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Study about the Physical Properties of Sugarcane Crop in Kawardha (Kabirdham) District, Chhattisgarh, India

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A B S T R A C T

Sugarcane, (*Saccharum officinarum*) L., is one of the several species of tall perennial true grasses of the genus Saccharum. Sugarcane is the source of sugar in all tropical and subtropical countries of the world that belongs to family Poaceae. The various physical parameters of sugarcane crops such as Length, diameter of cane and node distance, were studied in Kawardha district, (C.G.). Different varieties of sugarcane were available in Kawardha District (C.G.) such as Co-80036, Co-86032, COVSI-9805, Co-8014 and COM-0265. It was found that sugarcane length: 2000 to 3000 mm, diameter: 30 to 50 mm. The parameters depend on their variety, soil and climatic condition.

Introduction

India is the second-largest producer of sugarcane in the world and Brazil in first position. Sugarcane is an important commercial crop (industrial crop), with acreage of about 4 million hectares and production of 300 million tonnes in India. In India's sugar production increased to 11.5% during 2014-15, season on bumper cane production, the world sugar production amounted to approximately 175.1 million metric tons. Asia was the largest sugar-producing region in the world, yielding approximately 66.12 million metric tons of sugar. India, China and Thailand where the region's top sugar producers (www.business-standard.com). Physical parameters such as length and diameter of millable cane, node characteristics, leaf characteristics and amount of trash for the major varieties of sugarcane are measured in the farmers' field at Kawardha district, Variety is given as - Co-80036. Blackburn (1984) describes sugarcane as a tall tropical grass with a single un-branched stem of average height in the range of 3 to 4m with a stem diameter ranges from 3 to 5cm depending on the species. Bull (2000) reported that inter node length can reach over 30 cm, depending on growth conditions, and

stems normally reach two to three metres in the normal growing season.

Materials and Methods

The various physical parameters such as length and diameter of millable cane, node distance, row to row and plant to plant for the different varieties (Such as Co-80036, Co-86032, COVSI-9805, Co-8014 and COM-0265.) of sugarcane are measured in the farmers' field in Kawardha (Kabirdham) district,(C.G.)

Length of the sugarcane

The millable cane length in the farmers' field is measured using a 3m measuring tape and is recorded. Matured cane lengths were measured of different variety in the field. Sugarcane variety in Chhattisgarh are Co-80036, CO-86032, COVSI-9805, CO-8014 and COM – 0265.

Diameter of the cane

The diameter of the matured sugarcane was observed in the different varieties. The diameter of the sugarcanes was measured at three different positions viz., top, middle and bottom. The diameter varied from top to bottom and the variations depended upon the soil type and the climatic conditions prevailing in the growth phase of the sugarcane. From the data, it is clear that the crop growth is less in the dry land conditions than the wet land conditions and irrigated conditions. The diameter of cane varieties of Co-80036, Co-86032, COVSI-9805, CO-8014 and COM – 0265.

Results and Discussion

Physical properties of sugarcane crop at the time of harvest were studied for the harvesting. The various physical parameters such as length, diameter of cane, cane, row to row and plant to plant distance were studied in Kawardha (Kabirdham) district, (C.G.).

Length of the sugarcane

The lengths of sugarcane, five different verities of sugarcane locally grown in the Kawardha district were measured from the field (Table 1).

It was observed that average length of sugarcane varieties was found to be Co-80036, Co-86032, COVSI-9805, Co-8014 and COM-0265 was 206, 159.7, 174.4 176 and 202.2 cm respectively. The range of the millable cane variety of Co-86032 was found to be 132 cm to 200 cm which was lowest and 140 to 300 was highest among observed varieties.

Diameter of the cane

The diameter of sugarcane of different varieties, 5 verities were measured from the field and interpreted in the Table 2.

The diameter of sugarcane of different varieties, 5 verities were measured from the field and interpreted in the Table 2 It was observed that average maximum and minimum diameter of sugarcane variety was found to be Co-86032 (top, middle and bottom diameter of sugarcane was found that the, 2.85, 3.15 and 3.38 respectively.) and Co-80036 (top, middle and bottom diameter of sugarcane was found that the, 2.63, 2.81 and 3.10respectively), respectively. The range of the sugarcane diameter variety of Co-86032 was found to be top, middle and bottom diameter of sugarcane was 2.2 to 3.5, 2.5 to 3.91 and 2.7 to 4.13 respectively, which was highest and the top, middle and bottom diameter of sugarcane was found the 2.16 - 3.34, 2.3 - 3.5 and 2.54-3.18 respectively, was lowest among observed varieties Co-80036.

