

CITRUS FRUIT CULTURE IN CUBA

BY I. A. WRIGHT

DURING the first week in February, 1910, the Cuban National Horticultural society, an organization the membership of which is almost exclusively American and Canadian, held its fourth annual meeting in Havana. In connection, a horticultural show was open; among the exhibits were citrus fruits from every section of the island. The fruits were large, juicy, clean, thin-skinned, heavy, beautifully colored and delicious in flavor. Florida had sent across grape fruit and oranges from famous orchards of the peninsular state, to facilitate invidious comparison, and the comparison, when made, showed that Cuba can produce citrus fruit of first-class quality, and, moreover, that she is doing so.

Citrus-fruit culture is the principal interest of American and Canadian settlers throughout Cuba. Cubans and Spaniards are growers of no citrus fruits save pineapples—the grape fruit and orange groves belong to the English-speaking colonists. Orange and grape fruit culture is the business which has been boomed mercilessly by land companies advertising largely and sometimes unscrupulously all through the United States and in Canada during the past ten years. Their customers, arriving in Cuba, have insisted upon growing nothing but grape fruit and oranges, even in regions where other crops would assuredly have proven more immediately profitable if not the better investment in the long run.

For instance, there are Americans and Canadians growing citrus fruits in the heart of Vuelta Abajo and in other parts of Pinar del Rio province on lands that might be made to produce tobacco of the qualities which have made western Cuba famous the world around for this one crop, were the owners willing to co-operate with Cubans on the partidario system, according to which the newcomer furnishes the requisite capital and the native furnishes the skill no less necessary to success in the delicate undertaking. It is a notable fact that few Americans or Canadians who themselves do the actual work in their to-



VIEW OF HAVANA AND WATER FRONT



TYPICAL "COLONY HOUSE" OF CITRUS FRUIT GROWERS



CITRUS FRUIT ESTATE, ISLE OF PINES



GROVE OF YOUNG LEMON TREES

bacco fields have found this crop profitable. There are "tricks in the trade" of which Cubans are masters, especially those persons whose families have for generations out of mind engaged in tobacco culture entirely. They seem to be possessed of an intuition which enables them to handle the seedling, the plant and the leaf, when germinating, when maturing, and especially when curing, in a manner to insure a better outcome than any foreigner is likely to compass. To grow the very best tobacco requires capital. The venture is a gamble, the result of which, however, is known in a single season. If the planter wins, he probably rakes in "big money." If he loses, at least it takes him only months, not years, to find it out.

In the Isle of Pines, which was formerly a cattle and hog country, producing especially valuable draft oxen for sale in Cuba proper, American citrus-fruit growers consume large quantities of canned condensed milk, at high prices, as well as large amounts of canned meats and vegetables, despite the fact that some good pasturage exists. While still more could doubtless be planted, and the further fact that fine vegetables in remarkably large variety can be grown along the river banks, or, really, almost anywhere else where irrigation is possible. They also import hay and feed at ridiculous cost. All this into a region where corn at least can be grown and large herds used to "fend" themselves.

In central, but most particularly in eastern Cuba, Americans and Canadians are developing groves in lands admirably adapted to sugar cane, which is a quick, certain and profitable crop, sold either in the field, or cut and delivered wherever there is a mill near enough to buy up the cane. They are growing their trees on sites natives would assuredly prefer for coffee and cacao, or, more wisely, for the numerous indigenous crops (names, boniatos, etc.) for which there is constant and remunerative demand.

American and Canadian settlers in Cuba, including the Isle of Pines, are citrus-fruit mad. In Pinar del Rio, in the Isle of Pines and in central and eastern Cuba there is, nevertheless, in their madness so much method, plus grit and utter inability to realize the odds they are "up against," that it seems to be very probable they will succeed regardless. Money, time and hardship are to them no object at all.

Pinar del Rio is a province possessed of most fertile lands in certain districts. There are among the foothills and in the "organos" themselves rich valleys; unfortunately, some of the choicest are as yet almost inaccessible. There is good land always along the streams, and arable areas are to be found, here and there, everywhere. Also here and there and everywhere

is here, however, with proper fertilization and care, that growers are developing orange and grape-fruit groves.

These lands will produce the trees, if food to support them is supplied in the shape of fertilizer, and the trees will bear citrus fruit of the very best quality—bright colored, weighty, full of juice, inclosed in smooth, thin rind. No fair-minded person can longer doubt that they will do so after seeing fruit of the quality which growers located at Taco Taco exhibited at the latest horticultural show in Havana. These gentlemen had, however, the money to keep their trees properly nourished. Many others who have failed to succeed as they are succeeding owe that failure to the fact that they did not have the money to do so much for their groves.

