

1894

# Sugar cane: field experiments, varieties of cane, and striped vs. purple.

H C. Newsom

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## Recommended Citation

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SECOND SERIES,

No. 26.

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BULLETIN

OF THE

SUGAR EXPERIMENT STATION,

AUDUBON PARK, NEW ORLEANS, LA.

WM. C. STUBBS, Ph. D., Director.

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SUGAR CANE,  
FIELD EXPERIMENTS,  
VARIETIES OF CANE,  
—AND—  
STRIPED VS. PURPLE.

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ISSUED BY THE BUREAU OF AGRICULTURE.

H. C. NEWSOM, Commissioner.

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BATON ROUGE, LA.

PRINTED AT THE TRUTH BOOK AND JOB OFFICE.

1894.

# LOUISIANA STATE UNIVERSITY AND A. & M. COLLEGE.

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*Copy to  
H. C. Newsom  
W. B. Tappan*

SUGAR EXPERIMENT STATION,  
Audubon Park, New Orleans, La., Feb. 1894.

Hon. H. C. Newsom, Commissioner of Agriculture, Baton Rouge, La.

DEAR SIR—I hand you herewith a report on "Varieties of Cane," covering numerous experiments with foreign and domestic varieties. There is included also a discussion of the "Comparative merits of our home varieties, the 'striped' and 'purple canes,' based upon extensive experiments for four years." I ask that you publish the above as Bulletin No. 26, and oblige.

Respectfully submitted,

WM. C. STUBBS,

Director.



## PART III.

### "FOREIGN VARIETIES OF CANE."

Since our last report extensive experiments, with the varieties heretofore reported, have been made with, however, not very gratifying results. Cane is a plant which yields slowly to its environments. It is exceedingly difficult to acclimate. The inherited characteristics of tropical tendencies, so unsuitable to our short seasons, are but slowly modified by cultivation in our climate. Hence many years of patient care are necessary before pronouncing upon the merits of any variety. There is, however, a slow, but gradual change in nearly every variety with each year of cultivation, and hope is entertained that ultimately several varieties, now under trial, will prove beneficial to our sugar industry.

The nomenclature of the varieties of cane is execrable. No sooner is a cane received in a country than it receives some local name, either that of the introducer or the country from which it was directly imported. This is especially true in this State, where we have the *Otaheite* cane, the *Japanese* cane, the *Palfrey* cane, the *La Pice* cane, etc. These canes are frequently identical with those known in other countries by well established and long known names. Again the carelessness of introducers often ignores well known names, and substitutes new ones descriptive of color, etc., such as green or yellow, or yellow striped, red ribbon, etc.

The manner in which the canes of this Station were collected has been described in a past Bulletin. Frequently the "consuls" sending the varieties would label them by their local names, or according to color, omitting the history of the canes sent. The

Station has been busily engaged for several years in trying to establish the identity of these canes with the prominent ones of old sugar countries, as well as the original home of each, and several times in the last five years it has changed its opinion in regard to many varieties based upon what it deemed reliable evidence. Even now, many of our varieties still remain shrouded in mystery as to their origin and previous utility. There is, however, a growing demand on the part of those engaged in scientifically cultivating the cane, to have all this confusion of names eliminated, and a movement has recently been inaugurated looking to a solution of this perplexing problem. This Station has, accordingly, after consultation with those similarly interested in other countries, sent samples of all our varieties to the following countries: Hawaiian Islands, Australia and Demerara, with a view of comparing them with the varieties of those countries and establishing synonymous canes.

It is hoped in a few years that much information, of great value to general cane culture, may be obtained.

#### NEW SEEDLING VARIETIES.

Through the Department of Agriculture, at Washington, this Station has received, from the Royal Agricultural Society, of British Guiana, twenty new seedling varieties. As yet these varieties are known only by numbers. Names will be given them only when they prove worthy of extended cultivation. The following descriptive remarks were made when they were received.

#### DESCRIPTION OF NEW SEEDLING VARIETIES RECEIVED FROM ROYAL AGRICULTURAL SOCIETY, OF BRITISH GUIANA.

##### MARKS.

- XLI. Light purple, rather long jointed, and the purple color running into a sort of pink.
- LXI. Greenish yellow, medium jointed, depression under the eye.
- LXIX. A depression under the eye running up to the next joint, like corn stalk, medium jointed, light pinkish color, with occasional stripe.

GROUP VI.—No. 15, Pupuha, and No. 17, Kō'kea, both from Hawaiian Islands, are fine, clean canes, tonnage large and sugar content good.

GROUP VII.—No. 16, Uwala (of no value so far), and No. 25, Lakona, are closely allied.

GROUP VIII.—No. 20, Cuban, and No. 27, Sacuri; both clean, smooth canes.

GROUP IX.—No. 13, Caledonia Queen, a stout, short green cane, with few recommendations after several years trial.

GROUP X.—No. 14, Creole cane; too well known to discuss; of no value.

GROUP XI.—No. 28, Japanese or Zwinga; this cane is *sui generis*, it is extremely hardy and enormously productive under good cultivation, but exceedingly woody, difficult to crush, and low in sugar.

GROUP XII.—No. 18, Bamboo; another cane "without a fellow" in our collection, its enlarged nodes and prominent eyes are peculiar characteristics, it has not yet met our expectations.

## SECOND CLASS.

### *Striped Canes.*

GROUP I.—No. 30, Malay; No. 31, Brisbane, and No. 32, Green Rose Ribbon, are apparently the same canes, and are quite promising.

GROUP II.—No. 33, Red Ribbon; No. 34, Mexican Striped, and No. 35, Batavian Striped, our own importations, are identical with No. 36, our home striped cane.

GROUP III.—No. 37, Tsimbic; No. 38, Ysaquia; No. 39, Vituahaula, and No. 40, Horne, may for the present be classified together, though No. 38 has streaks similar to Group V., Class I., and No. 40 resembles somewhat Group VI., Class I. Not very promising.

GROUP IV.—No. 41, Ainakea; No. 42, Kainio, and No. 43, Akilolo, light striped; are peculiar canes, with many common characteristics—dark, closely appressed foliage, large, straight-growing canes, but of little value.

GROUP V.—No. 44, Akilolo (dark striped), and No. 45 Manulete; both of dark foliage, and apparently identical.

GROUP VI.—No. 46, Cavengerie; No. 47, Altamattie, and No. 48, Poaole, are beautiful, vigorous canes, identical in every way. Could a fair sugar content be coaxed into this plant, it would be one of the most valuable ones in our collection.

### THIRD CLASS.

#### *Solid Colors Other Than Class One.*

GROUP I.—No. 50, Norman; No. 51, Grand Savanne; and No. 53, Naga, are unlike canes of the same type; they are small, vigorous canes, and said to be well adapted to high, dry latitudes.

GROUP II.—No. 54, Black Java, is identical with our purest common purple cane, and is called Black Java, in contrast with the white cane in Class I., No. 53.

GROUP III.—No. 56, Breheret, and No. 57, Marabal, are so nearly identical that doubts have been entertained whether the former has not been sent through mistake.

GROUP IV.—No. 58, Purple Elephant, is unlike any other cane in the collection.

GROUP V.—These constitute the clean, claret colored canes; No. 61, Ohia; No. 62, Honuaula, and No. 63, Papaa, are Hawaiian Island canes, appear identical in every respect. No. 59, Cuapa, is smaller and of lighter colored foliage, while No. 60, Liguanea, is a short, stout cane of moderate habits, none of them are promising here.

