

THE SUGAR CANE VARIETIES OF NATAL.

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The often discussed topic, "Which type of sugar cane is best for Natal?" has occupied the attention of our sugar industry from earliest times, and much has been written, either as the result of observation or experiment, on the merits or otherwise of the succession of varieties which have found their way to the mills of this country. The object of the present paper is an attempt to view the whole position of varieties in as broad lines as possible, and to see if the lessons of past failures can be of any guide in assisting us in our search for new varieties which will meet the demands imposed upon them by our conditions here. From the early days up to the present, at least 180 varieties have been introduced from outside, of which only a few have ever succeeded in establishing themselves as commercial varieties, for a time at least.

The earliest record of the cultivation of sugar cane in Natal appears to be that of some shipwrecked mariners, who, in 1635, discovered the natives near Umzimkulu growing millet, maize, melons, beans, gourds and sugar cane.

The interest of this lies in its demonstration of the fact that, even at this early date, the natives were cultivating plants whose home was outside the African continent (for example, maize is American in origin) and somewhat invalidates the statements of some earlier historians that sugar cane is necessarily indigenous to Natal. Further, the genus *Saccharum*, to which sugar cane belongs, is not a South African genus, so that we are more correct in assuming that even the earliest variety or varieties cultivated by the natives had originally been introduced from elsewhere.

The first European to attempt cultivation of this plant was Morewood, of Compensation, who no doubt obtained some from the natives, and seeing possibilities in it as a crop plant, became interested in securing other varieties. This he did in 1847, when the "Sarah Bell" arrived with varieties from Mauritius and Reunion (Bourbon), among which were Ribbon cane, Bourbon Yellow and Bourbon Purple. These three were later (1852) planted on the South Coast, together with the supposedly indigenous variety which was then, as a means of distinguishing it, called Green Natal. This variety has been subsequently identified as Light Preanger, a variety well-known in the earlier days of sugar cane history in other countries, a fact which lends support to the view that the first sugar canes were introduced into this country.

Green Natal was the favourite variety up till 1870, when it began to be replaced by another cane

whose origin is obscure—China cane. According to some, this variety was descended from the native grown cane; according to others it was introduced. Owing to the fact that it has not been identified with any other well-known sugar cane, it is impossible to determine its origin, and the manner in which it came into cultivation is an open question. That it had been in the country some time before 1870, however, is certain, as the floods of 1868 and the frosts of 1869, in which Mr. Lamport of Merebank suffered severely, destroyed about 400 acres of cane, the bulk of which was China cane.

This variety is interesting as it provides us with the first record of disease of sugar cane in Natal. About 1877 smut appeared, and almost destroyed the variety in the Inanda division. This disease was identified at Kew as being caused by the fungus *Ustilago sacchari*, and was the first specimen they had received of this disease on cultivated sugar cane. The popularity of this variety then waned, and by about 1880 was largely being replaced by others. It is interesting to note that there is still some of this same stock of China cane, derived from healthy plants, growing at the Experiment Station, which have never shown any sign of smut.

From 1873 to 1880 several varieties were introduced from Mauritius, and in 1883 Uba was introduced by de Pass at Reunion, and again in 1884 by Sir Chas. Mitchell, who gave the plants to Wilkinson of Ottawa.

In 1902 the Government began to assist planters in the importation of varieties, and sugar canes came in from the West Indies, British Guiana, Mauritius, Queensland and Honolulu. In 1909 Egypt and Louisiana supplied cuttings, and in 1911 a number of Indian varieties were imported.

That such importations were done on a considerable scale is seen from the annual report of the Natal Agricultural Department, when in 1902 alone 597 sacks of cuttings were examined at the Port of Natal. This, of course, was before the days of strict quarantine restrictions; importations in such quantities would be impossible now.

A few years later the Natal Sugar Association obtained a piece of ground on the Eastern Vlei in Durban, to be used as an experimental plot for new varieties. Planting began in 1914, and the canes seem to have been under the supervision not only of the sugar industry, but of the Government botanist, entomologist, and also the sanitary inspector. The first issue of these canes was in 1916, and included some varieties from Argentine.

Difficulty, apparently, was found in supervising this plot, and in 1919 the canes were all cleared out; but during its existence several varieties were introduced. One interesting experiment was the introduction of Uba seedlings. Cuttings of Uba were sent by the Principal of Cedara College of Agriculture to various other sugar-growing countries, with the request to grow these till they flowered and send back the seed obtained. As a result, four seedlings were obtained from Mauritius, and one of these appears to have shown some promise, as we find it being referred to in a census of varieties taken later on.

