ——: The reason why I asked; in South Carolina where there is a good deal of aluminum in the soil, lime, combined with the acid phosphate, makes it more like basic slag. Whether there is any aluminum in this soil I do not know.

Mr. Green: I suggest we call Mrs. Prange to answer that question.

Mrs. Prange: There is a very great deal of difference between mixing lime and acid phosphate above ground and having the dissolved acid phosphate mix with the lime in the soil. As we know acid phosphate is made by taking away two parts of the lime. That leaves a soluble phosphoric acid. When you put the acid phosphate in the soil, this phosphoric acid is dissolved. As it is dissolved and comes in contact with the lime, it is reverted and to an extent precipitated in so much finer particles than any grinding could possibly bring it, that the availability is not impaired.

Hr. ——: How about the aluminum in the soil?

Mrs. Prange: There is always some aluminum and iron in all soils. It makes no difference how much there is, having plenty of lime in the soil keeps the phosphoric acid available, although that seems to be contradictory.

Mrs. Skinner. Let's refer the gentleman's question about the palmetto to Mrs. Prange, too (Laughter).

Mrs. Prange: There is one part of his question I really want to answer. He was speaking about the different advice about the use of potash since the potash is so difficult to get. Now, when you stop to consider, our plants and trees are really no more sensitive or important than are we, and our families. If there was any one article of food that was costing six times its real value, we certainly would lessen the amount we put on our table, and we would not starve to death, either.

I believe all kinds of life will adjust itself, in a measure, to its conditions.

I do not think anyone really considered an authority, claims that trees and plants can get on without any potash, but surely potash, at \$6.00 per unit, is not a practical proposition in the quantities as was used before, and I do not think any authority has ever advised the high amount of potash that the growers themselves have demanded in the past.

Mr. ——: Mrs. Prange spoke about acid phosphate and iron not working together. I have a piece of ground with a sort of iron pebble. It is very hard, and in same places you have to move the peb-

bles around with a pick. It can't be plowed. What would be the use of putting acid phosphate on that; or had I better use something else to get my phosphoric acid?

Mrs. Prange: I cannot imagine a soil with so much iron in it. I am sure you would find nothing more available than phosphoric acid. I think that would come more within the line of some scientist. Mr. Hume, I think you had better take that.

Mr. Hume: Mr. Skinner, I will ask you to answer that question. (Laughter.)

Mr. Skinner: I don't want to touch it. (Laughter).

After the freeze of '94-95, one of the largest manufacturers of fertilizer in this country located in New Orleans, came to Florida to close up all his accounts. Among some of the accounts, was mine. I settled mine with him and helped him settle a good many others. He was a big man, a fine man, and he said, "Skinner, I want to leave you one piece of advice to spread among the growers of Florida, and that is this; the growers of Florida are using altogether too much potash."

There is absolutely no need of it. Fertilizer people are glad to sell it to you, if you want it, of course. The German propaganda was pushing it all the time, to increase their trade.

Along the same line, one of the leading fertilizer manufacturers of our state was being tried out by the German potash agent in New York in regard to potash conditions in this country. Among other things he told this agent he did not think

the Americans would use, after the war, half as much potash as they had been using before as they had been finding out they had been using too much and the potash had been going to waste.

This potash seems to get away, or move about, in a very peculiar manner. Our friend over there has it manufactured by nature in saw palmetto roots, and one funny thing about the palmetto roots (he spoke of it, too) is that when you burn palmetto roots green, you get a high percentage of potash; let them dry two or three months and you get nothing. Where does it go to?

Mr. Hume: Any further discussion?

There is another thing about that saw palmetto root. Most of our Florida soils have a trace of potash. You must remember those palmetto roots have been tracing that trace for a long time; we don't know how long they may have been after it, but from my observation on the growth of palmettos, I think some of these old roots around in Florida, saw Columbus. I don't think we appreciate the fact that it is a very slow-growing plant and the roots are very long.

Of course, when we refer to the potash in saw palmetto, we refer to the ash as being rich in potash. But bear in mind that the ash obtained is a very small part of the plant, and you sift that down and you will find a very small amount of potash from a very large root. When this is put back on the soil, it may be that trace we were talking about.

There is Prof. Rolfs now. Prof. Rolfs, you have missed this; I congratulate you. (Laughter).

Mr. ——: Isn't there a difference in the soil which would determine the difference in the quantity? I mean, the difference in the amount of fertilizer to be applied?

Dr. Ross: Of course, I suppose there should be a difference in the practice in the different sections of the state. Please remember I was alluding to the light pine soil in Polk County. In this low-lying, heavier soil, I am not prepared to say.

Mr. ——: There is a good deal of difference in the soils in this county alone. A large area of this county, the analysis of the soil by the Department of Agriculture at Washington and by the state, an average in ammonia is 3 to 4 per cent, phosphoric acid, about .35 per cent, and

potash one-tenth of 1 per cent. Several young groves are being planted out on this ground, and vegetables of all descriptions seem to thrive without the aid of any fertilizer whatever. This has been done for several years.

It seems evident, however, that sooner or later we must have potash and phosphoric acid to add to the soil so that it will balance up the ammonia contained in the soil.

Speaking about the potash that Nature provides. There is very little potash in a soil that analyzes ten-one-hundredths of 1 per cent, yet our vegetables harden up well and stand shipments on that small percentage of potash.

Orchard Heating

B. C. Skinner

The members of this Association are probably more interested at the present time in the results obtained from orchard heating during the past freeze, than any other phase of the subject. The writer, has, therefore, endeavored to collect information on the results obtained and the methods employed in some of the leading groves.

The results obtained have generally been excellent and have shown conclusively that firing pays. Preparing for a freeze is really a form of insurance and the grower does not expect a return of ten per cent per year, but rather a large return at long intervals. During the past thirty years the records show the freezes of more or less intensity occur at intervals averaging six to seven years. The saving from freeze damage will, if adequate preparation is made, pay for the initial investment, pay the cost of taking care of the wood, fire pots or coke stoves, and pay the interest on the investment and a handsome profit besides.

The average up-to-date grower insures his house, barn and other buildings and his own life, but it is surprising what a small percentage of growers have in the past insured their groves and crops by preparing for freezes. It is probable, however, that this percentage will be much increased in the future.

The examples of the effects of the freeze stand out prominently; Mr. L. B. Skinner's groves which were very well protected and the Floweree groves which were not protected at all owing to the fact that Fort Myers was considered too far south to be hurt by any cold no matter how severe. In the first case the fruit saved by firing amounted to about twenty thousand boxes. It is probable that many of these could have been shipped though frozen and some money received per box, but it is safe to state that the return would probably be a dollar less per box, on the average. Then, to this saving can be added the crop which Mr. Skinner will get next year. As the average expected crop over the State is generally considered to be less than half the usual crop, it would be fair to state that half of the crop he will get can be credited to the firing,—or probably not less than thirty thousand boxes. The State crop will be short; prices will be high, and the returns for these thirty thousand boxes will be large. The investment in firepots and fuel is approximately thirty thousand dollars, so it can be readily seen that the saving will pay for this equipment and the compound interest for the past seven years.

The Floweree grove had removed practically all their fruit and the loss there can be measured only by the loss of the

next year's crop. Up to the present time no bloom has appeared worth mentioning, so it is probable that they have lost practically the entire crop for the next season. Their trees were in good shape before the freeze and a conservative estimate of the crop for next season placed it at 200 boxes per acre which is not by any means excessive. As grapefruit are now bringing two to three dollars per box the loss on fruit alone will be practically \$400 per acre. As protection could have been obtained for from two to three hundred dollars per acre the saving on next year's crop would have paid for this protection. Then consider the loss for two to three years to follow and the expense of pruning out the enormous amount of dead wood, and it is readily seen that the investment would have paid well. As this grove covers about four hundred acres the loss is enormous.

The sources of heat used in firing are wood, oil and coke. The wood is very satisfactory, the main objection to it being the difficulty in getting enough wood for large acreage. In preparing to fire it is essential that enough wood be provided to fire three nights in succession, as, usually, the severe freezes are of this duration. It is useless to fire one night and let your trees freeze on the second night. Another point of importance is to provide a large number of fires and not to be too saving of wood. Endeavor to save the grove and not the fire wood, should be the warning given the men attending the fires. The average of a large number of fires is a better distribution of heat without danger of scorching the trees

nearest the fires. One hundred fires to the acre is recommended.

When firing with oil pots it is just as important to provide a supply of fuel for three successive nights, and just as important to have a large number of fires. One hundred to the acre is recommended as giving the best protection, though one in every square where trees are spaced twenty-five foot centers has given good results. The oil for the first night is stored in the pots in the grove. The reserve fuel is stored in tanks at convenient places about the grove and distributed by means of wagon tanks. The grower should use an oil which is not too heavy, for two reasons: The first is that the heavy oils obtainable in Florida come from Texas and have an asphalt base which cannot be burned in the ordinary oil fire pot; it, therefore, remains as a residue in the pot and after several firings reduces the capacity of the heater to a considerable extent. The second objection is the difficulty in getting this heavy oil to run through valves and pipes when the temperature is around thirty-five degrees. Heavy oil is like molasses under these conditions. The fuel best suited is what is known as "fuel distillate."

The use of oil pots has many objections among which may be mentioned the damage to roots of the trees through spilling of oil, the high initial cost of the pots, storage tanks, and oil sufficient to give the necessary protection, and the difficulty in refilling these pots after the first night's freeze. For these reasons many growers are turning to coke stoves.

The stoves cost less than the oil pots;

the coke which is used as fuel does not deteriorate even when exposed to the weather. The cost of coke at the present time is high owing to the demands made on the coke burners by the steel mills. Even at the present prices of \$4.00 to \$10.00 per ton, coke is cheaper than oil. The coke stove seems to be more efficient than the oil pots for the reason that it gives off its heat close to the ground, the radiating surface is vertical so that the most intense radiation is directed horizontally where most needed. The draft required for complete combustion is small so that very little heat is carried away by the gases coming out of the stove, and (most important of all) the heat radiating area is large. Experiments on a coke stove twelve inches in diameter by two feet high show that the coke will be red hot for a depth of twelve inches, whether the stove is half full or filled to the top. This gives a total area of very hot metal of three square feet. In the case of the oil pot the body of the pot has no value as a radiating surface for the oil keeps it cool. The top of the pot is of very little value, since it is practically flat so most of the radiant heat is directed vertically where not needed. This leaves only the stack which gets red hot for a distance of about twelve inches above the pot; as it is only four inches in diameter the total useful area is only one square foot, or one-third of the useful area of the coke stove.

The coke stove has been used by Mr. H. B. Stevens in the Stetson Groves with success. He has used a large stove and few to the acre, but recommends a smaller

stove and a greater number to the acre in order to get better distribution of heat. There is another advantage of the small stove. If you reduce the diameter of the stove by one-half you only reduce the radiating area one-half, but at the same time reduce the amount of coke necessary to fill the stove by three-fourths—a very considerable saving.

The coke stove has been used in Whittier, California, for three years. The writer hopes to get definite information as to the success obtained there. They have been satisfactory, we know, for the number of the coke stoves used has been increased each year by these parties.

It is to be hoped that the growers of Florida will realize the value of this form of insurance and be prepared before another winter. It will pay in peace of mind as well as in dollars and cents.

DISCUSSION

Mr. Hume: Mr. Hart, I believe you wished to say something about this subject.

Mr. Hart: As we have a good deal to do, I will take only a few minutes.

In firing groves I have used wood for years, with very good results. I consider it one of the best materials we can use in protecting groves. There are a few drawbacks in my section; one is it is hard to get light wood; another is that it takes a good many men to handle even a small grove. Oftentimes when a freeze is on you cannot get all the help you need. This winter I had to let about one-fourth of

my grove go, and it was injured more or less by cold, while the rest of it was saved so far as the trees go, and the fruit was saved so that I got good prices on the market after the freeze.

Coke I know very little about; I never have used it but if it is better than oil I am very anxious to know it, because I want to use the best material I can get and that I can have available for the second and third and fourth nights, if necessary; something I can have in the grove ready to handle immediately without the employment of much help.

My custom is to have two rows of wood around the north and west sides of my grove and try to warm up the air as it comes into the grove, and then keep it warm by the use of oil pots.

I have not used the ground draft oil pot, because it does not seem to be as good as the square or oblong pots that were used before it came in.

I like those because you can have the heat where you want it. They also throw off considerable smoke, and I am convinced that smoke is of great value. This year, where there was a two-acre grove to the northwest of another grove and there was one to the southeast, not being protected at all except as it got the smoke and warmth from the other groves, that two acre grove was perfectly protected the coldest night we had and the fruit was shipped and brought a good, fair price, \$550.00 per carload.

I find that fruit lightly frosted will dry out a little in one end, but if left in the grove for a little while, they will come

out all right. But \$550.00 a carload is good from groves that have not been fired at all.

In protecting your grove, you not only protect your fruit for this year, but you also protect your crop for next year, as has been mentioned. That is well worth considering. Even if your trees are only frozen enough to drop the leaves, that is quite a shock to the tree. The orange tree holds its leaves three years, and if they all come off at once, that is quite a shock.

Another thing, now, in regard to pruning. If the trees have to be trimmed back to the size of your finger, that is a whole lot of work. A tree, too, after pruning like that, is more subject to disease.

Going back to the subject of oil pots. I have heard those who have used it complain about the water getting into the pot. You have to watch them very carefully or water will get into them in spite of you, and then when you start the fire going, as soon as that water gets heated enough to be converted into steam (water when converted into steam increases its volume about 600 times), it will throw the oil and fire and everything all around, and you may have a serious injury.

I have large tanks that hold 900 and 1000 gallons and quite a number that hold 600 gallons. I took what is called a bilge pump and I went around and pumped the water out from the bottom of my tanks, and in some of my tanks I got as much as fifteen pails full of water, that had settled at the bottom of the oil in my 600 gallon tanks.

If you don't pump this water out, it

will make trouble for you, or, at least, get it out some way.

S. C. Warner

Our grove which is located on the east bank of the St. Johns River, five miles north of Palatka, a section of about twenty acres, is protected. About one-third of this is grapefruit and two-thirds oranges. On thirteen acres there are tight board fences or walls, thirteen feet high, spaced eighty-four feet apart. On the balance these walls are spaced one hundred and sixty-eight feet apart. These walls face the northwest and act as wind-breaks.

For heating purposes we use pine wood, preferably lighter-wood. This is placed in alternate rows, the fire heaps laid as near each other as practicable. These fires are small, consisting usually, of three or four good sized four-foot sticks, under which have been placed kindling and some rotten wood. We light one or two of these heaps, as are needed, for each two trees. Kerosene is poured on to the kindling and rotten wood (which acts as a wick) and lighted with a torch, one man carrying the kerosene can in one hand and the torch in the other hand.

We find that one man can take care of two acres and keep the fires burning well. Reserve of wood is kept in cord piles between the trees, the ends of the sticks opposite the fire rows. In this way our reserve is convenient for the workers.

During the last eight years we have

used about 100 cords of wood at a cost of \$3.00 per cord. The labor costing rather less than the fuel.

The total cost for protection during the past eight years, including upkeep of fences, interest on investment, placing the fire-heaps in position each year and removing to reserve pile when danger is over, wood burned, labor and kerosene, will approximate \$2,000.00

We have had occasion to fire at only two periods during the above eight years. The total hours fired was sixty, amount of wood consumed, one hundred cords, which also includes fuel lost by rotting. Cost for actual firing \$600.00.

The results during the freeze of this winter were most pronounced. The lower half of the trees was saved in excellent condition, including new wood and bloom. The upper half was defoliated and fruit injured, though but few twigs were killed, and showing now much better than trees outside the protection.

The monetary value of this protection this season alone will amount to —Fruit saved (on ten acres, the other ten having been picked) \$1,200; prospective crop \$1,300.00, total \$2,500.00.

The superior condition of the protected trees also is of considerable value, perhaps \$3,000.00 to \$5,000.00.

The result of this season's work could have been much improved had we placed fire-heaps between the trees in both directions instead of only in alternate rows, thus getting a better distribution of heat. We believe that this arrangement will economize fuel, as well as give better results. In wood heating, small fires in

greater number seem more efficient than much larger fires in less number. Also there is less injury to low growing branches, from the flame. This method is even more desirable during hard frosts than a real freeze with wind, when the heat is circulated into the trees, rather than passing directly upward.

We believe that some efficient method of grove heating is almost a necessity to successful citrus growing, except in such localities as have a natural protection from large bodies of water. These cold

snows are sure to recur at intervals, causing large losses and possibly destruction of the entire tops of the trees. In our situation, on the banks of a wide river, windbreaks also are necessary, as otherwise the heat is swept away. This winter I believe that our fires would have accomplished nothing without windbreaks. The wind attained a velocity of something like 60 miles per hour and the temperature went to 20 degrees where it remained for about four hours.

Utilization of Citrus Culls and Other Products by the Florida Home

Prof. Agnes Ellen Harris

Mr. Hume: It has always been a source of wonderment to me that so many of our citrus products in this state have gone to waste. There is a side of our Florida horticulture that for years has been very much neglected. This phase of the question was not borne in on me until I went to Spain some years ago. In going through the citrus districts, I was struck by two things; first, that sour oranges, the common sour orange as we know them, were grown in large numbers in orchards, receiving the same care as was given to the orchard of sweet oranges, and for no other reason than to ship the fruit to England and Scotland and then we import the manufactured product in the shape of orange marmalade to the extent of many hundreds of thousands of dollars annually.

The other thing that struck me was that in a Spanish orchard, absolutely nothing went to waste. I went through districts and saw the flowers after they were dried and was told that at the blooming time they spread sheets under the trees and then as the petals dropped on these sheets they were gathered up, dried, and sent to the perfume manufacturies.

I saw tons of the small dropped oranges the size of peas or half an inch in dia-

ter. I was told they were dried and used in the manufacture of scents and perfumes and distilling the oil.

I saw tons of orange peels of various kinds that were stripped off the culls and dried. It seems to me that there was not a single thing produced in an orange grove that was not utilized; not a thing was wasted.

But in Florida, we have been wasting these things by tons and tons and thousands and thousands of dollars.

I hope the time is here, or that we will shortly reach it when these things that are in demand in our country can be supplied from our own groves throughout this state. There is no reason why orange marmalade cannot be manufactured to the extent of filling the wants and needs of the American market.

I am very glad to know there is a general drift in that direction. The manufacturing of grapefruit juice from fruit that would otherwise be useless, is being undertaken.

I hope that so long as this Society exists, it will lend its every effort in furthering this work, because it means more from our groves, more to us individually, and more for the State.

I am very happy at this time we have

with us, Professor Agnes Harris from the Florida State College at Tallahassee, who is going to talk to us along these lines for home purposes, but which are capable of extension into our commercial life.

Miss Harris: I feel quite like the negro man, who preached a sermon. When he began, he held up two fingers, and when he had closed his remarks, he held up two fingers. Someone asked him why he did that. He said that he copied his sermon, and holding up two fingers were quotation marks.

I have here nothing that I myself have found out, but I have had the pleasure of being in charge of the demonstration work that was started in the state several years ago, and our girls and women have been working on this work of saving the surplus fruits and vegetables for home use, and if we have done anything that can be of assistance to you, we shall certainly be delighted.

