CORN-BREEDING WORK IN PUERTO RICO

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Introduction

The improvement of corn in Puerto Rico by common breeding methods may produce results of remarkable importance to its agriculture. The great value of corn as food for human beings, as well as livestock, is well demonstrated by the fact that imports of corn and corn products amounted to 955,405 cwt. in the fiscal year 1949–50, with a total value of $3,674,006 (1).[2] During 1947–48, the Island's total production amounted to only 184,000 cwt. with a total value of $887,000.

The average production per acre is extremely low, 5 or 6 cwt. of shelled corn per "cuerda" (0.97 acre). Because of these poor yields, cultivation on a commercial scale is very limited, thus making the Island dependent on importations. High production costs also keep farmers from devoting large areas to corn.

The use of hybrid seed corn in the United States has increased the yields of corn per acre by at least 20 percent. The development of hybrid corn in Puerto Rico is necessary in order to increase actual yields. That is why the corn-breeding program carried on by the Station has as its objectives the isolation of desirable inbreds from which high-yielding hybrids may be produced, and the development of practical methods of dealing with them.

Previous Work

Although corn was grown in the Island even before the Spanish conquest, no organized effort has been made until recently to improve the crop.

Early efforts to improve our native varieties of corn by selection and hybridization were made at the Puerto Rico Experiment Station at Mayagüez by Thomas Bregger and W. P. Snyder, in 1921, and were continued by R. L. Davis, in 1924 (2, 3, 4, 5). Ear-to-row selection and pure-line breeding were used for the improvement of native varieties (6, 7, 8, 9, 10, 11).

As a result of these tests undertaken with the cooperation of the Isabela Substation a local variety from Isabela was found superior to the hybrids being tested. This variety, when crossed with the best S_5 line, and when

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[2] Numbers in parentheses refer to "Literature cited", p. 16.

submitted to mass selection, produced the variety known as Mayorbela, which for the time being is our standard variety (12, 13).

During 1936–37, Roque (14) started a project on the improvement of native field corn at the Agricultural Experiment Station of the University of Puerto Rico at Río Piedras. Within this breeding program a number of inbred lines were developed and tested in top crosses and single crosses. (15, 16, 17, 18).

Lebedeff, (19, 20) selected 7 inbred lines and combined them into synthetic varieties. These synthetics did not outyield the Mayorbela variety, though they were found superior to the Diente de Caballo, which is the standard variety for the southwest area of the Island. (21, 22)

The testing of synthetics was discontinued later on because of their inconsistent and unsatisfactory performance when compared with variety Mayorbela.

Present Breeding Program

The primary objective of the corn-breeding program is the production of high-yielding hybrids by developing, selecting, and crossing pure lines. Over 500 selections from native and foreign stocks are actually in the process of inbreeding. A number of inbreds selected on the basis of their top-cross performance are being tested in all possible single-cross combinations for evaluation of their specific combining ability. Based on these trials it is expected that the best double-cross combinations can be predicted, and final tests will be conducted before recommendations are made, based on their performance.

A complementary phase of this work consists in introducing and testing germ plasm from foreign countries. Strains of desirable genetic diversity may thus be isolated and utilized for hybridization, in appropriate combinations with native strains. The performance of the various foreign strains is also being studied with reference to their geographical sources.

Meanwhile immediate measures for the improvement of our commercial varieties are being applied. S. C. Harland (24) proposed a new method for the improvement of open-pollinated varieties of corn. This method is rather economical and results may be obtained in a shorter time than with the pure-line method. It is under test now to determine its effectiveness for the improvement of native varieties of corn.

Experimental and Breeding Methods

Selection, collection, and preliminary evaluation of material for inbreeding

The first step for corn improvement was the collection of open-pollinated ears from different corn-growing areas of the Island. This procedure insures

a reasonably accurate sampling of the different sources of native-yield genotypes which might be isolated and tested to be further utilized in the production of hybrid corn. Four hundred and sixty-three ear selections were collected in 30 "barrios" of 17 municipalities, for use as the foundation germ plasm for the development of inbred lines. (See table 1.)

Germ plasm from several foreign countries was introduced to be utilized for hybridization, in appropriate combinations with desirable native strains, if worth while. Actually 517 varieties or strains from the United States and 19 foreign countries are being tested and evaluated for their potential breeding value.