Meanwhile, an experiment station for subtropical agriculture had been started by the Government at Winkle Spruit, who tried a number of varieties from different countries, and in 1918 distributed Agaul, a variety very similar to Uba.

Introductions by private individuals or estates continued after this, and in 1923 we find reference to three lots of canes under trial—Queensland varieties at Natal Estates, Mauritian seedlings at La Mercy, and also some varieties from Java at the Botanic Gardens.

An attempt seems to have been made to revive the station on the Eastern Vlei, as we find it recorded that in 1923 several Indian varieties planted there did not grow.

A census of sugar cane plantations in 1924 lists the following varieties: Green Natal, Uba, Striped Uba, Agaul, Argentine canes, Antigua canes, P.O.J.213, D.74, a Mauritius seedling, and a cane called Dark Red (Port Mackay?), as well as "mixed varieties," with Uba largely predominating. In 1925 a quarantine glasshouse in Durban, donated to the Sugar Association by the late David Fowler and Edmund Campbell, was erected and put into use, in which imported varieties had to undergo a strict quarantine trial prior to transfer to the open at the Experiment Station at Mount Edgecombe.

The reason for this tightening-up of importation regulations was the occurrence of mosaic disease, to be referred to presently; but before doing so, and to finish this extremely sketchy outline of the introduction of varieties up to this period, a list of such varieties is given below:—

VARIETIES OF SUGAR CANE INTRODUCED INTO NATAL PRIOR TO THE ESTABLISHMENT OF THE EXPERIMENT STATION AT MOUNT EDGECOMBE.

Name (local name).	Name of variety (where different from local name).	Country whence introduced.	Country of origin or variety.
Agaul	—	India	India.
Argentine No. 1	P.O.J.100? P.O.J.234?	Argentine	Java.
Argentine No. 2	P.O.J.213	Argentine	Java.
Argentine No. 3	P.O.J.36?	Argentine	Java.
B.15	—	Antigua	Barbados.
B.95	—	Antigua.	Barbados.
B.109	—	Antigua	Barbados.
Badila... ..	—	Queensland... ..	New Guinea.
Belle-ougete	Black Cheribon	Mauritius	Java
Black Innes	—	Queensland... ..	Mauritius.
Black Cheribon	—	Egypt	Java.
Black Tanna	—	?	New Hebrides.
Bois Rouge	—	Mauritius	Java?
Bourbon Yellow	?	Reunion	?
Bourbon Purple	?	Reunion	?
China cane	?	?	?
Chin	—	India	India.
Cuban Selection	CH.64/21	Cuba	Cuba.
Clarke's Seedling	H.Q.409	Queensland... ..	Queensland.
D.74	—	British Guiana	British Guiana.
D.95	—	British Guiana	British Guiana.
D.109	—	British Guiana	British Guiana.
D.145	—	British Guiana.	British Guiana.
D.625	—	British Guiana	British Guiana.
D.626	—	British Guiana	British Guiana.
D.1135	—	Queensland... ..	British Guiana.
Daniel Dupont	—	Queensland... ..	Mauritius.
Dhaura	—	India	India.

Name (local name).	Name of variety (where different from local name).	Country whence introduced.	Country of origin or variety.
Egyptian No. 3	P.O.J.105 ? P.O.J.147 ?...	Egypt	Java.
Elephant	—	?	Siam ?
Fotiogo	—	Mauritius	New Caledonia.
Giraffe	—	Mauritius	?
Gingor	—	Queensland...	Queensland.
Green Natal	Light Preanger	?	Java.
Gold Dust	—	Mauritius	?
Horne ...	—	Mauritius	—
Horne ...	—	Brit. West Indies	—
Honolulu Rose Bamboo	?	Honolulu	?
Honolulu Lahaina	Otaheite ?	Honolulu	Society Islands?
H.Q.694	?	Queensland...	Queensland.
Imperial	Striped Otaheite ?...	Mauritius	?
Iscambine	—	Mauritius	New Caledonia.
Java No. 105...	P.O.J.105	Egypt	Java.
Java No. 147...	P.O.J.147	Egypt	Java.
Java No. 139...	P.O.J.139	?	Java.
Java No. 228...	P.O.J.228	?	Java.
Kewalu	—	India	India.
Kuswar	—	India	India.
Louisier (Golden Cuba)	Otaheite	Mauritius	Society Islands.
Light Preanger	—	?	Java.
Madras	—	India	India.
Matua	—	India	India.
Mango...	—	India	India.
Mauritius	Seedling of Uba	Mauritius	Mauritius.
M.1900 Seedling	—	Queensland...	Mauritius.
M.P.55	—	Mauritius	Mauritius.
Penang	Selangor	—	—
Port Mackay...	Cavengire	?	New Caledonia?
Purple Barrel...	—	Mauritius	?
Purple Mauritius	—	Mauritius	?
Po-a-ole	—	Mauritius	New Caledonia?
Purple Queen...	—	Mauritius	—
Poudre d'Or	—	Mauritius	Java.
Queensland No. 2	?	Queensland...	?
Queensland No. 3	?	Queensland...	?
R.C.719	?	?	?
Rose Bamboo	Light Preanger	Mauritius	Java.
Ribbon	Striped Preanger ?...	Reunion	Java ?
Saranti	—	India	India.
Sin Nombre	Saretha	Mauritius	India.
Tamarind	—	Mauritius	New Caledonia.
Uba	—	India	India.
Uba Seedlings	—	Mauritius	Mauritius.
White Tanna...	—	Mauritius	New Hebrdies.
White Queen...	—	Mauritius	?
Zwinga	—	Louisiana	China.

