VIRGIN ISLANDS AGRICULTURAL EXPERIMENT STATION,
LONGFIELD SMITH, Agronomist in Charge,
St. Croix, Virgin Islands, U. S. A.

BULLETIN No. 1.

Under the supervision of the STATES RELATIONS SERVICE,
Office of Experiment Stations, U. S. Department of Agriculture.

SEA ISLAND COTTON IN ST. CROIX.

BY

LONGFIELD SMITH, Agronomist in Charge.

Issued May 23, 1921.

WASHINGTON:
GOVERNMENT PRINTING OFFICE.
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[Under the supervision of A. C. TRUE, Director, States Relations Service, United States Department of Agriculture.]

E. W. ALLEN, *Chief, Office of Experiment Stations.*
WALTER H. EVANS, *Chief, Division of Insular Stations, Office of Experiment Stations.*

STATION STAFF.

LONGFIELD SMITH, *Agronomist in Charge.*
CHARLES E. WILSON, *Entomologist.*

LETTER OF TRANSMITTAL.

AGRICULTURAL EXPERIMENT STATION,
St. Croix, Virgin Islands, October 4, 1920.

SIR: I have the honor to transmit herewith a manuscript on the growing of Sea Island cotton in St. Croix, and to recommend that it be published as Bulletin No. 1 of the Virgin Islands Station.

Respectfully,

LONGFIELD SMITH,
Agronomist in Charge.

Dr. A. C. TRUE,
Director States Relations Service,
U. S. Department of Agriculture, Washington, D. C.

Publication recommended.
A. C. TRUE, *Director.*

Publication authorized.
E. T. MEREDITH, *Secretary of Agriculture.*

SEA ISLAND COTTON IN ST. CROIX.

CONTENTS.

INTRODUCTION.

Sea Island cotton seed was imported into the Virgin Islands from Barbados about 1908, and cotton raising has become one of the principal industries of the islands where the soil and climate are well suited to its cultivation. The area devoted to it, though at present small, is producing very well, the average yield of seed cotton in 1919–20 being around 1,000 pounds per acre. One of the plats at the experiment station produced at the rate of 4,450 pounds of seed cotton per acre.

Since the establishment in 1911 of the agricultural experiment station, the aim has been to secure varieties of cotton which are resistant or immune to the blister mite (*Eriophyes gossypii*) and which also possess a heavy bearing character with extra long, fine lint. Work in cotton breeding during the past year produced lint of excellent quality, the fiber being fine, strong, and silky; and one variety of cotton showed practically complete immunity to the blister mite. Greater production per acre is needed, more especially now that the whole world is demanding more cotton for clothing, textiles, fabrics, and the like, and the station will continue its experiments to obtain a higher yield per acre of first-class cotton.

The following table gives the yearly export of lint and cotton seed from the Virgin Islands since 1909:

Amount of lint and cotton seed exported from the Virgin Islands, 1909–1915.

Year.	Lint.	Cotton seed.	Year.	Lint.	Cotton seed.
	Pounds.	*Pounds.*		*Pounds.*	*Pounds.*
1909	219,040	569,414	1913	132,909	376,776
1910	243,323	467,288	1914	356,205	.....
1911	250,025	582,504	1915	138,463	.....
1912	263,794	545,603			

All of the cotton produced was exported to Liverpool. On account of the European war which started in 1914, the exportation of cotton lint became almost impossible and the cultivation was practically abandoned. The experiment station at St. Croix, however, kept up its cotton-breeding work, so that when exportation again became possible, seed of improved cotton would be available for the planters who desired to produce this staple. Cotton planting has not been resumed to the same extent as formerly, owing to the increasing interest in sugar which has brought very high prices. In 1919 about 200 acres only were planted to cotton, and it is unlikely that a much larger acreage will be planted on the island if sugar continues to bring high prices.

EXPERIMENTS IN IMPROVEMENT BY SEED SELECTION.