The betterment of present living conditions and the training of the girl for the home of tomorrow is the chief aim of Home Demonstration Work. We have not manufactured products from the grove on that large scale necessary to place them on a wholesale basis. We have, however, taught through our work, the preservation of the fruits from the grove for home use, and in a small way have developed this work to commercial proportions.

Florida fruits have been shipped into other states, manufactured into marmalades, preserves and jellies, and have been placed upon the market at a profit. A recognition of the fact that a large per-

cent of our fruit crop now goes to waste as culls, strongly suggests the undeveloped possibilities in this field of work within our State. Scientific investigation should precede the development of such work on a large scale. We have not been unmindful of this fact, but we have had no funds with which to pursue such investigation. By frequent appeals to the Bureau of Chemistry, at Washington, we have had four brief visits from one of their experts in this line of work. What he has done has been sufficient to indicate to us what should be done.

As a result of our work, there are now hundreds of women in the State making products of excellent quality; but our work and the work of the manufacturers in the State, would be greatly helped if more scientists were at work upon our fruits, developing the best methods for handling them, and determining the needed equipment in kitchen and factory for the same. If there is money in marmalades, jellies and preserves produced by factories located at a distance from the groves, then surely there is a profit to be realized on these products made in Florida.

On the shelves of Florida's retail stores, are California fruits of many kinds, Louisiana figs, jellies and jams from various other States and English marmalades far inferior to the products which could be made from our own fruits. We should not only be supplying our home market, but finding a place for our products in other fields.

In this discussion of the utilization of products from the grove, it will be im-

possible to give methods or recipes. Should you be interested in these, you will find a collection of the ones that Dr. Straughn, of the U. S. Department of Agriculture, Bureau of Chemistry, Washington, D. C. and others have worked out for us, in Bulletin No. 8, "Jellies, Preserves and Marmalades."

GUAVAS

In entering this discussion, we will first take up the guava. The two products from this fruit which we are emphasizing, are the canned guava in tin and glass, and the jelly from seed, pulp and peel. We recommend the canning of the thick meated guava, with seed and pulp removed, in a heavy syrup; and the making of jelly from the seed, peel and pulp. The guava may be canned without sugar, but the fruit canned in the syrup is a far superior product. This should in part replace the canned California peach on the Florida grocery shelves.

In DeSoto County last fall, Elma Wetherington, assisted by members of her family, put up 1,000 No. 2 cans of guavas in a heavy syrup, and sold them for from 10 to 12 cents per can. In Marion County one family put up 895 No. 3 cans and sold them at 35 cents per can retail. In a number of other instances, families have canned guavas. I have never heard of anyone failing to dispose of their guavas. Of course, it is much better for commercial purposes to can any fruit in tin. Even with cans at the present prices, we will be able to sell products for sufficient profit to make it worth while.

GUAVA JELLY

In studying the making of any jelly, we might with profit, refer to Miss Goldthwaite's Bulletin on Jellies and Jelly-making, published by the University of Illinois, (Champaign, Ill.) as result of Miss Goldthwaite's research work begun in 1908. Miss Goldthwaite says: "Ideal fruit jelly is a beautifully colored, transparent, palatable product obtained by so treating fruit juice, that the resulting mass will quiver, not flow, when removed from its mold; a product with texture so tender that it cuts easily with a spoon, and yet so firm that the angles thus produced, retain their shape, a clear product that is neither syrupy, gummy, sticky nor tough, neither is it brittle, and yet it will break and does this with a distinct beautiful cleavage which leaves sparkling characteristic faces. This is that delicious, appetizing substance, a fruit jelly."

To get an ideal fruit jelly, several factors must be considered. In the fruit juice there must be a substance akin to starch in composition and similar to gelatin in characteristics only, called pectin. This substance occurs in cooked juices in larger quantities than in the raw juice.

A jelly may be produced if the juice contains this substance and also contains sufficient acid, with the proper amount of sugar added. An equal amount of ethyl alcohol and the fruit juice shaken together gently, but never stirred, gives you instantly, definite information as to whether or not the juice contains pectin and in what proportion. If pectin is present the alcohol precipitates in a clot. The quantity of sugar added, should be based

upon the amount of pectin contained in the juice. If the pectin is precipitated in a solid clot, one cup of sugar may be added for each cup of juice taken. If the precipitate is a broken mass, reduce the quantity of sugar in proportion to the amount of pectin contained.

If the proper amount of sugar is added to an acid fruit juice containing pectin, an ideal jelly results. Miss Goldthwaite found that if too little sugar is added, the volume is less, the color deeper and the product tough. If too much sugar is added, the volume is increased, the color decreased in intensity, the pectin becomes softer, until finally it appears in lumps.

Failure in jelly making more frequently occurs because of the addition of too much sugar, than from any other cause. If the juice does not contain the necessary amount of acid, more may be added. "A fair rule is to add sufficient tartaric or citric acid powder, to make the juice of acid taste." The acid should be well stirred in the juice and entirely dissolved before tasting. To determine the correct acidity for the housekeeper, is a matter of experience.

Dr Straughn in a report to Chief Alberg, of the Bureau of Chemistry, says that out of five varieties of guavas that he worked with, three had too small an amount of acid to make a good jelly, but by the addition of citric acid, tartaric acid, lactic acid or lemon juice, an excellent jelly could be produced. This acid should be declared on the label for interstate commerce. The juice from the thick meated guava would not make jelly,

but by adding sufficient acid, an excellent jelly was produced.

The time for cooking jelly varies according to the amount of pectin in the juice and the proportion of sugar used. The flaking or sheeting from the spoon is the most satisfactory jelly test, but in the making of guava jelly, this test is not to be relied on. For this reason the housekeepers from the North, who are accustomed to making jelly from currants, apples and other such fruit, fail.

Dr. Straughn reports that frequently he got an excellent flake or sheet from the spoon when the thermometer registered 105 degrees C. and 106 degrees, but when the jelly was cool, a syrup resulted. He also reports that of the sixty batches he made, in which the acidity, pectin and sugar were all correct, successful jelly was produced by cooking the jelly to 108 degrees C.

The color of guava jelly depends, not on the color of the guava, but on the time taken to bring to the jelling point, usually about 108 degrees C. The longer the juice and sugar are cooked together to reach this point, the darker in color is the finished product. In his experiments he found that the longer guava jelly was cooked to reach the jelling point, the deeper red it became. One batch of guava juice was divided into six equal portions. The same amount of sugar was added to each, and each batch cooked to 108 degrees C., but the time of cooking each succeeding batch was lengthened. The first batch was cooked rapidly, reaching 108 degrees C. in a few minutes.

Jelly of six different shades was produced, varying in shade from a light amber when cooked rapidly, to a deep red when cooked slowly. One manufacturer of guava jelly withdrew from the State, because a standard color could not be obtained.

If a standard color is to be obtained, this point must receive consideration. Unripe guavas do not make a standard jelly. Jelly made from seed and pulp, shows no difference in flavor and texture, from the jelly made from the meat and peel. Dr. Straughn states that all jelly made from seed and pulp, needs acid.

CITRUS MARMALADES

Marmalades may be made from the grapefruit, kumquat, orange, sour orange, tangelo and other fruits, or from a combination of these fruits. The grapefruit, orange and pineapple made in Tampa under the name of G. O. P. Marmalade has proven a splendid selling product. It would be a simple plan to can the pineapple in its season, and use it with the orange and grapefruit in marmalade making when there is a surplus of the citrus fruit.

The sour orange marmalade has been most generally and successfully made by our club members. By following general instructions, a standard product can be produced. This orange is identical with the Seville Orange, which is shipped from Spain to Dundee, Scotland, made into the famous Dundee Marmalade and shipped to America. Two years ago an American factory attempted to buy 600 boxes of these oranges in Florida and was unable

to find them. The order was filled in Porto Rico. I am told that 200 boxes of these oranges were shipped to England from Dade County last year.

A variety of marmalades may be made from one fruit. The peel may be ground or sliced, the amount left in the marmalade varies from one-quarter to all of the peel, and the length of the time cooked determines the color.

An ideal marmalade is of a light yellow color, transparent, and with sufficient peel in it to have it generally distributed through the glass. It should be of jelly-like consistency, and if the peel is sliced it should be sufficiently thin to be transparent. Thick pieces of peel should be avoided.

ORANGE PECTIN

Miss Goldthwaite in her experimental work with jellies, on observing that orange marmalade had a jelly-like consistency, tested out the orange juice for pectin and found it deficient. By removing the outer yellow skin of the orange, and from the white portion extracting a juice, she obtained an acidless, tasteless, colorless liquid rich in pectin. Her method has been generally followed, and this juice added to a fruit juice lacking pectin may be made into jelly. The fruit juice gives the needed color, flavor and acid and by this combination a successful jelly may be made. For example, from pineapple juice, deficient in pectin, delicious jelly may be made by combining it with pectin juice. The pineapple juice must first be boiled to render inactive the pectin-destroying enzyme. Strawberry juice frequently lacks the necessary pectin

to make jelly successfully, but by adding pectin juice of orange an ideal jelly may be made. A jelly made by this combination will not have the rich red color of the strawberry jelly made without the pectin unless the pectin juice is heavy or the jelly is cooked slowly.

It has been suggested that this pectin juice can be used as a basis for pie filling, and that it should find a ready market with the manufacturers of pie fillers. Confectioners can find frequent use for this substance in making candy and cake fillings. The club girls throughout the State have found a ready market for a jelly made from the orange pectin juice and sugar, with lemon juice added to give acidity, a vegetable coloring used to give a green color and flavored with mint.

The peel of the grapefruit in marmalade causes it to be bitter, objectionable to some but relished by others. By extracting the bitter from the peel, the pectin is also removed, making a marmalade lacking a jelly-like consistency, but by adding orange pectin juice a marmalade of the required consistency can be made.

With the bottling of the orange juice and manufacture of an oil from the yellow skin, cannot the white portion remaining be made into pectin juice of commercial value; of value to the home-maker for use in her marmalades and her berry jellies; and of value to the manufacturers of candy, pie and marmalades?

ORANGE JUICE

We have just started to bottle fruit juices. This year, immediately after the freeze, there were hundreds of bottles

of the juice put up. A small capping machine has been put on the market this year, which will assist those who wish to bottle juices in small quantities.

ORANGE VINEGAR

Dr. Chase last year became interested in making vinegar from orange juices at the Citrus By-Products Laboratory in California. He made 10 hogsheads successfully, and sent samples of this orange juice vinegar to some of the leading wholesale merchants in the middle West. Immediately came orders from every firm to which samples were sent. One firm ordered a car load. If all the juice of our citrus culls was made into vinegar it should go far towards supplying Florida with vinegar.

CRYSTALLIZED GRAPEFRUIT PEEL

No product is made in the State by our girls and women with greater profit than the crystallized grapefruit peel. Even when sugar has been at the highest price this product has been sold at a splendid profit. It may be cut into various shapes, given various colors, or left the natural beautiful color; it is rolled in powdered or granulated sugar. One enterprising woman puts it on the market in a tin box, for which she receives 80 cents per pound. One of the County Agents writes that one of her co-operators crystallizes the peel and sells it for one dollar per pound. In Dade County, a number of the women crystallized whole grapefruits. This, filled with grapefruit crystallized sticks, sells at one dollar per pound. The Tourist Sec-

tion is a splendid market for this product.

KUMQUAT PRODUCTS

No fruit from the grove lends itself to our work better than the kumquat. By plunging the fruit into boiling water, with a large proportion of soda, the oil sacks are broken, the peel made tender and much of the oil removed. From kumquats so treated, the preserves put up of whole kumquats and of the halves, a marmalade of excellent quality, a sweet pickle and crystallized kumquats may be made. The kumquat juice is rich in pectin. A confection may be made from this by preparing the juice from the fruit as for jelly, and adding to it sugar, and the kumquat boiled until tender and rubbed through a sieve. This may be used like fondant as a basis for French candy, and also may be made into a gum drop. Kumquats being rich in pectin, may be combined with the strawberry juice.

One woman in Brevard County who is selling thousands of glasses of jelly this year, makes a kumquat jelly flavored with mint and colored green. She calls it mint julep jelly.

Mrs. Ives, of Manatee, in response to a request from the Waldorf-Astoria for roselle jelly, sent samples of other products and received from them at once an order for fifty-five pounds of kumquat jelly and later the order was duplicated.

REPORTS FROM HOME DEMONSTRATION WORK

The following reports sent in from some of the home demonstration County

agents indicate to what extent this work is being carried on in some of the thirty-three counties in the State.

From Putnam County 5,300 containers of products from the citrus fruits and 5,740 containers of products from the guava are reported this year. Winifred Cannon, a Putnam County Club Girl, made 1,500 glasses of guava jelly last year. She sold to the home market largely, supplying hotels near, but shipped a few cases North. Winifred has a good trade in citrus products, getting the citrus fruit at home. She buys all the guavas she needs and still makes a good profit. From her prizes and profits this year, she is planning to build and equip a small preserving kitchen.

In Osceola County, 8,000 containers were reported, with one girl reporting 500 quarts of canned guavas, and 275 other containers.

In Brevard County, 8,800 containers were filled by the girls before the contest, but the County Agent writes that several of the girls are making quantities of jellies and marmalades and find a ready sale for them.

Mrs. Vandergrift of St. Augustine, had had an excellent business for the past two years, and besides selling 312 half gallon jars of marmalade, she has sold 486 containers filled with other preserves and jellies.

In DeSoto County a group of girls put up 1,400 glasses of guava jelly and sold it in Tampa.

In Polk County a number of women and girls are making and selling marma-

lades and citrus fruits products at a good profit.

From Marion County we get the report that a number of families who live on groves are making marmalades and supplying the local markets, besides beginning to fill mail orders.

Leona Dedge, of Duval County, after the freeze, bought ten dollars worth of sugar, with this made marmalade of the frozen sour oranges from a tree in her yard. She sold \$30.00 worth, besides having a liberal supply for the family pantry.

To estimate that the women and girls of our clubs have put up over 100,000 containers of marmalades, jellies, crystallized fruits and other products from the grove, is conservative. The most important work our girls and women are doing, is the canning of vegetables in tin for the pantry and home market.

We shall continue our work in training the women and girls in the making of

these products, but we hope the time will soon come when the owners of groves will look into the possibilities of producing on a factory scale, these by-products from the grove, that factories may continue their investigations, and that our trained workers may assist in operating these factories.

DISCUSSION

Mr. Hume: Is there any discussion of this address of Miss Harris's? Any questions you would like to ask?

Mr. Skinner: I want to move a special vote of thanks for this very valuable paper.

Motion seconded.

Mr. Hume. Let us give it rising. (Motion carried).

Miss Harris. I wish to vote this audience my thanks for being interested in this kind of work.

Tropical Fruits

R. L. Goodwin

Mr. President and friends:

I am the only one on the committee that is present. I thought some time ago it would be impossible for me to be present at this meeting, and I depended upon the rest of the Committee to furnish papers upon tropical fruits and pineapples. Fortunately, I found my way clear to come and here I am, and will tell you what I know.

Many of you, as you came down the East Coast, saw the pineapples, and they looked bad. But I want to assure you they are not all dead. Probably 60 per cent of the crop has been lost from the effect of the freeze, and possibly another 20 per cent has been lost from the effects of our prolonged drought. From thirty-five acres, I expect to ship somewhere in the neighborhood of 1500 crates. The fields that have been taken care of, that have been well fertilized, will give a minimum crop. The fields that have not been taken care of, will in all probability, be abandoned. The good fields will yield a good fall crop and next season a full crop.

In 1909, from the East Coast we shipped over one million crates of pineapples. Last year, I believe we shipped less than 200,000. The industry has been gradually declining from 1909 to the present time.

There is more than one cause for this; one, the increased cost of fertilizer, crate material, labor, etc. You cannot run a pineapple plantation without fertilizing it heavily.

Various problems have come up since 1909, and among them is a diseased condition, or insect; in fact we do not know what it is but we call it wilt. There is a condition where the plants thrive for a while and then the leaves wilt and the plants fail to give a crop.

About three years ago, the wilt became alarming, and we took it up with the Experiment Station at Gainesville. They sent some of their scientific men down and their investigations have resulted in finding that the roots are affected with nematodes—root knot. How we are going to continue in the pineapple business and get rid of this trouble, is a question.

I have pineapples that were planted in 1892, that have borne for twenty-four years in succession, and are in fairly good condition. I have been applying plenty of fertilizer to them.

It seems to me we have tried to make the ground produce for entirely too long a period. We have exhausted the elements of fertility in the soil, and we do not know what to do with the land

now unless crop rotation will restore it. We have grubbed the plants off the land, turned them under, and planted velvet beans. We hope to starve out the nematodes.

But if we find the nematodes are still there after a year, we will plant natal grass and turn that under, still with the idea of putting back the fertility in the land. If after three years of crop rotation, pineapples cannot be grown, the pineapple industry on the East Coast, taken as a whole, is doomed. On the West Coast, from Haines City south, you have land similar in character to the land on the East Coast of Florida. It may be possible the industry could be started in that part of the state, but a location must be found that is as immune from frost as is the ridge south of Fort Pierce, fronting the Indian River with water protec-

tion as we have on the west of the ridge.

I have planted four acres of limes on our worn out pineapple lands, and I am assured by our agricultural bureau that we can grow them there. During the freeze, I had lime trees fourteen inches high that received very little damage. Large lime trees were scarcely damaged at all; on one or two trees a single branch was injured enough to cut back.

We can grow limes, avocados, mangos, velvet beans and natal grass, and we are seeking for something else that can be grown that will yield a commercial profit. Pineapples have been a great product, and the culture of pineapples has turned thousands of dollars into the pockets of the grower. Now we are seeking to find something else as staple as pineapples, to give us large profits.

Peaches and Other Deciduous Fruits

THE HOME FRUIT GARDEN

Maj. W. L. Floyd

In order to vary this report somewhat from those of recent years, I will discuss the home fruit garden consisting mainly of deciduous fruits; by so doing I trust I will not be considered as deviating too far from the subject assigned the committee.

The home fruit garden should receive the attention of every home maker in the state. No place is so small but that some fruit trees may be planted on the grounds, on the larger ones no area will produce greater returns if pleasure, healthfulness and financial returns are taken into consideration.

We are notably a fruit-consuming people. Observe the dried, canned, preserved, as well as fresh fruits that are brought into the state, consider the varieties adapted to our soil and climate and you must be impressed with the opportunities for us to help reduce the high cost of living by growing our own fruit.

We give much attention to the growing of certain fruits commercially, while doing this we acquire a knowledge of the principles which are applicable to growing a much greater number of kinds suitable for the home table, yet how rare it is to see a good fruit garden in Florida with

its well selected varieties, properly fertilized, cultivated, pruned and sprayed so that it will be a pleasure and profit to its owner.

The following is a suggestion of what may be planted in such a home garden, an acre in extent in the vicinity of Gainesville.

5 Pecans, 42x40 ft.; 10 Plums, 15x15 ft.; 4 Pomegranates, 15x15 ft.; 28 Peaches, 15x15 ft.; 14 Pears, 26x20 ft.; 2 Apples, 26x20 ft.; 20 Figs, 10x10 ft.; 20 Bunch Grapes, 10x10 ft.; 10 Muscadine Grapes, 20x20 ft.; 1260 Strawberries, 3x1 ft.