DEVELOPMENT OF INBREED LINES

Corn-breeding work consists of 3 main phases, namely: 1. Developing inbred lines through inbreeding and selection for at least four consecutive generations; 2. testing and evaluating these lines, and; 3. determining the best combinations between these lines for the production of the highest yielding hybrids.

Seed samples from ears selected as foundation stock for the production of inbred lines were planted in 20-ft. rows, 10 hills to each row. The best plants, judged by their vigor, freedom from insects, disease damage, etc., were self-pollinated by modern corn-breeding techniques. The ears obtained from the best plants were again selected for husk cover, size and shape of ear, kernel characters, insect and disease injury, etc.

The selected ears were planted again. The same procedure used for selecting and selfing the ears in the field, and the selection made in the ear stage after harvest, were carried out continuously until the lines were fixed or became almost homozygous.

The inbreeding process screened out numerous defective or undesirable conditions such as various types of sterility, tassel seed, virescence, dwarf, etc. which appeared mostly in the second and third self-generations.

A variation in the number of self-pollinations was required by different lines to attain uniformity; this fluctuated between 4 and 7 selfings. At this stage the pure lines were ready to be tested for general combining ability.

TESTING INBRED LINES

The combining ability of inbred lines is evaluated by determining their yield potential in test crosses. An inbred line, a single cross, or an open-pollinated variety may be used as tester for the production of these test crosses. No inbreds or hybrids were available as testers, so our standard variety Mayorbela was used for this purpose.

A selection of 100 practically homozygous native lines was top-crossed with the standard native variety Mayorbela, in 1949. A detasseled plot was

TABLE 1.—*Ear corn selections for pedigree-breeding collected in various corn-growing areas of Puerto Rico*

Pedigree No.	Number of selections	"Barrio"	Municipality
		North Section	
697–699	3	Cupey	Río Piedras
814–817	4	Sabana Llana	do.
889	1		do.
804–813	10	Carraizo	Trujillo Alto
624–629	6	Buena Vista	Bayamón
600–615; 700–713; 675–685	41	Cibuco	Corozal
616–623; 659–668	18	Palmarejo	do.
788–793	6	Palo Blanco	do.
630–641; 726–731	18	Loma	Naranjito
739–745	7	Cedro Abajo	do.
		Interior	
794–801	8	Valenciano Abajo	Juncos
802–803	2	Lirios	do.
779–787	9		Cidra
746–757	12		Cayey
714–725; 758–766	21	La Plata	Aibonito
642–658	17	Honduras	Barranquitas
767–771	5	Quebrada Grande	do.
772–778	7	Palo Hincado	do.
669–674	6	Damián Arriba	Orocovis
686–696; 732–738	18	Orocovis	do.
		Southern and Southwestern Section	
825–871	47	Pasto	Coamo
872–882	11	Llano	do.
975–985; 998; 1003–1014; 1092–1107	40	Llanos Costa	Cabo Rojo
1135–1144	10	Boquerón	do.
959–967	9	Machuchal	Sabana Grande
890–891	2	Parguera	Lajas
968–974; 986–992; 1015–1026; 1120	27	La Plata	do.
1035–1042	8	Lajas Alto	do.
1121–1134	14	Costa	do.
1108–1119; 1027–1034	20	Piedras Blancas	Guayanilla
1043–1054	12	Quebrada	do.
1055–1078	24	Magas	do.
1079–1091	13	Jagua	do.
		Eastern Section	
818–824	7		Vieques

TABLE 2.—*Yield data for corn top crosses test at Isabela Substation*[1]