Table.1 Length of different variety of sugarcane crop

Variety	Co-80036	Co-86032	COVS I-9805	Co-8014	COM-0265
length, cm	206.0	159.7	176.4	176.0	222.2
Range, cm	140-300	132-200	150-205	140-210	168-280
S.D.	55.16	20.16	19.35	29.03	49.99

Table.2 Diameter, cm of different variety of sugarcane crop

Variety	Particular	Average diameter, cm	Range, cm	S.D. (σ)
Co-80036	Top	2.632	2.16 to 3.34	0.472
	Middle	2.811	2.3 to 3.5	0.462
	Bottom	3.103	2.54 to 3.18	0.483
Co-86032	Top	2.854	2.2 to 3.5	0.519
	Middle	3.15	2.5 to 3.91	0.533
	Bottom	3.38	2.7 to 4.13	0.509
COVSI-9805	Top	2.613	2.0 to 3.2	0.421
	Middle	3.091	2.5 to 3.82	0.483
	Bottom	3.28	2.76 to 3.97	0.470
Co-8014	Top	2.931	2.21to 3.81	0.606
	Middle	3.40	2.40 to 4.29	0.470
	Bottom	2.98	2.2 0 to 3.66	0.586
COM-0265	Top	2.88	2.3-3.43	0.457
	Middle	3.13	2.5 to 3.8	0.485
	Bottom	3.3	2.7 to 3.84	0.488

Table.3 Different morphometric properties of sugarcane crop

Variety	Particular	Average, cm	Range, cm	S.D. (σ)
Co-80036	Node distance, T	14.54	12.5 to 16.3	1.1946
	Node distance, M	15.56	13.9to17	1.1027
	Node distance, B	8.47	7 to 10	0.861
Co-86032	Node distance, T	10.46	9to 12	1.152
	Node distance, M	9.88	8 to 12	1.342
	Node distance, B	6.80	5to7.52	0.955
COVSI-9805	Node distance, T	8.42	7 to10	0.937
	Node distance, M	12.51	11to2.5	1.018
	Node distance, B	5.85	4.9to 7	0.59
Co-8014	Node distance, T	11.84	11to13	0.52
	Node distance, M	10.32	9 to13	1.25
	Node distance, B	6.77	5to 8	0.96
Co-0265	Node distance, T	9.51	8 to 11.2	1.09
	Node distance, M	12.14	10 to 13.5	1.28
	Node distance, B	7.74	5 to 11	1.84

The variations in Co-86032 for stem was observed highest (σ:0.519, 0.533 and 0.509 was found the top, middle and bottom diameter of sugarcane respectively), whereas it was lowest in case of Co-80036. (σ: 0.472, 0.462 and 0.483 was found the top, middle and bottom diameter of sugarcane respectively).

Different variety of morphological characteristics of sugar cane crop

The node distance of sugarcane of five different varieties were measured from the field and interpreted in the Table 3.

It was observed that average maximum and minimum node distance of sugarcane variety was found to be Co-80036 (top, middle and bottom node distance of sugarcane was found that the, 14.54, 15.56 and 8.47 respectively.) and Co-86032 (top, middle and bottom node distance of sugarcane was found that the, 10.46, 9.88and 6.80respectively), respectively. The range of the sugarcane node distance variety of Co-86032 was found to be top, middle and bottom, node distance of sugarcane was 12.5 to 16.3, 13.9 to 17 and 7 to 10 respectively, which was highest and the top, middle and bottom node distance of sugarcane was found the 7 to 10, 11 to 12.5 and 4.9 to 7 respectively, was lowest among observed varieties COVSI-9805. The variations in COM-0265 for node distance were observed highest COM-0265. (σ: 1.08, 1.282 and 1 was found the top, middle and bottom node distance of sugarcane respectively), whereas it was lowest in case of CO-8014(σ: 0.521, 1.25 and 0.963 was found the top, middle and bottom node distance of sugarcane respectively).

In conclusion this study was understood the physical properties of sugarcane crop. The various physical parameters such as length, diameter and nodal distance were studied in Kawardha district, (C.G).The length of the sugarcane varieties such as Co-80036, Co-86032, COVSI-9805, Co-8014 and COM-0265 was 206, 159.7, 174.4 176 and 202.2 cm respectively. The maximum and minimum diameters such as Co-80036 -cm, Co-86032, COVSI-9805, Co-8014 and COM-0265 were 2.54 to 3.18, 2.7 to 4.13, 2.76 to 3.97, 2.22 to 3.66 and 2.7 to 3.84 respectively.

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