A total of 1373 plants of 10 different kinds, for some of which different varieties of each kind are desirable. Further south of course a number of changes would be made substituting subtropical for the hardier kinds.

SOIL

The location must be selected with reference to the residence. It should be near by, either to the side or rear. So very often the best adapted soil can not be used. Therefore, special attention should be given to its improvement in order to make it suitable for the purpose intended.

As most of the Florida soil is light and sandy the addition of vegetable matter should be given first consideration. In many cases it will be advisable to grow a leguminous cover crop such as velvet beans or beggar weed, and turn it under before the trees are planted. Cowpeas should not be used because of their susceptibility to root-knot which may be spread throughout the soil to attack the trees when planted. In some cases more than one such crop is desirable; as where there is but little humus in the soil and it is quite porous and lacking in plant food. Careful attention should be given to drainage and proper preparation of soil before planting.

PLANTING

Most of the trees will probably be purchased from a nursery. Florida nurserymen should be given preference as they are more familiar with the plants suited to Florida conditions. We have a number of reliable ones which can assist much in the selection of proper varieties adapted to a given locality. December and January are the preferable months for making the plantings. All broken and decayed roots should be cut away, leaving only clean cut surfaces, and as the roots must be very much reduced in transplanting, the tops should be cut back in proportion to the roots remaining. For most fruit trees they should be cut back from 18 inches to 24 inches, so when growth begins, a low headed tree will develop. In digging the holes for the plants they should be made large enough to receive the roots without bending or

crowding together. The top soil should be placed to one side in digging, and after the tree has been put in place this top soil should be put in first about the roots. It should be packed closely and if moist no water is necessary, but the sub-soil should be rounded up to a height of 6 inches to 8 inches about the stem of the plant. Careful cultivation should be given throughout the season up to about July 1st. After growth starts it is well to put one or two pounds of a good commercial fertilizer about each tree and work it in lightly. A cover crop should be grown after cultivation ceases. This latter should be worked into the soil in October or November to increase its humus content.

This home fruit garden is a good place to grow a few rare plants, as one often likes to grow things not ordinarily grown in the vicinity. New introductions may be tried out, thus securing valuable information regarding adaptability. Every fruit grower should feel a pride in introducing and growing successfully something that may prove of value and thereby adding to the list of those adapted to Florida conditions.

Many, too, are likely to become interested in propagating their own plants. The trying out of buds and scions and experimenting in methods of propagation will add much to the interest in this home planting.

PRUNING

Since no two plants are alike, each plant presents a special problem to the pruner; as different kinds of plants bear their fruit differently he observes these

differences and gives them proper consideration in his work. He may give more importance to the form of his trees, or more to general welfare and behavior, but in either case personal preference and opportunity are important factors in his pruning. No operation connected with the trees will bring the owner into such close contact and sympathy with them. He should thoughtfully and patiently work out his ideas as in the training of a child. He must use proper implements, make clean smooth cuts, and prune at the right time.

SPRAYING

As fruit growing has developed, insect and fungal pests have increased. No one can now reasonably expect to be successful without being able to recognize the most troublesome of these and knowing the best remedies for them. A good spray pump is, therefore, a indispensable adjunct to this home fruit garden. If an acre or more is included in it, a barrel pump would be the most satisfactory; for smaller area a good bucket pump should be secured.

In addition to the economic value of the home fruit garden which one naturally thinks of first, there is an aesthetic side not to be overlooked. The beauty of

shapely trees, conveniently placed with their flowers and fruit in season adds much to the beauty and home like appearance of a place. They furnish havens for the birds, where in return for their toll of fruit they give their generous aid in destroying insects, in field and garden, their gay companionship and cheerful songs. The man who grows old in his fruit garden lives in daily communion with nature, with the associations of earlier years about him, and the conditions most favorable for making him, like his favorite fruit, grow mellower with the years.

DISCUSSION

Mrs. ——: I would like to ask how he manages to raise apples in his garden.

Maj. Floyd: The garden I propose is supposed to be grown in the vicinity of Gainesville. We do succeed in raising a few apples of poor quality there. You will note I put in only two trees in my garden, and I put them there largely for association's sake. Many of us come from other states and for the sake of the old apple tree we remember, I would stick in one or two, provided my garden is anywhere north of Ocala.

Avocado Varieties for Florida

E. D. Vosbury, U. S. Dept. of Agriculture

That the avocado shows great promise of becoming an important fruit crop of Florida is well indicated by the interest which so many of our foremost horticulturists are taking in its culture. Where only a few years ago our entire crop was harvested from a few scattered seedling trees, there are now over 500 acres of budded groves in Florida and plantings are rapidly increasing. Of the many problems which must be solved before this new fruit industry becomes fully established, none is more important than that of the selection of standard varieties. While it is true that our present data on avocado varieties for Florida are still scanty and incomplete, it might be well worth while at the very start of the game to sum up our experience to date and to consider the merits and limitations of a few of the many varieties already available.

More than 140 varieties are described in recent publications. In order to more conveniently study this large number of avocado varieties several attempts have been made to group together those varieties having common characteristics. Perhaps the most convenient plan of classification is that which divides them into the West Indian, Guatemalan, and Mexican races.

THE WEST INDIAN RACE

Most of the common avocado trees in Florida, seedling as well as budded, belong to the West Indian race. The fruits of this race are variable in size, with thin skins, and ripen in Florida from July to December. The origin of this race is held to have been in the warm, moist lowlands of tropical America and this origin is reflected in the tenderness of the trees, which, as illustrated in the recent freeze, are considerably less hardy than the Key lime and somewhat more tender than the common guava. Mature trees begin to show pronounced injury at about 28 degrees, while at 25 degrees all of the largest trees will be killed to the main trunk or to the ground. Young trees, 1 to 4 years old, are much more tender and may be injured at any temperature below 30 degrees. While the avocados of the West Indian race are really tropical in nature, there is a considerable area in Florida where they may be commercially planted with reasonable safety. This area is perhaps best indicated by the presence of numerous old avocado trees which have grown for years without special attention. It includes much of the East Coast, from the vicinity of Ft. Pierce south; the best protected localities south

of Tampa on the West Coast; and portions of Pinellas County. In the interior of the state only the safest localities, such as the highlands of Pope and DeSoto Counties and sections protected on the north and northwest by large bodies of water like Lake Okeechobee, can be considered reasonably safe for commercial planting.

Of the West Indian varieties the most important and in fact the one standard variety on the market today is the Trapp. This variety constitutes more than 90 per cent of the budded groves of Florida where it has proven a reliable bearer and a good shipper. The season is from September to December, a few fruits hanging on later. While Trapp is only fair in quality, it would take a very good variety indeed to replace it as a standard variety for commercial planting.

Pollock has been planted commercially to some extent. The fruit is high in quality and the tree is vigorous, but unfortunately *Pollock* is such a shy bearer that it is generally considered an unprofitable variety for commercial planting. Its excellent quality, however, will give it a place in many home gardens as an August and September fruit. Occasionally a tree of *Pollock* is found that is much more productive than the average and it is quite possible that we may eventually find a strain which will combine productivity with the good qualities of this otherwise splendid fruit.

Butler is another August and September variety recently propagated and disseminated from the United States Plant Introduction Garden at Miami, Florida.

It has borne heavily and regularly and is of a very good quality.

A seedling tree possibly originated from a seed of *Pollock* as yet unnamed is bearing at the same station and is considered by Mr. Edward Simmonds, in charge, as the most promising in point of yield, vigor, and quality of the many mid-summer varieties he has tested.

Family is another summer variety grown to a limited extent. Although not high in quality it ripens through a long season, from early July to October, and is, for this reason, considered desirable for home groves.

The earliest commercial variety is the *Estelle*, ripening in early July. The fruit is only fair and the tree, while productive, is a weak grower. A very early summer variety, ripening early in July, more vigorous and of better quality than *Estelle*, would be a most desirable acquisition.

Webster is considered worthy of mention as a fruit for home planting to ripen in September and October. It is a reliable bearer and is fine in flavor. In color it is an attractive maroon, and it is interesting to note in this connection that some growers consider that any color except green will be discounted in the market. Others hold, with perhaps better reason, that the market is still so new that it can be easily educated to take desirable fruit no matter what the color. In fact, a distinct color may be of advantage in advertising a variety.

Among the other very recent West Indian varieties that seem worthy of mention are the *Baker*, a very late variety originating at Ojus; *Waldin*, another

very late variety originating at Homestead; and the *McKean*, a third very late variety originating at Ft. Myers.

THE GUATEMALAN RACE

In California, where the West Indian varieties are too tender, Guatemalan varieties are chiefly grown. In recent years, varieties of this race have attracted great interest in Florida on account of their extreme lateness of season and superior hardiness. In contrast to the thin-skinned West Indian fruit, they have fruits with a rough, leathery or shell-like skin. The quality of the Guatemalan fruits, while quite variable, is held by many to be somewhat superior in flavor and richness to the West Indian race.

In season the Guatemalan varieties promise to ripen in Florida from December to May and even later. This factor of late season may prove a great factor in extending the shipping season so as to make it possible for Florida to ship some variety of avocado practically every month of the year. Furthermore, the Guatemalan varieties, as demonstrated in the recent freeze, are considerably hardier than West Indian varieties. At the Miami Station, where the temperature registered approximately 26 degrees, they were for the most part untouched, while West Indian varieties growing by their side were severely cut back. It must not be supposed, however, that the Guatemalan varieties are in any sense freeze-proof. Mr. Wilson Popenoe, of this Department, who has made extensive observations with avocados in many parts of the world, considers that the average

tree of the Guatemalan race ranks in hardiness with the lemon. During the recent freeze in Florida five-year old trees of many varieties were killed to the ground at a temperature of approximately 23 degrees. Some of the Guatemalan varieties, *Fuerte* and *Pueblo*, for example, appear to be considerably harder than the average.

The first Guatemalan fruited in Florida in 1912 and since that date many varieties have been introduced from California. For the most part these are growing well although none have fruited sufficiently as yet to fully establish their value for Florida conditions. Even in California where Guatemalans have been grown for the past ten years only four or five of the hundred or more varieties that have fruited there are beginning to show up as desirable in all respects. *Fuerte*, one of the leading California varieties, has attracted much attention at Miami on account of its very rapid growth and hardiness. In many of its characteristics the first crop, borne in November, 1916, was somewhat disappointing, however, as the fruits showed a tendency to shrivel on maturing. Possibly this defect was due to the rapid growth made by the young tree and may disappear as the tree gets older. Its behavior illustrates the point, however, that even the most promising California avocados must be thoroughly tested before they can be safely planted in Florida.

Taft has also fruited in Florida, ripening from February to April, and is considered worthy of further trial.

Taylor is the only Guatemalan variety

that has been originated in Florida to date, having been grown from seed at the Miami Station. Its season here is from January to April, and those who are testing it consider it promising for further trial. An introduction of the United States Department of Agriculture, which has been propagated under the name of *Collins*, is a very late variety, ripening at Miami from April to May. The fruit, while small, is of high quality and the tree is a vigorous grower. A very promising new Guatemalan variety, introduced from Honolulu, is now bearing at the Miami station for the first time. This variety has been propagated under the name of *Beardsley*. In point of vigor, late season, and quality, it is one of the most interesting trees so far tested.

THE MEXICAN RACE

The Mexican race originated probably in the highlands of Mexico. The trees are distinguished by a curious anise-like scent of the leaves, and are markedly hardier than either the West Indian or Guatemalan types. In the recent freeze small trees withstood temperatures below 23 degrees, while large trees have undergone temperatures of 20 degrees without serious injury, indicating a hardiness apparently as great as the orange.

One seedling Mexican tree has been growing at Waldo, Alachua County, for many years. Most of the Mexican trees now growing in Florida are seedlings, but several choice named Mexican varieties are now available. The fruits of most of these varieties are high in quality but usually very small in size, and often

inclined to decay on ripening, so that most authorities consider them unprofitable for commercial groves. For home and local use, however, they will doubtless prove of great value, especially for localities too cold for the West Indian and Guatemalan varieties.

Among the most promising of the Mexican varieties for Florida is *Harmon* which ripens at Miami in July. The fruit, although small, is rich and oily and one of the earliest in season. Several other promising named varieties are on the market.

COMMERCIAL VARIETIES FOR FLORIDA

Perhaps the leading question among avocado growers today is "What varieties shall we plant?" Until the Guatemalan varieties have been more fully tested, commercial planting in Florida will be largely limited to the West Indian varieties. Most growers of experience agree on Trapp for 75 per cent or more of the groves. Many will plant a good block of the best summer varieties, and this would seem to be an excellent plan. The summer varieties are already in good demand, and moreover the man who has them is able to start shipping earlier and thus better satisfy his customers. In addition to Trapp and earlier sorts, most growers plan to plant and test out a few trees each of the most promising Guatemalan and new West Indian varieties.

VARIETIES FOR HOME GROVES

While commercial culture is at present limited to the tender varieties and hence

to the more tropical portions of the State, there is a much greater area wherein the avocado may be safely planted for home and local use. Even the more tender varieties can be grown in sheltered door-yards as far north as Orange and Lake Counties if the young trees are protected and banked in winter while hardier varieties, like *Harmon*, can doubtless be grown in any section not too cold for oranges.

A list of varieties can be selected for home planting which will supply fruit of highest quality through a long season, beginning, for example, with *Harmon* in July; following with *Pollock* and *Butler* for midsummer; *Trapp* and *Webster* for fall and Guatemalan variteies for winter and spring. It is now quite possible to pick fruit every month in the year from your own dooryards.

This fruit is high in real food value and is considered a luxury on the finest tables in the country. There is no better way of reducing the Florida summer canned goods bill than to plant avocados in the home grove. These small mixed plantings will prove, moreover, valuable test plots where the commercial possibilities and the requirements of new varieties can be carefully studied for each locality. In many cases, old dooryard seedling trees, bearing inferior, scanty crops, have been successfully topworked to superior named varieties.

The biggest problem in the avocado industry today is the selection from the great number of varieties now available, the half-dozen or so that in vigor, hardness, yield, and quality are best suited to rank as standard Florida varieties. To

this end there is no greater service that the grower can render than that of keeping careful and accurate records of each individual tree in his grove, especially of the new varieties. Such records will enable us to determine not only the comparative value of varieties, but may very possibly result in the discovery of superior strains and the elimination of inferior strains within the variety. When we stop to consider the wide range of hardiness, season, and quality of this new fruit, we must all agree that there is no more fascinating or more profitable object for careful horticultural study than the avocado.

W. J. Krome

Mr. President, Ladies and Gentlemen of the Horticultural Society:

For a man who is usually most progressive, our perfectly good president has some decidedly stand-pat tendencies. I believe I am correct in stating that during the past ten years he has made only one change or addition to the standing committees of this Society. That one exception was the appointment last year of a committee on avocados.

I mention this, however, simply as a positive proof that the avocado has obtained a firm foot-hold and has become an established factor in the horticulture of the state.

In appointing me as chairman of the Committee on Avocados, our president probably did not take into consideration that I have some quite pronounced ideas as to the duties of a chairman. Some

chairmen, for instance I might cite the chairman of our Citrus Canker Committee, have an idea that it is their duty to do a little more work than all the rest of the Committee put together.

My own ideas in that respect are decidedly different. My idea of the proper duties of a chairman of a committee are that he should see that the other members of the committee do all the work. I have tried to carry that out, and I think, since the president has favored me with a particularly strong committee, that you will all agree to be satisfied with my judgment.

During this time of war and preparation for war, we are very prone to analyze the merits of any product from a strictly utilitarian standpoint. From such a basis I am afraid most of you would not give a great deal of consideration to the avocado. I think that most of you would agree with a member of the California Avocado Association. He said at one of their meetings, in speaking of the characteristics that should be embodied in a

good avocado, that the fruit should have a rich and nutty flavor, and that a good many people considered that was also the qualifications necessary for the consumer of it. (Laughter.)

That is, to some extent, justified, but the things we are learning about varieties, about cultivation and the appreciation that must eventually come to the avocado as a food product, must soon bring to hand the day when the avocado will have a firm place in the horticulture of this state, based strictly on its economic value as a food product; not as a luxury, not as a salid fruit, but as a food. That day is certainly not at hand right now. The fruit is now grown for a restricted market, but with the extensive plantings that are bound to come and with a fruit that possesses so many high qualities from a nutritive standpoint, I believe that before many years we will see the avocado cultivated as much in Florida as the olive is in Italy, strictly as a food product.

MARKETING AVOCADOS BY PARCEL POST

Mrs. P. H. Rolfs

Mr. President, Ladies and Gentlemen:

After two seasons of interesting and satisfactory results obtained by marketing avocados by parcel post, I believe I have the right to recommend it. By timely advertising, careful picking and packing, and prompt attention to all the details of mail order service, the grower can develop a satisfactory market for his crop.

The consumer can place on his table products almost as fresh as can the grower himself, by availing himself of the parcel post method.

The paper published on page 216 of the Proceedings of the Florida State Horticultural Society for 1915, speaks of the success of my first trial. The following season the work was necessarily

dropped owing to my absence from the state, thus losing the trade so favorably started.

Following the results of last year's work, a campaign had been planned to market as much as possible of the 1917 crop of avocados by parcel post, but I am forced to again suspend the work, this time on account of the disastrous results of the cold of February first.

Before the 1916 crop was ready to be offered to the consumer, mailing boxes and other necessary supplies were secured, and for six months I was able to give parcel post marketing the second trial,—again with satisfactory results. The many courteous responses to my request that I be informed of the condition of the fruit at point of destination have furnished information for the writing of this paper.

I have sent parcel post packages to Maryland, Pennsylvania, Washington, D. C., Massachusetts, New Jersey, Minnesota, Michigan, Indiana, Ohio, Washington (State), New Mexico, Louisiana, Georgia and Florida. So far as known, only two boxes were received by the consignee in poor condition. One was due to the use of a damaged box. The loss of the other—sent to New Mexico—was unaccounted for.

I was determined to test the parcel post shipments into this territory, so a second box was packed exactly as the first, and it was reported to have arrived in good condition. Several fruits were remailed to Alberta, Canada, from a box sent to Seattle, Wash.

My work so far has been mostly with

seedling avocados and, as is well known, there are as many variations in the fruit from such a grove, as there are trees in the grove. The fruit from different trees varies also as to time of softening after being cut from the tree.

Unless otherwise noted in the order, I made it a point to select fruits from several trees. This gives a pleasing variation in appearance to the parcel, and also insures that the fruit will not all soften at the same time. With an adequate supply of budded fruits, and the trade knowing what variety to call for, the uniform box will probably prove the better seller.

ADVERTISING

When the fruit on the trees was sufficiently mature to allow time for an advertisement to appear in the paper and the consumer to place an order, the Family Box was advertised in one of our State papers. The proper wording of this advertisement was a problem to an amateur. The one finally used stated the size of the box in inches and price. It is not practicable to advertise by the dozen. As this method brought results, I shall use the same advertisement, or a similar one, in future mail order work, and have it appear regularly during the season. A well satisfied customer is one of the best advertisements the grower can have, so care must be taken to please the buyer.

The extra work and cost of putting up parcel post boxes must not be overlooked by the grower in stating his price. The consumer has the advantage of getting fruit in the shortest possible time after being cut from the tree.

NECESSARY SUPPLIES

The following supplies are all that is necessary. Parcel post boxes, gummed strips, packing and twine. Do not use an ordinary pasteboard box and expect satisfactory results, but get the box put out for the purpose.