Examination of such a list shows that some confusion exists, owing to the fact that in some cases the same variety had been grown under more than one name, and had been introduced more than once; it nevertheless shows that a wide choice of varieties had been made, and the resources of a large number of countries drawn upon in the attempt to find

canes suitable for our conditions here. At the very least 70 varieties had been introduced, of which only one, Uba, finally established itself, owing to immunity to the disease which then threatened the industry—mosaic.

This disease, first observed in 1918, had spread so that in 1923 it was recorded that all "soft canes"

and the Argentine varieties were infected, or capable of infection, and Uba alone was found free. The origin of the disease in Natal could not be definitely traced, but Dr. H. H. Storey, then Government Mycologist, who investigated the situation, was of the opinion that it had been introduced by the Argentine varieties which were distributed from the original quarantine station on the Eastern Vlei, and from these spread to the other susceptible varieties growing in the country. The mosaic situation was brought under control by the compulsory eradication of all varieties other than Uba; the intention being that after a period of some years the disease would be eradicated and the growing of susceptible varieties, superior to Uba, would become possible. This idea has had to be abandoned, however, owing to the discovery of a wild perennial grass, *Selaria sulcata*, which is susceptible to mosaic, and acts as a source of infection for sugar cane; and the only practical solution to the problem is the growing of varieties which are immune, or highly resistant. Uba, though immune to mosaic, has unfortunately proved itself susceptible to another disease of the same type—streak, which ranks with mosaic as one of our major diseases in Natal.

These two diseases are constantly appearing in the varieties growing in the collection of sugar canes at the Experiment Station, and it has been found instructive to classify the varieties affected into their botanical species. (It should be noted that the susceptibility recorded here refers only to cases of disease found actually in the field, and not as the result of artificial transmission.)

<i>Saccharum officinarum</i> .	Susceptible to	
	Mosaic.	Streak.
Natural varieties—		
Badila	X	X
Black Tanna	X	X
Otaheite	X	X
Light Preanger	X	X
Yellow Caledonia	X	—
Horne	X	—
Hybrids—		
B.726	X	—
B.H.10/12	X	—
Black Innes	X	X
D.1135	X	X
D.207/20	X	X
D.666/13	X	X
Diamond 10	X	X
J.247 B.	X	—
M.1900	X	—
M.P.55	X	X
Pompey	X	—
S.C.12/4	X	—
S.J.4	X	—
S.J.7	X	X

Saccharum sinense.

Agaul	X	X
CH.64/21, Cuban Selection	—	X
Kavangire	—	X
Merthi	—	X
Oshima... ..	—	X
Uba	—	X
Yon-tan-san	—	X

Two other species of sugar cane represented in the collection, viz. *S. spontaneum* by Glagah and Amu Darya, and *S. barberi* by Sin Nombre, have not been recorded with either disease.

The susceptibility of *Saccharum officinarum* varieties and hybrids towards mosaic and streak, and of *S. sinense* varieties towards streak, is amply illustrated in this table. (Agaul is peculiar in that it is susceptible to a type of mosaic which is not transmitted to other varieties, and is probably a different strain of the disease.)

The reaction of hybrids between these species of cane towards these diseases is seen in the following table, which applies only to varieties which are a first cross between the species concerned :—

Interspecific Hybrids.

(FIRST CROSSES.)