Top cross No.	Pedigree No.		Estimated yield per acre[2]
			Hundredweights
57	987-1-1	S_6	62.01
63	1002-2-1-2	S_6	61.10
55	972-b-1-1-2	S_6	60.83
29	813-1-6-1-2	S_6	59.86
11	621-1-1-1	S_7	59.63
28	779-1-1-2	S_6	59.61
56	972-1-1-2	S_6	59.57
19	695-1-1-1-2	S_7	59.42
6	174a-5-1-2	S_9	59.28
24	741b-1-1-1	S_6	58.31
47	963-1-1	S_6	57.38
12	636–4–1–1–1	S_7	57.09
31	889c-3-1-1-1	S_9	57.07
46	959-1-1-3	S_6	56.72
9	381b-5-1-2	S_9	56.67
53	970b-2-1-1	S_6	56.28
32	889c-3-2-1-2	S_7	56.07
8	342-5-1-2	S_9	55.95
37	915-2-1-2	S_4	55.81
17	670a-1-1-1	S_6	55.43
43	959-1-1	S_6	55.29
22	709-1-1-1	S_5	54.98
23	741a-1-2	S_7	54.73
15	649b-1-1-2	S_7	54.61
26	757b-1-1-2	S_6	54.44
34	889d-3-1-1	S_6	53.98
27	778-2-1-1	S_6	53.09
36	912-2-1-1-1	S_6	52.72
13	644-1-1-1	S_6	52.43
35	889c-3-1-1-1	S_7	52.12
41	953-2-1-2	S_6	52.04
48	967c-1-4	S_5	51.85
54	971-1-1	S_5	50.88
7	296-5-1-2	S_9	50.86
21	695-1-1-1-5	S_7	50.82
30	869a-2-1-2	S_6	50.72
16	649b-2-1-1	S_6	50.67
3	154-1-1-1-3	S_7	50.22
18	695-1-1-1-1	S_7	49.54
51	970b-1-1-2	S_6	48.65
10	381b-5-1-3	S_9	48.55
4	159-6b-1-1-2	S_{10}	48.07
62	994-2-1-3	S_6	47.97
39	917-1-1-1	S_7	47.39
44	959-2-1	S_6	47.39
64	Mayorbela		47.24

TABLE 2.—*Continued*

Top cross No.	Pedigree No.		Estimated yield per acre[2]
			Hundredweights
1	78a-2-1-1	S_6	46.97
25	742-2-1-2	S_6	46.87
52	970b-1-1-3	S_6	46.66
20	695-1-1-1-3	S_7	45.65
33	889c-3-2-1-3	S_7	44.80
59	990b-1-1-2	S_6	44.66
14	644-1-1-3	S_6	44.26
5	174a-4-1-1	S_9	43.93
42	956-1-1	S_5	43.10
2	78a-2-1-3	S_6	42.86
45	959-1-1-2	S_6	42.11
40	953-2-1-1	S_6	40.17
50	970b-1-2	S_5	40.17
49	967c-1-1-1	S_6	40.15
38	917-1-1-1	S_6	39.46
58	987-3-1-1	S_6	39.42
60	994-1-1-2	S_6	38.70
61	994-2-1-2	S_6	36.78
Top crosses, average yield			51.03

[1] Planted March 16, 1950; harvested June 29, 1950. Size of plots: 1/580.8 acre.

[2] Least significant difference at the 5-per cent point—3.89 cwt.; at the 1-per cent point—4.76 cwt.

planted, 1 row of Mayorbela for each 2 rows of inbreds, the Mayorbela being used as the pollen parent. The inbreds (seed parents) were detasseled as soon as the tassels were emerging and before pollen-shedding began.

Because there were insufficient top-crossed seed of every line, 63 top crosses were tested at the Isabela Substation with Mayorbela as a check, in the summer of 1950, using a triple lattice design.

Another yield test, a triple lattice, including 80 top crosses, and Mayorbela as a check, was conducted at the Lajas Substation during the late summer and winter of 1950.

Analyses of variance were made for each yield trial and least-significant differences at the 1- and the 5-percent points for yield per acre, were used as a basis for determining the combining ability of this group of lines.

EXPERIMENTAL RESULTS

The yield tests for determining the combining ability of a group of native inbred lines were carried out as described above.

In the yield test at Isabela, 31 top crosses out of 63, or almost 50 percent, outyielded Mayorbela significantly at the 1-percent point, as shown in

TABLE 3.—*Yield data for corn top crosses test at Lajas Substation*[1]

