

MAIN POINTS OF SOME OF THE IMPROVED SUGARCANE VARIETIES FROM THE CULTIVATORS' VIEW POINT

BY T. G. MENON, B.A., B.Sc., Ag.

Post Graduate Student, Imperial Institute of Agricultural Research, Pusa.

The sugarcane station at Coimbatore has evolved a number of new cane varieties which are rapidly ousting the indigenous ones in all the provinces. The thin and the medium thick canes are specially evolved to suit the demands of the North Indian cane cultivators who supply their canes to the mills. With a severe summer, when the temperature goes up to 110-112°F. for several days, and with an indifferent system of cultivation as is practised by most of the ryots in North Bihar under non-irrigated conditions, the only possibility of improving the cane supply for a successful cane industry is to evolve drought resistant varieties which give a fairly high tonnage and sucrose content.

The Agricultural Section at Pusa which has been the central agency for the distribution and spread of improved canes in the sugarcane tract, chiefly parts of the United Provinces, has been testing all canes sent out by the Imperial Sugarcane Station as to the suitability of growing them under the North Indian cultivators' conditions. The canes distributed by this section are spreading rapidly and all over the tract the improved varieties have come to stay. For instance, the 1931-32 estimates of the area under improved canes for the United Provinces and Bihar and Orissa (1930-31) would reveal the popularity of these canes.

	1931-32	1930-31
	Total Estimates	Area under improved canes over 70% of total area
United Provinces	1,554,000	
Bihar and Orissa	279,000	72,484

For these two provinces especially, sugarcane cultivation has been the sheet anchor for the agriculturists and the indigenous varieties are being displaced rapidly. This will again be evident from the fact that in 1930-31 season, 66,748 lbs. of sugarcane setts were distributed by the Imperial Department of Agriculture (1930-31). It will not be too much to say that today, the sugarcane industry in this tract is entirely dependent on the improved canes and in no respect has the readiness of the cultivator to accept an improvement been clearer, than in his adoption of the improved canes distributed by the Agricultural Section, Pusa.

In view of the added impetus to the sugarcane industry by way of sugar tariff of Rs. 7-4-0 per cwt. on foreign sugar, and the consequent increase of the area under sugarcane, it is but fitting that an attempt should be made to make a comparative study of the improved canes which are now, or shortly will be, available to the cultivator.

The more important canes which have so far been distributed by the agricultural section, or are being tried on an extensive scale under normal conditions, are the following :—

Co. 210, Co. 213, Co. 214, Co. 281, Co. 285, Co. 299, Co. 312, Co. 316, Co. 331 and Co. 205.

Co. 210 is of comparatively shorter growth than *Co. 331*. Canes are zig-zag, joints purple, internodes of medium length (four to five inches); canes are round, purple, with abundant foliage of light green colour, leaves long, of medium width, and of spreading curvature. Tillers good and five to six; the variety is a drought-resistant. It is now the standard cane and grown all over North Bihar. Yield six to seven hundred maunds per acre on good land; Sucrose 16 per cent. This is suitable to lighter lands, but grows on any type of soil.

Co. 213 has an erect habit, with canes usually straight, joints purple. Foliage is dark green and abundant; long, wide lamina. Canes straight, medium thick (thin upward) round, internodes of medium length (three to four inches); pink buds prominent and round. Tillers 5—6. Length of cane is four to five feet. It has aerial roots. It is less drought resistant than *Co. 210*. This is fairly resistant to water logging. Yield is 650 maunds per acre on good land. Sucrose 16 per cent. It needs better land, and optimum conditions as regards manuring and cultivation. It withstands lodging.

Co. 214:— This shows a lodging habit especially in rich land. It is very much like *Co. 299* with sub-erect habits; crooked cane, leaf-sheath not easily separated, abundant but dark green foliage, long narrow lamina; nodes even with joints, fair tillering; internodes of medium length; prominent round bud. Length of nodes three to five inches, height four to five feet. Yield about 400 maunds per acre. It is fairly resistant to water logging. The earliest cane not a heavy yielder (400 mds. per acre) but contains high percentage of sucrose. A premium is paid for these canes. It has more than 18 per cent. sucrose. Though this lodges, there is less deterioration in the juice than in other varieties. Its germination is good and uniform. During monsoons its growth is slow.

Co. 281 is an optimum cane. It yields about 600 maunds per acre and has a high sucrose content which goes up to 18 per cent. It is an early cane, ripening in November; does not lodge; but, under ordinary cultivation the variety does not come up well. Its foliage also dies up early and besides is susceptible to the attack of white ant at all stages and of jackals if allowed to remain after December.

Co. 285 has an erect habit, with erect canes, greyish white joints; with leaf-sheaths not easily separated. It has dark green abundant foliage; leaves with long narrow lamina; thin hard canes with nodes a bit thicker than joints, round, and internodes of medium length.

