Cotton Variety Trials in Puerto Rico

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INTRODUCTION

The genus gossypium has been very well represented in Puerto Rico and other islands of the West Indies since their early history. When the great navigator, Cristopher Columbus, landed in the West Indies, the natives brought skeins (1)[3] of cotton threads to his ships to be used in barter. Cotton was at that time extensively cultivated and the art of weaving was developed sufficiently to produce certain cotton goods. At the time of the colonization the Spaniards (2)[3] found that the Indians were using it to make hammocks and cloth. But it was not until 1776 that the growers showed some interest in large-scale production of this famous textile. Following this, cotton took an important place among the crops of economic value then under cultivation in the Island. Interest in this commodity grew to such an extent that, in 1837, the production of lint cotton was 10,000 bales.

The Barbadense species of cotton has been cultivated commercially here since 1904. Of this species Montserrat Sea Island has been a most outstanding variety in Puerto Rico. Its fiber is superior in quality to that of any other cotton produced and has been used by mills both in England and in the United States in the manufacture of sewing threads, lace yarns, typewriter-ribbon cloth, fine fabrics for broadcloth, and special fabrics to support heavy pressures at high altitudes, such as those used for airplane-wing coverings, parachute cloths, dirigible outside coverings, and gas-cell fabrics.

The cotton grown (3) in Puerto Rico in the period immediately prior to 1920 was ginned in a mill which was managed by Gandía and Stubbe of San Juan, P.R. The San Juan Ginnery Co., a subsidiary of the Spool Cotton Co., started business in this Island in the year 1920. For about 10 years before 1920, the San Juan Ginnery Co. had sponsored the growing of cotton in Puerto Rico, being encouraged to do so by J. and P. Coats, Ltd., of Glasgow, Scotland, and the Clark Thread Co., of Newark, N. J., for both of which concerns they served as agents for the sale of sewing threads and related products.

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[3] Numbers in parentheses refer to Literature Cited p. 61.

In the year 1930 the San Juan Ginnery Co. suspended operations in Puerto Rico and ever since the cotton grown and the acreage devoted to this crop have fluctuated considerably. These fluctuations have been largely due to a lack of demand market since the San Juan Ginnery Co. suspended operations in Puerto Rico. Our cotton growers have depended on deals with buyers or brokers who buy the cotton for certain mills where it is blended with other cottons of inferior quality in order to improve the length and luster of the inferior cotton fibers in the mixture. When this is done, our cotton loses its name and never again is known or mentioned as Sea Island cotton from Puerto Rico.

Table 1 presents the fluctuations in size and value of the crop from 1935 to 1950.

Cotton is a rather important cash crop for a large number of small farmers in both the northern and southwestern parts of the Island. The following exposition will give an idea of its general distribution among the principal producing areas.

In 1941, for example, the total acreage (4) planted to cotton amounted to 7,700 *cuerdas*, of which 6,000 were in the northwestern and 1,700 in the southwestern part of Puerto Rico. Isabela, with a total production of 10,836 hundredweights, was the leading producing center among the areas with a production of over 1,000 hundredweights. Camuy, with 8,402, and Hatillo,

TABLE 1.—*Acreage, production, and value of Sea-Island Cotton in Puerto Rico*, 1935–50[1]

Year	Area	Production of seed cotton	Exportation	
			Bales	Value
	Acres	*Cwt.*	*Number*	*Dollars*
1935	1,148	3,712	211	31,617
1936	2,208	9,856	544	89,218
1937	2,016	8,489	474	59,002
1938	2,072	8,608	513	64,587
1939	3,344	12,898	730	128,367
1940	3,884	24,690	1,376	263,261
1941	9,293	39,794	2,139	473,209
1942	10,367	42,044	2,226	589,370
1943	8,362	32,504	1,662	475,330
1944	5,684	19,159	997	295,260
1945	2,257	9,915	590	142,396
1946	486	1,424	97	20,497
1947	1,957	3,930	262	60,587
1948	3,779	8,543	565	191,382
1949	5,034	16,036	866	290,242
1950	3,960	11,405	604	209,380

[1] The above figures were obtained from the Cotton Grower's Cooperative Association, Arecibo, P. R., and the Sea-Island Cotton Co., Ponce, P. R.

with 6,164 hundredweights, ranked second and third in importance from the standpoint of total production. Other important producing municipalities were Quebradillas with 2,545, Cabo Rojo with 2,048, Sabana Grande with 1,457, Guayanilla with 1,337, and Yauco with 1,140 hundredweights.

