

Cotton on a Commercial Scale in Hawaii

BY DR. E. V. WILCOX, DIRECTOR U. S. EXPERIMENT STATION.

In order that Hawaii may be developed to the fullest extent along traditional American lines, it is necessary that a greater variety of crops be put upon a commercial basis. This would make possible the utilization of large areas of land which are now lying idle or which yield merely a minimum income. In making a selection of crops for the profitable utilization of lands now idle, the first point to be considered is the question of markets, and the second important point is the cost of production under local conditions. In the light of the first consideration, just mentioned, cotton stands out prominently as one of the most important world's crops with a recognized standing everywhere upon the markets of the world. It is easily shipped, can be held for long periods without deteriorating, and does not require special arrangements in transportation. Moreover, it is a crop which can be grown profitably on either a large or small scale. As soon as a considerable area of cotton is planted in these islands it will be possible for men who wish to plant only a half acre or a few acres to sell their crop as seed cotton, without any manipulation whatever, to factors who will assume the responsibility of marketing the crop. On the other hand, cotton lends itself well to cultivation in large areas. On large plantations the crop would naturally be managed somewhat differently, on account of the fact that it would then pay to buy a gin and remove the seeds on the place, after which the seed could be ground for animal feed, or perhaps preferably sent to a mill for the removal of the oil, after which the cotton-seed meal could be used for feed.

The United States has for many years held the foremost place in cotton production. Last year in the total world's production of 17,000,000 bales, the United States produced about 13,000,000. Notwithstanding this large production of raw cotton, the United States imported more than \$12,000,000 worth of Egyptian cotton for manufacture on the mainland. In order to secure firsthand information as to the recent developments in the cotton industry, an extended trip was made during the present cotton season throughout the whole cotton belt of the mainland, from Yuma, Arizona to Charleston, South Carolina and Florida. The production



AN OAHU COTTON FIELD—BEGINNING OF THE KUNIA DEVELOPMENT COMPANY'S COTTON PLANTATION.

that its spread can probably not be checked. It is expected, therefore, that this pest will spread across the cotton belt to the Atlantic Coast.

While we hear frequent reports of the successful growing of cotton in various other countries, and of the renewed interest in this industry in old cotton growing regions, yet the total production of cotton in old cotton countries is not increasing and the amount grown in new regions is thus far almost negligible, or at any rate, has no influence upon the market. Cotton is a standard staple of the utmost importance to the whole world. The use of cotton for the purpose of ordinary clothing is increasing everywhere, not only in tropical, but also in temperate climates, and its use in special indus-

tries is increasing rapidly as these new industries develop. There has been considerable hesitation as to the extent of the market for the higher grade cottons of the Sea Island type, but recent developments make it apparent that the market will demand more and more of this production, corresponding with its increased use for special purposes, such as mercerizing, automobile tires and allied industries. The price of ordinary upland cotton during the present season has ranged from 11 1/2 to 15 cents per pound, and that of Sea Island, from 19 1/2 to 35 cents. Certain fancy strains of Sea Island sold for seventy cents per pound. The price offered on sample for Caravonica cotton has ranged from 14 to 24 cents, and for Egyptian, from 19 to 29 cents. It is confidently predicted by those who have made a most exhaustive study of cotton prospects, that none of the present generation will live to see cheap

cotton again. The market side of the cotton industry may therefore be said to be most satisfactory from the standpoint of the producer. While on the mainland during the past cotton season, I frequently heard it stated, as a mature opinion of cotton experts, that this crop should be considered as one of the most important possible crops to grow in any country where a good quality and yield could be produced. As already indicated, there is an abundant demand for Egyptian cotton on the mainland without looking farther for a market. The technical industries which have use for cottons like the Sea Island and Caravonica will use more and more in the future and the centers of trade for these cottons are found in Liverpool, Bremen, Paris, New York and Charleston. The demand for cheaper Upland cottons is very active in Japan and China, and as reported by Mr. Krauss on his return from those countries, they are desirous of buying large quantities of Upland cotton from us. The possibility of their using high grade cottons is still somewhat doubtful.