When the experiment station was established in 1911 the Sea Island cotton fields showed considerable mixture of wild cotton and cottons having an undesirable habit of growth and abnormal boll dropping. Work was at once begun to improve these conditions. Two varieties of purebred Sea Island cotton, Sterling and Cameron 106, were imported from Barbados and planted at the experiment station in plats ranging in size from three-fourths to 1 acre each. From these, individual plants were selected for further improvement. A careful record was kept of the weight and quality of the lint of all selected plants, and the following year the best specimens were placed in plats of about one-fifth acre each. In 1913 the seed from the best plants was planted in plats of 4 to 5 acres each, and in 1914 seed from these was distributed to the various estates in St. Croix. Thus, within three years after starting the cotton experiments, the station was distributing seed of pedigree cotton to planters. In the meantime new selections were being made each year to keep up the improvement and purity of type. In 1913 and 1914 the cotton-breeding plats occupied approximately 40 acres of experiment station ground. The work has been kept up continuously, though on a much smaller scale in later years, and the cotton now grown in the island is practically all produced from pedigree seed raised by this station.

In addition to improving and purifying the Sea Island cotton seed of the island, experiments were undertaken to find some new varieties which might possibly be more remunerative than the ordinary Sea Island type. To this end the varieties Sakellaridis, Caravonica, Southern Cross Upland, and Virgin Gorda Native were imported and crossed with Sea Island varieties.

During two seasons Sakellaridis, an Egyptian variety of cotton, was found to give yields no higher than Sea Island cotton, and selected plants did no better. This cotton can not be recommended,

since its lint, being shorter and less silky, is considerably less valuable than that of the Sea Island cotton.

Southern Cross long-staple upland cotton gave yields of lint inferior to Sea Island cotton, and the quality of the lint being also inferior, this cotton can not be recommended.

Caravonica cotton gave poor results, and individual selections showed little improvement. After trying it out for three seasons it was eliminated from the experiments.

Virgin Gorda Native cotton possessed very good lint, and the plants were considerably improved by selection. The variety, however, proved very susceptible to flower-bud maggot, and for that reason it was eliminated from the tests.

Other crosses were made between Sea Island and a wild variety of cotton common in St. Croix. The local wild variety, though having very poor lint, shows complete immunity to the blister mite, which is a serious pest of cotton in the island. Considerable importance is attached to the outcome of these crosses.

HYBRID COTTONS.

The first generation of hybrids, the result of a cross between Sea Island cotton and Sakellaridis, was found to be excellent, the plants yielding a wonderful amount of lint of a quality fully equal to that of the Sea Island parent. It was found practical to raise large quantities of first-generation hybrid seed by hand pollinating a Sea Island plat early every morning with pollen of Sakellaridis. This work was done early in the morning before the pollen from the newly opened Sea Island flowers had much chance of being spread on the stigmas by any agency. The flowers treated were not emasculated or bagged, but the pollen of Sakellaridis was simply dusted on the stigma of the Sea Island variety and the flower marked with a tape. About 70 per cent of the resulting seed will be crossed. Inasmuch as the lint is very similar to that of the Sea Island cotton, it will hardly be affected by admixture, and the yield may be almost doubled by the process. In 1914 three acres were planted with seed obtained in this way, and the yield obtained was 1,046 pounds of seed cotton per acre. During 1914, which was a poor year for cotton, the best pure Sea Island plat yielded only 690 pounds of seed cotton. In 1913 a small plat of first-generation Sea Island crossed with Sakellaridis yielded at the rate of over 3,000 pounds of seed cotton per acre. Owing to lack of funds and time to devote to following up this work, the station lost the pure seed of Sakellaridis cotton.

The second-generation plants of Sea Island cotton crossed with Sakellaridis show considerable variation, but when selections are made from these the third generation comes fairly true to seed, and

further selections continue to come almost true. Some of these are still being grown at the experiment station.

Crosses were made between Sea Island and Southern Cross Upland cotton with favorable results in the first generation. The lint of this generation equals that of the Sea Island parent, and the yield is good. The plants, furthermore, show a special resistance to the leaf-cut disease, which in wet seasons does considerable damage to cotton in the Virgin Islands. Subsequent generations of this hybrid show a multiplicity of types, few of which are any good and none of which comes true to seed. Some selections of the best have been under experiment for several generations and are still being grown with a view to finding eventually a good one which will come true to seed.