Some land companies doing business in western Cuba deny overtly or by implication that fertilization is necessary, but no prospective owner of a citrus-fruit grove in western Cuba can afford not to include in his estimate of expenses the cost of fertilizing early and often in amounts properly augmented as years pass. Fertilizers in general use in the groves of the region mentioned cost, on a fair average, about \$45 a ton.

This is the situation in the Isle of Pines, as well as in the western and central mainland of Cuba. "The soils are all poor in plant food compared with the average soils in the United States, and the gravel ridges are especially so," states Mr. H. C. Henriksen, secretary of the Cuban National Horticultural society, referring particularly to the Isle of Pines. "but I have never seen the effect of good fertilizers so sharply outlined as in these very soils, and from experience in Florida and Porto Rico I would predict an abundant crop of fruit of superior quality wherever the groves are properly treated."

The vital question in these regions is, then, whether the owner is able to afford proper treatment. He will, save in exceptional cases, where the soil is too "American" for any use whatsoever, get his crop provided he has the money to supply enough fertilizer.

For there are richer lands in Cuba than those on which Americans and Canadians are developing their groves in western Cuba and the Isle of Pines.

Along the Cauto river, to mention but one locality, there are exceedingly deep, fertile, virgin soils which need no fertilizer to produce citrus fruit groves. Such lands must, at the very commencement, be cleared, at some expense, of the thick woods that cover them, and groves, once planted, must at all costs be kept fairly free of weeds. Secondary crops—corn, for instance—may be grown between rows without detriment to the trees; in fact, it would seem wiser to do

so than otherwise, for, exactly the opposite of the case in the west, these far eastern lands need to be reduced.

They are almost too rich, and the fruit of trees they produce, particularly young trees, is apt to be coarse-skinned, too big, and pithy. These defects, nevertheless, time remedies, for as groves age they lessen the supply of plant food. Eventually it will become necessary to fertilize the trees, and then growers, by selecting their fertilizer, can control the quality of their fruit.

They have, meanwhile, acquired their grove without the expense for fertilizer the grower in the west has been put in order to produce his. He, on the other hand, has been to less expense than the man in the east in the matter of clearing, and he has not had to sit up nights weeding to keep his grove from disappearing under a tangle of tropical vegetation.

The obvious conclusion, is therefore, that six is one-half dozen. Groves in both eastern and western Cuba will produce trees and good fruit, but neither will do so for any owner not willing to pay the price under one head or another in cash and also in hard work.

It is conservatively estimated that no man should undertake even a five-acre grove anywhere in Cuba unless he has at least \$5,000 where he can lay his hands on it. If he is a lively, capable man he will probably not need that amount of money, but no matter what his ability he should be able to command at least that sum before embarking in the citrus fruit business here. He may need it all, and more.

While no complete statistics are available, it is the writer's impression that in western Cuba, including the Isle of Pines, the acreage of oranges is more than that of grape fruit, while in the east it would seem that the grape-fruit acreage is the larger. The older groves seem, usually, to be orange groves; the younger the grove the larger the proportion of grape fruit in it.

Problems of transportation to market demand careful study from all growers, prospective or established. Groves situated at a distance from railway lines are handicapped at the start, for, although there are many good roads in Pinar del Rio province, and all over the Isle of Pines, every foot of haul counts, and where the roads are not excellent, it counts heavily, most especially in wet weather.

Americans and Canadians have plunged headforemost into citrus-fruit culture in Cuba. They are building up against odds, by their indomitable courage and optimism, an industry into which preceding owners of the lands they hold did not venture. The Spaniards and Cubans did not so venture may have been because they were blind to the possibilities, lacked specific knowledge, or the energy required; or possibly they were outmatched by adverse conditions in past decades. Then again, it may be they were deterred not by these things at all, but by a true understanding of basic conditions here; by a realization of difficulties in the way of competing, not to say controlling, in the markets where the citrus fruit of Cuba must be sold; and, especially, by a keen appreciation of more profit to be made more quickly and inexpensively elsewhere. In fine, they may have been governed by caution, which does not notably distinguish the Anglo-Saxon when engaged in opening up fields to him new.

New to him, he it noted, but in Cuba's case not in themselves either new or untried. This island is not a virgin wilderness in toto. It has been under the domination of white men for 400 years. Not all these white men were idle and incompetent. They appreciated the country and in developing its resources—not to the fullest extent possible nowadays, to be sure, but as far as was possible to them in their times—they made fortunes.