I use the 6x6x6 and 12x12x4 corrugated mailing boxes, but other sizes would prove equally good. The smaller box closely packed with fruit weighed about seven pounds, the larger about twelve. These boxes in a folded form, may be obtained in several styles from various dealers. I prefer the one known as the Two Piece L style. When required for use they are opened and the bottom flaps are fastened with a gummed strip. After packing, the top flaps are folded over each other, making a double layer of corrugated paper on both top and bottom of the box. It is well to keep a supply made up and ready for use, but care must be taken to keep them clean and dry.

HOW TO PACK

With the made up box placed flat on a table, fruit gathered and orders received, careful packing is next in order. During the early part of the season the fruits were wrapped in small pineapple wraps, but later the wraps were discarded. The wrapping is believed to hasten the softening of the fruit and is not in favor with some growers. A layer of fine excelsior, known to the trade as wood wool, is placed in the bottom of the box. On this the fruits are packed as closely as possible,—the number being governed by

the size and shape of the fruit, and all vacant spaces filled with the packing.

When fruits from budded trees are used, the name, written on a slip of paper, was placed inside the wrapping or pasted on the fruit. This is allowable under our postal regulations, and will help in advertising desirable varieties. The boxes were not wrapped after being packed, but were tied with No. 18 seine twine. The name and address of the grower, as well as of the consignee, and the word *perishable*, were written on the box. It is better to use gummed paper with the word *perishable* printed on it.

MAIL SCHEDULE AND PARCEL POST RATES.

An effort was made to know how many hours would be required to place an order at the point of destination after being placed in the post office. This proved of much help in selecting the fruit to fill the order. The express rate on some long distances is cheaper and more convenient. The same kind of boxes were used for express as for parcel post shipments, and both methods of marketing were equally satisfactory for long distance shipments.

A rule that will be of help in determining the cost of transportation is, that for the first and second zones (which is up to 150 miles from any given point) the weight limit is 50 pounds, and the cost is 1 cent per pound, plus 4 cents; thus 50 pounds would cost 54 cents. To the third zone (which is between 150 and 300 miles from any given point) the weight limit is 20 pounds, and the rate 2 cents for each pound plus 4 cents; thus 20 pounds would cost 44 cents. To the

eighth zone, which is over 1,800 miles from any given point, the rate is 12 cents per pound. For the other zones, refer to the Parcel Post sheet, which may be had for the asking at any postoffice.

CONCLUSION

This paper has been prepared with my experience in mind, but from reference to various articles on parcel post marking, I believe other growers who have been marketing fruits and vegetables, are satisfied that by this method the producer and consumer are brought more closely in

touch with each other than by any other manner of marketing, and I believe it will become more popular with the careful buyer.

Parcel Post marketing cannot fail to be of inestimable value in the better distribution of the fruit and in developing new markets. This method will enable the housewife in many a small town where the fruit is not for sale, to place them on her menu. One trial and the successful handling of a single Parcel Post shipment will often create a demand for larger supplies.

SELECTION OF MARKET VARIETIES

John J. Beach

In selection of varieties of avocados for commercial propagation, they will naturally be divided into two classes, those intended for home use and local markets, and those for long distance shipment. This is because our tropical strain has the habit of producing fruit with loose seeds. The most desirable fruit in every other particular, quality, flavor, productiveness, etc., etc., is disqualified for long shipment by a tendency to loose seed. This was proven to me very clearly last summer. I was in Baltimore during July, and had fruit sent me by parcel post while there, and later bought Cuban seedling fruit at fruit stores in New York. Every one which had a loose seed had begun to decay inside by the time it was mellow, and some in which the cavity was unusually large, were actually of-

fensive within, before the neck was soft enough to eat. As a commercial shipping proposition what we want to plant are varieties which will furnish fruit from November 1st, till July 1st, the period when the tropical seedlings in the West Indies are in season. While the Trapp is not by any means an ideal fruit in every particular, it is very good indeed, has a 15-year pedigree behind it, has made its own place in the market, and is with us to stay. At the same time if we could only secure an equally good variety of Guatemalan hard-shell type, which would begin its season December 1st, we would be much better off, because we would then market our Trapps, while they were just at their prime, and save a considerable loss from dropping. But we certainly must have something to come

in by January 1st, as holding Trapps after that is too great a loss to attempt on a commercial scale. Here the hard-shells, with their always tight seed will come in. In selecting a market fruit, quality and flavor, after shipping and qualities, must be considered, also appearance and size. Relative weight of seed is also a matter of moment, as well as nutritive value, and productiveness is also a most important item. Then we desire a succession from November to June, and probably we shall find, when we get them fully standardized, that it will require half a dozen varieties to furnish shipping fruit to best advantage over this extended period. The hardshell type with its habit of winter maturity, as well as its tight seed and hard shell, will doubtless supply the majority of our standard sorts, and this type possesses a very large percentage of purple skinned sorts. Some people want to bar out every variety which has not a purely green rind, but if this is done, it is placing a serious handicap against us at the start. Nearly 50 per cent of our Guatemalas will be eliminated at the start and it seems to me hardly justifiable. The industry is in its infancy and there seems no reason why any prejudice should be formed in the market against a purple skinned fruit, if we do not encourage it ourselves. Most of the lovers of avocados at this time are those who have learned to eat them in the tropics, and these people all know that a green rind does not in any way distinguish a superior fruit, nor is a purple one a sign of inferior quality within. In California and its adjacent markets, there

is no prejudice against purple fruit, and there is no reason why anything of the sort need grow up in Florida and our markets, if we are all careful from the start not to encourage it. If we are saddled with this handicap, it will be wholly our own fault. What can be more attractive than the deep, mahogany red of some of these, or the dark glossy purple-black, like a fine eggplant, so often seen.

A round fruit is the best shape for packing, of course, though it need not bar out ovate or even pear-shaped varieties possessing other desirable characteristics. Then we come to size: Our tropical strain averages over a pound in weight, and for this reason it has become customary to cut an avocado in half for serving, and in buying fruit the purchaser has an involuntary impulse to try to get the biggest one he can for his money. Everything else being equal, however, a fruit the size of the orange and apple, possesses many advantages over the big fruit. It may be served whole as an individual portion, and one opens his own fruit himself, as he cracks his own egg, and knows that no unclean hands, and no germ-bearing fly, has had a chance to contaminate it. Lightening the individual weight tends to safety in handling, while aggregate loss from damage or overripe individual fruit is reduced as the individual size is reduced. In deciding upon varieties we must not pass final judgment upon less than five years of fruiting experience, and eight or ten years is better. Moreover we must not judge a variety by its first crop, even though it may show objectionable features.

It is safer to give it another chance, provided it possesses any good qualities, as the objectionable feature noted in the initial crop may never recur.

Lloyd S. Tenny

Mr Simmonds had to leave this afternoon and can not take part in this discussion. He left a sample here of an avocado which has, in the last six weeks, been given the name of Beardsley. There is some question as to whether this variety will retain this name as there is a possibility that there is a prior name.

Mr. Simmonds is an enthusiastic believer in the avocado. I wish he had been here to say something to the Society. So

long as he is not here, I feel it is an opportunity for me to congratulate the growers of Florida, especially the avocado grower, that we have Mr. Simmonds in the state, and that we have a government station at Miami. They are testing out many varieties there. Mr. Simmonds is an excellent observer and the reports coming out from time to time from the Miami station relating to the different avocado varieties, will be simply invaluable to us during the coming years. I think we should appreciate the work Mr. Simmonds is doing and give him any support we can.

Mr. Simmonds left this specimen with me, No. 36603; each of you can see it at the close of the session.

Vegetables

FOLLOW-UP CROPS ON VEGETABLE LANDS

H. S. McLendon

Mr. President, Ladies and Gentlemen:

In looking over the proceedings of the State Horticultural Society for the past few years, under the head vegetables, I find so many things that have been covered, that there does not seem to be much more to say on these lines, until I am in doubt as to what to try and say that will interest many. But I have decided to take what seems the most important changes we need.

SUMMER CROPS

What we mean by summer crops is some follow-up crop after vegetables. That is, instead of letting our lands lie idle after we are through with vegetable crops until the time to start another vegetable crop that we grow something more than grass and weeds.

Now there are several things we wish to accomplish by this method: first, is more money during the season; second, to increase the producing power of our lands.

During the season that we are growing vegetables on the land there is usually applied from one to six tons of fertilizers, and where we do not have any irrigation

and happen to get a dry spring, as we do so often, a great deal of this fertilizer will be left in the soil unused.

Does it not look reasonable to think we might have a little growing power left from this amount if we were to get busy and start some crop immediately after the celery was harvested?

MORE MONEY THAT SEASON

Now, for the first purpose of these crops—more money that season—we are going to have to grow some crop that we can turn into money. First among these will be corn, sorghum, velvet beans, peanuts, beggarweed, etc. Space will not permit me to mention all that can be grown, with a more or less success, depending upon the local conditions, you will have to decide which are best suited to your special purpose.

It will depend upon how you harvest and sell these crops as to how much profit you get from them. Take the corn and sorghum, for instance. These should be put into a silo and fed to cattle right on the place. Sell the cattle and get your money for the corn through the profit from them.

PROFITS FROM FEEDING CATTLE ENSILAGE

You can make a profit of from \$50.00 to \$100.00 per acre by growing corn after other crops and feeding this to cattle in the shape of ensilage. This may seem a little large at first sight, but let us look into the matter a little. You can grow from ten to twenty tons of corn on good land; feeders have found out by experience in feeding that this silage is worth from six to twelve dollars per ton. Well, you can grow and put it in the silo for \$2.00 to \$3.00 per ton.

Now some will say that it takes too much money to buy cattle to feed. It is not necessary that you buy these cattle. There are plenty of men that own or will buy cattle and let you fatten them on this ensilage, you getting pay for all the gain they make. You should weigh the cattle when they are put in your feed lots and weigh them again when they come out, you being paid for the difference in weight.

Now to get the best results from this ensilage or all there is in feeding it, you want to run some hogs with the cattle. Of course you will understand that to get the most out of the feeding business you have got to get some good cattle. Still you can make money feeding any kind that will fatten.

THE CHANGE

Instead of letting our fields after each vegetable crop grow up in weeds and grass, then cutting this crop, setting fire to it and burning all the humus and plant food up, and buying more high priced fertilizers and growing another vege-

table crop we grow the corn, erect some silos, put the corn in and feed cattle.

To get the best results from these cattle we will need to feed something more than ensilage, and to make the most clear money we must grow these necessary feeds. So plant some velvet beans and peanuts. You can let the cattle run on the first and gather them or you can gather and feed in the hull or run through a feed mill. The peanuts can be gathered and cured and fed as a hay or run through a mill and fed. The peanuts can be grown on a separate piece of land or planted between the corn rows. But the beans must not be planted in with the corn that is to go into the silo or you will have trouble in handling the corn. But to have a legume on all your land each year you can at the last cultivation of the corn sow beggarweed. You can turn this back in your land or make hay out of it. I consider this the best crop for hay that we can grow on the truck lands.

GROWING MORE VEGETABLES AT LESS COST

How we are going to accomplish this under our change of methods will be by saving all the manure we can make while feeding our livestock, growing a legume crop on the lands each year, thus getting nitrogen from the air and storing in the soil at no cost, also adding more humus to our soils, making them stand more rain and more drought. That may sound like the Irishman that blew hot and cold from the same place, still it is true.

Yes, gentlemen, if we grow these legume crops each year, feed livestock, save all the manure and apply it to our

soils, we are going to make some of the fertilizer men find more customers if they handle the same amount of business. And we will make more and better crops than have ever been produced in Florida.

Our state is now a large producer of truck, and I expect it will continue to grow along this line. That is we will produce more truck each year. We produce some livestock, still we are not counted as a livestock state at present, but we are going to soon be one of the most foremost in this line, and the truckers of the state are going to fatten a large part of this livestock. When they do this they will not belong to the bankers and fertilizer men of Florida.

A great many are already starting in this business. The Sanford section will have erected before this year is out ten to thirteen silos, the Hastings section several, and a few others all over the state. When they get these up and feed cattle and hogs, even though their vegetable crops do not bring in any clear money they will have some clear money at the end of every year, and it is the follow-up crop that is going to turn the trick, too.

There are a great many growing truck and vegetables on a small acreage, and they may think that they will not be able to carry out any of these plans that I have mentioned. It may be impossible to erect a silo, but they can put some legume on their land after vegetables, turn this crop in the soil, and have their land producing more and be reducing their fertilizer bill too, thus getting more clear money on their acreage no matter what the size of their patches.

If you are doubtful about this way of handling your land paying, just take part of it and try handling the new way while you handle the balance as you have always done. You may not see any big difference the first year, but just try it three years and you will be satisfied. You would never let any more weeds grow up in your fields to be burned.

THE KITCHEN GARDEN

There is just one other thing along this vegetable question that I would like to mention, while I am on the subject, and it is the most important, but still the most neglected in the state, especially since everything has got so high, and that is the kitchen garden.

In this beautiful sunshine land of ours where we can have vegetables of some kind growing during the 365 days in the year there is not any excuse for not having fresh vegetables on our table right from our own gardens every one of these 365 days.

Still you may go on one hundred truck farms and take dinner with the owner and at least ninety out of that one hundred will serve you canned vegetables shipped in from some other state, or if they have fresh vegetables they will be some that they have bought, and very often which were shipped in from some other state, too.

LOCATION OF THE KITCHEN GARDEN

One of the most important things to be considered about our kitchen garden is its location. Two things need to be taken into consideration when we are

looking for the location. First, suitable soil, and second, nearness to the kitchen. That is, we want it convenient for the good wife to gather the vegetables with the least trouble.

Of course the soil is the most important thing, for if we do not have the soil that is adapted to growing vegetables the garden is going to be a failure. Still, here in Florida we can usually get any of our soils to grow vegetables with more or less success, especially if we will manage properly. But we want a spot that is naturally well drained, not too high and sandy, and if possible so situated that we can use some form of irrigation. Even if the land is naturally rather dry and thirsty, by getting plenty of humus in it and breaking deep this trouble can gradually be overcome.

Now since we have selected the land let us give a few minutes to the way to prepare and plant. The land should be broken deep and quite a while before you are going to plant, for you may either turn under some legume crop or a heavy application of stable manure or compost, and for any of these it will take some time for them to decompose. Then, too, you want to break early so the rains that fall may be saved in the soil for the time that moisture is scarce and the crops are needing it. This soil moisture will have to be conserved, though, by giving the land frequent and shallow cultivations, thus breaking the capillary action in the soil and keeping the soil moisture from evaporating.

There are very few farmers but who have vegetables from their own gardens

for at least a short time each year. Still, we do not want to stop at a short time, when we have the climate that we have in this state. What we want is something to come direct from our garden to our table every day in the year. When we do this the high cost of living that we hear so much talk of will not worry us nearly so much. To accomplish this we must plant a succession of crops, also make a number of plantings of the same crops. That is to keep putting seed in the ground every week or ten days. By this method we have good young healthy plants coming on all the time and if conditions are not suitable for a good crop as they might be these plants will be much better able to stand these unfavorable conditions and still produce a crop than old plants that have used up most of their vitality by production.

Another thing, if we want to make a success of this kitchen garden we have got to give it careful and constant attention in the way of cultivating, etc. If we want nice juicy, well-flavored vegetables we have got to keep the plants healthy and growing all the time. This can only be accomplished by frequent cultivations and attention. Give the plants plenty of moisture and necessary plant food.

This is another place where the garden being close to the kitchen will sometimes come in nice, for the lady of the house may be able to get a hand and look after having the vegetables worked when the man is too busy at some other work.

What I want to see is a small piece of land set aside on every farm and as many

town lots as possible for a kitchen garden. This piece of land properly handled and as many different kinds of vegetables grown as the family may like, and in such quantities as to more than supply their need. You can always exchange nice fresh vegetables for groceries that you need and cannot produce.

Who in this audience would not feel better by getting up some bright clear morning just as the sunbeams were making the dewdrops sparkle as diamonds, go out in their own kitchen garden and gather a basket of luscious strawberries that had ripened on the vine? Just think of plucking the blushing beauties from under the shadows of their dark green leaves! And all the pleasures do not stop here. For when these have been capped and sugar has been sprinkled over them and allowed to stand for awhile, then they are served with pure golden cream poured over them, who would not say that a kitchen garden is worth having; even if this were the only thing we could get from it?

But it affects one other thing that is very dear to everyone here—that is our pocketbook. Yes, we can reduce the cost of living by having this garden if we manage it right.

Would I be asking too much if I should insist that everyone that has not already a kitchen garden start one, and those that now have a garden grow more and better vegetables in it.

DISCUSSION

Mr. Mead: I want to say a few words

in corroboration of the paper we heard on vegetables. In Sanford, the feeding of stock has been tried very successfully. If anyone has a silo, the local banks will lend him enough money to buy cattle to be repaid when the cattle are fattened and sold. Not only is there a profit in fattening the cattle and selling them, but there is also the value of the manure to be counted in. A ten acre lot may be expected to return a profit of \$800.00 during the summer in the cattle, and the manure obtained is of almost equal value with the cattle profit.

Mr. Tenny: I just want to make an announcement that I think will be of interest to the people here who are interested in truck. I am not directly, of course, interested in truck growing, but it is rather difficult for me to keep out of any farmers' organization.

We scarcely appreciate the extent of the trucking on the East Coast and also in other parts of Florida. Approximately 6,000 cars of tomatoes moved from the East Coast last year. There are heavy losses due to diseases and poor methods of handling, and a movement has been started during the past year that is going to be very far reaching. We have gotten two organizations on the lower East Coast to co-operate with the Department of Agriculture at Washington and with the State Experiment Staion at Gainesville, to undertake another series of experiments to investigate all sorts of truck diseases and truck growers' difficulties. We are about ready to sign up a memorandum agreement which will probably be signed in the next month or six weeks,

providing for a five-year series of experiments, which will center upon the tomato industry, but which will probably include other vegetables before it is concluded. The Plant Pathologist will reside at Miami, and additional pathological work has been promised, so far as they are able to give it, from the Experiment Station, and we are hoping in the course of the next two or three years we can get at the fundamental causes of some of our troubles, and help out materially the

problems that are troubling the truck growers.

This is not to be confined to the East Coast, although the growers on the lower East Coast are being asked to put up a reasonable sum of money to carry the work on.

I hope it will be possible for the pathologist to be present at the Florida State Horticultural Society next year and make a preliminary report.

Sugar Cane

R. L. Goodwin

The Fort Pierce Chamber of Commerce is backing me up in a product that I have not heard mentioned on the platform, and I would like to talk about that a little. It is not a tropical fruit, but it is a tropical product; I refer to sugar cane. Prof. Rolfs and Capt. Rose have been trying to get people to grow sugar cane for a long time. They say every man to whom they have talked about it, says there is more profit in sugar cane with less labor and less expense, than any other single product grown in the State of Florida. Now, if this is the case, then 75 per cent of the lands in our state are adapted to the production of sugar cane. It seems we have overlooked our very best bet.

Someone says, "the reason why we have no large sugar cane plantations, is because we have no sugar mills, and the reason we have no mills is because we have no large fields of cane."

The question has been how to dispose of the cane at a profit after it is grown.

