Applying 2-AMP to wrapping tissues seems to be a promising method of application, especially since it does not bring about an attachment of the fungicide in a solid state to the fruit. Although 2-AMP has an odor, its presence on fruit could not be detected by smelling, nor did it affect the flavor or appearance of the juice of treated fruit.

SUMMARY

A 5 percent solution of 2-amino-pyridine (2-AMP) in water or in wax emulsion, applied to oranges after a 50 to 60-hour exposure to ethylene gas, gave very good to excellent control of decay in Florida oranges.

Plain wrapping tissue impregnated with 2-amino-pyridine was effective in checking decay in seedling and Valencia oranges.

Because of the relative absence of Penicillium rot during the period when the principal tests were made, the evidence of effectiveness against that fungus is not so striking as against the stem-end rot fungi.

Limited evidence based on inoculations indicates that weak concentrations of 2-AMP may not be quite so effective as sodium ortho-phenyl-phenate against green mold for a short period. 2-AMP did not affect the flavor or appearance of the juice of treated oranges.

The feasibility of commercial use of 2-AMP on citrus fruits, from the standpoint of possible toxic effects on consumers, has not as yet been determined.

PREVENTION OF ENTRANCE OF INSECT PESTS AND DISEASES FROM FOREIGN COUNTRIES

ARTHUR C. BROWN
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Gainesville

It is unfortunate indeed that the speaker scheduled for this period, Mr. Arthur G. Watson, Assistant Collector of Customs, Tampa, Florida, is not able to be here and present a picture of foreign plant quarantine as viewed by one not primarily engaged in plant quarantine enforcement.

The activities of Customs and plant quarantine enforcement inspectors are closely related. The former are responsible for the regulation of entry of foreign commodities, largely from a revenue angle, while the latter are responsible for regulation of entry of plants and plant products to protect the agricultural interests of the United States from economic losses, sometimes of serious proportions, likely to follow entry of affected plants, fruits, etc., from foreign countries. As a matter of fact, rigid enforcement of Customs regulations would deny plant quarantine inspectors the right to board any newly arrived air-or water-craft, or even inspect plants until after Customs had completed entry of the craft and officially disposed of its cargo. It is apparent that a procedure of this nature would seriously interfere with the efficient application of plant quarantine regulations.

Mr. Watson, a grove owner himself, has been intensely interested in foreign plant quarantine enforcement since the inception of this branch of the Plant Board's activities in 1916 and has done everything within his authority to provide for the closest cooperation of Customs inspectors. This has resulted in a situation whereby the number of plant quarantine inspectors at Florida ports of entry totals not the number of Plant Board employees assigned any particular port, but the combined number of Plant

Board and Customs inspectors at that place. This happy combination of effort has been the envy of other state and federal plant quarantine officials.

The 1947 Legislature provided the funds requested by the Plant Board for operations during the biennium 1947-49. It is believed that the Board's Nursery and Quarantine Departments are operating effectively. This is true of the Grove Inspection Department in so far as the present personnel is concerned. However, it has been most difficult to find a sufficient number of qualified individuals to fill all of the positions provided for in the Grove Inspection budget. If any of you know of anyone familiar with insects and diseases and their control and well informed as to citrus culture who may be interested in obtaining employment with the Board's Grove Inspection Department, please refer him to the Plant Commissioner at Gainesville.

You are all interested in the possibility of entry of destructive citrus pests, particularly from foreign countries. Federal plant quarantines prohibit entry of citrus trees, budwood, etc., from foreign countries. Citrus fruits are prohibited from most foreign countries. The Board's regulations prohibit entry of all citrus trees, budwood, etc., from other states in the Union. Lemons only are permitted entry—after treatment designed to eliminate risk of entry of brown rot—from California and treated lemons and oranges are permitted from Arizona. All citrus fruits from other states are denied entry into Florida.

It is easy to promulgate regulations seeking to prohibit entry of certain commodities; it is far more difficult to enforce such regulations, particularly domestic quarantines. I do not believe that any of you will be surprised when it is stated that the tremendous development of motor vehicle transporation has made enforcement of domestic plant quarantines, except in well planned and administered eradication projects, almost impossible. Therefore, so long as there persists in any part of the United States any major insect or disease affecting citrus the citrus industry of Florida is in jeopardy.

All of you know that as a result of state-federal eradication activities official announcement was made about fifteen years ago of the eradication of citrus canker from Florida, Alabama, and Mississippi. Similar announcement has never been made with respect to eradication in Louisiana and Texas, where federal-state eradication campaigns were in effect about 1944. At that time lack of appropriations made necessary discontinuance of the federal participation. Louisiana and Texas officials have, to the best of their ability, continued the project. The situation in the two states at the time federal aid was discontinued was essentially as follows:

Citrus canker infected trifoliata trees had been found in the old Satsuma area in the vicinity of Galveston and Houston, Texas, in 1943, and in one planting located south of New Orleans, Louisiana, in 1940. (No citrus canker has been reported from the Rio Grande Valley since 1917.)

The Texas Legislature in 1947 appropriated $40,000 for completion of citrus canker eradication in that state. Although the Bureau of Entomology and Plant Quarantine has not been able to obtain Congressional appropriations for canker eradication, Bureau officials have been able to allot some $15,000 from other sources and cooperative eradication activities are again under way in Texas, but not in Louisiana.