So much for the outlook for markets and the demand for cotton after it has once been produced. Turning now to the actual possibilities of cotton growing in the Islands, I may say that it has already been demonstrated that we can grow cotton of the higher grades, of excellent quality and with satisfactory yields. While on James Island, to which the world has hitherto looked for its finest Sea Island cotton, I secured a sample of lint which was sold for the Paris market at seventy cents a pound. This sample was submitted, together with a sample grown on the windward side of Oahu, for comparison to a prominent cotton grower at the cotton exchange in New York city. He stated, after an examination, that the sample from this island was certainly equal to that from James Island, and on the whole, rather superior. The fact that growers of Sea Island throughout the district where this cotton is raised wanted to get seed from us, after making an examination of samples of our lint, shows conclusively that the best quality of long-staple cotton can be grown in Hawaii. The samples of Caravonica cotton, produced by the Australian originator of this variety, compared rather unfavorably with samples of the same cotton grown in Hawaii. It is therefore a plainly established fact that we can produce the top grade of this cotton in the Territory. The Egyptian cotton which we have grown here in the Islands is equal to any samples which I was able to obtain on the mainland, and it is unlikely that this cotton can be grown on the mainland, outside of a few localities like Yuma, Arizona.

Last season about 150 acres of cotton were grown experimentally in the Territory. Small areas were planted on all of the four principal islands and encouraging results have been obtained in all cases. Those who planted last year will increase their plantations during the coming season and numerous others will plant on a much larger scale. So far as may be judged from the amount of seed which has been bought from present growers of cotton in the Islands, it is likely that 2000 or 3000 acres of cotton will be grown during the present season.

We are attempting to gain evidence as rapidly as possible on the climatic and soil conditions which are most

favorable for the production of this crop. Thus far Sea Island cotton has been grown at altitudes varying from sea level to 2300 feet. Doctor Raymond showed me a few days ago a very good sample of Sea Island cotton grown at that high altitude. The Caravonica cotton has thus far not been grown above 700 or 800 feet altitude, but we have no reason to suppose that it may not be grown at higher altitudes.

With regard to rainfall requirements, it appears from experiments thus far carried on that Caravonica is hardier than Sea Island under relatively dry conditions. It remains green and produces a satisfactory growth where the Sea Island shows decided effects of drought. The profit to be obtained from Sea Island cotton depends rather more on its quality than the yield, and it seems, therefore, a doubtful business proposition to choose this variety if the conditions are not favorable for the production of the best quality. The finest samples of Sea Island, which we have thus far obtained in Hawaii, were grown where the rainfall was rather abundant, say from sixty to seventy inches per year. This has not, however, been universally the case, since in a few instances, very fine samples were obtained from much drier localities.

As to the yield of Sea Island and Caravonica cottons and the relative profits to be obtained from them, it is sufficient to say that Caravonica cotton, at its best, will yield far more, probably double what can be expected of Sea Island. If we take what may be considered good average samples of Caravonica and Sea Island, allowing twenty cents a pound for the former, and thirty for the latter, it will readily be seen that in estimating the relative profits from the two varieties of cot-

ton we have to balance a higher yield, on the part of the Caravonica, against a higher price on the part of the Sea Island. The shades of variation in this balancing process will be so many that it is practically useless to speculate on the matter until we have secured further data from large areas of both varieties. It seems, however, a safe proposition that the large yield of Caravonica, at its best, will more than outweigh the higher price of Sea Island, at its best. This is not due entirely to the large yield of Caravonica, but also to the fact that it is more easily picked, has a higher percentage of lint, is apparently more resistant to drought and to the attacks of the Indian boll-worm.

It should not be understood from the above statement that the exclusive planting of Caravonica is recommended throughout the Territory. The fact that the higher quality of Sea Island can be produced here, with a greater yield than that obtained on the mainland, should make it profitable to grow this variety of cotton in favorable situations. In fact, it would seem a great pity not to establish a new source of Sea Island cotton, since it was conclusively demonstrated during the Civil War that a fine grade of cotton could be produced here, and has been redemonstrated during our recent experiments. The choice between Sea Island, Caravonica and Egyptian must be left largely to the individuals concerned, but it is strongly recommended that, after having made a choice, the planter should grow one kind of cotton exclusively, or should at least not allow two varieties to exist in close proximity. This practice is necessary on account of the ease with which cotton crosses.