In my campaign, I am planning this; the planting of all the cane seed available at the present time. All the sugar cane grown now, instead of being ground for syrup, shall be saved and planted for seed. The next year, we will grind half of it into syrup and plant the other half. There

is a great demand for this syrup, as you well know. There is the Alaga syrup, which is half cane and half corn syrup, and the other syrups have a greater or smaller percentage of the cane syrup. We import thousands of gallons into the state because we are unable to obtain here the syrup we should produce.

In various parts of the county, Vero, Felsmere, Okeechobee, Fort Pierce, etc., we will plant this sugar cane and then form co-operative organizations to build a small syrup plant that will cost about \$1,200.00. We will grind our cane into syrup and make a standard product, which we have not done in the state up to the present time. There will be central organizations to market the product.

If we have a successful start in St. Lucie County, the planting of sugar cane might extend all over the state, and it will give us a crop that will put money into our pockets every year. We are aiming to have a sugar mill as soon as we have acreage enough to warrant it.

I would like to hear a discussion about sugar cane this morning. There are many things I do not know about sugar cane, and I am anxious to get all the information I can.

I have been told the greatest problem we will have to contend with, is an insect, the borer. Some people say it never

becomes bad enough to destroy a crop or keep one from making money. Some say we can be free from it if we plant seed free from that worm. Some say we can get rid of it; some say we cannot get rid of it; even though we do not plant infected seed cane the worm will come and infest the corn, from Maiden cane that is infested with it.

I would like to have those of you who have tried it, say if you have made a failure, and if you think sugar cane growing cannot be made a success in the State of Florida, and why. I do not want to work myself to "a rag and a bone and a hank of hair" and have the growers make a failure after being urged to plant the seed cane.

Mr. Sheppard: I raised some sugar cane once, and if you think it does not require any work, you won't think that after you have raised a crop of it. I do not think it will grow on the pineapple ridge.

In regard to the Cuban worm, it was introduced some years ago when Mr. Disston had his farm. That worm put the sugar cane business almost out. The farmers had to stop growing cane on account of that worm. The boys and the negroes chewed it, and the worm was objectionable. (Laughter.) When it was made into syrup, the worm and the juice all went in together.

I do not think the worm lives in the Maiden cane; it entirely belongs in the sugar cane, and if you get cane free from

the worm, I do not think you will be troubled with it at all.

Mr. McQuarrie: I have grown cane about twenty years, and I have always found where the land is prepared properly, you need not work much.

I think it is one of the most remarkable crops we have, and I have often wondered why the people of Florida did not grow more of it and make syrup. I believe eventually we are going to have some sugar factories in the state.

The general rotation of farm crops is a great field. Where you make a number of crop rotations and bear in mind the idea of building up the land, I think sugar cane is one of the most desirable crops in the State of Florida.

Mr. ——: I have seen thousands of acres of sugar cane, and I would like to know if anyone here has ever seen a successful crop of sugar cane grown on poor land, loose, pine land, without its being heavily cow-penned or fertilized.

Mr. Goodwin: It is far from my intention to try to grow sugar cane upon our high dry, spruce pine land. Our high, sandy ridges are too dry, but we expect to extend our operations to the flat woods and where the soil is heavier, and make sugar cane a staple crop to replace the pineapple industry as a money maker for St. Lucie County.

Mr. Wilson: At one time I made a considerable study of the sugar cane borer. We found in a number of cases the sugar cane borer has practically run the sugar cane out. Now, whether that

was necessary or not, I cannot say, but it is a fact, just the same. In some parts of the state the sugar cane had existed for many years and it is still grown. Whether or not in those particular localities there are enough parasites to keep the borer in check, I cannot say. The sugar cane worm is infected with parasites that keep him in subjection in some parts of the world.

Mr. Goodwin: In many parts of the state there are no sugar cane borers at all. In most parts of the state, if clean seed is used, there is no reason that I can see why the borer should not be controlled.

So far as Maiden cane is concerned, there are many people who say it is found in Maiden cane. I have never found any in it. There have been made in this county during the past year, some very careful tests as to the glucose content of sugar cane. A large sugar cane grower in Louisiana who had charge of several large factories in Cuba, has made these tests very carefully. Contrary to general expectations, the glucose content on the muck runs as high, practically as that raised on the sand.

A good deal of the cane is being planted this year in Palm Beach County, and next year a thousand acres will be put in. If the results this year are promising and encouraging, a sugar factory will be put in this county next year.

Mr. Taylor: I am glad this sugar cane question has been brought up in regard to the borer.

We started at Moore Haven some fourteen months ago, the planting of

sugar cane. We had some cane sent to Moore Haven and we planted it. During the time we planted it, I discovered what was known as the borer. I afterwards sent word to the president of our company that I had found this cane was infected with what we called the borer and wanted him to have the cane pulled up and burned, to which he objected because the cane was valuable. Nevertheless, I dug it up and burned it, as I think it is a serious matter.

After being in the citrus canker work for about a year and a half, I realized what it meant to the state if it was not stopped, and after hearing Mr. Gillett talk about the citrus canker last night, I thought what if it were to start now and ruin the groves and citrus industry of Florida.

I am also a firm believer that a few years hence the sugar cane industry will mean as much to the State of Florida as the citrus industry does now. Therefore, I think we should take steps to trace this sugar cane borer up so that it may be eradicated as the citrus canker is being eradicated.

We have started an industry at Moore Haven in which there will be hundreds of acres planted the next few years, and if we can grow cane enough, we will have a sugar refinery.

We have had fine success with the seed cane we found on Lake Okeechobee; I have found no trace of it; that is, I have found no trace of the borer in the cane which I planted nor in the cane which we grew from that seed.

The cane grown upon the muck lands

of Okeechobee produces good syrup. We planted cane last May and June, and we have now syrup ground from that cane pressed out in January. It was a great success with us. In this state there are thousands of acres which will grow fine cane, without fertilizer.

Mr. Dade: How much syrup; I mean, how many gallons of syrup are produced per acre?

Mr. McQuarrie: About 500 gallons to the acre.

Mr. ——: I came to Florida about six years ago. I put in about two acres of seed cane; fine cane. I planted it so that it was on new land, took extra good care of it and gave it an extra amount of fertilizer, and it did splendidly. I expected to use that first crop for seed but some way or other we did not quite have the land ready for that seed when the seed was ready. We inspected every bit of cane that went into the ground, but the borer came in somehow, and it turned yellow.

It was on new ground and we gave it extra good care. It did not have any stable manure; nothing but commercial fertilizer, and it has always been a great question to me where that borer worm was introduced. There was no other cane within four miles.

I think the proper way to go about having a mill to take our cane, is to have someone go around to the different cane growers and ask each one, "How much will you supply for the mill?" Then later he can go around with a contract to be signed by each farmer as to how much cane he will grow. You get such

a thing as this established on this basis, and suppose the grower has a bad season; the people at the head of the business will go with that man to the bank and help him out to get the money he needs to buy fertilizer, or whatever he needs. I would like to see the matter taken up and something done with it. On almost any land you can make a crop of sugar cane and make it quick.

Mr. Taylor: I would like to know if anybody knows anything about the origin of this worm, and how it started and all about it. Does any one know?

Mr. Wilson: The borer worm has been in the state a long time. It is practically all over the southern states; it may have come from Cuba. I believe it was originally introduced into Louisiana from Cuba back in the '70's. In Louisiana they raise sugar cane and make syrup in spite of the borer worm. The government has been studying this proposition for many years; sometimes they have had as many as three men at work upon it. Last year they had a man in Cuba, but it is impossible at this time to state positively the best methods of control.

They used to recommend in Louisiana that the tops be burned, the idea being that the eggs were laid in the tops, which is true. However, they found that by burning the tops off they were doing more harm than good, as burning killed the parasites as well as the borer. The last I heard, the control measures were pretty well up in the air, because they had to abandon the only control measures they knew anything about, that of burning.

There are several government bulletins

issued in regard to the sugar cane borer, and also bulletins of the several states. The insect is a moth, you know.

Mr. Goodwin: About four years, I saw an article in the "Rural New Yorker" describing a White Sapota (*The Casimiroa edulis*), as a most delicious tropical fruit that was similar to a peach in flavor. I sent to Reasoner Brothers and got one of the plants and planted it four years ago, and now it is about fifteen feet high and ready to bear.

While I was at the Fair in Tampa, the freeze came and I worried more over that one plant than all the other put together.

When I came home, I went out expecting to find it killed. Much to my surprise, it was entirely uninjured.

Now, a friend of mine from Mexico

tells me the fruit is one of the best fruits of Mexico. Day before yesterday I looked it up in Funk and Wagnalls dictionary, and found *they say* it is a fruit something like an apple; that *it is unwholesome* and the *seeds are poisonous*. Mr. Reasoner says it is a fine fruit for South Florida, with pleasing taste. I would like to know something about it.

Mr. Krome: I have grown the White Sapota, and my own personal opinion of it is that I am in favor of it if any one wants it. For myself, I would take something else.

Mr. Goodwin: I have found out since, that seeds do not come true and inferior, unpalatable varieties may come from seed, as is true of other fruits.

Ornamentals

H. S. Pennock

About a week ago our President wrote to me and said, "Last fall you were appointed on the Ornamental Committee with Miss Elizabeth Skinner as chairman. Please get in touch with her."

I have been trying to make out why he withheld the good news so long; whether he thought by springing it on me at the last moment I would not have time to back out or whether he kept waiting to see if he could not do better. I am rather inclined to think it was the latter as he has already tried me twice previously, but perhaps he thought somewhat this way; "I have tried that fellow a couple of times and now I am going to do it just once more to see if he can't do something." I think he is going to be disappointed, though, as I hardly know the first thing about ornamentals. Now, if he had asked me to tell you something about a good looking cow I could have told you something—I could have told you she ought to have a nicely dished face with large placid eyes and a nice little pair of crooked horns and a good level back and so forth; or if he had asked me to say something about good looking roads I think I could have told how to make a good looking road and a lasting one too, but ornamentals, as I said before, I hardly know the first thing about.

Take for instance the cabbage palmet-

to, they are used a good deal for avenue planting, but I do not see anything very ornamental in them with their dead leaves hanging down below and dead berry branches sticking out above. They can't compare with the cocoanut or the *phoenix canariensis*. The cocoanuts are grand with their long swinging leaves, but of course they won't grow much further north of here without being cut back with the cold pretty often. The *canariensis* is different in that respect as it will stand lots of cold. Lots of them are used about New Orleans and there are some fine ones there, too. It certainly doesn't get any colder in Florida than it does in Louisiana and yet you see very few of them in Florida. One big advantage the cabbage palmetto has, it is cheap; the sprouted cocoanuts, though, for the southern part of Florida, are on a par with them as they can be bought for twelve dollars and a half a hundred.

Then again, to show how little I know about ornamentals, is this, I think the yellow pine would make a fine avenue tree. I suppose they are too common to think about, but will they be common seventy-five or a hundred years hence? Can't you imagine what a grand view an avenue of these fine big trees would make and have you ever noticed how interesting and handsome the trunks of the older

trees are. There is such a variety of color in the bark and in the late afternoons with the sun at your back they are almost a bright pink and the tops seem to be so many green puffs. They have quite a number of good points, too. They do not grow as fast as the Australian pine which is being used a great deal in Dade County, but they grow quite rapidly, growing more than a foot in a year and the young trees are such good looking little fellows with their nice bushy heads. They make much better looking young trees than the Australian pines and then, too, they are not subject to disease like the Australian pines. In some places they have to be sprayed once a year to keep one from dying out here and there.

The mango is being used for an avenue tree also. Some let them grow up in their natural bush shape, others trim

them up so they have a trunk six or eight feet high. I think the latter way is the nicer. They take on a nice round top when treated this way. The mango, though, is only for the southern part of Florida. A tree that could be treated the same way and give the same effect for the northern part of Florida would be the camphor. It is naturally of a bushy growth, but if trimmed up so as to have a single trunk at the bottom it makes a very nice head quite similar to the water oak.

The great thing to my mind in ornamenting is simplicity. Don't try too much, but get started; it takes years for trees to grow and we are soon dead and gone.

I thank you very much for your attention.

WHAT THE WOMEN OF THE FEDERATION ARE DOING: ORNAMENTAL PLANTING AND ROYAL PALM STATE PARK

Mrs. Edgar Lewis, Vice-President of Section Five, Florida Federation Women's Clubs

The Florida Federation of Woman's Clubs grows so rapidly that it is dangerous to quote membership statistics; statements which are perfectly good and reliable, one month, will not pass muster in thirty days; glittering generalities leave one's reputation for accuracy in better standing.

However, until the next meeting of the Board of Directors, it is reasonably safe to say that there are in the Florida Fed-

eration, 145 clubs, with a total membership of more than 8,000 women. These clubs are doing all kinds of work, since the latitude for Federation eligibility is very broad indeed; when applying for membership, a club must only show that it is working for individual or community betterment, is non-sectarian and is organized to operate within the state. It is, therefore, not hard to believe that these 145 clubs show 145 varying possi-

bilities for activity, representing as they do, the needs of almost 145 separate and differing communities.

The state organization has a State Chairman for each and every department of work possible to any club, and there are nineteen of these chairmen, with still others at the head of special committees, such as the Committee on Moving Pictures, etc. Of course, no one club tries to do nineteen kinds of work. Some are strictly literary clubs, some are musical only; others are civic clubs, still others are mothers' clubs; some emphasize home economics, others, educational work, equal suffrage, philanthropy, social service, public health, library work, rug and general art weaving, needlecraft, basketry, and so on through an infinite variety. Some clubs follow a single line of work; many follow several, and are divided into departments ranging from two to thirteen in number.

Out of the entire 145 clubs, 85, with possibly 4 or 5 more of the new clubs whose scope is not fully known, are doing civic work; and while the first civic impulse is, undoubtedly, to "clean up," the second is, just as surely, "to plant and beautify."

In the Federation edition of The Tampa Times, published a few weeks ago, considerable space was devoted to a collection of opinions, under the heading: "The Most Valuable Work Our Club Has Done," "by The Club Presidents." It is interesting to note the frequency with which statements like this appear: "The most valuable work our club has

done, has been working for a city park." "Planting shade trees," "Improving railroad station grounds," "Planting trees and shrubs around a city monument," "Holding our annual fruit and flower show," "Planting ornamentals along the Dixie Highway," etc., etc.

Several clubs report commendable improvement work in the local cemeteries, the Cycadia Cemetery Association of Tarpon Springs, which owes much to the capable management of Mrs. J. C. Beekman, a past president of the Federation, perhaps leading along this particular line. School yards come in for attention; also church properties, and the grounds around all sorts of public buildings. Club women are not exclusive in their labor, but give gladly of their strength wherever a need is manifest; if the town council or the county commissioners, or the chamber of commerce graciously co-operate, as, fortunately, they generally do, so much the better, but the women have been known to produce gratifying results in the face of seemingly overwhelming odds.

The materials used in this state-wide planting show a correspondingly wide range, since this beautiful Florida of ours offers a diversification of soil and climate that not only admit of, but demands a marvelous variety. And clubs are showing their wisdom, by making use of that growth which thrives best in each particular locality. Some are using the native oak, others, the camphor tree; yet others, the sour orange, the Australian or silk oak, the Australian pine, the

eucalyptus robusta, the palms, cocoanut, date or sago, the hibiscus, crotons, and oleanders.

The Dade County Federation of Women's Organizations, with over 700 members, will plant a tree for every club baby; in Palm Beach County, several miles of the Dixie Highway have been planted with ornamentals, by the club women. The Saint Lucie County Federation of Women's Clubs, has promised the commissioners to plant the entire 52 miles of the Highway through that county, furnishing all ornamentals themselves, and only asking the assistance of the county convicts, in the actual planting, and the use of the county water wagon to facilitate the watering. Ten miles are already planted, with material for several more ready, and awaiting the completion of the roads. The Saint Lucie plan includes the planting of eucalyptus robusta, every fifty feet, with red hibiscus between; occasional clumps of white oleander, red hibiscus and jacaranda to furnish the red, white and blue, of the Dixie Highway color scheme; giant bamboo at the waterways; and cabbage palmetto seeds planted throughout the course, so that, in time to come, if so desired, the eucalyptus may be cut down, leaving a driveway bordered by red hibiscus and cabbage palmetto, two characteristic growths of St. Lucie County. A member of the Woman's Club of Fort Pierce raises the eucalyptus robusta, as well as the jacaranda, from seed, while many women throughout the county, have large beds of hibiscus cuttings and quantities of palmetto seed, in the saving of

which, by far the most difficult part was to harden one's heart against the hordes of hungry robins who evidently considered palmetto seeds their own particular dainty.

While the women of the federated clubs have, through their civic planting, dotted the state with beautiful and lasting monuments to their taste, their public spirit and their industry, they have accomplished quite as much of value through the conservation of natural beauties that must otherwise have fallen before that so-called progress, in which the ruling idea of advancement seems to be, "to cut down." Many towns of the state have to thank the clubs for the present possession of the noble trees on which they base their sole claim to character and beauty, and no one can quite forget the valiant woman who stood for hours, with their arms around some beloved trees, in order to save them from the axes of the destroyers.

But the crowning conservation glory of Federation, destined, through the struggles of the Federation, to stand for the glory of Florida, and the benefit of future generations, is Royal Palm State Park, the only property of its kind in the United States, and probably in the world, owned by a woman's organization.

Lying 48 miles south of Miami, a rare tropical jungle called Paradise Key was for years a wonderland of romance and beauty, known only through the tales of the Seminoles and of the fortunate few white men who had the hardihood and good fortune to reach it.

Many years passed, many things happened that might easily be woven into an

interesting story, but, to be brief, in 1915, soon after Mrs. W. S. Jennings became president, the Legislature ceded to the Florida Federation of Women's Clubs, a tract of 960 acres, in its midst, the fairy-land of Paradise Key, to be maintained as Royal Palm State Park. At the same time, conditioned upon the grant, Mrs. Mary Lily Flagler-Bingham gave the Federation another 960 acres as endowment. This endowment land did not immediately adjoin the Park, so was, subsequently, exchanged for other tracts which do, and the entire 1920 acres lie together and on the Ingraham Highway, the last 78-mile lap of the Dixie Highway, which runs from Miami to Cape Sable and is hard surfaced, not only from Miami to the Park, but through it and for some distance beyond it, making the entire tract easy of access.

The jungle part of Royal Palm Park comprises 350 acres; contains hundreds of royal palms, large and small; a tropical growth which, botanically, belongs to the West Indies, is peculiar unto itself, and not duplicated anywhere in the United States; 241 forms of plant life, from mushrooms up; over 60 varieties of trees; and between 50 and 100 kinds of birds. There are gigantic live oaks whose spreading branches form the leafy roofs of what might be called "out-door auditoriums;" there is grey-green moss in graceful festoons, and every exquisite variation of color on the tree-trunks; there are head-high ferns, and tiny, dainty growths that only close scrutiny can disclose; there are wonderful vines, and orchids, and tree snails; beauty overhead, beauty underfoot, such a riot of

loveliness as to overwhelm one anew with the mystery and power of nature, and make the mere beholding almost a sacrilege, and an intrusion.

Planning to destroy as little as possible of the natural beauty of the hammock, narrow paths lead from the one broad road which is allowed and which passes through the park. There are at present about six miles of these paths, named "The Mrs. W. S. Jennings Paths" by the appreciative women of the Federation, in recognition of the wonderful president to whom they are indebted for the possession of Royal Palm State Park.