<i>S. officinarum</i> × <i>S. spontaneum</i> .	Susceptible to	
	Mosaic.	Streak.
Kassoer (<i>S. spontaneum</i> Java)	—	—
Toledo (<i>S. spontaneum</i> Celebes)	—	—
Co.205 (<i>S. spontaneum</i> India)	X	—
<i>S. officinarum</i> × <i>S. barberi</i> .		
P.O.J.36	X	—
P.O.J.213	X	X
P.O.J.234	X	—
<i>S. officinarum</i> × <i>S. sinense</i> .		
U.D.1	X	X

It is interesting to note that the reaction of the above varieties towards mosaic is the same as has been found elsewhere, viz. that the first cross between *S. spontaneum* and *S. officinarum* is resistant except when the Indian form of the wild cane is used, and that the first crosses between *S. officinarum* and *S. barberi* are susceptible.

The remainder of the varieties in the collection are mostly more complex in their hereditary constitution, as they either consist of hybrids between more than two species, or if only of two species several varieties have been used in their breeding.

(Exceptions are the hybrids between sugar cane and sorghum, but none of these have been seen with either streak or mosaic.)

In this group of complex hybrids, consisting of about seventy varieties, only two have been found with mosaic, and ten with streak.

The position may be summarised briefly as follows:—

1. Varieties of *S. officinarum* (the thick "soft" canes) in Natal are highly susceptible to mosaic, and are also susceptible to streak.
2. Varieties of *S. sinense* (the Uba type canes) are highly susceptible to streak.
3. Control of these diseases appears to have the greatest chance of success by the growing of varieties of complex hereditary constitution.

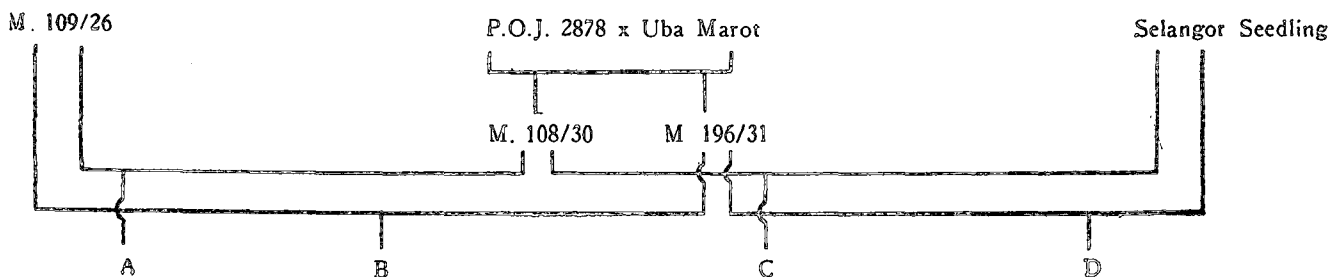
It is thus seen that the varieties grown in past days, once mosaic and streak had been established, had little chance of surviving as commercial canes. The same holds good for varieties of these susceptible groups introduced to-day. For example, two Queensland varieties, S.J.4 and S.J.7, introduced recently, both contracted mosaic, and both belong to *S. officinarum*; likewise the well-known Barbados variety, B.H.10/12. Every variety of *S. sinense* has been recorded here with streak, suggesting that the introduction of canes of this type stand little chance of success.

In cane breeding work in other countries the fact that certain forms of *S. spontaneum* are immune and confer resistance to their offspring when crossed with varieties belonging to other species of sugar cane has been utilised, but it has been found that as the amount of wild blood becomes diluted the degree of resistance declines.

An example of this is seen in some seedlings raised here from seed of Mauritian origin; in this line of seedlings P.O.J.2878 was first crossed with a vigorous, hardy cane of unknown origin, but apparently of the *S. officinarum* type—Uba Marot. Of this cross, two of the best seedlings were again crossed with (1) M.109/26, a cane of pure *S. officinarum* blood, (2) Selangor Seedling, a cane containing *S. spontaneum* blood.

(It should be borne in mind that P.O.J.2878 carries some *S. spontaneum* blood in its constitution.)

The following diagram illustrates the line of descent:—



The essential details of this line is the crossing of varieties containing *S. spontaneum* blood with one which has none, and therefore considerably diluting the blood, and with one which has itself some of that blood. Of the first two crosses, A and B, mosaic was found in 36 per cent. and 44 per cent. respectively of the seedlings, while in the second two crosses, C and D, mosaic was found in only 5 per cent. and 2 per cent.

Thus the dilution of the *S. spontaneum* blood considerably reduced the number of offspring resistant towards mosaic.