The Spaniards devoted all the energies they had for agriculture in Cuba to sugar cane and tobacco in the eastern and central provinces, and especially to tobacco in the west. For four centuries they held fast to these two products, thus demonstrating that they were possessed of no more versatility than the American and the Canadian who, in Cuba, insist upon discovering no future save in citrus fruit.

From tobacco and from cane the Spaniard, and the Cuban with him, has wrested the "wealth of the Indies." "Rich as a Cuban planter"—planter of cane and tobacco, not of oranges and grape fruit—is a significant English phrase. To attain to the wealth and the ease it implies has been the ambition of the adventurous and the avaricious from 1492 to the present time.

INJURIOUS GREEN AND ROSY APPLE APHIDS

Former Attacks Terminal Shoots and Tender Leaves, Restricting Growth, While Latter Seriously Affects Fruits.

(By W. E. BRITTON, Connecticut Agricultural Experiment Station.)

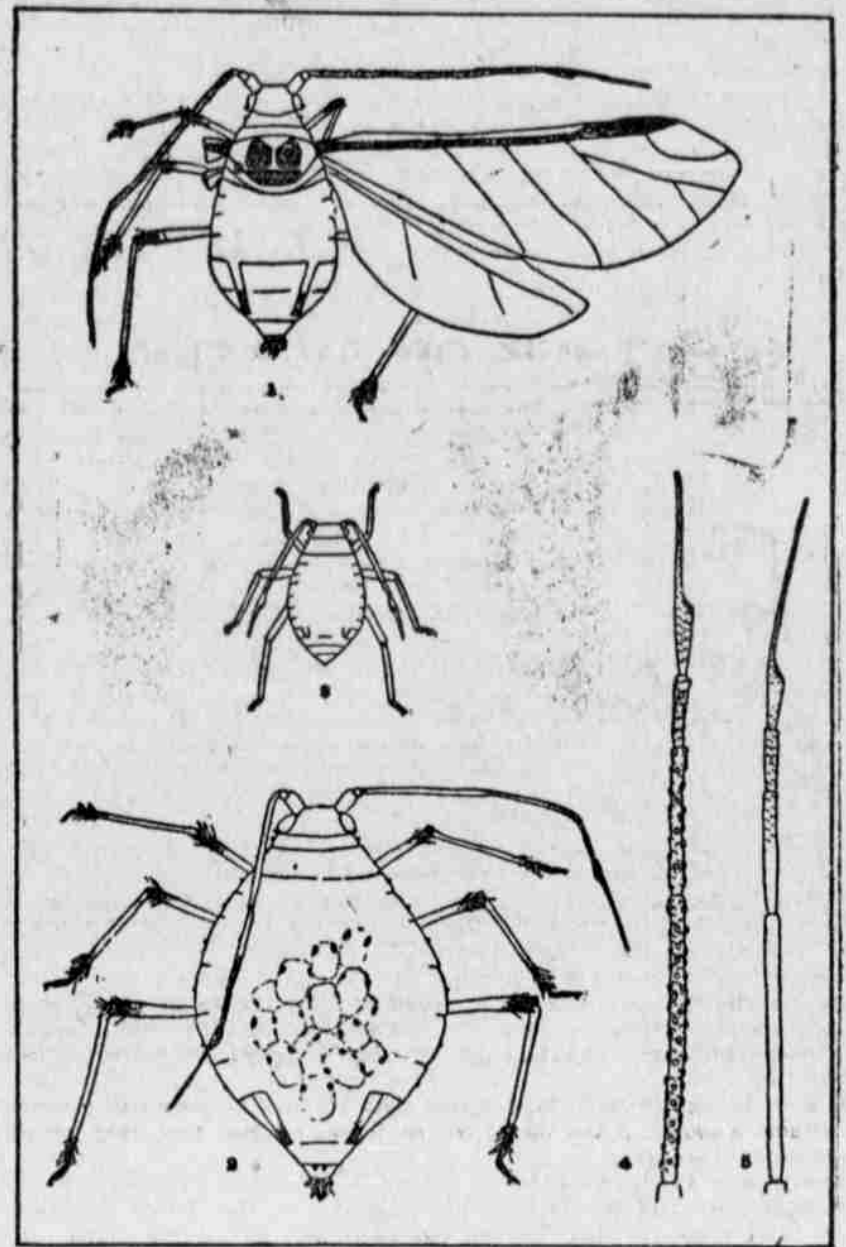
The most troublesome plant lice on apple in Connecticut are the green apple aphid, *A. pomi* De Geer, and the rosy apple aphid, the identity of which seems not to have been well established. For instance, we find accounts of apparently the same insect as *Aphis sorbi* Kalt., as *Aphis pyri* Boyer, and as *Aphis malifoliae* Fitch. The green apple aphid was described briefly and figured in the report of this station in 1903. It attacks the terminal shoots and tender leaves, causing the leaves to curl. It affects the tree chiefly by restricting the growth and is much more serious on young orchard trees and nursery stock than upon old trees. All stages are bright green except the oval egg, which is green when first laid but soon turns to a shining black. Eggs are laid on the terminal twigs late in the season.