Scientists in all parts of the country are manifesting interest in the park and asking the privilege of studying its peculiar and unusual flora.

Dr. Chas. Simpson, of national fame and world wide experience, and Dr. J. K. Small, Curator of the Bronx Botanical Gardens, N. Y., have been of untold assistance already, in the work of preliminary classification, and promise yet further help. Both are enthusiastic regarding the Park, and deeply thankful for its preservation.

It is planned to make the Park a bird reserve and sanctuary, and the valuable co-operation of Mr. Edward McIlhenny of Louisiana, the greatest living bird conservationist, is promised in the work of restoring many lovely forms of bird life, formerly abounding in Florida but now well-nigh extinct. A deer park is one of the visions of the future, and a scenic driveway, bordered by a canal, to extend entirely around the Park, has already been outlined by skilled engineers, but is too expensive to be more than dreamed of.

A most competent warden and at the same time a naturalist of no mean ability has been employed by the Federation for more than a year, not only to guard the Park from depredation and fire, but to perform the difficult and delicate task of opening up paths with the least possible loss of plant life.

A comfortable lodge has been built for his use, with water and light plants and a garage. There are to be rooms set aside for scientists wishing to remain in the Park for study, and it will be possible for visitors to obtain a light luncheon from the warden's wife. Though the Park is 13 miles from Homestead, there are sometimes as many as 50 visitors in a day, with the number constantly increasing. The furnishing of the lodge promises to be a labor of love with the clubs, and various plans are on foot to carry out unique designs.

The grant by the Legislature carried an exemption from all taxation, but no appropriation, so that the financing of the Park has been a problem which has taxed the ingenuity of the club women, though it has never sapped their courage nor weakened their faith.

The Dade County Commissioners appropriated \$1,000.00; another \$1,000.00 was raised by a mile of dimes and a chain letter scheme; friends have been appreciative and generous; some money has been borrowed; but while the burden has been heavy, the reward has justified every effort, and the committee in charge has handled the Park business in so able a manner that no one despairs of the outcome. It is confidently expected that the present Legislature, realizing that the

great trust of Royal Palm State Park has fallen into worthy hands, will make a sufficient appropriation to insure its maintenance and steady development.

The Federation is *almost* as enthusiastic over Ingraham Highway as over the Park, since it was largely through the efforts of Mr. J. E. Ingraham that the wonderland came into their possession, and there is accordingly, a marvellous plan for making the highway which bears his name a wonder road bordered by royal palms and yellow flowering shrubs, the green and yellow of the Federation colors.

On November 23, 1916, during the week of the Federation Convention in Miami, the Park was formally dedicated by the president, Mrs. W. S. Jennings, and the Ingraham Highway, by the Honorable S. A. Belcher, Chairman of the Dade County Board of Commissioners. The day was a remarkable one in the history of the Federation. An interesting program was carried out, Mrs. John Dickinson Sherman, Conservation Chairman of the General Federation making the principal address; Mr. Ingraham and Dr. Chas. Simpson also spoke. 136 automobiles carried over 1,100 people to the Park for the day, and the Woman's Club of Homestead served an elaborate luncheon to more than 600 of the visitors.

Now while the women of the clubs have advanced rapidly and with enthusiasm along the trail blazed by the pioneer Horticultural Society; while they have worked with almost fevered intensity for beautification and conservation, their minds, just now, are turning to other and more serious needs, and the 8,000 trained work-

ers of the Florida Federation will be a power upon which to depend when they turn their skill and energy to the raising of food supplies, or to any other labor

that shall help in the struggle looming ahead of us, that struggle in which our men must risk their lives and our country be in danger.

The Federal Land Bank and the Florida Citrus Grower

Mr. Hume: We had expected to take up topic No. 19 this evening instead of this morning, but it has been deemed best that the discussion of the Federal Land Bank work in relation to Florida, should come up this morning. It was postponed until this evening because for several days past the Florida East Coast trains have had a habit of running late and we did not believe the gentlemen who are to address us on this occasion would be able to get in in time for the morning session.

However, contrary to our expectations, they are here, so that we will now take up this part of our program.

I am going to ask Mr. D. C. Gillett to open this discussion.

Mr. Gillett: Mr. Chairman, Ladies and Gentlemen:

In discussing this matter, I shall take into consideration the fact that I am a grower interested in nurseries, the holders of some grove mortgages, and a director in two banks in Tampa, which might be rightfully considered the center of the industry, at least on the West Coast. Therefore, in what I am going to say, I shall endeavor in a small way to reflect the attitude or sentiment of two banks in this state.

As I understand it, the basic principle underlying the Farm Loan Act, the meas-

ure of the loan primarily is the productivity of the soil upon which the mortgage will be based. Of course, the moral risk and any other risk which would come into a loan of either commercial or industrial matters would also apply to this.

As I understand it, what you want to know is this: assuming that the improvements on a Florida mortgaged grove were removed in a single night by a freeze, over which, of course, we had no control, what productive value would that land have with those improvements removed?

Now, if it is to be considered that the freezing of an orange grove to the ground means total depreciation of that land from a citrus-producing standpoint, then it might be a subject of discussion.

But a frozen orange grove, with the vitality of the root system in the ground, certainly has a value as an orange grove far in excess of the raw value of the land, plus the improvements to rebuild one.

The age which an orange tree may attain and still bear fruit, has never yet been determined. In Sicily there are groves four hundred years old, and apparently just in their prime. In Florida we have them seventy-five years old and bearing more fruit each year. Unlike deciduous fruits which at a certain age begin to depreciate, a citrus grove continues to appreciate as years go on. There

are groves in this state that I would not hesitate for loan purposes to value at \$1,000 per acre, and loan \$500 per acre thereon. There are other groves in this state for which I would not read the loan application, and those two properties may be identically the same in soil, in character and only divided by a fence.

Florida has every kind and description of soil, from the sands of the sea to the richest muck in the world. Our soil is not uniform; there is no graduation. A fence will often divide good from worthless land.

Therefore, it seems to me no set rule can be established for the intelligent valuation of any citrus property, and that there must be an individual inspection, taking into consideration the physical condition of the property and other conditions surrounding it.

If I were asked to value a citrus property, there are three things I would consider:

First, the location of the property with respect to elevation and immunity from cold.

Second, the adaptivity of the soil to profitably produce citrus fruits.

Third, the varieties planted in that grove, and whether profitable or not.

Any banking loan on farming property, whether it be corn or wheat or cotton or citrus, has an element of risk which must be considered, just as the risk is carried in any other loan. If you loan on a cotton field for thirty-six years, the local board approving or recommending that loan must have confidence in the borrower to the extent that he will not lose heart; that he will keep on planting crops continu-

ously for thirty-six operations in order that the security of what you loan may be conserved.

In a citrus grove in a high state of production, that risk is to a certain extent eliminated, for our trees will stand much abuse, and if it were seen that the owner of that grove was not keeping it up in the very best manner, the local board could go in and rehabilitate that property and keep it up to a high state of production without any impairment of the security of the loan.

In a cotton or a corn field, it is true, if you have a crop failure or invasion of boll weevil, you can recover in one year. Now, granted that the worst should come to a citrus investment and it should be frozen to the ground. The owner of that grove, under favorable or even normal circumstances, would be back in profitable operation of his grove in from three to five years and, therefore, I say that the length of time the loan can run, thirty-six years, is a very strong point in favor of the citrus grower.

Take a given acreage of cotton, or corn, or wheat, with the normal drawbacks that come to them, and carry them along for a period of thirty-six years, and then consider a similar acreage of citrus, which may be frozen twice in thirty-six years (which is above the average); the citrus grove at the end of that time will be worth ten times the value from a productive standpoint as all of the other lands combined, because, as years go on, our values are increasing. From the standpoint of profit, if we did not have this one great drawback to the industry, the possibility of a freeze, I am firm in my be-

lief that every man in America would be down here growing citrus fruits, the industry is so profitable, the business is so easy, our people are so happy and contented. It is just these freezes that keep down the value of our lands.

But for these freezes there would be citrus in Georgia, possibly farther north, but when these freezes come they push back the line where citrus fruits can be profitably grown and establish and increase the valuation of those lands where they should be grown.

I can show you statements of profits of groves in this state, undamaged in any way from the freeze of February 2nd, that will run from \$300 to \$500 per acre per annum over a period of the last five or seven or eight years.

In any industry, or commercial investment any stock that will pay 6 per cent is considered worth par, usually, and 10 per cent stock is worth considerably above par. On that basis these properties are worth \$2,000 and \$3,000 and \$4,000 per acre. I do not say that is a proper basis for general loans, because those are selected properties here and there, and cannot be considered in any way as an average.

Let us assume for a moment that here is a grove, a ten-acre grove, in a high state of production, ten or twelve years old. It has a value of \$10,000 by your appraiser, and you will loan the owner on that grove, say, 30 per cent of its value, about three thousand dollars. The repayment of the principal and interest over a period of thirty-six years on that investment, would amount to about \$112.00 per year from a ten acre grove or less than \$15.00 per acre per year for

thirty-six years. The average, as the gentleman who will follow me will tell you, is about six times that per annum covering the entire industry, and in that is included "skeletons" and non-producing properties.

Now, gentlemen, if you are going to be of any benefit to the citrus growers, if this law has been created for the encouragement and advance of the resources of this country, the citrus grower must not be considered in the class with those who pursue general farming. He has a cumulative value to his property that even a freeze cannot destroy.

Value those groves at as near their real value as you possibly can. Let it be known that the Farm Loan Bank places an one hundred per cent valuation on the properties. And then, if you wish, cut the amount on which you will loan down below fifty per cent as much as in your opinion it should be. In establishing an one hundred per cent valuation on our citrus properties, it then places our groves in such condition with the money market that there is no question about how much they are worth.

For instance, in some of our cities our taxes are on a 100 per cent valuation. If I owned a \$50,000 property and offered it for sale to someone a hundred miles away from it at \$10,000 below the assessed valuation, without any inspection or without any inquiry as to the surrounding values, that man would know that I am sacrificing \$10,000 from a \$50,000 investment, because the tax receipt shows it.

If you will assess our citrus properties at 100 per cent, our receipt or our mort-

gage from you will establish a value on that property so that in case of disaster our people can take that and create a second mortgage on their property and still have a good merchantable security.

Suppose you establish a 30 per cent valuation on citrus properties; suppose you have a leeway of 20 per cent of what you loan; then suppose a severe freeze should visit the state again and raze those properties to the ground; you then, under the law, could properly loan an additional 20 per cent on that mortgage and with those funds properly expended that property can be brought back again to a state of production where it can go on and take care of the interest and the principal.

I believe a 30 per cent loan on a 100 per cent valuation in the state of Florida, offers the Farm Loan Bank a better security than any other farming land in America.

From a banking standpoint, there are loans in this state made on a higher percentage than 30 per cent, considered perfectly good, but for the fact that these are not liquid loans and on account of national restrictions on real estate loans, our banks in this state, if they had any money they could loan for thirty-six years, would be eager for these investments, because they know that, taking the average which has come in the past on these disasters, and judging the future thereby, a citrus grove will pay back principal and interest so many times during its period of prosperity that they can stand these losses and still have an excellent investment and ample security.

Therefore, in considering this matter, if your appraisers will try to establish a

100 per cent valuation on our property, and then cut down the percentage that you are going to loan, if you fear there will not be enough left to take care of the property during some disaster, you will then give to this state a basis of valuation which it has never had before, and which will serve our growers well if we should need to place a second mortgage for short-time periods on the property.

It was a happy thought that came to the author of this law when he provided for the local boards. You can go into every community in this state and select three or five men, and those three or five men know every property within a given radius. They know what each property will produce; they know the moral risk behind the loan; they know the possibility of the property being frozen, because they know local conditions; they know if a property is planted on cold land or not. Those questions can all be answered by that local board and the investment is safeguarded to far greater extent than any appraiser could possibly safeguard it in establishing his valuation. It requires local knowledge to obtain that information.

You have come to Florida at what I regard the most opportune time to hear this discussion, within the past twenty-two years, for you are seeing this state at its lowest ebb from the standpoint of security that at any time within that period. It will be very interesting to you gentlemen to return to the state in twelve months from today, or twenty-four months from today, and see for yourselves the great recovery that has taken place in these properties, which today are

frozen to the ground. Only in that way can you appreciate the value of the citrus properties.

I have some pictures of properties in this state taken on the 10th of March. I show these, not in a spirit of braggadocio, but I would like to have you gentlemen see the photos of these properties and then decide whether or not you can class all citrus land under one head, or each locality under one basis of valuation. Thank you. (Applause.)

Mr. Hume: We have with us Capt. Smith of the Farm Loan Commission, who is going to address us now.

Mr. Smith: Mr. Chairman, Ladies and Gentlemen: I question very much when those gentlemen in Washington perfected and put through the Farm Loan Act, whether they realized the work that was necessary to put it into effect. You know we have very little to go by in this country to guide us. Those countries that already have a Farm Loan system are, comparatively speaking, small countries; many of them no larger than our states, and to attempt in this country to bring into active operation an act that would work from the Canadian border to the Gulf, and from the Atlantic to the Pacific, is a huge task.

I did not come down here to talk, I came down here to listen.

We have just heard this gentleman speak of the citrus problems, that is one of the fruit troubles. But you must realize one thing, and that is that the attitude of the Board in Washington is to help the farmer, and if there is any possible way to help them, we must do it.

But there are two sides to be consid-

ered; there is, first, the man who wants to borrow the money, and there is the security, on the other side.

There is a wrong impression in many parts of this country, that is that this money is "easy money." Now, to put the thing in plain language, it means this: that where a man has good title to productive property, to be mortgaged as security, he can borrow a sum equal to one-half of the value put upon his property by the appraisers. It is just as well to be perfectly plain with the whole matter, and I have been particularly anxious to come through Florida and see what your problems are and see if there is any way to help you out of the difficulty you are in.

We have today on file about \$175,000.000 worth of applications on hand for farm loans. We have already loaned in the State of Kansas, and we hope shortly to be lending in this district here.

There are very few people who realize the different problems that are going to come up from time to time, and in many cases it will be impossible to form any rules that will be applicable to all the districts; they will all have to be handled separately.

But we must keep in mind one thing; that each one of those banks, the other eleven, are responsible for what each bank does. This does not mean that the other banks are going to carry along a weak system. But it means every loan is going to be made on its own bottom.

You must realize the government is not lending money on the Farm Loan Bank basis; it has temporarily put in \$9,000,000, which we have to pay back, and after

a bank has lent so much of this money and begins so sell its bonds, it begins to be an endless chain. To keep this endless chain going, it must have the confidence of the people of the country.

We are figuring this bank in Kansas will have to turn over its capital of \$750,000 every few weeks. If we could issue one large issue of bonds and put it before the country and be done with it, the matter would be simplified, but we are going to be on this bond market every few weeks forever, and we cannot afford to have any bonds come before this country that there will be the slightest question about.

I hope these men who are interested in the farm loan question, will realize that they alone make the first valuation of their lands. After that comes the appraiser, and yet these men should realize that the whole system depends on these bonds, and that they ought to look at this thing with a cold-blooded view, to make these bonds safe.

You doubtless can comprehend that in every state, the people who live in it think that their state is the best and that their land is the best. This is a very pardonable pride. I sincerely hope if there are any growers here, that you will see that you look at this thing from an entirely reasonable point of view, and value your lands at actually what they are worth.

I should like very much down here today, to get an idea from some of the bankers here, just to ask one or two questions. I do not ask these questions with a view to criticize or with a view of "knocking," but I would like to know this: we are told that some of these groves are

worth \$1,000.00 an acre. I have no doubt they are. Now, I would like to know what the local banks will lend on these groves on their valuation. May I have an answer?

Mr. Gillette: No local bank in Florida would loan \$500.00 per acre on any grove that I know of.

Mr. Smith: That is one of the points I wanted to be assured of.

Mr. ——: I would state that I have borrowed \$600.00 per acre from the banks on my grove on short loans. And the bankers, when it came due, were willing for it not to be paid then, but were willing to carry it.

Mr. ——: I am attorney for a bank, and I know they will lend more than \$500 per acre on grove property in our section of the state, that is, productive groves. But they will not lend for long terms and they must be assured the man who borrows the money has other security to pay back the loan.

Mr. Smith: There is one other point that is well worthy of a little consideration.

Under the present system of lending, where a man goes to a banker, the moral risk has a great bearing upon the matter. If the banker knows that man is personally all right, that he understands his business, he may, in many cases, give him a considerable loan to carry him for a few years. But we are making these loans for thirty-six years, and the moral risk at the time the loan is made may be safe. But later on the man who borrowed the money may not live the thirty-six years and someone else may get hold of the place and it may not be good security.

We must have the actuality of security outside of the moral risk, you see.

Mr. Brown: Isn't the moral risk on groves in Florida, as good as on Illinois farms?

Mr. Smith: Certainly. But I would say in regard to Illinois farms. It is valued at \$300.00 an acre. We have no intention of loaning \$150.00 per acre.

You understand, I am not talking about Florida in particular, I am talking about the system all over the country.

That is all I am going to say this morning.

Mr. Hume: I will ask Prof. Rolfs to continue this discussion.

Mr. Rolfs: Mr. President, Members of the Farm Loan Bank and Ladies and Gentlemen:

Mr. Gillett, in addressing you on this subject, mentioned the matter of a disaster that is upon us at the present time; that is, the freeze.

We hear it stated over and over again in the papers; also we hear it stated that Florida has had a freeze and the citrus industry is wiped off the map. I have lived a long time and seen the citrus industry wiped off the map, figuratively speaking, many times. Put it down now, that when a man talks about the citrus industry being wiped off the map through a freeze in Florida, he has been misinformed.

There certainly could not be a worse freeze than we had in 94-95. So long as the records of thermometers have been kept in Florida, there is no other instance where the conditions were so disastrous, and yet, gentlemen of the Board, the citrus groves rocked through the storm; in a

short time we had a splendid production again of citrus fruits.

Further than that, Florida has had freezes before, in '58 we had a freeze, in '37 we had a freeze, and when we began to look through the state for stock upon which to bud groves, we found on the shores of Lake George, some old citrus trees, and cutting those off and looking at the rings, we found that stock was growing before '58, and the sprouts growing from it were younger than '58. I may mention that to show the extreme longevity of the citrus tree root, its persistence. I know of no other tree comparable to the citrus tree in this respect except the olive and we do not grow olives in Florida, so we cannot make a comparison with that.

But the citrus tree stock is very long lived. That we proved by the trees in the woods which were frozen down before the state was inhabited by the present generation, or the white race, possibly.

We have had experience in '94-'95 where the trees were frozen to the ground and in the fall of '99, you will remember what a splendid crop we had. The crop was marketed and brought a good price, showing that there was a very rapid and quick recuperation of the industry on a large scale.

We should not for a moment, however, consider that a citrus tree planted in any place and cared for in an indifferent way, may be frozen down and recuperate immediately. We must take into consideration the local conditions concerning those trees, and yet when a citrus tree is planted on the proper citrus soil, the root may be neglected for as long as eighteen or twenty years, without disastrous effects.

We have numerous cases of trees and sometimes groves that were neglected fifteen or even twenty years and then rehabilitated and rebudded, and a good, marketable product produced.