Sea Island crossed with St. Croix Native gave good results the first year they were tried in the first generation, as the plants were almost completely immune to blister mite. Furthermore, it was found that the plants could be ratooned and thus made to give large yields the second year. (Ratooning of ordinary Sea Island cotton is impossible because the ratoons come up infested with blister mite.) The lint of the hybrid is not as good as that of the pure Sea Island. However, the results of this crossing were so successful that the station planted a 10-acre plat early in May, 1914, to hybridized seed. The results were disappointing. The plants suffered severely from boll dropping and were so severely attacked by cotton stainers that the yield of lint was rendered very low. The experiment has not been repeated, though it is thought that it might be worth while to try it again, planting the next time in July or August. The first-generation hybrid seed can be readily made in any quantity by the method suggested above for producing Sea Island crossed with Sakellaridis. When this seed is planted it is easy to pick out and pull up the uncrossed Sea Island plants which differ markedly from the crossed plants. A stand consisting entirely of first-generation crosses can be obtained by planting five or six seeds in each hill, and by removing those plants which are not crosses. During the first year the yield of lint from the crossed plants is much the same as that of pure Sea Island. The advantage of raising this type lies in the possibility of ratooning it, since it is immune to blister mite, and ordinary Sea Island cotton can not be ratooned because at the end of its season's growth it is always killed by this pest. In ratooning, plants should be cut down to within 1 foot of the ground, and all branches burned to destroy stainers, scales, and other pests. The station hopes to repeat this experiment in the near future to determine definitely whether it will pay to raise this hybrid. Though immune to blister-mite attacks, the first generation resulting from Sea Island crossed with Native is susceptible to attack by cotton stainers. This difficulty may preclude the possibility of ratooning.

When the seed of the first-generation hybrid is sown the plants split into a great variety of types. Some plants are completely sterile, producing no flowers; other plants produce flowers yet ripen no fruit; others again entirely lose an erect habit and trail on the ground; and the lint characters are highly variable in each plant, the majority being of little value. Selected plants of the second generation present the same bewildering number of types when their seed is sown. The station is finding it extremely difficult to extract a pure type by repeated selection; nevertheless, it will continue its experiments for this purpose.

Experimental work with cotton has had to be much curtailed owing to lack of funds to carry it on. Since the receipts for sales of products do not accrue to the station, but are deposited in the United States Treasury, the area formerly cultivated has been much restricted. Were the station to keep the money received for cotton sold, the experiments could be made to pay for themselves and the station continue to provide the island with pure seed.

SELECTION EXPERIMENTS.

Much work has been done in selecting plants from all the plantations of the island. When the experiment station was inaugurated the fields of cotton contained a considerable mixture of types. From these the best types were selected, and the selections repeated from year to year. As a result, the station now has a large variety of types of long-linted cottons. Some of these are very promising. In fact, they may in the future displace the pure Sea Island cotton now grown in the island, all of which has been obtained by repeated selections from Cameron 106.

METHOD OF PLANTING.

In St. Croix it was customary to prepare ground for cotton planting by plowing it to the same depth as for cane planting—that is, 8 or 9 inches. After plowing, the land was harrowed and scored into shallow furrows 4½ feet apart with two cuts of a small vineyard plow drawn by mules. The seed was planted in the furrows in hills 3 feet apart, some five or six seeds being placed in each hill. When the plants reached a height of probably 6 inches they were thinned out to one plant per hill.

When the writer came to St. Croix in 1911 he was confronted with the problem of boll dropping and leaf-cut, or tomosis. In fields where the cotton was growing luxuriantly the young leaves would acquire a curling and crimpling habit, while the flower buds would abort, turning black and dropping off when only the size of a pin's head. No organism or fungus could be found associated with this condition, and it was observed that the more luxuriant the vegetative

growth the worse was the leaf curl. It was further noted that one or two rows around the edges of nearly all the fields would almost invariably be superior to the cotton plants inside the field. The plants on the outside grew less luxuriantly, but were of better shape and full of bolls. In some cases this difference in condition was very marked, a fact which was attributed to the compact nature of the land around the edges of the fields where the plow had not been able to do thorough plowing. This deduction was later confirmed by an examination of a field at Mount Pleasant plantation, where a heavy rainfall occurred, causing the young cotton in one part of the field to be almost submerged for a number of days. The cotton in this part of the field was much stunted in growth; but later, on account of its freedom from leaf curling, it bore a much superior crop to the rest of the field. The water, being on the soil for some days, had compacted the land.