#### *Varieties Originating from Bud Variation.*

Three years ago some stalks of cane, partly white and partly purple, were selected from the field of Soniat Brothers', Tchoupitoulas plantation. They were called by them bastard canes. These stalks were taken and planted as follows: First row, the entire stalk; second row, the white joints of each stalk; third row, the colored joints of each stalk. At the end of the season four distinct canes, as far

as color could direct us, were obtained. Types of the four new varieties were selected and separately planted. Selection and separate plantings have been made annually since. The rest each year harvested and analyzed. These canes have been named as follows: First, a white cane, No. 29, Soniat, after the owners of the plantation; second, a light striped, No. 59, Nicholls, after the then governor of our State; third, a light purple cane, No. 64, Bird, after the then Commissioner of Agriculture; fourth, a dark striped, No. 65, Garig, after the other member of the Board of Agriculture. The yield and analyses of these canes are given elsewhere. These canes are different from any other in our collection.

The classification abovegiven has been verified by subsequent cultivation. In Group I., of the First Class, were placed No. 1, Panache or Beltrain; No. 2, LaPice; No. 3, Tibboo Merd; No. 4, LeSassier; No. 5, Bourbon; No. 6, Crystallina; No. 7, Green; No. 53, Light Java, and No. 55, Hope.

Continuous cultivation, with frequent critical examination of habits of growth, botanical characteristics and chemical analyses confirm the opinion there advanced that these canes are one and the same, and whatever differences now exist, when cultivated under similar conditions, may be ascribed to degrees of acclimation. There is appended here the results of 1892-93 of each, and an average of them all. This was with plant cane, and the average may be assumed as the true value of this class of canes. By comparing both tonnage and sugar content with our home canes, grown and analyzed under same conditions, we find these canes are fully the equal of our purple or striped varieties.



TABLE SHOWING ANALYSES OF PLANT CANES OF GROUP I., CLASS I., FOR YEAR 1892-93.

1892.										1893.							
Class.	Group.	No.	VARIETY.	Tons Per Acre.	Brix.	Sucrose.	Glucose.	Solids not Sugar.	P. C.	G. R.	Tons Per Acre.	Brix.	Sucrose.	Glucose.	Solids not Sugar.	P. C.	G. R.
1.....	1.....	1	Panache .....	36.99	13.1	9.7	1.97	1.43	74.0	20.3	39.52	14.1	10.4	1.90	1.80	73.76	18.27
1.....	1.....	2	LaPice. ....	36.03	12.9	7.9	2.53	2.47	61.2	32.06	41.22	13.2	8.6	2.59	2.61	65.15	30.10
1.....	1.....	3	LeSassier.....	30.24	13.7	9.6	1.93	2.11	70.1	20.7	36.30	13.9	10.0	2.04	1.86	71.94	20.4
1.....	1.....	4	Tibboo Merd.....	36.06	13.2	8.5	2.28	2.37	64.8	26.7	43.85	13.6	9.7	2.18	1.72	71.32	22.47
1.....	1.....	5	Bourbon.....	48.31	11.3	6.7	2.17	2.43	59.3	32.4	35.39	15.4	11.6	2.10	1.70	75.32	18.10
1.....	1.....	6	Crystallina.....	41.58	12.0	7.7	2.05	2.25	64.2	26.66	35.84	13.2	9.1	2.53	1.57	69.69	27.69
1.....	1.....	7	Green .....	40.78	13.6	9.5	2.08	2.02	69.9	21.9	31.76	15.2	12.1	2.00	1.10	79.60	16.52
1.....	1.....	53	Light Java.....	39.90	13.1	8.9	2.14	2.06	68.0	24.0	42.65	12.2	7.7	2.56	1.94	63.11	32.24
1.....	1.....	55	Hope.....	34.37	11.9	7.3	2.46	2.14	61.4	33.7	26.82	16.5	13.5	1.74	1.26	81.81	12.88
Average.....				38.25	12.76	8.42	2.19	2.15	65.98	26.01	36.93	14.14	10.30	2.18	1.73	80.69	19.10

The above canes were grown on rows thirty-five feet long. The stalks were counted, weighed and run through a three roller horse mill, and juice, after being well mixed, was sampled and analyzed in duplicate. This was done on December 5 and 10, in 1892; December 1 to 8, in 1893. Besides the above larger areas were grown with several, both as plant and stubble cane, each year, and the tables below give the results. Table I. gives the results of 1st year stubble for seven of these varieties. Table II. gives the results for two years, 1892 as plant cane, and 1893 as stubble. There is here included only three of these varieties, but we have added the results of Batavian Striped, grown with them under similar conditions, to which variety we shall presently refer.

In 1893 Tibboo Merd was selectly of these varieties to grow on a large scale, and was worked up in the sugar house, along with other varieties similarly grown, and Table III. covers such results.

**TABLE I.**

1ST YEAR STUBBLE—GROWN ON A LARGER SCALE AND WORKED  
IN SUGAR HOUSE—1892—PLAT VII. "D."

	Brix.	Sucrose.	Glucose.	Solids not Sugar.	Glucose ratio.	Purity coefficient.	Fibre.	Tons per Acre.
Panache.....	16.20	13.10	1.20	2.60	9.16	80.9	11.23	38.99
LaPice.....	15.20	11.40	1.62	2.18	14.20	75.00	9.15	31.85
Tibboo Merd.....	14.20	10.00	1.94	2.26	19.40	70.42	9.16	31.85
LeSassier.....	13.70	9.60	1.99	2.11	20.70	70.10	.....	30.24
Bourbon.....	14.30	10.30	1.98	2.02	19.20	69.90	9.28	34.02
Crystallina.....	13.60	8.3	2.24	3.06	26.90	61.00	8.65	26.11
Green.....	13.80	8.6	2.25	2.95	26.20	62.30	8.84	31.71

TABLE II.

VARIETIES GROWN ON LARGE AREAS AND WORKED IN SUGAR HOUSE—PLANT CANE, 1892—PLAT VI. "D," UNTILED.

PLANT.	Brix.	Sucrose.	Glucose.	Solids not Sugar.	Glucose ratio.	Purity coefficient.	Fibre.	Tons per Acre.
Panache .....	13.6	9.95	1.93	1.72	19.45	73.65	9.44	36.99
Tibboo Merd.....	13.2	8.55	2.28	2.37	26.70	64.80	10.11	36.06
LaPice.....	13.0	8.90	2.18	1.92	24.50	68.50	9.98	36.03
Batavian Striped.....	13.0	8.70	2.32	1.98	26.70	67.00	8.92	35.87

SAME VARIETIES 1ST YEAR STUBBLE—1893—ON SAME PLAT.