Top cross No.	Pedigree No.		Estimated yield per acre[2]
			Hundredweights
40	889c-3-1-1-1	S_7	27.67
57	959-1-1-3	S_6	26.87
50	917-1-1-1	S_7	26.39
80	1002-2-1-3	S_6	25.65
75	994-2-1-3	S_6	25.01
20	670a-1-1-1	S_6	24.92
67	971-1-1	S_5	24.78
34	778-2-1-1	S_6	23.83
76	1002-2-1-2	S_6	23.66
47	912-2-1-1	S_6	23.56
24	695-1-1-1-5	S_7	23.48
21	695-1-1-1-1	S_7	22.75
78	674-1-1-1-1	S_7	22.24
19	661a-1-1-1	S_6	21.33
72	990b-1-1-2	S_6	21.20
79	813-1-2	S_6	20.99
44	889c-3-2-1-4	S_7	20.83
48	915-2-1-2	S_4	20.68
59	967c-1-4	S_5	20.31
73	994-1-1-2	S_6	20.25
32	757a-1-1-2	S_6	19.84
38	860-2-2-1-4	S_6	19.71
55	959-2-1	S_6	19.71
43	889c-3-2-1-3	S_7	19.51
74	994-2-1-2	S_7	19.46
29	741a-1-2	S_7	19.30
28	738a-2-1-1	S_6	19.21
46	889d-3-1-1-1-1	S_7	18.86
16	644-1-1-3	S_6	18.78
42	889c-3-2-1-2	S_7	18.74
62	970-1-2	S_5	18.41
23	695-1-1-1-3	S_7	18.26
36	779-1-1-2	S_6	18.00
33	757b-1-1-2	S_6	17.95
26	711-1-1-1-1	S_7	17.91
70	967-1-1	S_6	17.73
35	779-1-2	S_5	17.73
22	695-1-1-1-2	S_7	17.68
8	342-5-1-2	S_9	17.64
10	381b-5-1-3	S_9	17.62
56	959-1-1-2	S_6	17.58
58	963-1-1	S_6	17.50
66	970b-2-1-1	S_6	17.39
7	275-1-2	S_9	17.08
31	742-2-1-2	S_6	17.02
30	741b-1-1-1	S_6	16.98

TABLE 8.—*Continued*

Top cross No.	Pedigree No.		Estimated yield per acre[2]
			Hundredweights
69	978-1-1-1	S_6	16.96
3	154-1-1-1-3	S_7	16.75
45	889d-3-1-1	S_6	16.73
11	644-1-1-1	S_6	16.15
6	174a-5-1-2	S_9	15.74
39	869a-2-1-2	S_6	15.70
18	649b-2-1-1	S_6	15.62
77	1002-1-1-2	S_6	15.58
14	621-2-1-2	S_7	15.57
4	159-6b-1-1-2	S_{10}	15.57
5	174a-4-1-1	S_9	15.43
68	972-1-1-2	S_6	15.31
52	953-2-1-2	S_6	15.22
71	987-3-1-1	S_6	15.20
64	970b-1-1-2	S_6	15.18
54	959-1-1	S_6	15.12
41	889c-3-1-1-2	S_7	14.66
13	621-2-1-1	S_7	14.42
15	636-4-1-1-1	S_7	14.37
49	917-1-1-1	S_6	14.29
61	967c-2-1-4	S_5	14.19
65	970b-1-1-3	S_6	14.07
17	649b-1-1-2	S_6	14.00
25	709-1-1-1	S_5	13.82
81	Mayorbela (check)		13.67
12	621-1-1-1	S_7	13.36
63	970b-1-2	S_5	13.36
9	381b-5-1-2	S_9	12.86
53	956-1-1	S_5	12.74
2	78a-2-1-3	S_6	12.45
37	813-1-6-1-2	S_6	12.43
1	78a-2-1-1	S_6	11.75
60	967c-1-1-1	S_6	8.03
51	953-2-1-1	S_6	6.80
27	725a-2-1-2	S_6	3.39
Top crosses, average yield			17.69

[1] Planted August 28, 1950; harvested January 1951. Size of plots: 1/580.8 acre.

[2] Least significant difference at the 1-per cent point—2.69 cwt.; at the 5-per cent point—2.21 cwt.

table 2. The average yield of the top crosses, 51.03 cwt. per acre, was almost equal to the limit of significance from the check at the 5-percent point, 51.3 cwt. per acre.