The eggs of the rosy apple aphid hatch about the middle of April just as the green leaves begin to show at the end of the buds. On April 16th in an orchard at Meriden, the aphids were hatched and the buds had opened just enough to show the green tissue. Many newly-hatched aphids could be seen on the opening buds, though many eggs were still unhatched.

These aphids were abundant through blossoming time and were thick on the young fruit. During the latter part of June, or about the first of July, they disappeared entirely from the trees, and did not return until October.

On November 12, 1909, the aphids were laying eggs, though but few could be found.

Gillette states that lime and sulphur mixtures are among the substances most effective in destroying eggs of the green apple aphid in Colorado,



Rosy Apple Aphid.

1. Winged viviparous female; 2. apterous viviparous female; 3. young nymph; 4. antenna of apterous viviparous female. All greatly enlarged.

and are conspicuous and often abundant. The rosy apple aphid is pink or purplish in color and seems especially prone to attack the fruit spurs and the inner portions of the tree top rather than the terminal twigs and exterior part. The eggs are smaller and much less conspicuous than those of the green apple aphid, and one often needs to hunt carefully in order to find them at all, as they are hidden around the buds, sometimes partly under the scales.

The attacks of the rosy apple aphid affects seriously the fruit and prevents its growth and development, causes it to be gnarled and irregular in shape. The leaves curl early and often turn yellow and fall late in June if badly infested.

The green apple aphid remains on the apple leaves and shoots throughout the season, but the rosy apple aphid leaves the apple and goes to some other unknown plant host—during the latter part of June—returning in October and later laying eggs to carry the species through the winter.

and Hodgkiss reached similar results with his tests on eggs in various species of aphids in New York.

Tests were made with kerosene emulsion in different dilutions late in June to determine the proper strength to use. The emulsion standard was prepared after the formula printed on the spray calendar and is as follows:

Kerosene Emulsion.—Two gallons kerosene, one-half pound common soap, one gallon water. Dissolve the soap in hot water, add the kerosene, and churn together until a white creamy mass is formed which thickens on cooling.

Into the diluted emulsion were dipped typical infested branches. Fourteen trees scattered throughout the orchard were included in this test and both trees and their dipped branches were marked.

The dilute emulsion killed the aphids quickly when brought into direct contact with them. This could be done by dipping the branches, but would not be accomplished so successfully by spraying on account of the curled leaves.

CORN HELPS IN PASTURAGE

Easy Means of Supplementing Grass in Pastures and Stimulating Flow of Milk in Dairy in Late Summer.

An easy means of supplementing grass in the pastures and stimulating the flow of milk in the dairy herd is to feed green corn late in the summer. With a continuance of the present drought this supplement is liable to be required earlier than usual. A small amount of corn cut each day and taken to the pasture will amply repay the labor it costs in an increased flow of milk. As soon as ears begin to form green corn can be fed to advantage; and it may be so fed until it is near maturity. The Minnesota experiment station at St. Anthony Park has records of good crops of fodder corn planted as late as the middle of July. In view of the present dry season it may be advisable to plant a crop of fodder corn this month, as pasturage is reported to be very short and a scarcity of hay is likely to follow. It is better to try fodder corn now on any vacant land the farmers may have, and to cultivate it well,

than to allow the land to grow a crop of weeds.

Haying Machines.

Equally wonderful have been the improvements made in machines for handling the hay crop. The modern mowing machine is a marvel of simple efficiency, says the Ohio Farmer. The old revolving, wooden-tooth hayrake has given place to the self-dump silky steel hayrake. This machine can be operated by a ten-year-old boy, who can do more and better work than could a man using the old method. The hay-tender enables the farmer to cure his hay quickly and greatly improves the quality of the hay. By means of the hay loader timothy, clover or alfalfa can be taken direct from the swath and loaded on the wagon. With the modern sweep rake the hay can be taken direct from the swath or cock and put into the stack with the hay stacker. The derrick hay fork is also used quite extensively, especially when the hay is to be put away in the mow.

Alcohol from Cobs.

One ton of cobs will make 49 gallons of alcohol of 180 proof, and afterwards the cobs may be burned for fuel. The alcohol is worth \$20, the cost of extraction is \$6.