STUBBLE.	Brix.	Sucrose.	Glucose	Solids not Sugar.	Glucose ratio.	Purity coefficient.	Fibre.	Tons per Acre.
Tibboo Merd.. .....	14.5	10.9	1.98	1.62	18.16	75.17	.....	31.81
Panache.....	14.7	11.15	1.77	1.78	15.94	75.19	10.2	33.78
LaPice.....	14.6	10.15	2.18	2.27	21.47	69.52	10.3	34.12
Batavian Striped.....	13.4	9.9	1.82	1.68	18.28	73.88	.....	31.76



**TABLE III,**  
**VARIETIES GROWN ON LARGE AREAS AND WORKED IN SUGAR HOUSE—PLANT CANE—1893,**

	Brix.	Sucrose.	Glucose.	Solids not Sugar.	Glucose ratio.	Purity coefficient.	Fibre.	Tons per Acre.	HOW FERTILIZED.
Tibbo Merd.....	13.60	9.7	2.18	1.72	22.47	71.32	9.40	43.85	Nitrogenous and phosphatic manures.
Marabal.....	12.00	7.6	3.23	1.17	42.50	63.33	8.30	49.42	Nitrogenous and phosphatic manures.
Pupuha.....	14.20	10.0	1.73	2.47	17.30	70.42	8.8	38.3	No manure.
Pupuha.....	14.40	10.1	1.37	2.93	13.56	70.13	.....	41.12	Nitrogenous manures.
Pupuha.....	14.90	11.0	1.56	2.34	14.20	73.82	.....	41.76	Nitrogenous and phosphatic manures.
Pupuha.....	14.40	10.6	1.85	1.94	17.45	73.61	.....	37.36	Nitrogenous, phosphatic and potash manures.
*Batavian Striped.....	14.10	10.6	1.90	1.60	16.12	75.13	.....	41.61	Nitrogenous and phosphatic manures.
†Batavian Striped.....	13.70	9.95	1.98	1.77	19.00	73.01	.....	42.45	Nitrogenous and phosphatic manures.

\*Planted with stubble cane.

†Planted with plant cane.

These tables give more nearly the results which may be expected of these canes under plantation cultivation. They are excellent canes, and so far seem to be very hardy—suckering and ratooning well. They are fully up in sugar content to our home canes, and make a beautiful sugar. From the large number of canes grown on small areas, this type of cane was selected, several years ago, as one of the best for extended cultivation, and subsequent experience has fully justified the action.

#### OTHER GOOD CANES.

Besides the above, several other canes were, at the same time, given more extended areas. Among them were those given incidentally in Tables II. and III.—*Marabal*, *Batavian Striped* and *Pupuha*.

The *Marabal*, after several years trial, has not developed as was expected. It is a beautiful cane, dark purple in color, with enlarged internodes, suggesting high sugar content, heavy stalks, suckering and ratooning well and, withal, most attractive, but the laboratory invariably gives it a low place as a sugar producing variety and, hence, it is again transferred to the experimental plat of foreign varieties. Perhaps, in time, it may become better acclimated and yield more sugar. If so, it will be a superb variety.

The *Batavian Striped*, by acclimation, appears almost identical with our home striped. At first it was rather darker in color and larger in stalk, but now, under similar conditions, they seem alike. However, it is being propagated separately, and further studies are needed to positively affirm their identity.

*Pupuha* has been, from the first, one of our best, if not the best, of our foreign importations. It is rich in sugar and gives a heavy tonnage. Analyses show it to be high in solids not sugar, and the sugar maker complains of gumminess in manipulating its juices. It is, however, improving in this quality, and hopes are entertained of its becoming, at an early day, well adapted to our wants, both in the field and sugar house. It suckers and ratoons well. One patch of third year stubble, with-

out a plow since it was planted, shows strongly its great vitality. It is worthy of trial on every plantation.

*Kokea*, similar in origin, and very much like the *Pupuha* in all its main characteristics, is yet slightly inferior in sugar content.

#### GROUP II, CLASS I,

is given because the three canes are here identical. Table IV. gives the results from the experimental plats of plant cane for 1892-93. These canes give heavy tonnage, with low sugar content, high glucose and non sugars. They are slowly becoming acclimated, but are as yet unworthy of extensive cultivation. They sucker and ratoon well.

TABLE IV.

RESULTS OF GROUP II., CLASS I.—PLANT CANE—1892-1893.

Class.	Group.	No.	NAME.	1-92.							1893.						
				Tonnage per Acre	Brix.	Sucrose.	Glucose.	Solids not sugar.	Purity coefficient.	Glucose ratio.	Tonnage per Acre.	Brix.	Sucrose.	Glucose.	Solids not sugar	Purity coefficient.	Glucose ratio.
1.....	2.....	8	Yellow.....	39.51	13.5	8.7	2.79	2.01	64.4	32.1	40.38	14.0	9.1	3.45	1.4	65.00	37.91
1.....	2.....	9	Otaheite.....	40.18	13.8	8.7	2.80	2.30	63.0	32.2	43.10	14.0	8.8	3.18	2.02	62.85	36.12
1.....	2.....	11	Loucier.....	39.55	13.1	8.0	2.74	2.36	59.7	33.9	31.76	13.9	9.0	3.57	1.33	64.75	39.66
Average.....				39.75	13.47	8.47	2.77	2.23	62.88	32.70	38.41	13.97	8.97	3.40	1.78	64.21	37.90

## GROUP III., CLASS I.

The members of this group are unquestionably identical. They are the last canes, both as plant and stubble, to appear in the spring, and sucker and ratoon very badly. They grow rapidly, perhaps make more size in our summer months than any other variety, coming to harvest as large stalks with fairly good sugar content. On account of delay in coming up in spring, the stand is frequently defective and, hence, low tonnage, in several instances, given below.

Stubbles from this group are very defective. They are popular in Hawaii, but as yet worthless here. Table V. gives results for years 1892-93, both plant cane.



TABLE V

RESULTS OF GROUP III, CLASS I.—PLANT CANE—1892-1893.

Class.	Group.	No.	NAME.	1892.							1893.						
				Tonnage per Acre.	Brix.	Sucrose.	Glucose.	Solids not sugar.	Purity coefficient.	Glucose ratio.	Tonnage per Acre.	Brix.	Sucrose.	Glucose.	Solids not sugar.	Purity coefficient.	Glucose ratio.
1.....	3.....	10	Portier.....	41.72	12.9	7.6	2.80	2.50	58.9	36.8	48.55	15.0	11.1	2.86	1.04	74.0	25.73
1.....	3.....	12	Lahaina.....	41.79	11.5	6.7	3.97	0.83	58.3	56.6	28.13	14.4	9.9	3.06	1.44	68.05	30.9
1.....	3.....	20	Keni Keni.....	31.46	10.9	5.7	3.25	1.95	52.3	57.0	12.70	11.9	7.4	3.57	0.93	62.35	48.37
Average.....				38.32	11.79	6.66	3.34	1.76	56.58	50.05	29.79	13.77	9.47	3.16	1.14	68.13	35.00

The remaining groups of Class I., except VI. and VII., will be noticed only so far as to give their analyses in general tables further on. The members of Group VI., Pupuha and Kokea, have already been discussed. The analyses of both appear elsewhere.

The members of Group VIII. are clean, smooth, green canes, received in 1890, and are now undergoing field tests. The tonnage is not large; the stalks are medium, but rich in sugar. Particularly attractive in sugar content is *Sacuri*, which has for two years surpassed every variety of cane on the Station, foreign and domestic, when submitted to polariscopic tests. Analyses are given in general results.