In 1935, the Puerto Rico Marketing Association was organized to give new impulse to the growing of cotton, which had been practically abandoned because of the low price and lack of a dependable market to absorb the total production of the Sea Island Cotton in the Island. But in 1940, according to a resolution approved at a general meeting of stockholders, the name of the Cooperative was changed, and since then it has been known as the "Puerto Rico Cotton Growers Marketing Cooperative".

Large acreage was planted to cotton in response to unusual needs experienced during World Wars I and II; but since the end of World War II, the acreage has continued to decline. It is generally agreed that weighty decisions need be taken if the production and marketing of Sea Island Cotton are to be set on a sound basis.

Increased industrialization has been suggested as a means of permanently improving the cotton situation, but it has encountered many objections. Some believe that commercial growing of Sea Island Cotton in Puerto Rico is economically impractical from the point of view of the dollar yield per acre. Others feel that it is not a practical cotton to process as compared to such Egyptian or American cottons as Karnak, Sudan, Pima 32, or Amsak, and that the number of spinners interested in its use is most limited.

OBJECTIVE

Variety trials have been conducted in Puerto Rico by the Agricultural Experiment Station of the University of Puerto Rico, to determine whether it would benefit our cotton growers to replace the Montserrat Sea-Island variety of cotton currently planted in the Island with one of the Egyptian or American-Egyptian types. This paper reports the results of these variety tests.

MATERIALS AND METHODS

TRIAL LOCATIONS AND SOILS

The cotton-variety trials were conducted at the Isabela Substation; at Colonias Florida, Fortuna of Luce & Co., in Santa Isabel and Salinas, respectively; and at the Lajas, Corozal, and Aibonito farms of this Station. The cotton varieties used were Montserrat Sea Island, Coastland Sea Island, Sealand, Pima 32, and Amsak.

At Isabela the soil used was a Coto clay of medium fertility which had been planted to sugarcane, and to root and grain crops for several years. Roberts described (5) this type of soil as Coto clay, which occurs in nearly

level areas, the largest of which are southwest of Isabela, and south of Quebradillas. This soil is very similar to Coto clay, heavy phase, but the surface soil is slightly more friable, looser, and has a higher sand content. Yields are slightly less than on Coto clay, heavy phase. Some fields, however, have produced 50 tons of gran cultura sugarcane to the acre under irrigation. Other crops returning a good profit when the land was irrigated were Red Spanish peppers, which yield about 150 crates to the acre; tomatoes, about 200 crates; tobacco, from 600 to 800 pounds; and corn, from 1,000 to 1,500 pounds. Under good management corn has produced as much as 38 hundredweights per acre. Some farmers have more than one crop on their land at the same time; for instance, young cotton, beans, and 18-inch to 2-foot banana plants. In nonirrigated areas, tobacco, cotton, and other minor crops are the principal ones grown.

At Santa Isabel, the soil used was a Santa Isabel silty clay loam. In Roberts' Soil Survey of Puerto Rico this soil is described as one similar to Santa Clara clay, but it differs from that soil in that it contains a larger proportion of silt and less clay. It is slightly easier to plow and cultivate than the clay soil and for this reason is more desirable. The agricultural use of this soil is nearly the same as for Santa Isabel clay, and nearly all of the land is used for the production of sugarcane, except in places where the content of salt in the surface soil is greater than 0.2 percent.

At Colonia Fortuna, in Salinas, the soil used was *Altura* loam, which is a soil developed from alluvial material that has been washed from the steep hills of the southern side of the Cordillera Central. It occurs in several areas near the foothills between Guayama and Juana Díaz. With the exception of the texture of the surface soil, this soil corresponds with *Altura* silt loam, but nevertheless it is one of the most productive soils, and nearly the entire area is used for the production of sugarcane—that is all areas that can be irrigated.

At the Corozal Substation the soil used was a Lares clay. This soil occupies very old well-drained terraces that have been derived from the wash from the *Catalina* and associated red acid soils and, to less extent, from the *Múcara* and associated brown soils. This soil is desirable for the production of coffee, sugarcane, pineapples, citrus, and minor crops, and the cultivated acreage is about equally divided among these crops. It has never been cropped to commercial cotton.