The experiment station has recommended that plowing for cotton be shallow, not exceeding 4 or 5 inches, and this recommendation has been followed with success by many planters. Rolling the land before planting is also recommended, as this reduces the leaf curl and enables the plants to acquire a better habit of growth and to give larger yields. In other respects the method of planting remains the same, except that the rows are now usually made 4 feet apart.

TIME OF PLANTING.

Just before the experiment station was started a law was passed by the Colonial Council calling for a closed season for cotton for one month in each year. All cotton plants in the island had to be uprooted and burned by a certain date named each year by the regularly appointed commission, and no sowing of cotton could take place prior to the lapse of four weeks from that date. The period for clearing was one and the same for all growers. This law gave rise to much dispute and bitterness, some growers having planted earlier in the year than others. The greater part of the cotton was planted by one large plantation company whose director believed in early planting because cotton was planted early in neighboring English islands. To fall in with his ideas, everybody had to pull out his cotton early, and it often happened that the fields of late planters were laden with bolls at the very time fixed by the commission for uprooting and burning.

The writer was finally instrumental in getting the governor and members of the Colonial Council to change this law so that different closed-season periods would be allowed in the several parts of the island. This change was much appreciated by the smaller growers and has worked very satisfactorily. The writer has come to the conclusion,

after many years of experience with and observation of cotton grown at different periods, both at the experiment station and elsewhere, that July to September, inclusive, is the best time to plant cotton in St. Croix. Very early planting—in May, for instance—causes the first bolls to ripen in September, when usually the rains are heavy. When cotton plants that are laden with bolls are subjected to heavy rains a large amount of boll dropping usually occurs, and the cotton that opens is spoiled. Probably August and September are the best months to plant cotton here. Very good returns can be obtained, however, by planting as late as October. During the past two years unusually large yields were had by the majority of growers who planted in September and October.

FERTILIZING.

In these islands it is not customary to manure land that is to be planted to cotton. An area that has been grown to cotton for some years would doubtless benefit by the application of manure to the soil. The appearance of most of the cotton fields here seems to indicate, however, that the soil does not need fertilization. In fact, the fields are often evidently too fertile for the cotton, producing a rank growth resulting in coarse and unproductive plants. Soils at the east end of the island are deficient in lime and it is probable that lime applications would result in increased yields in this area. The East End has always suffered most severely from boll dropping and leaf curl. East End growers, though repeatedly urged to experiment with lime applications, have so far not done so. Cotton grown in other sections of the island is usually planted in rotation with sugar cane on soils containing plenty of lime. Fertilizing is unnecessary on soils where such rotation is practiced as the sugar-cane land is generally well fertilized with farmyard manure before planting. It is thought that experiments with artificial fertilizers on land to be planted to cotton would be of interest and value, but up to the present these have not been undertaken.

CARE AFTER PLANTING.

In this island the custom is to keep the soil between the rows of cotton well stirred by means of a 2-shovel cultivator drawn by mules. This is an excellent practice, but should not be continued too late in the season for fear of root pruning and consequent dropping of bolls.

COTTON PICKING.

Cotton picking is usually done by women and children, who are paid about 2 cents for each pound. Formerly the price was 1 cent a pound. A woman can pick 40 to 60 pounds of seed cotton daily. The

cotton is not picked as clean as it should be. Too much trash and dirt are picked along with the cotton; and it is almost impossible to make the laborers understand that they must put the stained cotton in a bag separate from that for white cotton. The picking of clean cotton, however, should be insisted upon, as the whipping process designed to remove trash and dirt can be made cheaper and perhaps dispensed with altogether when diligent care is exercised in the picking process.

SUNNING, WHIPPING, AND CLEANING.