#### JAPANESE OR ZWINGA CANE

Requires only a word or two to emphasize its few merits. Its hardiness and powers of ratooning are unequalled. A plat on this Station, now entering its fifth year since planting, seems more vigorous than the usual plant cane. When its powers of resistance and reproduction are considered, one cannot suppress feelings of hope for this cane in the future—when central factories with diffusion batteries shall reach the northern confines of our sugar belt. Improved culture may enhance sugar content. Tonnage is already satisfactory. In mill houses its hard woody nature will always make it objectionable.

#### SECOND AND THIRD CLASSES.

In these so far only Group II. and Group VI. of Second Class have been tried on a large scale, and hence only mention of these will be made. The members of Group II. have been shown to be similar in every way with our home striped cane, and the analyses have been given elsewhere.

#### GROUP VI.

The members of this group are beyond doubt identical. They are such pretty, vigorous canes, large, straight, long-jointed stalks, dark red, with faint black stripes without, with the whitest and juiciest of fiber within. They give large ton-

nage, sucker well and ratoon vigorously. Everything about these canes is attractive save the sugar content, which is uniformly low. The analyses of these canes will be found in the general results, disappointment in its sugar content having banished it from the field and relegated it again to the experimental plat.

#### EXPERIMENTAL PLAT.

Every year there is set aside a plat for the continuation of the cultivation of the numerous varieties of cane now possessed by the Station. The rows in this plat are 35 feet long by 6 feet wide. Each variety occupies a row. This plat is carried into first year stubble and then eradicated. Each year the canes from this plat are harvested about Dec. 1st. The stalks from each row are counted, weighed and passed through a three roller horse mill. The entire juice is mixed and duplicate samples taken and analyzed. When it is found that a cane gives for two or more years a fair tonnage with good sugar content, it is transferred to the field and cultivated on a sufficient area to give quantity enough to work in the sugar house. In this way its properties are thoroughly established.

So far only those mentioned in foregoing pages have been tried in large field experiments. Of these the La Pice or Light Java Group, Pupuha and Batavian Striped have been tested sufficiently to pronounce positively upon their merits. The Sacuri, Cuban and Marabal are now on trial. There are others which have done well this year, and if such excellence be again exhibited next year they too will be transferred to field trials. The results of the experimental plats for 1892 and 1893 in plant cane are herewith given. Also results of first year stubble for 1893.

**TABLE IV.**  
**VARIETIES OF CANE PLANT—PLAT VI.—1892—UNTILED—WORKED ON HORSE MILL.**

NAME OF CANE.	Tons per Acre.	Per Cent of Extrac- tion.	ANALYSES OF JUICES.							Stalks to Foot.	Weight of Stalks in Pounds.
			Fibre.	T. S. by Brix.	Sucrose.	Glucose.	Solids not Sugar	Glucose Ratio.	Purity Coeffi- cient.		
Sacuri.....	27.12	67.2	13.58	16.4	12.7	1.24	2.46	9.8	77.4	3.8	2.
Cuban.....	42.66	69.1	13.57	15.6	11.7	1.21	2.69	10.4	75.0	4.4	2.6
Liguana.....	44.10	74.2	14.10	14.8	11.2	1.18	2.42	10.5	75.7	3.7	3.2
Vitua-haula.....	22.50	71.4	11.54	15.2	10.0	3.28	1.92	32.8	65.8	3.2	1.6
China.....	40.24	75.71	11.63	14.1	9.8	2.30	2.00	23.5	69.5	3.5	3.1
Tsimbie.....	31.64	73.20	11.64	14.4	9.6	2.52	2.38	26.2	66.6	3.1	2.4
Green.....	40.78	76.90	8.88	13.6	9.5	2.08	2.02	21.9	69.9	3.6	3.1
Horne.....	38.15	70.70	11.55	13.20	9.3	1.70	2.20	18.4	69.2	2.7	2.2
Cnapa.....	48.94	70.27	11.93	13.60	9.1	2.01	2.49	22.9	66.9	5.3	2.5
Pupuha.....	37.80	69.70	9.27	13.30	9.1	1.76	2.44	19.3	68.4	4.1	2.5
Breheret.....	49.70	76.00	14.43	13.40	9.0	2.45	1.95	2.73	67.20	4.7	3.5
Naga.....	34.75	66.60	12.45	13.50	9.0	2.35	2.11	26.1	66.70	4.5	2.1
Light Java.....	39.90	71.70	11.50	13.10	8.9	2.14	2.06	24.1	68.0	3.6	3.2
Yellow.....	39.51	68.20	11.35	13.50	8.7	2.79	2.01	32.1	64.4	3.5	3.1
Otaheite.....	40.18	71.90	13.54	13.80	8.7	2.80	2.36	32.2	63.0	3.3	3.3
Bamboo.....	30.55	68.00	11.67	12.00	8.6	2.21	1.99	25.7	67.2	3.5	2.3
Lakona.....	42.14	71.50	10.82	13.00	8.5	1.87	2.63	22.0	65.4	4.	2.9
Kokea.....	41.82	69.10	10.92	12.50	8.2	1.91	2.39	23.3	65.6	4.3	2.6
Caledonia Queen.....	31.67	73.70	13.12	13.00	8.2	2.96	1.84	26.1	63.1	4.	2.1
Loucier.....	39.55	72.60	11.57	13.40	8.1	2.74	2.56	33.9	59.7	3.7	3.2
Vulu Vulu.....	35.25	71.59	10.94	13.70	8.0	2.88	2.82	36.0	58.4	3.4	2.4
Cavengerie.....	55.84	73.20	15.43	12.90	8.0	2.66	2.24	33.3	62.0	4.1	3.5



**TABLE IV.—Continued.**  
**VARIETIES OF CANE PLANT—PLAT VI —1892—UNTILED—WORKED ON HORSE MILL.**

NAME OF CANE.	Tons per Acre.	Per Cent. of Extrac- tion.	ANALYSES OF JUICES.							Stalks to Foot.	Weight of Stalks in Pounds.
			Fibre.	T. S. by Brix.	Sucrose.	Glucose.	Solids not sugar.	Glucose Ratio.	Purity Coeffi- cient.		
Grand Savanne.....	30.62	72.90	12.45	13.10	7.8	3.00	2.30	38.5	59.5	5.6	2.3
Crystallina.....	41.58	74.20	10.31	12.0	7.7	2.05	2.35	26.6	64.2	3.6	3.2
Portier.....	41.72	74.45	10.70	12.9	7.6	2.80	2.50	36.8	58.9	3.6	3.2
Salangore.....	27.00	77.10	9.88	12.80	7.3	2.31	3.19	31.6	57.0	2.7	2.7
Rose Bamboo.....	34.89	70.40	13.00	12.30	7.3	2.32	2.68	31.8	59.3	3.1	3.
Ys quia.....	28.87	71.90	11.8	12.40	7.3	3.21	1.9	45.8	58.9	3.6	3.4
Hope.....	34.37	70.80	10.95	11.9	7.3	2.46	2.14	33.7	61.4	3.9	2.4
Kainio.....	44.45	73.20	11.28	12.50	7.1	3.65	1.75	51.4	55.9	3.4	3.6
Altamattie.....	41.58	70.50	16.00	12.30	7.1	3.27	1.93	46.1	51.7	4.4	3.1
Ponole.....	45.38	73.40	14.47	12.10	7.0	3.08	2.02	44.0	57.8	4.3	2.9
Manulete.....	42.98	71.10	14.47	11.20	6.9	3.30	1.	47.9	61.6	3.4	3.3
Ainakea.....	36.12	72.00	9.58	12.00	6.9	3.27	1.83	47.2	57.5	3.	3.3
Green Elephant.....	22.19	71.50	10.16	11.16	6.8	2.79	1.57	41.0	58.6	2.5	2.4
Bourbon.....	48.31	73.90	11.65	11.30	6.7	2.17	2.43	32.4	59.3	4.7	2.9
Lahaina.....	41.79	75.00	9.74	11.50	6.7	3.79	1.01	56.6	54.3	3.8	3.
Norman.....	28.42	74.7	10.00	11.30	6.20	2.35	2.80	37.9	54.9	3.2	2.4
Green Rose Ribbon.....	29.12	74.7	9.20	12.30	6.20	3.24	2.86	52.3	50.4	3.0	2.2
Keni Keni.....	31.46	73.4	9.67	10.90	5.70	3.25	1.95	57.0	52.3	3.0	2.8
Malay.....	30.49	75.2	10.20	9.30	4.90	2.61	1.79	53.2	52.0	2.5	2.6
Akilolo Light Striped.....	35.77	73.4	9.80	9.60	4.75	3.91	.91	81.5	50.1	1.7	2.4
Purple Elephant.....	44.94	80.5	9.78	9.00	4.6	3.06	1.34	66.5	51.1	3.6	3.4
Brisbane.....	22.97	76.9	9.95	7.40	2.9	2.78	1.72	95.8	39.0	3.0	1.8