TABLE 4.—*Comparison of individual yields of top crosses with Mayorbela (check)*
[Data from Isabela and Lajas tests]

Top cross No.	Pedigree No.		Isabela data: Increase or decrease (—) in yield as compared with check		Rank, according to yield at Lajas[1]	Lajas data: Increase or decrease (—) in yield as compared with check	
			Hundredweights per acre	Percent		Hundredweights per acre	Percent
57	987-1-1	S_6	14.77	31.27	36	4.06	29.0
63	1002-2-1-2	S_6	13.86	29.34	9	9.99	73.0
55	972-1-1-2	S_6	13.59	28.77	58	1.64	10.00
29	813-1-6-1-2	S_6	12.62	26.71	77	−1.24	−9.0
11	621-1-1-1-1	S_7	12.39	26.23	72	−.31	−2.0
28	779-1-1-2	S_6	12.37	26.19	33	4.33	32.0
56	972-1-1-2	S_9	12.33	26.10	58	1.64	10.0
19	695-1-1-1-2	S_7	12.18	25.78	38	4.01	29.0
6	174a-5-1-2	S_9	12.04	25.49	51	2.07	15.0
24	741b-1-1-1	S_6	11.07	23.43	46	3.31	20.0
47	963-1-1	S_6	10.14	21.46	42	3.83	28.0
12	636-4-1-1-1	S_7	9.85	20.85	65	.70	5.0
31	889c-3-1-1-1	S_9	9.83	20.81			
46	959-1-1-3	S_6	9.48	20.07	2	13.20	97.0
9	381b-5-1-2	S_9	9.43	19.96	74	−.81	−5.9
53	970b-2-1-1	S_6	9.04	19.14	43	3.72	27.0
32	889c-3-2-1-2	S_7	8.83	18.69	30	5.07	37.0
8	342-5-1-2	S_9	8.71	18.44	39	3.97	29.0
37	915-2-1-2	S_4	8.57	18.14	18	7.01	51.0
17	670a-1-1-1	S_6	8.19	17.34	6	11.25	82.0
43	959-1-1	S_6	8.05	17.04	62	1.45	10.0
22	709-1-1-1	S_5	7.74	16.38	70	.15	1.0
23	741a-1-2	S_7	7.49	15.86	26	5.63	41.0
15	649b-1-1-2	S_7	7.37	15.60	69	.33	2.0
26	757b-1-1-2	S_6	6.83	14.46	34	4.28	30.0
34	889d-3-1-1	S_6	6.74	14.27	49	3.06	20.0
27	778-2-1-1	S_6	5.85	12.38	8	10.16	74.0
36	912-2-1-1	S_6	5.48	11.60	10	9.89	72.0
13	644-1-1-1	S_6	5.19	10.99	50	2.48	18.0
35	889c-3-1-1-1	S_7	4.88	10.33	1	14.00	100.0
41	953-2-1-2	S_6	4.80	10.16	59	1.55	10.0
48	967c-1-4	S_5	4.61	9.76	19	6.64	49.0
54	971-1-1-1	S_5	3.64	7.71	7	11.11	81.0
7	296-5-1-2	S_9	3.62	7.66			
21	695-1-1-1-5	S_7	3.58	7.58	11	9.81	72.0
30	869a-2-1-2	S_6	3.48	7.37	52	2.03	15.0
16	649b-2-1-1	S_6	3.43	7.26	53	1.95	14.0
3	154-1-1-1-3	S_7	2.98	6.31	48	3.08	20.0
18	695-1-1-1-1	S_7	2.30	4.87	12	9.08	66.0
51	970b-1-1-2	S_6	1.41	2.98	61	1.51	10.0
10	381b-5-1-3	S_9	.31	2.77	40	3.95	28.0

TABLE 4.—*Continued*

Top cross No.	Pedigree No.		Isabela data: Increase or decrease (—) in yield as compared with check		Rank, according to yield at Lajas[1]	Lajas data: Increase or decrease (—) in yield as compared with check	
			Hundredweights per acre	Percent		Hundredweights per acre	Percent
4	159-6b-1-1-2	S_{10}	.83	1.76	56	1.90	14.0
62	994-2-1-3	S_6	.73	1.55	5	11.34	83.0
39	917-1-1-1	S_7	.15	.32	3	12.72	93.0
44	959-2-1	S_6	.15	.32	23	6.04	43.0
64	Mayorbela				71		
1	78a-2-1-1	S_6	−.27	−.57	78	−1.92	−14.0
25	742-2-1-2	S_6	−.37	−.78	45	3.35	20.0
52	970b-1-1-3	S_6	−.58	−1.23	68	.40	2.9
20	695-1-1-1-3	S_7	−1.59	−3.37	32	4.59	34.0
33	889c-3-2-1-3	S_7	−2.44	−5.17	24	5.84	43.0
59	990b-1-1-2	S_6	−2.58	−5.46	15	7.53	55.0
14	644-1-1-3	S_6	−2.98	−6.31	29	5.11	37.0
5	174a-4-1-1	S_9	−3.31	−7.01	57	1.76	14.0
42	956-1-1	S_5	−4.14	−8.76	75	−.93	−6.8
2	78a-2-1	S_6	−4.38	−9.27	78	−1.92	−14.0
45	959-1-1-2	S_6	−5.13	−10.86	41	3.91	28.0
40	953-2-1-1	S_6	−7.07	−14.97	80	−6.87	−50.0
50	970b-1-2	S_5	−7.07	−14.97	73	−.31	−2.0
49	967c-1-1-1	S_6	−7.09	−15.01	79	−5.64	−41.0
38	917-1-1-1	S_5	−7.78	−16.47	66	.62	4.5
58	987-3-1-1	S_6	−7.82	−16.55	60	1.53	11.19
60	994-1-1-2	S_6	−8.54	−18.08	20	6.58	48.0
61	994-2-1-2	S_6	−10.46	−22.14	25	5.79	42.0
Top crosses, average.....			3.79	8.02		4.02	29.41