Seed cotton is usually spread out in long trays to be sunned for a day before whipping. This operation consists in striking the seed cotton on a piece of stout mesh wire forming the bottom of the tray. When the dirt has passed through the tray, the stained and weak cotton, all leaves, and hardened bolls are picked out.

GINNING AND MARKETING.

After being cleaned the cotton is sent to be ginned and baled. At present there is only one gin in operation here. Formerly there were three. About 26 or 27 per cent of lint is obtained from the seed cotton. St. Croix cotton hitherto has been sold in England, where it brings a high price. This year (1920) it sold for $1.80 to $2 a pound.

YIELD.

Accurate figures on yields of cotton in St. Croix are not available, but it is thought that during the years 1911 to 1915, inclusive, 500 pounds of seed cotton per acre was about the average. Some fields have yielded 1,000 and 1,100 pounds to the acre. Others have not yielded more than 100 or 150 pounds to the acre. The low yields in East End were no doubt due to a combination of causes, principally adverse rainfall conditions, the showers in that section being very heavy and usually followed by severe droughts; the leaf-cut disease, or tomosis, which was probably greatly helped by the unfavorable climatic and soil conditions; and the presence in great numbers of the stinkbug (*Nezara viridula*), which owes its existence to the numerous wild massambee (*Cleome viscosa*) and fireweed (*Datura metel*), on which it lays its eggs.

SOME DISEASES AND PESTS OF COTTON.

FUNGUS AND BACTERIAL DISEASES.

Bacterial disease of cotton (*Bacterium malvacearum*), known under the various names of angular leaf-spot, black-arm, boll-spot, round-spot, mildew, and internal boll-rot, all make their appearance in the fields, together with anthracnose (*Colletotrichum gosspyii*),

due to a parasitic fungus. A rust, probably due to unfavorable soil conditions, is not infrequently found, and a wilt, due to a fungus (*Fusarium vasinfectum*), is noticeable after heavy winds. Mildew and rust are not very serious, as they do not appear until toward the close of the plant's life. Angular leaf-spot seems to do considerable damage, especially when the bacterium attacks the stems and causes black-arm. Under good cultural conditions, however, this disease is not troublesome. The most serious of the diseases is internal boll-rot, which is spread by punctures of cotton stainers and green stinkbugs. The boll-rot could be controlled were measures adopted to exterminate these pests.

In order to check fungus diseases, all cotton seed should be soaked in corrosive sublimate solution, 1 part to 1,000 parts of water, for 10 minutes before planting.

INSECT PESTS.

The Cotton Stainer (*Dysdercus andreæ*) and the Green Stinkbug (*Nezara viridula*).

Only one variety of cotton stainer (*Dysdercus andreæ*) occurs in St. Croix. Since the greatest damage wrought by this insect is the spreading of internal boll-rot, efforts should be made to eliminate the pest as soon as it appears. This can best be done by having the stainers knocked from the bolls into pans containing a little water and kerosene.

The green stinkbug (*Nezara viridula*), in addition to spreading internal boll-rot, causes boll dropping by sucking the juices from the plants. The fields and their immediate vicinity should be kept free of weeds, more especially the wild massambee (*Cleome viscosa*), and the fireweed (*Datura metel*), which act as host plants for the pest. Much of the boll dropping suffered by the cotton in the East End is caused by the prevalence of this insect.

When a cotton field is not under cultivation but allowed to lie fallow, it generally becomes covered with wild massambee. However, this weed is not commonly found on old pastures. It is important that old cotton fields be planted to some crop to keep down noxious weeds. Any cover crop which makes quick growth, such as sweet potatoes, Lyon, or velvet beans, or elephant (Napier) grass, can be used for this purpose. In the sugar-growing sections of the island, where cotton is used as a rotation crop only, extensive areas of wild massambee do not occur.

Cotton Worms (*Alabama argillacea*).