Buds are not so prominent. Tillers well (eight), rich in sugar content. It lodges to a slight extent. If allowed to stand the buds begin to sprout. It is attacked by jackals.

It grows on any land but better on low land which is particularly suitable to it and grows on conditions similar to Co. 205, to which it is preferred, being less fibrous. It yields about 700 to 800 maunds per acre and the sucrose content is 15 per cent. This germinates quicker than most other varieties and grows very quickly in hot weather. The cane formation is quite early. It stands water logging.

Co. 299 seems to do better than Co. 214 and has no tendency to lodge; the canes are zig-zag, yellow jointed, with leaf-sheaths not easily separated. It has a light green abundant foliage. Leaves have long narrow lamina, with erect curvature. Canes are medium thick, the base being thicker; nodes are even with joints; tillering is rather poor. Buds are not prominent. After passing through a rather severe summer with temperature going up to 110 to 112° for over a week, this cane has done better than Co. 214 in tonnage. It promises to be an early cane and may replace Co. 214. In comparison it is a heavy yielder and possesses good agricultural habits. The sucrose content is 17 per cent. The yield is 600 maunds, although it is a little lower on poor lands. It is not a fast grower, but stands drought well. Germination is not uniform, and is slow and late.

Co. 312 is a fast growing variety with pale green leaves. Its germination is good and uniform; tillering good; stands bad weather better than other varieties. This is a soft medium cane and has many good agricultural points except for its tendency to lodge in rich land. Canes are thin, internodes of medium (3-4") length. Sucrose content varies from 13.26 to 16.59 per cent. The yield is 600 maunds.

Co. 316 canes are crooked and have a tendency to lodge; Joints are brown, leaf-sheaths are easily separated, leaves are long and broad, canes are medium thick, with internodes of medium length, 3-4 inches. Tillers fairly well on good land. Its yield is about 350 maunds per acre. It is being tried on light soils. It stands water logging. Sucrose content varies from 14.65 per cent on low land to 18.81 per cent on high land. This is not good as a drought-resister and cracks badly. It is a juicy medium-thick cane.

Co. 331 is a promising variety and has excellent agricultural habits. It is a tall strong erect growing variety, with medium thick purple canes, with fairly long nodes (6-8"). Leaves are long, erect and tough. It tillers fairly well (eight). It resists droughts well and gives a good tonnage but matures late; sucrose content is 15 per cent. Yield is 720 maunds as calculated from a small area.

Co. 205 is, from the point of the mill not a desirable variety as it contains over 20 per cent. of fibre. But it is specially suited to water

logged situation, where it grows vigorously with bushy growth. It tillers fairly well. People in the Punjab prefer this because the gur (jaggery) made from this is of superior quality and the variety is less liable to damage by men and animals than other varieties it. Further it grows on poor land with less manuring. These and a few more are still under experiment. The sucrose content is 14 per cent. and the yield 400 maunds.

Yield, sucrose percentage and main points at a glance.

Variety	Average yield.	Sucrose %	Remarks.
205	400	14	Late cane. Fibre over 15 per cent.
210	600-700	16	Standard cane. Drought resistant. Grown on light lands.
213	650 on good land	16	Needs better land. Stands water logging to a certain extent.
214	400	18	Earliest cane. Premium offered by mills. Fairly resistant to water logging.
285	700	15	Suitable for low lands. Less fibrous than Co. 205. Grows on similar conditions. To be preferred to Co. 205.
331	720	15	Excellent agricultural habits but late variety. Resists drought well.
312	1931 trial 600	(1931 analysis) 15.5
316	400	(1931 analysis) 16	Being grown on light lands.
281	600	(1931 analysis) 18	Optimum cane. An early cane ripening in November.
299	600	17	Seems to be better than Co. 214 in tonnage. Has good agricultural habits. Promises to be an early cane and may replace Co. 214.

Acknowledgment. The author's best thanks are due to Mr. Wynne Sayer, Imperial Agriculturist for his critical suggestions and to Mr. Arjan Singh for providing certain figures.

References.

- Annual Report of U. P. Department of Agriculture. (1930-31).
 Scientific Report of the Imperial Institute of Agricultural Research, Pusa (1930-31)

"CHROMOSOMES AND PLANT BREEDING"*

The lecture dealt with the study of chromosomes in relation to sterility. Sterility could be classified under three heads: (1) Relational sterility, where the pollen grains of one plant are not able to grow on the styles of the same plant. This is due to self incompatibility which is governed by the interaction of certain genes; (2) Morphological sterility where malformation of sexual organs enters into the causation of sterility and this is also genetically determined and is governed by a single gene; and (3) Generational sterility, which is by far the most important, is due to the segregation of chromosomes at meiosis.

* Abstract of a lecture delivered by Dr. C. D. Darlington Ph. D., D.Sc. Cytologist, John Innes Horticultural Institution, London, under the auspices of the Association of Economic Biologists, Coimbatore on 13th August 1933.