The position regarding the crossing of *S. officinarum* with other species to confer resistance towards streak is not so well understood, but again it appears as if the greater the amount of *S. officinarum* blood, the less resistance is shown towards that disease. Of the two Indian varieties now most commonly grown, Co.290 has considerably more "noble" blood than Co.281, and is susceptible to streak. Two offspring of Co.290 under trial here at present, Co.413 and Co.419, have likewise been found with streak. (Co.301 is interesting, in that it has no *S. spontaneum* ancestor, but is a hybrid between *S. barberi* and *S. officinarum*; and although not immune to streak it shows very high resistance.)

In the foregoing survey only the reactions of these groups of sugar cane varieties towards the virus diseases in Natal is discussed; other important features, however, distinguish these groups as well.

S. officinarum, the "noble" canes, are essentially tropical varieties, and though usually of good sucrose and low fibre, are not suited to adverse climatic factors. *S. sinense*, the Uba type of canes, are of wider adaptability and more suited to the sub-tropics; they are characterised, however, by a higher fibre content. *S. barberi* is somewhat similar, being suited to the sub-tropics, while *S. spontaneum*, a species of extremely high fibre and low sucrose, has no varieties of any commercial interest.

The mixture of *S. spontaneum* blood with *S. officinarum* to produce varieties with the desirable agricultural qualities of the latter and the disease resistance of the former has produced spectacular results in tropical climates, e.g. the modern P.O.J. varieties, but such varieties have only a limited scope in Natal. More success has been found here

in crosses of *S. officinarum* × *S. spontaneum* × *S. barberi*, or even *S. officinarum* × *S. barberi*. This suggests that perhaps the species *S. barberi* might be exploited more for our conditions here. It may be that it can to some extent replace *S. spontaneum*, and while giving varieties more suited to our conditions, impart considerable disease resistance.

In a batch of seedlings raised recently at the Experiment Station from seed of Indian origin, of a cross representing the above three species of cane, but with *S. barberi* in much greater proportions than *S. spontaneum*, out of 3,268 seedlings only 14 contracted mosaic in the field, 3 contracted streak, and 1 had both mosaic and streak.

As more experience is gained concerning the behaviour of the different combinations of these sugar cane species in Natal, it may become possible to confine ourselves to testing offspring only of varieties which we have discovered make the best parents for our conditions here; meanwhile, we have the experience of the past to guide us along certain broad lines in making a choice of varieties to introduce for trial. As indicated previously, the chances are against any variety of *S. officinarum*, or with too much *S. officinarum* blood; they are also against *S. sinense*, but they are greatly in favour of the interspecific hybrid, and the tentative suggestion is put forward that the proportion of *S. barberi* blood

might be profitably increased rather than the *S. officinarum* blood.

It is believed that the greatest chance of success in proceeding along these lines is by raising new varieties from seed, instead of relying on the proven varieties of other countries to put under trial here. With this end in view this aspect of variety raising has been increased of late at the Experiment Station, and several thousand seedlings have been raised within the last few years, many of which have been propagated and are undergoing preliminary trials. By this means it should be possible to maintain a large number of varieties to select from, thus increasing the chances of securing commercial varieties over the method of relying on the few that can be introduced from outside each year.

SUMMARY.

A brief outline of the introduction of sugar cane varieties into Natal from the earliest days is given, and it is shown that with the presence of mosaic and streak in the country the random selection of varieties for cultivation had little chance of success. The majority of varieties were of *Saccharum officinarum*, which is susceptible to mosaic; those of *S. sinense* are susceptible to streak, and evidence is presented in support of the view that varieties of complex hybrid constitution are those that stand the greater chance of survival.

APPENDIX.

LIST OF SUGAR CANE VARIETIES IN THE COLLECTION, AND SEEDLINGS RAISED LOCALLY, AT THE EXPERIMENT STATION, MOUNT EDGECOMBE, AND OF VARIETIES INTRODUCED INTO THE QUARANTINE GLASSHOUSE IN DURBAN.

Initials used to Designate the Origin of Varieties.