**TABLE IV.—Continued.**  
**VARIETIES OF CANE PLANT—PLAT VI—1892—UNTILED—WORKED ON HORSE MILL.**

NAME OF CANE.	Tons per Acre.	Per Cent. of Extrac- tion.	ANALYSES OF JUICES.							Stalks to Foot.	Weight of Stalks in Pounds.
			Fibre.	T. S. by Brix.	Sucrose.	Glucose.	Solids not sugar.	Glucose Ratio.	Purity Coeff- icient.		
Akilolo Dark Striped.....	28.17	71.0	8.51	7.00	2.75	3.29	.96	148.7	31.4	3.7	2.0
Soniat.....	66.2	10.97	15.50	12.80	1.24	1.46	9.7	82.6	3.3	...	...
Garig.....	43.26	71.6	11.74	13.80	10.70	1.64	1.48	15.3	77.5	3.8	2.3
Bird.....	35.00	69.5	9.84	12.20	8.40	1.97	1.83	23.5	68.9	4.1	2.2
Nicholls.....	34.92	73.7	10.26	11.00	7.30	2.37	1.33	32.4	66.3	3.8	2.1

## NOTE ON ABOVE TABLE RELATIVE TO FIBRE.

In the above table the fibre is given. It was determined by running three average stalks through the cutter and comminutor. After mixing well, duplicate samples were taken and analyzed. Fibre determinations as usually determined in technical work are at best only approximate. The nodes vary in fibre content from the internodes. Different parts of the same stalk, top, middle and butt, contain different amounts of fibre. The hard outer bark is largely fibre, while the inner pith is quite low in this substance. To obtain a fair sample for analysis entire canes should be cut up into small pieces and these ground to a fine powder and thoroughly mixed. While striving at accuracy in obtaining proper samples enormous errors creep in, due to the rapid evaporation from the finely divided cane, during the long time required for the preparation of the samples. In the regular march of the sugar house, where diffusion is practiced, the cutting up of the cane by the cutter, the transfer by carriers to the comminutor and the elevation of the chips to the battery, where small samples are taken at frequent intervals and these samples mixed thoroughly together, and from the mixture laboratory samples taken, constitute the best method known to us of obtaining true representatives of the canes to be analyzed. Even by this process of sampling duplicates of fibre determination sometimes fail to agree.

In the above fibre determinations only three stalks were used, and hence imperfect sampling, which doubtless gives rise to results not strictly accurate. Other determinations were made on the juice and are accurate.

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The following tables give the yield and analyses of the foreign varieties grown in the experimental plat. Table V. gives the plant cane for 1893 and Table VI. gives the first year stubble. The tonnage varies considerably, especially in the first year stubble. This variation is due partly to defective stands with the plant cane and to the difference of ratoon qualities in the various types of cane. Some of these canes ratoon well, others, *e. g.*, the Norman, not at all.

TABLE V.

VARIETIES OF CANE—PLANT—PLAT VII. "C," UNTILED—1893.

NAME OF VARIETY.	Tonnage per Acre.	Brix.	Sucrose.	Glucose.	Solids not Sugar.	Glucose Ratio.	Purity Coefficient.
Panache	39.52	14.1	10.4	1.90	1.80	18.27	73.73
LaPice	27.22	13.2	8.6	2.59	2.01	10.11	65.15
LeSassier	36.31	13.9	10.0	2.04	1.86	20.4	71.94
Bourbon	35.39	15.4	11.3	2.10	1.70	18.10	75.32
Crystallina	35.84	13.2	9.1	2.53	1.57	27.80	68.94
Green	31.76	15.2	12.1	2.00	1.10	16.52	79.60
Light Java	42.65	12.2	7.7	2.56	1.94	33.24	63.11
Hope	26.82	16.5	13.5	1.74	1.26	12	81.81
Yellow	40.38	14.0	9.1	3.45	1.45	37.91	65.00
Otaheite	43.10	14.0	8.8	3.18	2.02	36.13	62.85
Loucier	31.70	13.9	9.0	3.57	1.33	39.66	64.74
Portier	48.55	15.0	11.1	2.86	1.04	25.76	74.00
Lahaina	28.13	14.4	9.9	3.06	1.44	30.90	68.75
Keni Keni	12.70	11.9	7.4				62.18
China	56.26	13.6	9.0	3.18	1.42	35.33	66.17
Green Elephant	26.31	13.2	9.0	2.53	1.67	28.11	68.18
Rose Bamboo	29.04	13.9	9.6	2.19	2.11	22.81	69.06
Salangore	34.96	13.2	8.3	3.39	1.51	40.80	62.87
Vulu Vulu	36.34	14.0	9.3				66.43
Kokea	60.5	14.9	11.3	1.77	1.83	15.66	75.83
Uwala	10.89	14.0	9.1	3.16	1.74	34.72	65.00
Lakona	36.75	14.4	10.6	1.81	1.92	17.73	73.61
Cuban	34.48	10.7	5.2	3.39	2.11	65.19	48.59
Sacuri	35.84	17.1	14.3	1.20	1.60	8.32	83.62
Caledonia Queen	50.92	11.9	6.8	3.45	1.65	50.73	57.14
Bamboo	40.3	12.6	8.2	2.86	1.54	34.87	65.08
Malay	28.13	12.5	7.3	3.85	1.85	52.73	58.40
Brisbane	26.31	8.0	2.7	3.45	1.85	127.77	33.75
Green Rose Ribbon	32.67	11.6	6.5	3.63	1.47	55.84	56.03
Tsimbic	24.50	15.3	11.1	2.66	1.54	23.96	72.54
Ysaquia	31.76	11.1	5.8	3.45	1.85	59.08	52.25
Vituahaula	15.87	14.8	9.1	4.17	1.53	44.72	61.48
Horne	36.75	14.2	10.5	1.94	1.76	18.47	74.00
Aiuakea	34.48	13.7	8.4	3.57	1.73	42.50	61.31
Kainio	39.02	13.0	8.2	3.45	1.35	44.09	63.07
Akilolo Light Striped	32.67	13.3	8.5				63.91
Akilolo Dark Striped	41.29	11.1	5.9	3.83	1.37	64.91	53.15
Mannulete	28.58	13.3	8.6				64.66
Cavengerie	44.01	11.8	6.5	3.28	2.02	50.46	55.08
Altamattie	38.11	13.3	8.7	2.99	1.61	34.37	65.41
Po-a-ole	41.29	12.5	8.0				64.00
Norman	11.34	12.5	7.6	2.90	2.00	38.15	60.80
Graud Savanne	14.52	10.8	5.0	4.09	1.71	81.8	46.29
Naga	33.12	15.2	11.4	2.33	1.47	20.48	75.00
Purple Elephant	39.47	11.5	6.4	3.33	1.77	52.03	55.65
Ohia	23.14	12.9	7.2	3.57	2.13	49.58	55.81



TABLE V—Continued.