Another development of which you should be informed is the rapid movement northward through Mexico of the spiny citrus whitefly, or blackfly (*Aleurocanthus woglumi* Ashby), a pest that has demonstrated its destructive nature in Cuba and the Bahamas, where citrus trees were either killed or severely injured. The infestation in Mexico has aroused the apprehension of citrus growers in Texas, Arizona, and California, who fear that unless the northward spread is checked blackfly will invade these states. The California Department of Agriculture has made arrangements with officials of the

Mexican government whereby California entomologists will go into the infected areas in Mexico and attempt to bring blackfly under control.

This insect is now effectively controlled in Cuba and the Bahamas by parasites and predators introduced from India by our federal Department of Agriculture. (Incidentally, your State Plant Board was largely responsible for interesting authorities in introducing these natural enemies.) We are informed that attempts to introduce parasites into Mexico have not been successful. We are not informed as to whether this attempt was made by specialists of the United States Department of Agriculture or by growers in Mexico. It is imperative that a determined attempt to control blackfly in Mexico be made before it spreads into the southwestern states. Once established there, it is bound to spread eastward and eventually into Florida.

You will be interested also in contemplated changes in the manner of inspection of passengers and baggage from foreign countries now being considered by the Bureau of Entomology and Plant Quarantine, the federal agency responsible for enforcement of foreign plant quarantines. Arrangements have already been made for the inspection at Honolulu of passengers and baggage from the Orient, New Zealand, and Australia, en route to the continental United States via Honolulu. Following the inspection at Honolulu, passengers will be allowed, after arrival on the mainland, to proceed to their destinations without further inspections. Now under consideration is the inspection at San Juan, Puerto Rico, of passengers and baggage destined for the United States, and similar inspection at Mexico City, Mexico, of passengers entering the United States through that country.

The thought behind this inspection at foreign points instead of at ports of entry is an excellent one. Such inspection, together with confiscation of contraband or pest-ridden plants or fruits, should prevent the entry of such material into this country. But there may be some question as to the wisdom of assigning to individuals located a thousand or more miles away the important task of protecting Florida's agricultural and horticultural interests from invasion by alien plant pests. Such inspection must be performed by federal inspectors. These federal inspectors will be charged with the responsibility of protecting the entire United States, and not one particular state or section. Their procedure must of necessity be a uniform one. Unfortunately, because of the wide diversity of climate and flora in the United States, uniformity of inspection of commodities moving into this country is not practical. It is for this reason that the State Plant Board has supplied funds and personnel for practically all foreign plant quarantine enforcement in Florida since 1916. Your Plant Board has protested against the substitution of inspection at San Juan, Puerto Rico, for inspection at the ports of Florida, and has requested federal authorities to consult with the Board and growers in Florida before making effective any change in the current inspection practices.

It is my suggestion that the Florida State Horticultural Society give thought to the desirability of adopting resolutions addressed to the appropriate federal authorities on the following subjects:

1. Need for federal appropriation to carry on state-federal citrus canker eradication activities in Louisiana and Texas until such time as officials feel justified in making announcement that the disease has been eradicated from those two states.
2. Need for federal cooperation with Mexican authorities in the control or eradication of blackfly in Mexico.
3. The need for conferences between the State Plant Board and growers'

organizations in Florida on one hand, and officials of the Bureau of Entomology and Plant Quarantine, United States Department of Agriculture on the other, before any change is made in the present manner of inspecting passengers and baggage from Puerto Rico.

GRASSHOPPER CONTROL IN CITRUS GROVES IN FLORIDA

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In May, 1947, grasshoppers of the species *Schistocerca americana* (Drury) were reported as doing damage in citrus groves in southeastern Hillsborough County. Since this grasshopper was formerly thought to cause damage only in the fall of the year, the situation was regarded as abnormal and potentially serious. A survey indicated that grasshoppers were abundant over a fairly wide area and that some control measures would be necessary. The following is an account of the 1947 infestation and a review of the control program proposed for this pest.

In the fall of 1946, heavier than normal populations of grasshoppers were present in western Polk and southeastern Hillsborough Counties. Benzene hexachloride was used as a dust (0.6% gamma isomer) and as a spray at the rate of 2 to 3 pounds of wettable powder (6% gamma isomer) per 100 gallons of spray. This proved to be an effective control measure. In January and again in March of 1947 casual observations were made and it was noted that adult grasshoppers were in the fields. It is not known at present whether these represented relatively newly emerged adults or whether they were left from the fall generation. The fall of 1946 was abnormally warm and it is suggested here that there may have been at least a partial or possibly a complete extra generation in the fall. In any case it appears that the warm fall and winter offered favorable overwintering habitats and this was a major factor in the abnormal increase in grasshopper numbers in 1947.

There was a heavy hatch of grasshoppers about May 1, 1947. The last of May showed a population which was generally about 1/3 to 1/2 grown. By late June a few of these individuals had grown wings and were present as adults. Adults continued to mature and in late July most of the grasshopper population was in the adult stage. There was some oviposition in late July and eggs began to hatch shortly after August 1. Through the cooperation of the Bureau of Entomology and Plant Quarantine, Mr. Andrew Frazier came into the state in July and he was able to make a thorough survey of the infestations. He found the grasshoppers mainly in the area south of Plant City in Hillsborough County,, both north and south of Lakeland in Polk County. and in scattered places from Bartow to Wachula in Polk and Hardee Counties. There were occasional infestations on the east coast, but they were of minor importance. In the central part of the state, it appeared that grasshopper infestations were associated with areas where crab grass was the predominant type of cover crop and where groves were adjacent to old vegetable fields. Groves had become infested both from adja-

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