I am mentioning that to show how very different the citrus root is from a peach root, for instance, the apple root and the other fruit crops of the United States.

Mr. Gillett has already spoken about the long life of citrus trees in Europe. We have not grown citrus long enough in America to state just how old a citrus tree must be before it becomes too old to be productive.

Mr. Chairman, I believe I have pointed out the matters I wished to bring before the Board. I want to assure them that when a citrus grove has been, as we generally say, "frozen to the ground," that does not mean frozen to the ground at all. In Gainesville, really beyond the northern limits of citrus growing, a few days after the freeze, people said the trees were frozen to the ground, even the roots were dead. Yet you can go there and find leaves twelve feet up in the trees.

Somehow people like to go around and magnify disasters, and they do not tell the truth in a calm and dispassionate way. The trouble is in our minds and not in the citrus tree.

We can rebuild these citrus roots in a very short time, or, rather, rebuild the citrus grove. Five years is ample time in which to rebuild a grove to a condition in which the grove will again produce a paying crop, not only a paying crop but a crop that will pay an interest on the investment. There are many groves that have

done that in three years, but five years has been shown to be ample time, taking the state as a whole, and basing that statement in view of the great freeze in '94-'95.

Mr. Smith: If a man had a ten-acre grove, and we should loan him, say, \$4,000 on that grove, and it takes four or five years after a freeze to have it begin to bear again, how could he utilize that grove in the meantime, or would he have to live on that \$4,000 we loaned him?

Mr. Rolfs: He would have to have some means of livelihood besides that grove, and you want to know how he could get that livelihood.

Our people had that experience; you remember that freeze was a clean sweep. It wasn't like this year's freeze. Well, the first thing the people did—and they had no farm loan to fall back upon; they had to fall back upon their own local institutions—the first thing done was that of producing crops so they could live at home, and in the five years following that disaster, our people by living at home and finding out that the Florida climate in the summer time was thoroughly delightful, produced vegetables, corn and other materials not to be used at home. In the five years following the freeze, the length of good roads in the state more than doubled; there were four times the number of school houses built and painted and more churches built and painted than there were in the five years preceding that. (Applause.)

That was the renaissance of education, road building and church building. Remarkable as it may seem, with \$70,000,-000 of property wiped out in one night, you see the farmers starting in to raise

truck and crops, taxing themselves higher when they had apparently nothing to tax; taxing themselves to build roads, school houses and churches. That seems improbable, but I would not dare to say it before this audience if it were not so, because there are men and women here who went through that freeze and know I am speaking the truth.

If you wanted to go into the details it would take two or three hours, but you will know from what I have told you that we have a fine recuperative power, and when it comes to the question of doing something else or getting something to do that will tide us over until the citrus comes back, I have shown you that it has been done in the past, and can be done again. (Applause.)

Mr. Hume: I might further say at this moment for your information, Captain Smith, that it was out of the freeze of '94-'95 that the vegetable industry of Florida was born, and that industry probably equals or is greater in its worth to the state than is the citrus industry.

I am going to ask Mr. Skinner to continue this discussion.

For your information I might say that Mr. Skinner is a large orange grower, and large handler of oranges and a manufacturer of packing-house machinery, consequently is pretty well posted on the several phases he will discuss.

Mr. Skinner: I have been greatly interested in these talks.

I have been in the state thirty-four years. When I came to the state I had \$500.00. It seemed to me that every man I met was anxious to take it away from

me—and they did, and a great deal more besides.

But the year after I came to Florida, '86, I went out in the morning and my oranges were frozen, my trees were frozen and I was without much money. My neighbors were all in the same fix. But we all recovered.

There is a phase that has not been touched on. There is no need of a man being frozen out. You can insure your grove by fire just as well as you can insure your house against fire. In most parts of the state, as Mr. Gillett says, every place must be judged on its own merits, there is no reason why any man should freeze in the greater part of the State of Florida, so far as citrus groves are concerned.

The reason why more farm crops are not grown in Florida, is because citrus products are much more profitable. I would loan a great deal more money on good citrus land than I would loan on good farm land, and any man, any banker, in the State of Florida would do the same. A good citrus grove with a good growth of trees on it, and a good piece of land with a farm crop of some kind; ask these people which they would take. They will take the grove every time. It has established value.

A great many of the wealthiest men in our state now, are men who took those frozen groves after the freeze of '94-95, and brought them out. I say, groves have an established value, and it is a big value, too, not a small one.

As this attorney says, the banks would loan money on grove property, but a safe

banker will loan his money when he can get it back when he wants it. Ninety-day paper; that is a different proposition and does not appeal to a grower.

If your loan is secured, it does not make much difference who the man is if he takes care of the property, and if you have a loan board it is their business to see that the man does care for the property in the right way, and if he does not take care of it, you can go in and take possession.

It is not the rich man who wants this loan bank; it is the man of moderate circumstances, the working man, who gets \$1.75 or \$2.00 a day. Give him a chance to get ahead; don't be overcautious. I have wanted to do that in my community. Sometimes one makes enemies of the ones you are trying to help; they distrust you the minute you intimate that you are going to give them something for nothing, you might say. It is the greatest pleasure of my life to help these men to start, and I would give him thirty-six years if I stayed here that long, to pay it back, and be glad to do it.

I let one of my workmen have some money to pay for his place and he wanted to know if it could go on for a while, and

I told him yes. "Well," he said, "I am going to get in this farm loan bank, if it isn't another one of those fakes."

The people need the help; the value is there, and any community that will take five or six men, whatever the number is, who will say they will stand responsible for these different loans, I think it is a pretty safe proposition, and you men are in position to know who these five men are. You are going to know; you are going to look up every one of these men, write to the bank and to prominent citizens about them. To loan a man an inadequate amount is going to do him an injury instead of helping him. You should lend him enough so that he can go ahead and succeed.

You can go over this state anywhere, and you will find the most prosperous men are those who have groves. The value is there. Any man who owns a grove can go into a bank and get money immediately. A grove has an established value, notwithstanding freezes or anything else.

I have here the averages by one of the large selling agencies for a period of five years:

	Oranges	Grapefruit	Tangerines	Total Citrus
Five years F O B averages ----	\$ 1.483	\$ 1.831	\$ 2.052	\$ 1.597
Cost to produce -----	.50	.50	.50	.50
Cost to market -----	.625	.625	.825	.633
Total cost -----	1.125	1.125	1.325	1.133
Net profit per box -----	.358	.706	.727	.464
Average profit per acre on basis 160 boxes -----	57.28	112.96	116.32	74.24
Values per acre on basis 6 per cent on capital -----	954.66	1882.66	1938.66	1237.22
Loanable value at 25 per cent---	238.66	470.66	484.66	309.33

Mr. Hume: I am now going to call on Dr. Ross, president of the Florida Citrus Exchange, to continue the discussion.

Dr. Ross: The first thing I will say is, I am not going to talk to you long. Not that these things have not all been true, but I understand there must be a limit, and I am going to set the limit.

You observe the gentlemen who have spoken to you make very frequent and free allusions to freezes which have occurred in this state. That would seem to intimate to you that we are living under the shadow of a freeze all the time. Now, that is really the only element of a chance this part of the country has. It is really the only element of chance there is in the citrus industry of Florida.

I know that a good deal of consideration must be given to the moral element in a loan which is to run for thirty-six years. And yet I apprehend that the men who are going to succeed the present people who are engaged in this industry, will be of much the same caliber and mental timber as those who are engaged in it now and this element of uncertainty and danger is to be counted upon in every like undertaking.

Certainly this business has attracted to it, the bold, venturesome, daring people who mean progress; people who are willing and like to take a chance. These are the kind of people who do not often fall down, and when they do, they don't stay down.

Mr. Skinner read us some figures showing returns in fruit. We have tried to collect statistics recently by the acre in most of the citrus counties in the state and

base that upon the net returns to the grower. I do not know where Mr. Skinner got his figures, I am sure we did not get them from the same source, but the very best figures we have been able to get have indicated, and I am pretty sure I am representing no other marketing agency, but the best figures we have been able to get are that the net returns to the growers from twenty counties or more of the citrus parts of the state, and I would have you understand that we included a great many groves both well cared for and indifferent groves, many of them miles and miles from a packing house, where the overhead expense of carrying the fruit to a packing house is very heavy; after getting these returns together and making a most conservative tabulation over that entire area, the annual net return to the grower has been about \$95.00 per acre.

Now, I submit that is not a poor return, and that it will compare very favorably with agricultural returns in the most fertile parts of the north.

I have had experience farming in the north, and I know a corn crop is considered a very good crop if it brings a net return to the farmer of from \$15.00 to \$20.00 per acre. My son recently boasted of a crop of oats he had, and it was a very beautiful crop and oats are worth 35c a bushel, and I asked him what net profit he was making. We made an exhaustive calculation and found that oat crop netted him \$9.00 per acre.

We have tried to eliminate all the elements that should be subtracted from the Florida producer of citrus fruits. Mr. Skinner has given you a profit of about

\$60.00 per acre, while the figures I have collected and which might bear shading a little, although I assure you they are conscientious, are a little higher.

There is one other thing I should mention, merely for the purpose of calling your attention to it, and because in all probability we have all thought of it. The other day a man had a box of King oranges which he sent to New York, and someone paid \$18.00 for that box. At this season fruit is scarce and it brings high prices. A good quality of orange brings \$5.00 or \$6.00 per box.

I was looking at a map of the United States some time ago, a map two or three feet square, on which the areas producing various articles of food were shaded in different colors so that one could see at a glance the areas producing corn, cotton, wheat, cattle, etc. I looked to see where the citrus product area was, and I found a little spot away down here on this arm pointing into the south seas. Compared with the total area it was almost infinitesimal, about the size of my thumb. Of course, California is a citrus-producing area, but the citrus-producing parts of the country are comparatively small. If you were to take Florida and squeeze out all the land that will not produce citrus fruit successfully, you will have diminished the size of Florida by about three-fourths. There are thousands and thousands of acres of land in the peninsula where the orange tree should never be planted.

And this area where it can be grown cannot be extended. And the population of the entire country is increasing very rapidly and it is growing in wealth and

they will insist more and more on having citrus fruits, and the actual returns from these fruits are going to be so satisfactory that it will add to the intrinsic value of this land that it brings within the jurisdiction of the Farm Loan Bank.

Let me give you an example of the impression the stability of Florida securities has made upon close and careful and thorough financial investors, by alluding to the county in which I live. We don't manufacture anything in our county, not even an axe handle. We have no factories of any kind. The county is given over almost exclusively to the production of citrus fruits. It became necessary, we thought, to bond for good roads. The county did so, and at the first sale of bonds of that county, held a few months ago, a great many bond buyers investigated the security and bid upon those bonds and paid a large premium above par for a million and a half of bonds carrying 5 per cent interest.

We thought those roads would be a very great thing for the county, and we think so yet, and we are rather a restless village and want to have the best of everything if we can get it, and so we formed a local road and bridge district which embraces two townships, and we had a bond election and voted \$325,000 to pay for these rural roads running around our lakes. They will be useful and be a beautiful pleasure drive. With that little bond issue, in a county which was bonded for \$1,500,000, these bonds running for thirty years, bearing interest at 6 per cent, we sold them two weeks ago at a premium of \$10,075.00. That was a second mortgage, you might say.

In a county where there is practically nothing but citrus culture; the \$1,500,000 sold at a premium, and the second bond issue, or second mortgage you might call it, of \$325,000, sold at a premium of \$10,075.00. That proves that there must be some value to citrus lands.

I stated to you at Jacksonville at the hearing there, that I believed on a seven-year-old bearing grove, or older, it would be extremely conservative to put a valuation of \$300.00 per acre on it for purposes of loaning money. I base that valuation first of all upon the enormous profits which result from the business when the trees are not injured, and upon the limited area in the United States upon which citrus fruits can be raised.

I offered a man across the fence from me, \$11,000 for twenty-two acres of land, twelve acres in six-year-old bearing trees, the other ten acres not planted. We came very near trading but not quite. Now, if every tree on that place were killed tonight, I would be glad to give him \$300.00 an acre for the twenty-two acres, the trees killed to the ground, because I would think I was getting a bargain.

I want to allude to one more thing; that is, the people who live in Florida, the people who are supposed to know the actual value of real estate, have in the last few years taxed themselves to build \$14,000,000 worth of roads in this state. That must add to the productivity of this land, at least so far as net profits are concerned, because these roads will lessen the cost of hauling, it adds to the facility with which people can get their farm products to a market or shipping point.

These \$14,000,000 expended to the bet-

terment of the state, must increase the intrinsic value of the lands of the state, and I believe it will be perfectly safe for the Farm Loan Bank to act on the assumption that citrus grove properties are among the most profitable agricultural or horticultural businesses in the world. (Applause.)

Mr. Hume: When the district in which we are included under the Farm Loan Act was made up, the Bank was located in a South Carolina city, but they came to Florida for the president of the Bank.

I am now going to introduce to you, Mr. Von Engelkin, the president of the Farm Loan Bank at Columbia, South Carolina. (Applause.)

Mr. Von Engelkin: Mr. Chairman, ladies and gentlemen: If that is an invitation for a speech, it is going to meet with failure. I hope you are glad to see me now, and that you will be glad to see me a year or two from now. (Laughter.)

We have come down here for you to help us to arrive at a determination as to what shall be done in a matter in which you and we are vitally interested; that is, to determine a valuation that will be safe and secure. Naturally, this being my own state, it is a matter of the deepest concern to me, and you may, of course, rely upon me to do everything possible to meet the situation as fairly and amply as it is possible to do.

It was at my suggestion and invitation that Captain Smith of the Farm Loan Bank has come down here. We felt in Columbia we might need the counsel of our superior officers in this situation, and I hope before we leave we may get from you gentlemen your frank and honest

opinion as to what you think is the thing to be done. We will rely on that to a very large extent, and I know, being so well acquainted with the membership of this society, that we will get opinions from you which will not in any way be prejudiced or biased.

Mr. Hume: On our program appears the name of one of our members, Mr. Warner of Palatka. He had a very graceful way of getting out of this discussion this morning, but he is going to say just a word to us before we adjourn.

Mr. Warner: Mr. Chairman, Ladies and Gentlemen: We should congratulate ourselves very heartily in having the members of the Farm Loan Board who are here this morning, and officials of the Bank in Columbia, and it seems to me we have presented our case to them most happily and well. I do not think much can be added to it, except that these gentlemen see for themselves the condition of the orange groves in Florida, just at this time. It is a good time to form a very correct idea of the possible effect of cold on our groves. In some localities, the groves are still in good condition, while in others they are severely injured.

Of course, the amount of protection from cold will form a very decided basis for the value of those properties. We have done a little firing. Years ago we were much interested in the different methods of protection of grove property, but for the last few years we seem to have been quite willing to take chances, and if a freeze happened along to take the freeze.

But a few of us have persistently pre-

pared for a freeze in the belief it was sure to come, sooner or later.

I fired a part of my grove this year. We have a grove of about fifty acres on the St. Johns River facing the northwest and when the freezes come, the wind is about as strong as it can be anywhere. We have high board fences facing the northwest and these break the wind and cause an eddy behind them.

We use light wood for firing. We have fired about sixty hours in the last eight years at different times, two times particularly, and during this last freeze, Friday night and Saturday morning, we fired twenty-four hours. Our results were not exactly what we could have wished, but I am sure with the experience we had this time, another time they would be much more satisfactory and make the firing much more effective.

However, it is my conclusion we saved enough of the fruit and prospective crop for another year and in the better condition of the trees, to pay for the expense of building those fences, for all the upkeep and the interest on the investment, and yet have several thousand dollars to spare.

Mr. Skinner had a very interesting experience this year in firing, and I think it will be of decided interest to these gentlemen to know what the results of his firing have been. It will surely preserve the fruit and trees, if properly done.

Mr. Skinner, may we not hear from you about this?

Mr. Skinner: Well, you would not think there had been any freeze at all in my home grove, as I call it. The trees

there are about eight feet high at the entrance, and they have been loaded with oranges up to the present time, and suffered no damage whatever.

We fired with oil pots and wood. We fired, I suppose, about seventy-five fires to the acre. We fired, altogether, I should think, in the neighborhood of pretty nearly two hundred acres in three different groves, and you could tell where firing was not done right to the line, you might say, right to the rows of trees. In fact, the Florida Grower published a couple of weeks ago a photograph of a pineapple grove at Sutherland, Florida, where you really could tell to the row of trees where the firing took place. There was a ten-acre pineapple grove and ten acres of Tardiffs. The pineapple grove was fired adequately, and hardly a leaf was touched, and the fruit went to the market and averaged over \$5.00. The Tardiff grove, the trees lost a good many leaves, some wood and most of the fruit.

In the grove west of that there was no loss at all, the fires protected it absolutely, and the groves south of that, also scarcely any loss occurred.

At Dunedin where we fired, there was no loss at all. Where we did not fire, the

trees lost their leaves, most of them, they lost some wood and most of their fruit.

We feel that firing practically insures your grove and your crop. If you fire, there are no "ifs" and "ands" about it.

Wood is as good as anything you can use, if you can get it. But it may very frequently happen, when you need it the most, you can't get it.

The first man who fired in our neighborhood, fired in '94-'95. He had purchased his grove without any money whatever, had made his living up to this time, and had these large trees loaded with fruit. With this threatened loss staring him in the face, late in the afternoon he went out in the woods and hauled in lightwood and saved his crop. He started the idea of firing in our vicinity.

A little time ago, one of the speakers asked the question about what a man can do while he is waiting for his grove to come on. There are people in our community, who make their entire living off their places. There is a man in Largo, I think you can put him down on any forty acres in Florida and he can make a good living without any trouble whatever. And there are lots of others just like him. (Applause.)

Necrology

THOMAS E. ARNOLD

Thomas E. Arnold was born in Garrard County, Kentucky, February 19, 1860. On September 23, 1897 he was married to Miss Delta Heartick of DeLand, who survives him.

Most of his early life was spent in Richmond, Ky., where he was in business. Nearly twenty-five years ago Mr. and Mrs. Arnold moved to Florida to make their future home, and he engaged in citrus and truck growing.

On January 29, 1917, while on his way to the depot with an automobile full of oranges, a long freight train backed into Mr. Arnold's machine, demolishing the machine and crushing Mr. Arnold beneath the wreckage. Death resulted instantly, the immediate cause being a crushed chest.

Mr. Arnold was a member of the First Christian church at DeLand and for years identified with all good movements in his town and county. Liberal with his finances as well as with his time, he was always among the first to be called upon to assist in public enterprises.

He was the first manager of the Volusia Citrus Sub-Exchange and it was through his efforts that so much of the fruit of his section was secured. After getting the exchange firmly established, he refused re-election as manager, but acted as secretary until his death.

No man in Volusia County was held in higher esteem by all people than Thomas E. Arnold.

DR. W. H. CONIBEAR

Although he had not been a resident of long years nor a veteran member of the Society, we all owe much to the memory of another of our departed members in the person of the late Dr. W. H. Conibear.

He came to this state first in March, 1909, from Illinois being persuaded to come here by a real estate man who assured the doctor that the genial climate of Florida would cure a cough which bothered him constantly during the winter months in the cold north. He came and on that first trip purchased 80 acres near Fort Myers.

In December, 1911, he again came to the state and remained four months.