A.	Antigua.	M.P.R.	Federal Experiment Station, Mayaguez, Puerto Rico; is My. in previous lists.
B.	Barbados.	N.G.	New Guinea.
B.H.	Barbados Hybrid (seedlings of proven parentage).	P.	Peru.
B.	After a number, which is usually preceded by J, seedlings raised by Bouricius in Java.	P.O.J.	Proefstation Oost Java.
C.H.	Cuban Hybrid.	P.R.	Puerto Rico (Rio Piedras Insular Experiment Station).
Co.	Coimbatore, India.	Q.	Queensland.
C.P.	Canal Point, Florida, U.S.A.	R.P.	Seedlings raised by a planter in Demerara.
D.	Demerara (British Guiana).	S.C.	Saint Croix (Santa Cruz), Virgin Islands.
Diamond	Diamond plantation, Demerara (British Guiana).	S.J.	South Johnstone, Queensland.
E.K.	Seedlings raised by E. Karthaus, Java.	S.W.	Sempal Wadak, Java.
F.C.	Fajardo Central, Puerto Rico.	Tjep.	Tjepering, Java.
H.M.	Hebbal, Mysore, India.	Tuc.	Tucuman, Argentine.
H.Q.	Hambledon Sugar Co., Queensland.	U.D.	Seedlings of Hawaiian Uba (= Zwinga) × D.1135, Hawaii.
J.	Java (formerly used instead of P.O.J.).	U.S.	U.S. Experiment Station, Canal Point (formerly used instead of C.P.).
M.	Mauritius.		
M.P.	Seedlings raised by Perromat, Mauritius.		

VARIETIES GROWING AT THE EXPERIMENT STATION.

I.—Varieties of Known Identity.

Variety.	Parentage.	Country of origin.
Agaul	Natural variety	India.
B.726	—	Barbados.
Badila (N.G.15)	Natural variety	New Guinea..
B.H.10/12	B.6835 (B.1379 open cross) × B.4578	Barbados (1910).
Black Cheribon	Natural variety	Java.
Black Innes (M.189)	—	Mauritius.
Black Tanna	Natural variety	New Hebrides.
CH.64/21	Uba × D.74 (Light Preanger open cross)	Cuba (1921).
Clarke's Seedling (H.Q. 409?)	87 Couvé × unknown (?)	Australia.
Co.205	Vellai × <i>S. spontaneum</i>	India.
Co.210	P.O.J.213 × Madras 2	India.
Co.213	P.O.J.213 × Kansar	India.
Co.214	Striped Mauritius × M.4600 (Saretha × <i>S. spontaneum</i>)	India.
Co.223	Chittan × M.1515 (Naanal × <i>S. spontaneum</i>)	India.
Co.237	P.O.J.213 × Red Fiji	India.
Co.243	A.2 × Co.206 (Ashy Mauritius × <i>S. spontaneum</i>)	India.
Co.244	P.O.J.213 × Co.205	India.
Co.270	B.3747 × Co.206	India.
Co.281	P.O.J.213 × Co.206	India.
Co.284	P.O.J.213 × Co.206	India.
Co.285	Green sport of Striped Mauritius × ? (Co.205 or Co.206?)	India.
Co.290	Co.221 (P.O.J.213 × Co.291) × D.74	India.
Co.299	Co.213 × P.O.J.1410 (Cheribon × Chunni)	India.
Co.300	Co.213 × P.O.J.1410 (Cheribon × Chunni)	India.
Co.301	Co.213 × P.O.J.1499 (P.O.J.385 × P.O.J.181)	India.
Co.303	Co.221 × P.O.J.1507 (P.O.J.213 × P.O.J.369)	India.
Co.312	Co.213 × Co.244	India.
Co.313	Co.213 × Co.244	India.
Co.317	Selfed Co.229 (Selfed Co.205)	India.
Co.331	Co.213 × Co.214	India.
Co.351	P.O.J.2725 × Sorghum durra Stapf.	India.
Co.354	P.O.J.2725 × Sorghum durra Stapf.	India.