VARIETIES OF CANE—PLANT—PLAT VII. "C," UNTILED—1893.

NAME OF VARIETY.	Tonnage per Acre.	Brix.	Sucrose.	Glucose.	Solids net Sugar.	Glucose Ratio.	Purity Coefficient.
Honuaula.....	29.84	11.0	4.7	4.44	1.86	94.46	42.72
Papaa.....	30.90	13.0	7.5	3.45	2.05	46.00	57.6
Cnapa.....	49.45	14.0	9.6	.....	.....	.....	68.57
Lignana.....	24.04	14.7	11.4	1.56	1.74	13.68	77.55
Soniat.....	43.10	16.0	13.4	1.28	1.32	9.85	83.78
Nicholls.....	35.84	14.0	10.5	1.89	1.61	18.00	75.00
Bird.....	46.28	16.1	13.5	1.19	1.41	8.81	83.21
Garig.....	52.18	15.7	13.1	1.37	1.23	10.45	83.43

TABLE VI.

VARIETIES OF CANE—1st YEAR'S STUBBLE—PLAT VI. "D"—UN-  
TILED—1893.

NAME OF VARIETY.	Tonnage per Acre.	Brix.	Sucrose.	Glucose.	Solids net Sugar.	Glucose Ratio.	Purity Coefficient.
Bourbon.....	39.51	13.8	9.8	1.91	2.09	19.48	71.01
Crystallina.....	51.11	12.9	8.9	2.19	1.81	24.60	69.00
Green.....	39.15	15.1	11.8	1.82	1.45	15.42	78.14
Light Java.....	31.17	14.3	10.2	1.91	2.29	18.72	71.32
Hope.....	32.98	14.95	11.9	1.87	1.18	15.71	79.59
Yellow.....	50.02	13.90	9.7	2.29	1.91	23.60	69.78
Otaheite.....	27.91	13.40	8.5	2.86	2.04	33.65	63.35
Loucier.....	30.81	15.30	11.2	2.59	1.51	23.12	73.20
Portier.....	7.25	13.10	8.6	2.86	1.64	33.25	65.64
Lahaina.....	9.06	14.70	9.1	2.17	2.33	23.84	61.90
Keni Keni.....	8.33	10.60	5.5	3.23	1.87	58.72	51.88
China.....	10.15	14.00	9.8	2.12	2.08	21.63	70.00
Green Elephant.....	25.37	11.80	7.4	2.78	1.62	37.56	62.71
Rose Bamboo.....	30.23	13.40	9.2	2.10	2.10	22.06	67.16
Salangore.....	9.06	10.50	5.4	3.15	1.95	58.38	51.43
Vulu Vulu.....	11.96	13.50	8.9	2.74	1.86	30.78	65.92
Pupuha.....	42.85	16.40	13.10	1.20	2.10	9.16	79.87
Kokea.....	48.57	14.6	10.9	1.64	2.06	15.04	74.65
Lakona.....	42.77	14.1	10.4	1.55	2.15	14.90	73.75
Cuban.....	27.55	15.3	11.3	1.67	2.33	14.78	73.85
Sacuri.....	10.15	16.4	13.2	1.33	1.87	10.07	80.48

TABLE VI.—Continued.

VARIETIES OF CANE—1ST YEAR'S STUBBLE—PLAT VI. "D"—UN-  
TILED—1893.

NAME OF VARIETY.	Tonnage per Acre.	Brix.	Sucrose.	Glucose.	Solids not Sugar.	Glucose Ratio.	Purity Coefficient.
Caledonia Queen...	19.57	15.1	10.3	2.76	2.04	26.79	68.21
Japanese.....	43.24	16.6	12.8	1.45	2.35	11.33	77.10
Bamboo.....	55.46	13.7	8.7	2.53	2.47	29.08	63.50
Malay.....	31.17	13.1	8.7	.....	.....	.....	66.41
Brisbane.....	15.95	8.7	3.5	.....	.....	.....	40.23
Green Rose Ribbon.....	17.03	14.1	9.1	3.65	1.35	40.11	64.54
Tsimbic.....	15.58	15.4	11.5	2.08	1.82	18.08	74.67
Ysaquia.....	47.85	11.0	5.7	.....	.....	.....	51.81
Vitnahaula.....	7.97	14.7	8.8	3.70	2.20	42.04	59.86
Horne.....	39.51	14.3	10.5	1.75	2.05	16.66	73.42
Ainakea.....	32.26	11.7	6.4	3.57	1.73	15.78	54.70
Kainio.....	27.91	10.0	5.0	.....	.....	.....	50.00
Akilolo Light Striped.....	12.68	12.8	7.7	3.65	1.45	47.40	60.15
Akilolo Dark Striped.....	21.75	10.3	4.6	4.00	1.70	86.95	44.66
Manulete.....	21.38	11.7	6.6	3.44	1.46	55.13	56.41
Javengerie.....	55.10	12.0	6.9	3.45	1.65	50.00	57.50
Altamattie.....	59.84	13.0	8.4	2.78	1.82	33.08	64.61
Po-a-ole.....	31.17	13.5	9.0	3.12	1.36	34.66	66.66
Norman.....	Failed	.....	.....	.....	.....	.....	.....
Grand Savanne.....	33.35	13.4	7.9	.....	.....	.....	58.95
Naga.....	17.40	13.8	9.4	2.63	1.77	27.97	68.11
Purple Elephant.....	46.40	13.3	8.8	2.70	1.80	30.68	66.16
Cuapa.....	60.17	13.9	9.8	1.80	2.30	18.36	70.50
Liguana.....	25.73	14.6	10.9	1.76	1.94	16.14	74.65
Nicholls.....	48.21	13.10	9.5	1.89	1.71	18.89	72.52
Bird.....	39.87	14.20	11.0	1.79	1.44	16.27	77.46
Garig.....	43.03	16.50	13.9	1.09	1.51	7.84	84.27
Breheret.....	49.66	13.90	10.0	2.44	1.49	24.10	71.96

## PART IV.

### COMPARATIVE MERITS OF OUR HOME CANES—THE STRIPED AND THE PURPLE.

In Bulletin No. 14, page 377, the origin of our red or purple ribbon cane is given. Quoting from Mr. J. B. Avequin, it is pronounced a native of Java and was introduced from Batavia to the West India islands about the middle of the last century. Mr. King, of Savannah, Ga., brought a schooner load of it from the island of St. Eustatius and planted it on St. Simon's Island, near the mouth of the Savannah river, in 1814. Mr. John J. Coiron brought a dozen or more stalks from Savannah in 1817 and planted them in his garden at Terre aux Bœufs. He followed this small importation with a sloop load in 1825 and planted them on the St. Sophie plantation below New Orleans. This is the origin of our striped cane.