The most annoying insect pest is the cotton worm which will ruin an entire crop unless checked. It can be kept under complete control

provided Paris green is applied as soon as the worm makes its appearance. The presence of young cotton worms in the field is most readily detected by a rather strong odor resembling that of the four-o'clock flower. The field should be dusted as soon as this odor is noticed. Persons having defective sense of smell should examine the plants daily for young worms on the leaves. It has been found that the most economical method of using Paris green here is to mix it with eight times its weight of air-slaked lime and to dust it by hand through a coarse cotton bag, applying the poison thinly but evenly over the plants. Powdered lead arsenate applied at the rate of about 4 pounds per acre is recommended on the Mainland as more effective than Paris green in the control of cotton worms.[1]

Blister Mite (*Eriophyes gossypii*).

The blister mite attacks all parts of the cotton plant, but especially the young leaves. When thoroughly infested the plants present an ugly sight, being only a mass of warts and nodules. A closed season is the most effective means of keeping this pest in check. A period of from two to four weeks is sufficient, and if properly carried out good results can be obtained in the shorter period. The law in St. Croix compels cotton growers to uproot and burn old cotton plants by a certain date fixed for each plantation by a commission composed of four cotton growers and the agronomist in charge of the agricultural experiment station. A period of three weeks is generally given during which no cotton can be planted. After the expiration of this period the cotton seed is planted as soon as the weather permits. The law gives the Cotton Pest Commission the privilege of granting different periods for different plantations, when in their opinion no harm is likely to result by so doing. This variation in closed season can readily be allowed where a range of hills cuts off one plantation from another, or where each plantation is separated by the distance of a mile or more and the prevailing wind is not in a direction to convey mites from the old cotton plants.

The station is now working with a view to obtaining by selection a variety of cotton that will be immune to blister-mite ravages. Several varieties of cotton only slightly attacked have been produced (Pl. I, figs. 1 and 2) and another variety now appears to be completely immune. The latter was grown this year in a plat containing only 22 hills. Seed of this cotton will be used in a much larger plat next year. The lint of this immune variety is shorter than that of the best Sea Island cotton, being only $1\frac{3}{4}$ inches long. It is hoped to improve the variety in this respect by further selections.

[1] U. S. Dept. Agr., Farmers' Bul. 890, How Insects Affect the Cotton Plant and Means of Combating Them.

FIG. 1.—NEW VARIETY. LINT 1¾ INCHES LONG; YIELD 1,500 TO 2,000 POUNDS SEED COTTON PER ACRE. PARTLY RESISTANT TO BLISTER MITE.

FIG. 2.—SELECTION NO. 29. LINT STRONG, 1.8 INCHES. PARTLY RESISTANT TO BLISTER MITE.

VARIETIES OF COTTON TESTED.

FIG. 1.—A SAKELLARIDIS HYBRID. LINT STRONG, 1¾ INCHES. YIELD 1,700 POUNDS SEED COTTON PER ACRE.

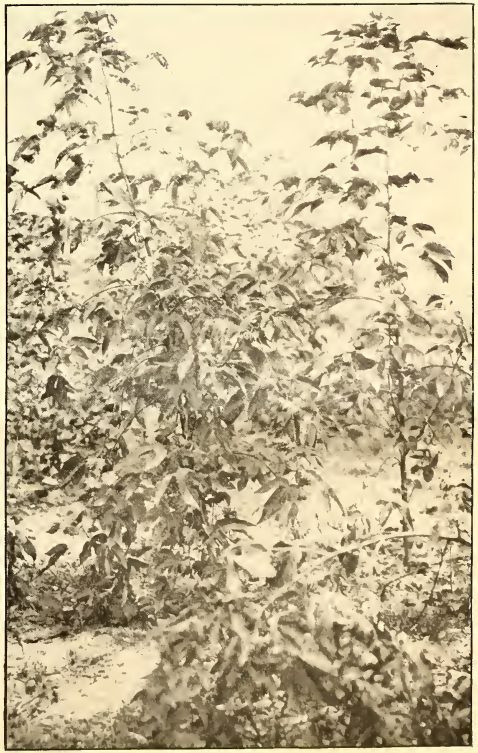

FIG. 2.—SELECTION NO. 117. LINT STRONG, 1.8 INCHES. RESISTANT TO BLISTER MITE.

VARIETIES OF COTTON TESTED.