In August, 1912, he moved his family to his home at Lake Hollingsworth where he had a small 6-year-old grove and a 14-acre truck patch under irrigation. The doctor was a student of chemistry and biology and made many experiments in his own grove and garden the results of which he published in the Lakeland Telegram and the result of his studies induced a commercial fertilizer company to put a grinder (the first in the state) at their mines where they began turning out

a fine grade of ground phosphate. One of the last things we have seen that the doctor wrote stated:

"Agricultural and horticultural science is yet in its infancy, some are beginning to get a glimpse of its possibilities, especially if we study the working of the soil bacteria which God has undoubtedly made for a purpose.

"Heretofore chemists have had the stage and tried to make us believe that the acids produced by decaying vegetation were the solvents of earthy matter for plant food. Bacteriologists now know that this is not wholly so and some go so far as to dare to think there is none of it true but that the whole business is done by the bacteria of the soil.

"Yours truly,
"W. H. CONIBEAR, M. D."

MRS. GEORGE W. ADAMS

Another of our members to depart this life during the last year was Mrs. George W. Adams, born Elizabeth Conant. She died on March 6th, 1917, at her home at Lake Thonotosassa.

Mrs. Adams was the oldest lady member of the society, being 83 years old, and had been on the roll of the Society for twenty years.

She was born at Dudley, Mass., being a descendant of Roger Conant, one of the pioneers of that state. After her marriage to Mr. George Willard Adams she moved with her husband to Florida in 1877, where they were the first settlers to take up a homestead at Lake Thonotosassa.

In addition to her interest in the development of her home section, Mrs. Adams was deeply interested in religious matters,

being the founder and patron of the Union Mission at her home city.

LEMUEL HARRIS CUNLIFF

On August 8th, 1916, Lemuel Harris Cunliff, who had spent twenty winters with us passed away at his summer home in Norwich, Conn.

Mr. Cunliff was born in North Providence, R. I., on May 13th, 1838.

In early life he fitted himself for a draughtsman and mill engineer. He served in that capacity for the Franklin Mfg. Co. of Providence, R. I., and made the plans for the Oriental Mill.

In January, 1861, he married Abbie J. Cadwell, daughter of Henry M. Cadwell of Sutton, Mass. He left Providence to enter the employ of the Frank Skinner Company of Lewiston, Me., and made plans for the Androscoggin Mills, also re-organized and put in operation the Duck Mill at Rockport, Mass.

After a residence there of three years he went to Norwich, Conn., and made plans for the Ponemah Mills at Taftville, three miles from Norwich. From there he went to Manchang, Mass., and made and executed plans for a large cotton mill. Completing his work there after a residence of four years he went to Boston, Mass., and opened an office in the Rialto Building as a mill engineer. He afterwards was engaged by the A. T. Stewart Co., of N. Y., which position he held for five years when he was appointed agent and general manager of the A. T. Stewart estate at Garden City, L. I., resigning the position after fifteen years of service. He was well known among the industrial leaders of New England.

He retired from active service in 1896 spending summers in New England and winters in Florida. Was prominent in Masonic circles being a K. T. in the order.

Was a staunch Republican and director and vice-president of the Aspinook Company of Jewett City, Conn.

MAHLON GORE

On June 26th, 1916, there passed away at Orlando one of our members whose loss will ever be deeply felt. I refer to the late Mahlon Gore.

Born in Michigan in 1837, he was injured from birth to the joys and hardships of pioneering. It is stated that he was the first American citizen to homestead under the Andrew Johnson law. He moved from Michigan to Yankton, Dakota, and in the year 1864, having lost his entire crop through the grasshopper devastation was anxious for something else than farming as an outlet for his energies. At that time he learned that the Sioux City Journal was for sale and went to Iowa where he concluded arrangements for the editorial management of the paper. In a year or so he bought it and became a prominent figure in the ranks of the Republican editors of the Middle West.

In May, 1869, he sold the paper to the late Geo. D. Perkins. Subsequently, from 1880 to 1884 he lived in Colorado, coming to Florida in the latter year.

Florida at that time had not even promised to become a state of world-wide prominence in any of its present developments. It was practically a wilderness when Mr. Gore arrived here.

But the pioneer spirit was in his blood and he ached with the spirit of hoped-for

achievement. For thirty-five years he labored with his tongue, with his pen, with the utmost of his magnetic personality to make known to the rest of the world the glories of the land he had chosen as his permanent home.

Those who knew him have, to a man, stated that he had a way of reaching any man's heart at once. The hearty hand clasp, the genial smile, the logical enthusiasm with which he presented any proposition, won him friends and admirers on every side. For several years he edited a paper at what is now Orlando, but turned it over to other capable hands, realizing that the real estate business was a better field for him and that he could do more real good to those who desired to make Florida their home, in that calling.

The beauty and the development of that section of the country will ever be a monument to his memory. He mastered all the things that a Floridian should know. He studied nature both in the raw and from the text book and laboratory, and could advise any of his friends and neighbors as to just what to do and when to do it in any of the problems that worried them as citrus growers or truckers. And like all big men he was glad to see others succeed when their success meant increased prosperity for Florida. In the words of his widow which I take the liberty of quoting: "Mr. Gore loved Florida and everything that was done for its benefit. I was rather happy that he did not live to see the disaster which the freeze of February 2nd brought to the State."

May the example he set cause others to follow his footsteps.

C. M. GRIFFING

Mr. Griffing died at his home in Jacksonville on September 23, 1916. He would have been forty-five years old on the 10th of October. Born in New York, Mr. Griffing removed to Florida while yet a young boy. It was necessary for him to make his own way in the world, and he was not long in establishing the reputation for industry and application that was characteristic of his whole life.

Before he had been in the State very long, Mr. Griffing secured a position with a nursery concern. After a few years he started in this business, with one or more of his brothers, under the firm name of Griffing Brothers. From a very modest beginning, the big establishment at Macclenny developed, and was later supplemented by plants at Grand Bay, Alabama; Fort Arthur and McAllen, Texas; and two or three branches at Florida points.

Just at the time that the long years of hard work on the part of himself and brothers seemed to have had such results as to assure the future of the great business that they had built up, citrus canker was introduced into their nurseries. The story of the unfortunate outcome of this matter is too fresh in the minds of Florida to need recital. There were many angles to the situation, in some of which his friends felt that C. M. Griffing was much misunderstood and unjustly blamed. Bravely he set about to rebuild his shattered fortunes, and was

well on the way to another success when death claimed him.

To all of those who knew him intimately the death of Mr. Griffing came as a severe shock. His clean life, progressive spirit and determined character had greatly endeared him to a wide circle of acquaintances. His association with the Florida State Horticultural Society and service to it is a matter of record, which shows that he was faithful to all the trusts reposed in him by the organization.

EDWARD K. HARRIS

Edward K. Harris, son of James Harris, merchant and banker of Boston, was born in that city in 1835. He was educated at the Norwich Military Academy in Vermont and later at the famous University of Heidelberg in Germany. He spent the earlier part of his life in travel both in the United States and in Europe. He lived for many years in Germany and in France, where he became thoroughly familiar with the life and language of both countries. During the war of 1870 he carried dispatches between London and Paris, saw the entrance of the Prussian army into Paris, and witnessed many stirring scenes of the Commune there.

When Mr. Harris returned to settle definitely in his own country, he became keenly interested in agriculture, and he bought an island in Penobscot Bay on the Maine coast and an orange grove on the St. Johns river in Florida, where he experimented in farming during the summer and in orange growing during the winter. Observations made during his travels gave him many ideas on the subject which he had an opportunity to put

into practice. He demonstrated the possibilities of farming on the coast of Maine, and introduced modern farm machinery into that part of the country. He developed his island to a remarkable extent. He superintended the draining of swampy lands, the leveling and cultivating of stony fields, the clearing out of woods, and the planting of hard wood trees to take the place of the short-leaved spruce which grow almost exclusively on the Maine islands. He was the pioneer farmer among the summer residents of that region, and those who followed him in this work profited by his experiences.

During the last twenty years of his life he took an active interest in orange culture. His grove, which was known as "Una Grove," produced besides oranges, grapefruit, lemons, and tangerines of excellent quality. He was an enthusiastic admirer of Florida, and believed firmly in its possibilities. When he died in Washington in 1913, he was on his way to Florida.

MRS. FLORENCE E. INMAN

Mrs. Florence E. Inman of Florence Villa, Fla., one of the faithful members and friends of the Florida State Horticultural Society, died September 10, 1916, at her summer home in Chautauqua, after a short illness.

Mrs. Inman was closely associated always in interest and work with all the activities of her husband, Dr. F. W. Inman, and in every way that a devoted wife can, she furthered his work in developing the section of Polk County, in which they lived. Dr. Inman's appreciation of her work is shown to some ex-

tent by the fact that he named the hotel which grew out of their home, "The Florence Villa," in her honor, and the region itself bears the same name. The sub-exchange in that section is called "The Florence Citrus Growers Association," and her name is also used to distinguish the best brand of citrus fruit, the "Florence" brand.

Mrs. Inman was universally beloved by all who knew her, and her loss is deeply mourned by a large inner circle of friends, and by the whole region which she stood ready to help and befriend.

She was always interested as was Dr. Inman, in the work of the State Horticultural Society, and made a point of attending its meetings whenever it was possible for her to do so. Her name is honored by all who knew her personally, and should be honored by all who know of her noble life and work.

WILLIAM CHASE TEMPLE

By His Friend, Edgar A. Wright

Was there a man or woman in Florida who had ever known him who but realized that when William Chase Temple died, a great man had passed away, one whose place can never quite be filled, a man of intelligence and heart and big brain. Many with me bowed their heads in sorrow when the news came and regretted that it was so.

It was my good fortune to be somewhat closely associated with Mr. Temple for over two years and those two years were an inspiration for me, for I believe that every man with whom he came in contact could not fail to be inspired by his sharp intellect, keen judgment and ready wit.

Mr. Temple was born in this state at Starke in 1862 so that he was a comparatively young man of 55 when he died. His early youth was spent largely in grove or lumber camp and before he was 21 he was in full charge of a grove for a prominent grower of that time. However, the call of the world was loud, and to a man of his vision, appealing, and so in 1884 we see him going north to seek his fortune. We are all inclined to look at Mr. Temple as a very wealthy man but this was not *always* true as he has told me that there were times when the scratching was very hard and that he hardly knew where the next meal was coming from. I think it needless to recite his biography, to tell how he finally succeeded and became a great factor in the steel business, and associate of Carnegie and Mr. Frick and a trusted advisor. It is my understanding that when the great steel trust was formed Mr. Temple sold out his holdings for a substantial sum and came back to his beloved Florida, not, however, without trying California and other places but never finding one as dear to him as his own native state. We all know more or less of his connection with the citrus industry and the formation of the Florida Citrus Exchange, of which he was manager from June, 1910, to May, 1912. We can remember his strenuous work for the affiliated growers, of his strong fight against the shipment of green fruit and how he made bitter enemies by his vigorous work. Whether or not Mr. Temple's policy was right we all concede that he was fighting for what he believed to be right and doing his best for the industry as a whole as he saw the light.

Mr. Temple was almost a life-long member of this society, believing in its work and being a consistent attendant, and it is fitting that we, assembled here, should pay tribute to him and his memory and I am glad indeed that the constructing of this testimonial should have fallen to me, the one who appreciated his goodness and loved him well. He was the best friend I ever had outside of my own family and to his wisdom and forethought do I owe not a little of the worldly gain I am possessed of today.

Were a star quenched on high,
For ages would its light
Still downward through the sky
Shine on our mortal sight;
So when a great man dies
And fades beyond our ken,
The light he leaves behind him lies
Upon the paths of men.

I could tell many a tale of Mr. Temple's kindness and generosity, to others and to myself, but he was not one to brag of such deeds, and I shall not for him, but I am sure that the recording angel has a shining page made up for him to counterbalance any lack of piety, for Mr. Temple was not a religious man.

It was my melancholy duty to attend the funeral of my old friend, and as I looked upon that strong face for the last time the thought came to me of one of his sayings, "that every successful business is a monument to some one man," and I realized that here had been a master of men indeed, one that had made a splendid success in every line he had ever undertaken, and then I looked over the sorrow-

ing family, realizing how they would miss his kindly banter and words of wisdom. His friends and neighbors were all there, and many were the kindly words I heard spoken of his lovable character and his kindly charity.

I am told that he realized that he could not live long and that he was fully reconciled but the end came very suddenly and without warning, and his wonderful brain, worth far more than any millions he may leave behind him, was stilled forever.

The world needs the man who says: "I can"—

Not the man who says "I might."
There are things to do, and it's up to you
To do 'em and do 'em right.
The big prize goes to the man who knows
And really knows he knows—
It's a long hard run
But when all is done,
It's the record of deeds that shows.

There is another verse that I like to couple with the name of William Chase Temple:

Somebody said that it couldn't be done
But he with a smile replied
That maybe it couldn't but as for him,
He'd never be sure till he'd tried.

His last trial is over. May he rest in peace is the wish of one friend who loved him.

DR. GEORGE KERR

Doctor George Kerr, who passed away at his summer residence, Lavallette, New Jersey, Aug. 12, 1915, was born near Mc-

Connellsburg, Bedford County, Penna., Jan. 9, 1841.

Dr. Kerr attended for a time Elk Ridge public school in East Nottingham. Took a three-years course at New London Academy, graduating as valedictorian of his class in 1860.

In 1862 he graduated from Eastman's State and National Business College located in Poughkeepsie, New York. In 1864 graduated in medicine from the University of Pennsylvania. Received his Ph.D. in 1872 from the same university.

Soon after Dr. Kerr's graduation in 1864 he was appointed assistant surgeon in the U. S. army. After the war he practiced his profession in Newburg, N. Y., Omaha, Nebraska, and Philadelphia, Pa.

Dr. Kerr was the founder of Lavallette, a seaside resort on the New Jersey coast. It was fitting that he should end his days in the place over which he had spent so much thought and energy. However, wherever he was located the profession of healing was his main thought.

On February 1, 1893, Dr. Kerr married Miss Caroline L. Trout of Philadelphia, who survives him.

For the past twenty-two years Doctor and Mrs. Kerr have spent the winters in Florida occupying their Lavallette cottage in the summer. I do not know what year he joined the State Horticultural Society and what year he became vice-president.

His parents, John A. Kerr, born in Gettysburg, Pa., and Eliza Jane Hutchinson Kerr, daughter of James Hutchinson, Esq., East Nottingham Township, Chester County, Pa.

Annual Reports

REPORT OF AUDITING COMMITTEE

West Palm Beach, Fla., April 19, 1917.

The Auditing Committee, as appointed,
has examined the books of the Secretary

and the Treasurer and find them accurate
and correct in all particulars.

B. C. SKINNER,
W. L. FLOYD.

REPORT OF SECRETARY

Credit	
Receipts from April 29, 1916, to April 13, 1917.	
April 27—	
Monies taken after auditing last report	\$222.00
June 1—	
E. O. Painter Estate, gift	100.00
Back reports sold	16.00
Seven Life Memberships	70.00
1917 Memberships	372.00
1916 Memberships	78.00
Postage	.10
June 12—	
Received from Treas. Hart for Stenographer	79.00
Total	\$937.10

Dr.	
No good checks	\$ 1.00
Postage	64.71
Printing	98.83
Stationery	2.94
Secretary's Salary	100.00
Stenographer	79.00
To Treasurer Hart	590.62
Total	\$937.10
Membership Roll at Beginning of Meeting	372
Members Enrolled During Meeting	123
Honorary Members	4
Life Members	118
Total Membership Enrolled	617
Members in Attendance	255

REPORT OF TREASURER

1916—	
April 30—To Balance on hand	\$450.91
May 14—To Secretary Williams	295.00
May 14—To Contributed	.43
June 30—To Interest from Savings Bank	3.83
Sept. 30—To Interest from Savings Bank	6.50
1917—	
April 2—To T. D. Drake's Membership	1.00
April 2—To Interest from 1915-16	6.33
April 18—To Secretary Williams	295.62
	\$1059.62

Cr.	
1916—	
June 10—By Stenographer's Bill	\$ 79.00
Oct. 9—By E. O. Painter Printing Co.	401.24
1917—	
April 18—By Balance in Treasury	579.38
	\$1,059.62

FLORIDA STATE HORTICULTURAL SOCIETY

REPORT OF EXECUTIVE COMMITTEE

At a meeting of the Executive Committee held immediately following the close of our 1916 meeting the Secretary was instructed to have 1,000 reports printed.

At a meeting of this same committee

held February 21 the date of our 1917 meeting was set for April 17 to 20, inclusive. The preparation of the program was left in the hands of Chairman Rolfs and President Hume.

ELECTION OF OFFICERS

On Thursday evening, April 19, 1917, the following officers were elected for the year January 1, 1918, to December 31, 1918:

President—H. Harold Hume.

Vice-Presidents—L. B. Skinner, W. J. Krome and S. F. Poole.

Secretary—Bayard F. Floyd.

Treasurer—W. S. Hart.

Executive Committee—Prof. P. H. Rolfs, E. S. Hubbard and Lloyd S. Tenny.

SELECTION OF PLACE OF NEXT MEETING

Invitations for the next meeting were received from Fort Myers and Orlando. Ballots were cast and by a vote of 83 to

50 it was decided to hold our next meeting, of 1918, in Fort Myers.

Resolutions

Resolved, That the Committee on Resolutions heartily commend the President's address as being timely and of unusual importance. We recommend that every member of the Florida State Horticultural Society make his utmost endeavor to plant every acre of land to feed or forage crops, so far as it is in his power to do so.

We further urge that every member of the Horticultural Society use his fullest endeavor to influence as many people as possible to plant food and forage crops as a patriotic duty.

Resolved, That the Horticultural Society urge that as much publicity as possible be given to the President's patriotic and timely address.

Final Resolutions

We, your Committee on Final Resolutions, do hereby recommend the following resolutions for the consideration of the Thirtieth Annual Meeting of the Florida State Horticultural Society:

That the Society express its sincere appreciation of the generous hospitality which has been extended to its members by the citizens of West Palm Beach. We desire to mention especially the Board of Trade and Woman's Club who planned the delightful outing with its opportunities to see the beauties of this semi-tropical region, and the enjoyable reception in Palm Park.

We desire further to thank Mr. Biggers, the genial and energetic Secretary of the Board of Trade, for his earnest and successful efforts in providing ample and satisfactory entertainment for the Society during its visit here.

We desire to express appreciation to the members of the Musical Club, the high school girls and their instructor, Miss Rowe; Messrs. Furgeson and Baker, Mrs. Gable, Miss Palmer, Miss Kubn,

Mrs. Stearns and Miss Farrow for the delightful music contributed to our program.

We wish to thank Mr. T. L. Mead for the beautiful flowers used in decorating the assembly hall, and Mrs. Cragin for throwing open for our inspection her estate, which we found to be truly a "Garden of Eden."

To the railroads of Florida for special rates extended and for their co-operation we desire to express our thanks.

For the able papers and addresses contributed by various members of the Society and those presented by others interested in the advancement of horticulture we are indebted.

Lastly the Society wishes to express recognition of the efficient services of its Executive Committee and officers, especially the President who for the past nine years has so ably guided its destinies.

W. L. FLOYD,
P. R. ROBINSON,
R. L. GOODWIN.

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