[1] Minus sign indicates yield below check. Blank spaces indicate missing data.

At Lajas, 49 top crosses out of 80, or 61 percent, outyielded Mayorbela significantly at the 1-percent point. The average yield of the top crosses, 17.69 cwt. per acre, was significant over that of the check at the 1-percent point. (See table 2.)

At Isabela, 24 top crosses gave increases in yield over Mayorbela of over 15 per cent and up to 31 percent, equivalent to a range of 7 to 14 cwt. per acre, as shown in table 3.

In the Lajas test, 52 top crosses produced increases in yield over Mayorbela of from 15 to 100-percent, which is equivalent to a range of 2 to 14 cwt. per acre. (See table 3.)

The data indicated definite variations in the performance of some top crosses at Isabela, as compared with those at Lajas, as shown in table 4.

The best top crosses did not perform the same at both experimental sites, obviously because Isabela has irrigation facilities, while Lajas is a very dry region with no irrigation. Also, weather and soil conditions are quite different in these two regions.

Discussion

It is known that most varieties or hybrids adapt themselves differently under diverse environmental conditions. These differences in performance of the top crosses, as shown above, might be explained as being the consequence of genetic variability as modified by the environmental requirements of the lines tested.

The ultimate objective of producing inbred lines is to utilize them for the production of hybrids, so their final selection is based on their performance as hybrids.

The inbred-variety cross (top cross) is used to measure the average general combining ability of the inbred. However, this test is principally used for the preliminary screening out of lines of low or inferior combining ability. It must be supplemented by the single-cross performance test, to measure the specific combining ability of the line. The single crosses are being tested and the results should provide the necessary information to determine how the lines will nick.

The results so far obtained indicate that a number of pure lines with a high combining value are now available and this is fundamental to the production of high-yielding hybrids.

On the basis of this information there is no doubt that the possibilities for corn production in the Island can be improved with the development of high-yielding hybrids.

Although the yield results presented here are based on two tests only, they nevertheless indicate that some of the inbred lines developed possess a high combining value for the production of hybrids superior to our present varieties. Discounting the economic considerations which determine the feasibility of producing hybrid corn in Puerto Rico, it is expected that some of these lines will give rise to hybrids that, in turn, will increase local corn production considerably. With the development of additional new lines, and through the improvement of the original inbred stocks, new hybrids of superior yielding capacity can be produced to replace the original hybrids and thus increase Puerto Rican corn yields.

It is expected that the use of hybrid seed in Puerto Rico will cause farmers some difficulties. As it is, they have been producing their own seed corn every year for many generations. But the farmer must obtain hybrid seed corn from the producer each season. It is believed that this practice will not be readily accepted by corn growers. The value of this deviation from

daily routine will have to be demonstrated and proved before it is accepted. Therefore, an intensive educational campaign is necessary to teach farmers the approved practices to be followed in the production and utilization of hybrid corn seed.

Summary

A breeding program for the improvement of corn production in Puerto Rico is being carried on. A number of inbred lines have been developed and tested in top crosses. Results obtained in these tests show that some of these lines possess a high combining value, which is the primary basis for the production of high-yielding hybrids.

The data so far obtained indicate that the possibilities for improving corn production in Puerto Rico by developing high-yielding hybrids are promising.

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