Cotton Bollworms.[1]

These worms frequently cause much damage to cotton in St. Croix, and they are especially severe on cotton grown at the east end of the island where they occur in numbers. Among the species attacking bolls and flower buds the following have been found: *Heliothis obsoleta*, *Prodenia ornithogalli*, *P. latifascia*, *Laphygma frugiperda*, and *Xylomyges sunia*.

The amount of damage which *Heliothis obsoleta* is capable of doing can somewhat be realized when it is stated that young caterpillars before pupating, when kept in captivity, devoured between 30 and 36 young buds and bolls apiece. The pest is most numerous during September and October. Cotton planted in May and June, consequently, always receives the worst attacks. There is little or no danger of infestation in late-planted cotton, that is, cotton planted in September and October.

Spraying plants with lead arsenate would probably be a fairly effective means of dealing with these pests. In passing from one boll to the next they have to eat through the bracts and the rind of the boll and in so doing get enough poison after a time to kill them. Paris green impregnated with lime is not likely to be so useful for this purpose as lead arsenate, since it does not stick to the leaves but is readily washed off the plants by a light shower. The poison to be effective should be firmly glued to the plants. At the experiment station trays containing molasses were laid among the plants for the purpose of collecting the moths, from 8 to 10 trays being placed on every acre of land. Very excellent results were obtained by the use of the molasses, and some of the East End planters who used this method of control also reported good results. Kerosene tins cut in half lengthwise make splendid trays and are about the cheapest to use. Black molasses can be obtained at small cost from the sugar factories.

Bollworm-attack first causes a flaring of the bracts. Later the young buds and bolls drop off. Older bolls may remain firmly attached to the plants. It is suggested that all fallen buds and bolls be collected and burned daily.

Flower Bud Maggot.

In certain years flower bud maggot does considerable damage, and it is generally worst when the cotton is planted early. During the past two years, when nearly all cotton was planted in September and October, no flower bud maggots were observed. The presence of the maggot is made known by the the flaring of the bracts of the flower buds. An examination of the flower buds will show whether

[1] While this publication was going through the press the pink bollworm (*Pectinophora gossypiella*) was reported on St. Croix.

this condition is due to flower bud maggot or to bollworm. The maggots are very minute, about the size of a small pinhead, and pinkish in color. Several are found in one flower bud, and they spring out when the buds are opened.

CUTWORMS.

Sometimes cutworms are very troublesome among the newly-planted fields, cutting down the young seedlings as they appear above ground. If they are very troublesome they can be destroyed by means of a poisoned bait composed of 50 pounds of bran and 1 pound of Paris green mixed into a paste with molasses and water. A bit of this mixture can be dropped at each hill.

COTTON APHIS.

This insect occurs abundantly on young cotton in this island, especially when the weather is dry. It causes the leaves to assume a curled and blistered appearance and seriously checks the growth of the young plants. However, no permanent injury to the crop has yet been observed, probably because as the insects become abundant their natural enemies (ladybird larvæ and syrphus-fly larvæ) increase in numbers sufficient to destroy them.

PLAT EXPERIMENTS, 1919–20.

During the season of 1919–20, 127 plats of individual cotton-plant selections were grown at the experiment station (Pls. I and II). The plats were planted in September, 1919, and harvested at the end of April, 1920. Owing to lack of funds to carry on the work the plats had to be very small, consisting for the most part of 25 to 50 hills each.

The largest yield obtained was at the rate of 4,450 pounds of seed cotton per acre. Two plants of this plat produced 2 pounds of seed cotton each. The lint of this variety was 1.75 inches in length, and was comparatively free from blister mite. The next largest yield was at the rate of 2,862 pounds seed cotton per acre. The lint of this cotton was 1.8 inches long, and the plants were only little attacked by blister mite. The third largest yield was at the rate of 2,724 pounds of seed cotton per acre. The lint was 2 inches in length, strong, and of fine quality, but the plants suffered severely from blister mite.

The average yield of 16 of the plats was over 2,000 pounds of seed cotton per acre, and only 15 plats fell below 1,000 pounds per acre in yield. The lengths of the lint ranged from 1.5 to 2.2 inches; the lint lengths, like blister-mite resistance, were variable. One plat only showed complete immunity to this pest.