It seems necessary to say a few words regarding the seed supply for

the benefit of those who will plant cotton in the future. It is an assured fact that the Caravonica seed, now to be obtained in Hawaii, is equal, and probably better than can be obtained in any other part of the world. It is, therefore, useless to send elsewhere for this seed, particularly since there are a number of growers here who have it for sale and there is the constant danger of introducing some new pest by importing seed from elsewhere. I would particularly wish to sound a warning against the purchase of any cotton seed whatever from the mainland. If Upland cotton seed is purchased there is the great danger of introducing the cotton boll-weevil, and if that pest should be introduced and find favorable conditions here, it would practically make a cotton industry in the Islands impossible. Moreover, if Sea Island cotton seed is purchased from the mainland there is the risk of importing the disease known as "cotton wilt." In view of these two very grave risks to be run it would seem highly desirable not to import seed from the mainland, even if a superior quality of seed could be obtained from there. It should be remembered, however, that from our past experience it is certain that an inferior quality of seed will be obtained by importing either Upland or Sea Island seed. The only growers of Sea Island who have really select seed refuse absolutely to sell or give away their seed, and it may well be doubted whether their best seed is superior to that which we already have. At any rate, after looking over the plantations of the best growers in the center of the Sea Island district, I



ROW OF CARAVONICA COTTON IN OAHU.

felt that the risk was too great to justify bringing seed for experimental purposes, even on the Experiment Station grounds, where we could control matters and eradicate any pest or disease which might develop. If Sea Island seed is purchased from the mainland the purchaser will obtain the average seed which comes from the gin. The cotton field produced from such seed will lack uniformity in height of plant, character of growth and quality of the lint, and these points will greatly diminish the value of the product. As a matter of fact, no one should attempt cotton growing without making careful seed selections on his own place. Good seed can now be purchased of a number of growers here, or the Experiment Station will distribute seed in small quantities in order to make it unnecessary to take chances in importing seed from the mainland or from other countries.



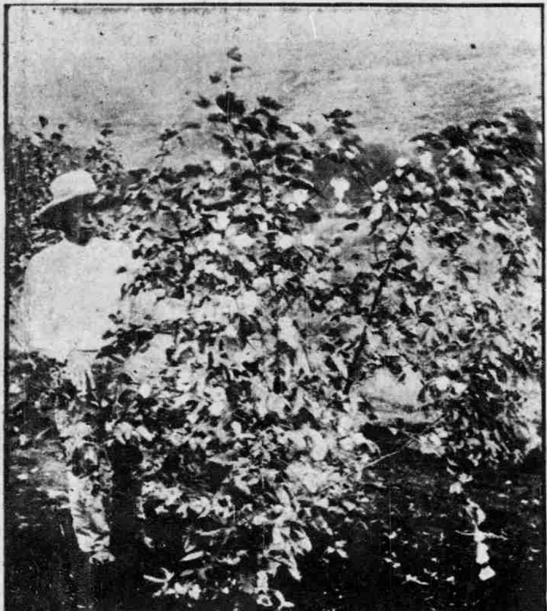
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HOW OAHU COTTON THRIVES—CARAVONICA TREE, ONE YEAR OLD.

of cotton this year on the mainland will be considerably less (probably to the extent of 500,000 bales) than last year. This decrease is due, partly, to an excessive drought which prevailed in a large part of Texas, but is in part due also to the continued prevalence and spread of the cotton boll weevil and cotton wilt. On account of the great inroads which the cotton boll weevil is making on the cotton fields of the South cotton growers generally in the infested district are changing their methods of farming, whereby a system of rotation is followed more consistently, and the acreage of cotton, correspondingly diminished. I have been estimated by technical and business experts that the total cotton production of the mainland will fall away to the extent of 500,000 bales annually for the next ten years to come. It is admitted by the entomologists who are working with the cotton boll weevil

that the market will demand more and more of this production, corresponding with its increased use for special purposes, such as mercerizing, automobile tires and allied industries. The price of ordinary upland cotton during the present season has ranged from 11 1/2 to 15 cents per pound, and that of Sea Island, from 19 1/2 to 35 cents. Certain fancy strains of Sea Island sold for seventy cents per pound. The price offered on sample for Caravonica cotton has ranged from 14 to 24 cents, and for Egyptian, from 19 to 29 cents. It is confidently predicted by those who have made a most exhaustive study of cotton prospects, that none of the present generation will live to see cheap

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