Variety.	Parentage.	Country of origin.
Co.355	P.O.J.2725 × Sorghum durra Stapf.	India.
Co.356	P.O.J.2725 × Sorghum durra Stapf.	India.
Co.413	Co.290 × J.247 B.	India.
Co.419	P.O.J.2878 × Co.290	India.
Co.421	P.O.J.2878 × B.3412 (D.74 open cross)	India.
Co.426	P.519 [Vellai × P.O.J.1410 (Cheribon × Chunni)] × Co.360 (P.O.J.2725 × Q.116)	India.
Co.432	P.O.J.2727 × Co.285	India.
Co.434	P.O.J.2878 × (probably) E.K.28	India.
Co.508	Selfed Co.214	India.
C.P.177	—	U.S.A.
C.P.807	Selfed U.S.1643 (probably Selfed P.O.J.213)	U.S.A.
C.P.28/11	Co.281 × U.S.1694 (P.O.J.213 × ?)	U.S.A.
C.P.28/19	Co.281 × U.S.1694 (P.O.J.213 × ?)	U.S.A.
C.P.29/103	P.O.J.2725 × C.P.1165	U.S.A.
C.P.29/116	P.O.J.2725 × C.P.1165	U.S.A.
C.P.29/320	Co.281 × C.P.27/34 (D.74 × U.S.1694)	U.S.A.
Cuban Selection	Probably identical with CH.64/21	Cuba.
D.1135	D.103 open cross	British Guiana.
D.207/20... ..	D.145 open cross	British Guiana.
D.666/13... ..	D.625 [open cross of Dyer (open cross of Meligeli)] open cross	British Guiana.
Diamond 10	Diamond 185 (unknown) × D.145 (open cross of Striped Preanger)	British Guiana.
E.K.28	P.O.J.100 (Black Borneo × Loethers) × E.K.2 (Lahaina × Red Fiji)	Java.
F.C.915	P.O.J.2725 × S.C.12/4	Puerto Rico.
Gingor	Reputed graft hybrid between Mauritius Gingham and Goru; is either one or other of these canes	Australia.
Glagah (<i>Saccharum spontaneum</i>)	Natural species	Java.
H.M.609	—	India.
H.M.619	—	India.
Hind's Special	Natural hybrid?	Philippine Islands.
Horne	Striped sport of Louisier (Otaheite)	Mauritius.
J.247 B.	Black Cheribon × Red Fiji	Java.
Kavangire	Natural variety	India.
Kassoer	Natural hybrid: Black Cheribon × Glagah	Java.
M.1900	Unknown	Mauritius.
M.P.55	Selangor × ?	Mauritius.
M.P.R.3	P.O.J.2725 × S.C.12/4	Puerto Rico.
M.P.R.7	P.O.J.2725 × S.C.12/4	Puerto Rico.
M.P.R.28	P.O.J.2725 × S.C.12/4	Puerto Rico.
M.P.R.42	P.O.J.2725 × S.C.12/4	Puerto Rico.
M.P.R.49	P.O.J.2725 × S.C.12/4	Puerto Rico.
M.P.R.61	P.O.J.2725 × S.C.12/4	Puerto Rico.
M.P.R.63	P.O.J.2725 × S.C.12/4	Puerto Rico.
M.P.R.151	P.O.J.2364 × M.P.R.9 (Selfed S.C.12/4)	Puerto Rico.
Merthi	Natural variety	India.
Oshima	Natural variety	China.
Otaheite	Natural variety	Society Islands.
P.O.J.36 M	Bud selection of P.O.J.36 (P.O.J.105 ?)	Japan (Formosa).
P.O.J.36	Striped Preanger × Chunni	Java.
P.O.J.100	Black Borneo × Loethers	Java.
P.O.J.213	Black Cheribon × Chunni	Java.
P.O.J.234	Black Cheribon × Chunni	Java.
P.O.J.2714	P.O.J.2364 (P.O.J.100 × Kassoer) × E.K.28 (P.O.J.100 × E.K.2)	Java.

Variety.	Parentage.	Country of origin.
P.O.J.2722 P.O.J.2364 (P.O.J.100 × Kassoer) × E.K.28 (P.O.J.100 × E.K.2)	Java.
P.O.J.2725 P.O.J.2364 (P.O.J.100 × Kassoer) × E.K.28 (P.O.J.100 × E.K.2)	Java.
P.O.J.2727 P.O.J.2364 × Batjan	Java.
P.O.J.2753 P.O.J.2364 × P.O.J.1507	Java.
P.O.J.2803 P.O.J.2703 [P.O.J.2354 (P.O.J.100 × Kassoer) × E.K.28] × P.O.J.2713 [P.O.J.2364 × P.O.J.2571 (Cheribon × Fiji)]	Java.
P.O.J.2822 P.O.J.2526 (Cheribon × Kassoer) × Tjoekir 154	Java.
P.O.J.2878 P.O.J.2364 × E.K.28	Java.
P.O.J.2883 P.O.J.2364 × E.K.28	Java.
P.O.J.2946 P.O.J.2875 × S.W.111	Java.
P.O.J.2947 P.O.J.2875 × S.W.3	Java.
P.O.J.2952 P.O.J.2722 × S.W.499	Java.
P.R.803 P.O.J.2725 × S.C.12/4	Puerto Rico.
P.R.809 P.O.J.2725 × S.C.12/4	Puerto Rico.
Pompey (7R.428) —	Fiji.
Light Preanger Natural variety	Java.
Q.813 Badila open cross	Australia.
R.P.8 B.208 × D.145	Demerara.
S.C.12/4 B.6835 (B.1379 open cross) open cross	Barbados.
Sin Nombre (probably Saretha) Natural variety	India.
S.J.4 Badila open cross	Australia.
S.J.7 Badila open cross	Australia.
S.W.499 J.247B × Batjan	Java.
Tjep.24 Kassoer × Cheribon	Java.
Toledo Natural hybrid (<i>S. officinarum</i> × <i>S. spontaneum</i>)... ..	Philippine Islands.
Tuc.451 —	Argentine.
Tuc.454 —	Argentine.
Tuc.472 —	Argentine.
Tuc.544 —	Argentine.
Tuc.1406... Co.243 × Co.244	Argentine.
Uba Natural variety	India.
Uba Marot Natural hybrid?	Mauritius.
U.D.1 Zwinga × D.1135	Hawaii.
Yellow Caledonia Natural variety	New Hebrides.
Yon-tan-san Bud Sport of Oshima... ..	Japan (Formosa).
Zwinga Natural variety	China.
U.S.663 —	U.S.A.