At the Aibonito Substation, around 2,000 feet in elevation, the soil used was a Juncos clay. This soil is similar to *Múcara* silty clay loam in color, origin, and consistence, but owing to its smoother relief it has a thicker surface soil and more plastic subsoil, greater depth to parent rock, and is much more productive, especially for sugarcane. Nearly 90 percent of the land is cultivated to sugarcane. This soil occupies the lower slopes and low

rounded hills throughout the Island, in association with the *Múcara* soils. Subsistence crops and tobacco yield better on this soil than on Múcara silty clay loam.

PLOTS AND PLANT TREATMENTS

The layout of the fields was a Latin-square design for all the trials except for the variety trial at Lajas where a split-plot design was used, variety being the main effect and fertilizer the subplot effect.

The size of the plots differed somewhat for the different experiments. From the data shown in table 2, it appears that the rainfall was sufficient for the successful production of a cotton crop in most cases, but this was not so in these variety trials, as the rain was very irregularly distributed in many instances, and thus the crops did not receive the necessary amount of moisture during their growing periods. As a matter of fact, there are no sharply defined weather seasons in Puerto Rico (5), though we do have a rather rainy period comprising the months from May to November. Frequent showers may occur during the winter months, but the heavy rainfall usually takes place during the spring and summer months. Evaporation is much higher in comparison to the rainfall during the winter months and irrigation is necessary for maximum crop production even in regions with an annual average rainfall of 65 inches.

During our variety trials at Isabela, as well as in Lajas, Salinas, and Santa Isabel, the cotton plants were supplied with the necessary amount of soil moisture by mean of irrigation water when rain was sparse. So, notwithstanding the light rainfall in some locations during the growing period of the cotton plants, we obtained high yields of seed cotton at these places.

At the Isabela and Aibonito Substations we used plots one one-hundredth of an acre in area; at the Corozal Substation, one fifty-fifth of an acre; at Colonia Florida in Santa Isabel one-eighteenth of an acre, at Colonia Fortuna of Salinas, one-twentieth of an acre; and at the Lajas Substation the main plots were one-eighteenth acre in area and the subplot size was one ninety-fourth of an acre. At Isabela, Lajas, Santa Isabel, and Salinas where the cotton was artificially irrigated, the rows were spaced 42 inches apart. At Corozal and Aibonito (uplands) where we had to depend on the rainfall the rows were spaced 36 inches apart. The treatments were replicated five times.

To ensure a good stand on each plot, germination tests were made and Aldrin (25 percent) was applied to the soil at the rate of 1 gallon per acre before planting. The germination tests showed good viability of the seed—over 90-percent germination in all tests. Aldrin was used for the control of soil insects such as mole crickets (*Scapteriscus vicinus* Scudler), white grubs, Phyllophaga spp., and cutworms.

TABLE 2.—*Regions, soil types, elevations, and rainfall data at the different locations where the cotton trials were established, 1952–54*

Region	Soil Type	Elevation	Months	Rainfall data[1]			Average for the month
				1952	1953	1954	
		Feet		*Inches*	*Inches*	*Inches*	*Inches*
Isabela	Coto clay	275	Jan.	5.14	2.23	2.77	3.38
			Feb.	1.39	.65	6.54	2.86
			Mar.	6.11	.68	3.46	3.42
			Apr.	11.65	5.20	4.35	7.07
			May	6.05	6.05	13.42	8.51
			June	6.35	6.20	9.51	7.35
			July	4.53	5.30	4.55	4.79
			Aug.	6.29	4.22	6.06	5.52
			Sept.	9.52	6.78	7.39	7.90
			Oct.	4.44	5.84	8.95	6.41
			Nov.	3.36	5.12	1.89	3.46
			Dec.	3.07	9.98	1.80	4.95
			Annual	67.90	58.25	70.69	—
Lajas	Santa Isabel clay	50	Jan.	1.10	1.46	3.44	2.00
			Feb.	2.06	.95	4.84	2.62
			Mar.	1.96	4.28	1.53	2.59
			Apr.	4.47	2.14	9.19	5.27
			May	2.45	2.71	2.81	2.66
			June	1.19	5.44	3.54	3.39
			July	2.68	4.79	3.51	3.66
			Aug.	5.39	8.58	7.16	7.04
			Sept.	14.90	2.81	10.22	9.31
			Oct.	5.99	6.10	6.60	6.23
			Nov.	3.40	5.56	3.97	4.31
			Dec.	1.03	2.39	.84	1.45
			Annual	46.62	47.21	57.75	—
Aibonito	Juncos clay	2,000	Jan.	4.16	1.40	1.98	2.51
			Feb.	3.63	1.23	4.04	2.97
			Mar.	2.36	1.38	1.06	1.60
			Apr.	4.59	2.93	4.99	4.17
			May	6.03	1.90	4.07	4.00
			June	2.73	3.80	5.56	4.03
			July	4.00	4.04	4.92	4.32
			Aug.	6.00	7.45	3.77	5.74
			Sept.	12.12	[2]	8.75	—
			Oct.	5.69	[2]	10.62	—
			Nov.	2.47	4.46	7.66	4.86
			Dec.	1.91	[2]	1.69	—
			Annual	55.69	—	59.11	—