The violet or purple is asserted to be a degenerate variety of the striped. This assertion, strongly combatted by some, rests upon fairly good testimony. Old planters assert that a plantation started with striped canes will ultimately contain only purple. In the northern confines of the cane sugar district, only purple canes are found. Fields planted only with striped canes, will show in a few years and sometime the first year, both purple and white canes, evidencing a lack of permanency in this striped cane—a property common to all striped varieties. The Station has studied this transformation with intense interest and has found occasionally white stalks with the purple stripe so faintly delineated as to escape casual observation, and simultaneously purple canes with white stripes almost as faintly portrayed, and both mixed with the pure striped canes, with every proportion of the two colors. This evolution of the striped cane gives two offsprings, the one white with a much more delicate nature, the other purple, far more hardy.

Indeed, in the differentiation to suit its environments the striped cane seems to have adopted the purple color as one "fittest to survive." The word color is used because, as will presently be shown, its superiority in sucrose content, tonnage, etc., can

hardly be determined, so nearly equal are the claims. The purple color seems to bestow upon it a thicker rind, a greater capacity to absorb heat, and therefore a hardier nature and increased powers of reproduction.

A few years ago, taking advantage of some of the many bud variations, to which all striped canes are subjected, the Station originated four new canes, to which the names "Soniata," "Bird," "Nicholls" and "Garig" were given. See Bulletin No. 14, page 379, for detailed statement. These canes have been selected carefully now for four years and yet the striped varieties show no permanency of type.

A few years since the Mexican striped was imported from Mexico, the Batavian Striped from Java and the Red Ribbon from Jamaica. They were found after cultivation to be identical with our home "striped." The cultivation of the Batavian and Red Ribbon has however been continued with every effort to keep them separate and pure. They are fine canes, giving large stalks, and are very attractive to the eye, but transformations similar to those described above are already noticeable, and purple stalks are occasionally found, sometimes in the middle of the plat.

To test the comparative merits of our home canes, experiments were begun in 1890 of selecting and planting each separately, and have been since continued.

The results of 1890 and 1891 were reported in Bulletin No. 14, page 394, *et seq.* Since that time fresh plats have been planted yearly, duplicating experiments with striped and purple varieties upon tiled and untiled lands. In 1892 twenty experiments were made with each, covering the capabilities of these canes for appropriating different fertilizers. In 1893 twenty-four of each, covering physiological questions, were made. These added to those of 1891, with varying widths of rows with and without fertilizers, and those of 1890 involving only widths of rows, give us in all 174 experiments for each cane, extending over four years and covering plant and first and second year subplots. In, two of these plats, one plant and one first



versus standing for the preservation of the cane for the mill. The standing cane of both has been further subdivided into topping and untopping to test the suggestive question whether the prompt removal of the sour bud may not arrest the downward fermentation in the stalk.

In all of our experiments three rows of equal length and width are used. In experiments in windrowing, the middle row of each was cut, counted and weighed, worked up in sugar house with great care, with the laboratory following it upon duplicate samples from the canes to the sugar. Simultaneously with the cutting of the middle row, the left hand row was windrowed and the right hand one left standing. After the lapse of a month or more both were separately harvested, being treated identically as the first.

Equal number of standing rows of each variety were topped when the left handed row was windrowed. Otherwise they, too, were treated as the rest. These experiments were undertaken to test the relative capabilities of these canes for resistance under such treatment. The details of these experiments will be given in a separate bulletin, only the average results being given in these pages. Tables VII. and VIII. give results of Plat VIII. d, untiled, first year stubble, 1892, and second year stubble, 1893.

**TABLE VII.**  
**SECOND YEAR STUBBLE, 1893—PLAT VIII, "D"—UNTILED—COMPARATIVE RESULTS OF STRIPED AND PURPLE**  
**CANES—AVERAGE OF THIRTY EXPERIMENTS.**

	STALKS IN A Row.			Average Weight of Stalk.	Tonnage.	Brix.	Total Solids.	Sucrose.	Glucose.	Solids not Sugar.	Fibre.	Purity Coefficient.	Glucose Ratio.
	May.	July.	November.										
Striped, all experiments.....	202	568	280	1.80	23.87	14.7	14.2	11.5	1.42	1.81	.....	78.23	12.34
Purple, all experiments.....	249	604	284	1.68	24.87	14.7	14.4	11.58	1.26	1.89	10.52	80.41	10.86
Striped, 3 feet rows.....	133	456	216	1.53	22.61	15.3	15.0	12.3	1.33	1.70	.....	82.00	10.81
Purple, 3 feet rows.....	141	454	225	1.56	23.75	14.9	14.5	11.8	1.3	1.76	10.90	81.37	11.10
Striped, 4 feet rows.....	179	544	261	1.68	23.15	14.5	14.1	11.3	1.62	1.68	.....	80.14	14.33
Purple, 4 feet rows.....	222	629	296	1.66	25.86	14.7	14.3	11.7	1.24	1.82	9.53	81.81	10.59
Striped, 5 feet rows.....	151	621	294	1.88	24.86	14.2	13.8	10.9	1.25	1.78	.....	78.94	11.46
Purple, 5 feet rows.....	307	648	336	1.82	25.25	14.5	14.3	11.2	1.22	2.08	11.13	78.25	10.88
Striped, 6 feet rows.....	264	629	277	2.30	24.84	14.7	14.2	11.4	1.49	2.07	.....	80.28	13.07
Purple, 6 feet rows.....	303	599	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

TABLE VIII.

FIRST YEAR STUBBLE, 1892—PLAT VIII, "D"—UNTILED—COMPARATIVE RESULTS OF STRIPED AND PURPLE CANES—AVERAGE OF THIRTY EXPERIEMENTS.

	STALKS IN A ROW.		Weight of Average Stalk.	Tonnage.	Brix.	Sucrose.	Glucose.	Solids not Sugar.	Fibre.	Purity Coefficient.	Glucose Ratio.
	May.	Harvest.									
Striped Canes, all experiments.....	289	299	1.89	27.89	15.25	11.50	1.62	2.14	11.00	75.41	14.08
Purple Canes, all experiments.....	307	346	1.87	29.03	15.43	11.30	1.72	2.00	11.17	75.18	15.22
Striped Canes, 3 feet rows.....	271	236	1.75	32.32	15.90	12.29	1.51	2.10	11.11	77.30	12.29
Purple Canes, 3 feet rows.....	254	295	1.60	28.88	14.60	10.70	1.85	2.05	11.28	73.28	17.28
Striped Canes, 4 feet rows.....	284	310	1.71	26.82	14.87	11.30	1.65	1.92	11.21	75.99	14.60
Purple Canes, 4 feet rows.....	305	289	1.72	27.53	15.30	11.83	1.71	1.76	10.91	77.32	14.45
Striped Canes, 5 feet rows.....	274	293	1.99	24.88	14.75	10.80	1.73	2.22	10.64	73.22	16.01
Purple Canes, 5 feet rows.....	370	331	2.05	28.60	15.01	11.17	1.70	2.13	10.64	74.41	15.21
Striped Canes, 6 feet rows.....	361	374	1.99	27.53	15.50	11.60	1.58	2.32	11.04	74.83	13.62
Purple Canes, 6 feet rows.....	376	441	2.09	31.13	15.20	11.50	1.62	2.08	11.85	75.65	14.26

The plant cane of 1891 of this plat was given in Bulletin No. 14, page 394 *et seq.* In the first year stubble, on varying widths of rows, with and without fertilizers, the striped canes are fewer in number, larger in size, lighter in tonnage, with a heavier Brix, sucrose, and solids not sugar, and lower in glucose and fibre.