2.—Varieties, whose Identity is not now known, Introduced into Natal previous to the Experiment Station Introductions.

Variety.	Country of origin.
Booth's Selection (Striped Preanger ?)	—
La Mercy Red	Mauritius (?).
La Mercy Yellow	Mauritius (?).
Ogle's Selection	—
Rapson's Selection (P.O.J.213 ?)	Mauritius (?).
Rouillard's Selection (P.O.J.213 ?)	Mauritius (?).
Townsend's Selection (China cane)	—
Transkei Selection	—
H.Q.694 (?). Probably a wrong number for some other H.Q. variety...	Australia.
Unidentified variety from a Native kraal	—

3.—Bud Sports of Varieties.

Variety.	Country of origin of sport.
Co.281—striped (various forms)	South Africa.
Co.281—green	South Africa.
Co.281—with drooping leaves	South Africa.
Co.290—striped	South Africa.
P.O.J.2725—striped	South Africa.
Uba—striped	South Africa.
Gilbert's Selection—sport of Uba	South Africa.

4.—Seedlings Raised at the Experiment Station.

No. of Seedlings.	Parentage.	Country of origin.
(a) <i>First Year Seedlings.</i>		
58	Amu Darya 59, self-fertilized	U.S.A.
8	(<i>Saccharum officinarum</i> , <i>S. spontaneum</i> , <i>S. barberi</i>).	Mauritius.
(b) <i>Replanted from First Year Seedlings.</i>		
11	Selangor Seedling × M.108/30 (P.O.J.2878 × Uba Marot)	Mauritius.
43	Selangor Seedling × M.196/31 (P.O.J.2878 × Uba Marot)	Mauritius.
414	Co.421 × Co.312	India.
54	P.O.J.2725 × Co.281	India.
117	P.O.J.2725 × Co.301	India.
18	P.O.J.2725 × Co.214	India.
(c) <i>Second Selection.</i>		
18	P.O.J.2878 × Uba Marot	Mauritius.
(d) <i>Discarded after Trial, but Retained in Collection.</i>		
2 (N.F.35 and N.F.42)	P.O.J.213 open cross	U.S.A.

VARIETIES INTRODUCED IN 1939.**5.—Varieties in the Quarantine Glasshouse in Durban.**

Variety.	Parentage.	Country of origin.
Co.356*	P.O.J.2725 × Sorghum Durra	India.
Co.385	Co.213 × Co.281	India.
Co.407	P.O.J.2725 × B.3412	India.
Co.408	P.O.J.2725 × Co.243	India.
Co.453	Black Cheribon × Co.285	India.
Co.455	P.O.J.2725 × <i>Saccharum spontaneum</i>	India.
C.P.29/291	Co.281 × U.S.1694	U.S.A.
Creole	Natural variety (hybrid?)	India.
F.C.916	P.O.J.2725 × S.C.12/4	Puerto Rico.
Khakai	—	North Thailand
Kham	—	„ (Siam).
Uba	A reintroduction of this variety from East Africa... ..	India.
E.16	P.O.J.2878 × Uba Marot	Egypt.

6.—Varieties Destroyed in the Quarantine Glasshouse.

Variety.	Parentage.	Country of origin.
Co.433	P.O.J.2878 × E.K.28 (?)	India.
H.M.606	—	India.
H.M.608	—	India.
H.M.613	—	India.

7.—Varieties Introduced into the Quarantine Glasshouse but which have Failed to become Established.

Variety.	Country of origin.
Hok	North Thailand (Siam).
28 N.G.219	New Guinea.

* Second importation.