TABLE 2.—*Continued*

Region	Soil Type	Elevation	Months	Rainfall data[1]			Average for the month
				1952	1953	1954	
		Feet		*Inches*	*Inches*	*Inches*	*Inches*
Corozal	Lares clay	400	Jan.	11.03	3.28	5.48	6.63
			Feb.	5.73	2.37	3.11	3.74
			Mar.	3.36	3.80	1.50	2.89
			Apr.	11.93	6.45	6.52	8.30
			May	10.06	10.49	5.70	8.75
			June	2.64	7.21	2.54	4.13
			July	7.60	9.72	5.20	7.51
			Aug.	6.62	4.38	7.41	6.14
			Sept.	6.05	5.87	7.36	6.43
			Oct.	7.00	6.57	6.86	6.81
			Nov.	5.14	5.36	6.62	5.71
			Dec.	6.07	8.03	3.75	5.95
			Annual	83.23	73.63	—	—
Santa Isabel	Santa Isabel silty clay loam	25	Jan.	0.95	0.62	0.18	0.58
			Feb.	.35	.35	1.40	.70
			Mar.	.00	.10	.58	.23
			Apr.	4.19	.60	.75	1.85
			May	3.56	.56	.60	1.55
			June	7.07	2.07	3.72	4.29
			July	5.55	2.65	2.40	3.53
			Aug.	7.00	3.75	2.60	4.45
			Sept.	12.30	8.11	5.45	8.62
			Oct.	2.22	5.17	9.49	5.63
			Nov.	.28	.75	1.18	.74
			Dec.	—	1.17	—	—
			Annual	39.20	25.90	28.35	—
Salinas	Altura	50	Jan.	1.66	0.92	0.40	0.79
			Feb.	1.59	.32	1.78	1.23
			Mar.	.90	.23	.20	.44
			Apr.	2.04	1.40	.40	1.28
			May	4.97	.49	.80	2.09
			June	5.49	4.06	3.45	4.33
			July	8.87	2.82	1.85	4.51
			Aug.	4.68	6.74	4.45	5.29
			Sept.	10.62	8.52	9.00	9.38
			Oct.	4.34	8.93	14.03	9.10
			Nov.	.44	1.11	1.20	.92
			Dec.	.10	.68	.27	.35
			Annual	45.62	35.62	37.83	—

[1] Data obtained from U. S. Weather Bureau Office; San Juan, P.R.

[2] Missing.

The cotton plants in the experiments were sprayed every 15 days with DDT at the rate of 4 pounds per 100 gallons of water in order to check the development of pink bollworms (*Pectinophora gossypiella* Saunders). At Colonia Fortuna, BHC was added to the DDT spray in order to check the cotton aphids, and at the Lajas Substation two sprays with Clordane, at the rate of 1 quart per acre were made to check the leaf worms, (*Alabama argillacea* Hübner). During the pickings, samples were prepared for the laboratory for fiber spinning tests.

EXPERIMENTAL DATA

YIELDS OF SEED AND LINT COTTON

In the first trial at Isabela, there was a heavy pink bollworm infestation and abnormally heavy rains which affected all the varieties under trial with the exception of Sealand, which is an early variety. All of the Sealand crop had been picked when this trial was discontinued, whereas only about one-fourth of the crop of the Montserrat Sea Island had been picked. Although these results were attributable to factors extraneous to the yielding capacity of these varieties, yet the earlier yielding ability of the Sealand, enabling it to produce its crop early and thus avoid the possibility of damages of these sorts, indicates that it may in the long run outyield the other varieties in the Isabela region.