In the second year stubble the same conditions exist as to number and size of stalks, with an equal Brix, while the purple excels in the rest.

In 1892 Plat VI. b and c, unfilled, was planted in duplicate, the object being to test the capacity of these different canes to appropriate different kinds of fertilizers. There were twenty experiments with each variety. This plant cane was continued in 1893 as first year stubble.

Here, with plant cane, the purple has the ascendancy in number of stalks, Brix, sucrose, solids not sugar and fibre. The striped leading in the rest, viz: Size of stalk, tonnage, glucose and alcoholic precipitate.

In first year stubble the purple has again the increased number of stalks, smaller size, less tonnage, larger brix, sugar content, solids not sugar, and with smaller glucose and fibre. Table IX. shows results.

TABLE IX.

PLANT CANE 1892—PLAT VI. "B" AND "C"—UNTILED—COMPARATIVE RESULTS OF STRIPED AND PURPLE CANES—AVERAGES OF TWENTY EXPERIMENTS.

	No. OF STALKS IN PLAT.		Average Weight of Stalks.	No. of Stalks to Acre.	Tons per Acre.	Brix.	Total Solids.	Sucrose.	Glucose.	Solids not Sugar.	Alcohol precipitate.	Fibre.	Purity Coefficient.	Glucose Ratio.
	May.	December.												
Striped Cane, five feet rows.....	465	1083	2.70	29.734	40.71	13.13	12.29	9.46	1.61	2.06	.785	9.47	72.27	17.02
Striped Cane, six feet rows.....	414	1189	2.86	27.325	38.12	13.43	12.56	9.80	1.65	1.98	.697	9.56	72.97	16.83
Striped Cane Average.....	439	1136	2.78	28.529	39.41	13.28	12.42	9.63	1.63	2.02	.741	9.51	72.62	16.97
Purple Cane, five feet rows.....	534	1210	2.43	35.628	29.75	13.47	12.38	9.54	1.63	2.30	.761	9.97	70.82	17.09
Purple Cane, six feet rows.....	498	1206	2.53	27.820	35.01	13.57	12.73	10.11	1.62	1.84	.709	9.85	74.40	16.00
Purple Cane Average.....	516	1208	2.48	31.724	37.38	13.52	12.55	9.82	1.62	2.07	.735	9.91	72.61	16.54



TABLE IX.—Continued.

FIRST YEAR STUBBLE 1893—PLAT VI. "B" AND "C"—UNTILED—COMPARATIVE RESULTS OF STRIPED AND PURPLE CANES—AVERAGES OF TWENTY EXPERIMENTS.

	No. OF STALKS IN PLAT.				Average Weight of Stalks.	Tons per Acre.	Brix.	Sucrose.	Glucose.	Solids not Sugar.	Fibre.	Purity Coefficient.	Glucose Ratio.
	May.	July.	Harvest										
Striped Cane, five feet rows.....	661	1506	895	2.5	31.00	15.04	11.53	1.42	1.92	11.56	76.66	12.31	
Striped Cane, six feet rows.....	705	1406	1035	2.1	30.91	14.91	11.39	1.52	2.00	10.87	76.38	13.34	
Striped Cane Average.....	683	1457	965	2.3	30.95	14.97	11.46	1.47	1.96	11.21	76.55	12.83	
Purple Cane, five feet rows.....	796	1739	1013	2.0	28.59	15.51	12.01	1.23	2.08	10.58	77.49	10.24	
Purple Cane, six feet rows.....	841	1485	1025	1.88	26.98	14.77	11.25	1.48	2.06	10.81	76.16	13.16	
Purple Cane, Average.....	818	1612	1019	1.94	27.73	15.14	11.63	1.35	2.07	10.69	76.81	11.60	

In 1893 Plat VII., "a," tiled, was planted in duplicate to test certain physiological questions relative to their varieties. There were twenty-four experiments in each cane. Each experiment was duplicated with the two canes. The middle row of each experiment was harvested on December 7th, directly after a frost which killed the bud. The left handed rows were windrowed, the right handed left standing. One-half of the standing rows were topped at once. Table X. gives the results, separately and collectively.

**TABLE XI.**  
COMPARISON OF STRIPED AND PURPLE CANES FOR FOUR YEARS.

	STALKS - IN PLAT IN			Average Weight of Stalks.	Tonnage per Acre.	Brix.	Sucrose.	Glucose.	Solids not Sugar.	Fibre.	Purity Coefficient.	Glucose Ratio.
	May.	July.	Harvest.									
<i>Average Four Years.</i>												
Striped plant cane.....	411	1692	1087	2.89	40.40	13.24	9.79	1.59	1.86	9.24	73.18	16.24
Purple plant cane.....	459	1769	1151	2.61	38.48	13.28	9.61	1.61	2.04	10.02	72.36	16.75
<i>Average Three Years.</i>												
Striped first year stubble.....	775	1457	931	2.27	33.22	14.74	11.19	1.60	1.93	10.67	75.91	14.29
Purple first year stubble.....	869	1612	1029	2.03	31.07	14.79	11.24	1.54	1.98	11.14	75.99	13.70
<i>One Year.</i>												
Striped second year stubble.....	606	1704	840	1.80	23.87	14.70	11.50	1.42	1.81	.....	77.86	12.34
Purple second year stubble....	747	1812	852	1.68	24.87	14.70	11.58	1.26	1.89	10.52	78.77	10.88
<i>Average of all.</i>												
Striped.....	597	1618	956	2.32	32.49	14.23	10.83	1.54	1.87	9.95	76.10	14.22
Purple.....	692	1731	1012	2.11	31.44	14.26	10.81	1.47	1.97	10.56	75.80	13.60

In the final summing up we find the following : The striped cane has a larger stalk, gives a slightly larger tonnage with slightly less solids not sugar and fibre. The purple cane is conspicuous for its increased powers of germination and multiplication, and to the latter fact may probably be ascribed the generally smaller stalk. In Brix and sucrose there is a wonderfully close agreement, with but a slight difference in glucose. In fact, beyond the reproductive power of purple and the larger size of stalk of the striped, the two canes may be said to be almost identical. Higher fibre and solids not sugar attach to the purple and may to some extent modify its manipulation in the mill and vacuum pan. Otherwise the two canes are similar.

In the above table the germinative or reproductive power of the purple exceeded that of the striped by 16 per cent. By actual count this has frequently risen as high as 20 per cent., and sometimes more. At harvest 6 per cent. more purple stalks existed than striped.

These facts suggest the true reason for the final survival of the purple in a field where originally both canes existed. With sixteen per cent. more reproductive power, it will be but a short time before it will be master of a field.