In fact, this has been the case with the Sealand variety which has outyielded the others in all trials in a highly significant way, with the exception of Montserrat Sea Island in trials No. 5 (table 3), at Salinas, and No. 2 (table 3), at Santa Isabel, where the Sealand and Montserrat Sea Island outyielded the other three varieties in a highly significant way, there being no significant difference between these two varieties.

The Coastland variety outyielded Pima 32 and Amsak at the 5-percent point in trial No. 2, at Santa Isabel, and in a highly significant way in trial No. 8, at Lajas.

When trial No. 3, at Isabela, was harvested, the plants were green and the climate and soil-moisture conditions were ideal for them to develop new shoots and leaves. Having had no experience before with ratoon cotton, we decided to take advantage of this situation to gain some experience in the cultivation of cotton-ratoon crops, and pruned all the plants in the trials by cutting them about 6 inches above the soil. Two or three main limbs or vegetative branches were left on each plant from the large number of new shoots and branches developed. The field was fertilized with a 12–8–6 fertilizer at the rate of 600 pounds per acre.

Montserrat Sea Island and Sealand recovered very well from the pruning and developed a good number of fruiting branches. The other three varieties Pima 32, Amsak, and Coastland, did not respond well to the pruning.

Sealand and Montserrat flowered abundantly and nearly all the flowers

TABLE 3.—*Mean yields of seed cotton for 5 varieties, in hundredweights per acre, at the different locations used for the cotton-variety trials*

Variety	Yield at locations indicated							
	Santa Isabel No. 2	Isabela No. 3	Isabela No. 4	Salinas No. 5	Isabela No. 6	Corozal No. 7	Lajas No. 8	Aibonito No. 9
Montserrat Sea Island	20.18	10.92	11.540	16.57	9.99	9.25	17.46	6.59
Pima 32	10.66	10.53	2.704	14.06	7.22	10.78	8.86	7.15
Coastland	11.80	12.60	3.954	13.29	9.14	12.90	13.22	10.80
Sealand	19.06	20.53	7.942	17.28	22.86	19.59	23.71	22.40
Amsak	8.52	12.21	.694	13.90	7.73	9.39	10.51	7.59
L.S.D. for comparison between 2 variety means:								
At the 5-percent point	3.19	1.36	1.55	1.28	2.54	2.71	2.07	3.63
At the 1-percent point	4.55	1.91	2.17	1.73	3.56	3.81	2.85	5.08

produced bolls which ripened normally, producing a good cotton crop. The other three varieties in the trial did not recover well from the pruning and developed only a small number of fruiting branches, the yield of seed cotton per acre being very low.

The picking of the cotton started 3 months after the plants were pruned. Harvesting of the cotton from the variety Sealand was finished in 30 days, and the picking of cotton from the variety Montserrat Sea Island took 54 days. This variety (M.S.I.) outyielded the others in a highly significant way. If we compare the results in table 3, which shows per acre yields of seed cotton, with those in table 4, which shows yield of lint cotton per acre,

TABLE 4.—*Mean yields of lint cotton for 5 varieties, in hundredweights per acre, at the different locations used for the cotton-variety trials*

Variety	Yield at locations indicated							
	Santa Isabel No. 2	Isabela No. 3	Isabela No. 4	Salinas No. 5	Isabela No. 6	Corozal No. 7	Lajas No. 8	Aibonito No. 9
Montserrat Sea Island	6.36	3.35	3.52	5.18	3.16	2.94	5.50	2.07
Pima 32	3.48	3.97	.85	4.56	2.37	3.49	2.90	2.33
Coastland	4.16	4.31	1.35	3.65	3.23	4.55	4.66	3.80
Sealand	5.93	6.20	2.40	5.34	7.13	6.09	7.38	6.95
Amsak	2.75	3.87	.23	4.39	2.50	3.04	3.40	2.44
L.S.D. for comparison between 2 variety means:								
At the 5-percent point	1.06	0.98	0.47	0.41	0.83	0.89	0.71	1.15
At the 1-percent point	1.49	1.38	.66	.57	1.16	1.24	.98	1.61

TABLE 5.—*Results of classification, fiber tests, carded and combed yarn for varieties of cotton of the Barbadense species grown at 5 locations in the Island, processed at a card-production rate of 3½ pounds per hour*[1]

Test item	Results on variety indicated				
	M.S.L.	Pima	Coastland	Sealand	Amsak
Classification (Official Standard)					
Grade[2]	1	1	1	1	1
Staple (inches)	1½	1½	1⅝	1½	1½
Fiber length (fibrograph):					
Upper half mean (inches)	1.49	1.45	1.48	1.40	1.37
Mean	1.32	1.17	1.18	1.18	1.17
Uniformity ratio	89	81	80	84	85
Manufacturing:					
Carding rate (lbs./hr.)	3.5	3.5	3.5	3.5	3.5
Comber setting (inches)	.54	0.54	0.54	0.54	0.54
Wt. Fed. 1st. picker (lbs.)	9.00	9.00	8.83	8.73	9.00
Waste:					
Picker and card (percent)	10.24	10.91	10.26	10.34	11.82
Neps in card web (per 100 sq. in.)	12.53	14.71	11.85	13.86	12.05
Spinning-end breakage	[3]	[3]	[3]	[3]	[3]
Twist multiplier (all yarn Nos.)	3.50	3.55	3.50	3.60	3.60
Yarn strength and appearance:					
Carded 22s (pounds and grade)	184.4 B+	183.6 B	172.4 B	164.2 B	180.6 B
Carded 60s (pounds and grade)	54.3 B	54.8 B	51.6 C+	49.5 B	55.8 C+
Long draft processed:					
Average yarn strength index	102.2	102.5	87.4	91.1	102.4
Average yarn appearance index	115.0	115.0	105.0	110.0	115.0
Combed—60s (pounds and grade)	58.0 B+	58.2 B+	54.7 B	52.8 B	58.0 B
100s (pounds and grade)	29.4 B	29.8 B	28.1 C+	26.6 C+	30.0 B
Average yarn strength index	102.7	103.6	86.2	93.2	103.8
Average yarn appearance index	115.0	115.0	105.0	105.0	110.0

[1] Tests performed at the USDA Cotton Testing Laboratory, Clemson, S. C.

[2] Grade based on Sea Island Standards.

[3] Low.

we find that there is little difference in the yields of lint cotton from the variety Coastland, which outyielded Montserrat Sea Island, Pima 32, and Amsak in the seventh trial performed at Corozal and in the ninth trial at Aibonito, at the 5-percent point.

Montserrat Sea Island outyielded Pima 32, Coastland, and Amsak at the 5-percent point in the eighth trial at Lajas.

After the first trial, satisfactory results were obtained, pink bollworm and cotton aphis having been effectively controlled by fortnightly sprays with DDT and Aldrin.

COTTON TESTING LABORATORY REPORT

The main results obtained in the test carried out at the U. S. Cotton Testing Laboratory and reported in table 5 were summarized as follows:[4]

I. The total picker and card waste for the Sea Island, Pima 32, Coastland, and Sealand cottons are considered to be at about the same level, since the difference between the extremes of those 4, namely 10.24 percent for Sea Island and 10.91 for Pima 32 was less than 0.75 percent. The picker and card waste for Amsak was higher at 11.82 percent, indicating greater waste content than for any of the other four varieties in the test. These manufacturing waste levels are lower than average for the grade of these samples of cotton.

II. The total manufacturing waste, including that extracted at the picking, card and comber was higher for Pima 32. Sealand and Amsak were at approximately the same level, and were second. Sea Island was third from highest and Coastland was lowest with 20.89 percent.

III. In considering both carded and combed yarn strengths, Sea Island and Pima 32 which show no significant difference are best of the test. Samples from Amsak, are on the average second, followed by those from Coastland, with those from Sealand falling weakest of the test.

IV. Yarn appearance grades were best for Sea Island and Pima 32. The average yarn appearance indexes for the carded and combed of these were 115, which is significantly higher than that expected from average cotton. The combed yarns of Amsak, averaged next highest for the combed, but the carded yarns of Sealand were second. Coastland produced the lowest yarn grades of the test.

V. Sea Island strain is considered the best of the test. The total manufacturing waste from this sample was lower than the average expected from this grade, the strengths for both carded and combed yarns were above those for average cotton of this length, and the appearance grades for all yarns were above the level expected when manufactured under those conditions.

Pima 32 is considered second best. It is at the same level as Sea Island except for the waste content. The waste for this cotton was higher than for Sea Island. Amsak is the choice for third from an over-all spinning standpoint. This is followed by Coastland, with Sealand falling lowest in quality for the test.

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[4] The Laboratory report refers to the varieties by code, since the identification of the samples sent to the Laboratory was in code. For this report we have substituted the names of the varieties in quoting.

It is believed that cottons represented in the samples of Sea Island and Pima 32 could be carded and combed at a considerably higher rate of production than the 3½ pounds per hour used for these samples and still make yarns of acceptable grade by the best fine yarn mills.

GENERAL DISCUSSION

From the standpoint of yields, Sealand seems to be the best cotton variety to cultivate in Puerto Rico, but Montserrat Sea Island seems to be just as good for planting in the southern part of the Island. However, from the standpoint of the fiber quality, Montserrat Sea Island seems to be the cotton for Puerto Rico.

The statement that growing Sea Island cotton commercially in Puerto Rico is economically impractical from the point of view of the dollar yield per acre, and that it is not a practical cotton to process as compared to such Egyptian or American cottons as Pima 32 or Amsak, seems to be unwarranted. The yields of seed cotton obtained, as shown on tables 2 and 3, the tests carried out by the Laboratory of the Research and Testing Division, U. S. Department of Agriculture, Clemson, S. C., and their conclusion that Sea Island can be carded and combed at considerably higher rates of production than the 3½ pounds per hour used for the sample tested, and still enable the fine yarn mills to make yarns of acceptable grade, all indicate that growing Sea Island is economically feasible in Puerto Rico.

On the basis of the varieties available today and of the data presented, Montserrat Sea Island should be the variety to be considered, if a cotton mill were to be established in Puerto Rico, since it not only yields as much as any other cotton variety in the southern part of Puerto Rico, but its fiber is of better quality, and so would be the yarn and the goods manufactured therefrom.

The Station has already initiated a cotton-breeding project, and within the next 5 to 10 years we may hope to have a still better variety for the commercial production of cotton in Puerto Rico.

SUMMARY

Sea Island cotton, which has been cultivated in Puerto Rico for many years, is an important agricultural commodity for the minor crop growers or sharecroppers. With good management it is economically practical from the point of view of the dollar yield per acre.

The production of cotton has fluctuated considerably, as it has had no definite market since the cotton-ginning company suspended operations in the Island. The milling of cotton in Puerto Rico could probably do most to solve the cotton problem in a more permanent and satisfactory way. In the light of our experimental data from both field and the laboratory it is clearly shown that this type of cotton produces satisfactory yields of fine lint.

Sealand is a productive variety of cotton with a lower-quality fiber and good agronomic characteristics which could be used for the production of cotton at lower costs.

When the climate and weather conditions are suitable, additional good crops of cotton can be obtained from the same plants when the Sea Island, Montserrat variety, and Sealand are properly pruned.

RESUMEN

El algodón Sea Island se ha venido cultivando en Puerto Rico por muchos años como medio de vida para pequeños agricultores o agregados. Bien administrado el cultivo del algodón resulta remunerativo.

La producción de algodón en Puerto Rico ha fluctuado considerablemente debido a que no ha tenido un mercado seguro desde que se retiró de la Isla la San Juan Ginnery Company, única firma que por algún tiempo había venido comprando el algodón en rama producido aquí.

No hay duda de que la instalación de un telar que procesara nuestro algodón ayudaría grandemente a resolver el problema que actualmente confronta esta empresa agrícola.

Los datos de campo y laboratorio indican que el algodón Sea Island produce en Puerto Rico una fibra larga y de superior calidad.

La variedad Sealand es productiva aunque su fibra es de calidad inferior a la del Sea Island. Su alto rendimiento por cuerda amerita la variedad Sealand como recomendable para producir algodón a más bajos costos.

Cuando las condiciones climáticas son adecuadas se puede lograr una cosecha adicional si se podan las plantas de algodón, tanto de la variedad Montserrat (Sea Island) como las de la Sealand.

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